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SPECIAL PROBLEM REPORT
FLOOD INSURANCE STUDIES

Date: OCTOBER 1, 1997

Contract Number: _____

Name of Community: Clark County, Nevada

Study Contractor: G. C. Wallace, Inc.

PROBLEM AREA

TECHNICAL COORDINATION	☒
UNRESOLVED	☐
DISCREPANCIES	☐
UNREALISTIC SCHEDULE	☐
OTHER	☐

DETAILED EXPLANATION THE 1991 FIS HEC-1 MODEL WOULD NOT RUN ON THE SEPTEMBER 1990 VERSION, SO THE 1985 VERSION WAS USED FOR PRELIMINARY DISCHARGES. WHEN MODIFICATIONS TO THE HEC-1 MODEL WERE MADE TO ALLOW IT TO RUN ON THE SEPTEMBER 1990 VERSION, HIGHER DISCHARGES RESULTED.

PROPOSED SOLUTION USE THE HIGHER DISCHARGES FROM THE HEC-1 MODELS RUN ON THE SEPTEMBER 1990 VERSION IN THE HEC-2 MODELS.

SPECIAL PROBLEM REPORT
FLOOD INSURANCE STUDIES

Date: _____

Contract Number: _____

Name of Community: Clark County, Nevada

Study Contractor: G. C. Wallace, Inc.

PROBLEM AREA

TECHNICAL COORDINATION	☐
UNRESOLVED	☐
DISCREPANCIES	☐
UNREALISTIC SCHEDULE	☐
OTHER	☐

DETAILED EXPLANATION

PROPOSED SOLUTION

550.030

FLAMINGO WASH FLOOD INSURANCE STUDY RESTUDY

Monthly Meeting Minutes
September 16, 1997

BY: Jerry Pruitt

PLACE: Clark County Regional Flood Control District

TIME: 10:00 AM

ATTENDING: Kevin Eubanks, CCRFCD; Noel Laughlin, GCW; Jerry Pruitt, GCW; Steve Parrish, CCPW

1. Reviewed the Draft Technical Support Data Notebook. Kevin wants two (2) copies of the draft for review by the next progress meeting October 8, 1997.

2. Reviewed the Draft Work Maps. Kevin wants proposed tie-ins to be shown on the work maps. Discussed making Panel FL0 more legible. Discussed Cameron Street overflow hydraulic analysis. More pictures can be taken in this area if needed. Also, discussed the floodplain delineations at areas near Winnick Avenue, Mojave Road, and Boulder Highway.

3. Discussed Principle Flood Problems. Kevin will provide copies of the Event Reports and Steve will provide photographs of past major flooding events.

4. Discussed Flood Protection Measures. The bridges and culverts are the only facilities other than the Flamingo Wash itself which is represented by the aerial topography.

5. Reviewed FEMA Forms for CCRFCD concurrence. Kevin informed GCW that new FEMA Forms are out and should be available in digital format. Kevin also gave us a hard copy of the new forms.

6. Next meeting scheduled for October 8, 1997 at 10:00 AM at the CCRFCD office.

550.030

FLAMINGO WASH FLOOD INSURANCE STUDY RESTUDY

Monthly Meeting Minutes
August 13, 1997

BY: Jerry Pruitt

PLACE: Clark County Regional Flood Control District

TIME: 10:00 AM

ATTENDING: Kevin Eubanks, CCRFCD; Calvin Black, GCW; Jerry Pruitt, GCW; Allan Fajardo, GCW

1. Reviewed the Summary Memorandum. Kevin was concerned that waiting for the recommended Flamingo Wash maintenance would hold up the project submittal date. GCW will coordinate with CCPW's staff concerning these maintenance issues. Also, GCW will look at what kind of engineering effort it would take to model the problem areas as is.

2. Discussed the Cameron Street Bridge capacity and breakout. More detailed topography is required for the analysis of the breakout flows to Harmon Avenue. GCW will talk to Nevada Aerial Mapping (NAM) to see if they can provide the additional topography and how much it would cost. Also, Kevin requested the digital files for the bridge modelling.

3. Discussed the Winnick Avenue Storm Drain capacity and breakout. More detailed topography is required for the analysis of the breakout flows to Ida Avenue. GCW feels the additional detail could be picked up by a minimal amount of survey work. Also, the decision was made to use 50 percent interception at the inlet structure (i.e. 1750 cfs).

4. Provided rating curves and supporting information for the requested bridge locations.

5. Discussed the SFHA tie-ins to the confluences at the Tropicana Wash breakout which hits along Winnick Avenue and the Tropicana Wash itself which hits at Cambridge Street. These confluence areas will be labeled "Limit of Study."

6. Discussed the project budget. Calvin mentioned some shuffling of money between tasks may be necessary. Kevin stated that internal shuffling is O.K. as long as the project total does not change.

7. Next meeting scheduled for September 10, 1997 at 10:00 AM at the CCRFCD office.

FLAMINGO WASH FLOOD INSURANCE STUDY RESTUDY
AGENDA FOR JULY 11, 1997 MEETING

1. Review previous meeting.

2. Review draft work maps. Input of bridge as-built data in progress.

3. Review tie-in for Zone A from breakout from the Tropicana Wash.

4. TSDN preparation in progress.

5. Discuss schedule.

550.030

FLAMINGO WASH FLOOD INSURANCE STUDY RESTUDY

Monthly Meeting Minutes
June 11, 1997

BY: Noel Laughlin

PLACE: Clark County Regional Flood Control District

TIME: 10:00 AM

ATTENDING: Kevin Eubanks, CCRFCD — Jerry Pruitt, GCW
Steve Parrish, CCPW — Noel Laughlin, GCW

1. Reviewed previous meeting held on April 9, 1997. No meeting was held in May.

2. HEC-2 models in progress. Not all field survey data of bridges has been completed. Bridges being input into model from design drawings and will be refined based on "as-built" data when available

3. Kevin relayed that project for Clark County for frontage road on east side of I-15 will close the gap between the I-15 culvert and the Caesars Palace culvert. GCW will coordinate with CC's engineer.

4. The decision was made to use the higher flow value calculated at the confluence of the Flamingo and Tropicana Washes for the reach of the Flamingo Wash between the north fork and the Tropicana Wash instead of using the flow adjusted by the DARF from the north fork.

5. Discussed the modeling of the culvert at the Orleans casino and the transition from the old culvert at Cameron.

6. The Winnick Ave. storm drain inlet will be modeled using the remaining surface flow above the capacity of the inlet as determined by the physical model prepared by the BOR.

7. Next meeting scheduled for August 13, 1997 at 10:00 AM at the CCRFCD office.

FLAMINGO WASH FLOOD INSURANCE STUDY RESTUDY
AGENDA FOR APRIL 9, 1997 MEETING

CURRENT AND UPCOMING WORK PLAN

1. DATA COLLECTION AND REVIEW

   A) GCW continuing with field survey of existing bridges. Discuss additional structures at Flamingo\Industrial Connector and tennis court between Maryland Parkway and Spencer.

   B) Field reconnaissance conducted on March 31 and April 1. Discuss findings of field recon.

   C) Collection of existing improvement plans in progress.

2. TOPOGRAPHY

   A) GCW has requested 2-foot contour interval and break lines for HEC-2 modeling purposes.

3. BASE MAPS

   A) Base maps have been set up.

4. WORK MAPS

   A) Discuss hydrology tie-ins
   B) Discuss hydraulic tie-ins
   C) HEC-2 modeling in progress

FLAMINGO WASH FLOOD INSURANCE STUDY RESTUDY
AGENDA FOR MARCH 12, 1997 MEETING

1. Review minutes from previous meeting.

2. GCW completed survey control for detailed bridge surveys on March 11, 1997. Field survey to begin March 17, 1997. Duration of field survey is estimated to be 30 days.

3. Site visit has been delayed to March 17 in order to coincide with the start of the bridge surveys.

4. As of March 5, 1997, GCW has received all the aerial topographic mapping. Digital files will be checked for errors.

5. GCW is begining to develop cross section data for hydraulic models.

6. Review results of hydraulic modeling for the UFWDB outfall channel with higher outflow.

550.030

FLAMINGO WASH FLOOD INSURANCE STUDY RESTUDY

Monthly Meeting Minutes
February 19, 1997

BY: Noel Laughlin

PLACE: Clark County Regional Flood Control District

TIME: 10:00 AM

ATTENDING: Kevin Eubanks, CCRFCD — Calvin Black, GCW
Steve Parrish, CCPW — Noel Laughlin, GCW

1. Reviewed modified HEC 1 results without the tributary area to the Red Rock Detention Basin to simulate the USACOE expansion. The change in the DARF without the Red Rock area resulted in a change in the inflow to the Upper Flamingo Wash Detention Basin from 6660 cfs (from the B & V LOMR) to 7794 cfs. This also results in an increase in the outflow from 2579 cfs to 3806 cfs.

   Kevin requested that the B & V HEC 2 model for the outfall channel be run with both flows to estimate the impacts on the channel and surrounding area.

2. Reviewed revised HEC 1 model results with various storm centerings. A summary of the results is attached.

3. Nevada Aerial Mapping is scheduled to begin delivery of topo by February 21, 1997 and should complete by March 7, 1997.

4. Next meeting scheduled for March 12, 1997 at 10:00 AM at the CCRFCD office.

550.030

FLAMINGO WASH FIS RESTUDY
AGENDA FOR JANUARY 1997
PROGRESS MEETING

To: Kevin Eubanks, CCRFCD
Robert Thompson, CCPW
Denis Cederberg, CCPW

The monthly progress meeting will be held at 10:00 AM on January 8, 1997 at the Clark County Regional Flood Control District office. Subsequent meetings to be held on the 2nd Wednesday of each month at the time and place listed above, unless otherwise noted.

DISCUSSION ITEMS

Past Meeting

1. Meeting held on December 3, 1996 at GCW's office. See the attached meeting minutes.

Current and Upcoming Work Plan

1. **Data Collection and Review**

   a) Completed review of TSDN for Upper Flamingo Wash Detention Basin Letter of Map Revision.
   b) Discuss hydrology for Upper Flamingo Detention Basin. Discuss storm centerings with and without the Red Rock watershed included.
   c) Need hydrology from the Red Rock Detention Basin Expansion, if available, for inclusion in TSDN.
   d) Discuss Las Vegas Valley FIS hydrology versus 1996 MPU hydrology.
   e) Field reconnaissance - schedule dates.
   f) GPS Ground control for aerial mapping underway. All panels have been set. Anticipate submitting control data to Nevada Aerial Mapping (NAM) the week of January 20th.
   g) NAM scheduled to fly the project area on January 9, 1997, weather permitting. Aerial topographic mapping to be complete within 25 days from receipt of ground control.
   h) Begin field survey of specified bridges and hydraulic structures.

G.C. WALLACE, INC.

CONFERENCE NOTES BY: Noel Laughlin JOB NO. 550.030

SUBJECT: Flamingo Wash FIS Restudy			
PLACE: G. C. Wallace, Inc.			
TIME: 4:00 PM		DATE: December 3, 1996	
ATTENDING:	Kevin Eubanks, CCRFCD Robert Thompson, CCPW		Calvin Black, GCW Noel Laughlin, GCW

1. Reviewed areas to be mapped by Nevada Aerial Mapping with CCPW and CCRFCD.

2. GCW will include the portion of the Flamingo Wash previously modeled by Willdan & Associates for CCPW.

3. GCW will use the HEC-1 model from the Upper Flamingo Wash Detention Basin LOMR request with the tributary areas to the Red Rock Detention Basin deleted.

4. Progress meeting will be held at 10:00 AM on the second Wednesday of the month at the CCRFCD office.

NCL:sjl

C L A R K C O U N T Y
REGIONAL FLOOD CONTROL DISTRICT

Gale Wm. Fraser, II, P.E.
General Manager / Chief Engineer

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Clark County

November 17, 1997

Federal Emergency Management Agency
Federal Insurance Administration
Office of Risk Assessment
500 C Street, SW
Washington, DC 20472
Attn: Mr. Karl Mohr

Request for Letter of Map Revision
Flamingo Wash Study Area

Dear Mr. Mohr:

On November 14, 1996, the Clark County Regional Flood Control District Board approved and authorized the Chairman to sign an Agreement for Professional Services between the District and G.C. Wallace, Inc. to prepare a flood insurance restudy of the Flamingo Wash from Rainbow Boulevard to the confluence with the Las Vegas wash. A committee consisting of staff members from the District and Clark County worked with G.C. Wallace, Inc. to prepare the enclosed study documents. The committee has had the opportunity to review and comment on the study results throughout its development and is in agreement with the study findings.

This study is based in part on the construction of the Red Rock Detention Basin and Upper Flamingo Detention Basin. These projects were funded by the District and will continue to maintained by Clark County with District funds.

Please accept the enclosed study to support this request for Letter of Map Revision. If you should need further information, Please call.

Sincerely,

Kevin Eubanks, P.E.
Assistant General Manager

Enclosure

cc: Robert Thompson, Clark County Public Works w/o enclosure
Les Sakumoto, FEMA Region IX w/o enclosure

KLE:csm

File: Flamingo Wash FIS

301 E. Clark Avenue, Suite 301 • Las Vegas, Nevada 89101
(702) 455-3139 • FAX: (702) 455-3870

G.C. WALLACE, INC.

MEMORANDUM

550.030

To: Kevin Eubanks, P.E.
Assistant General Manager

From: Jerry E. Pruitt, P.E. JEP

Date: November 3, 1997

Subject: **Flamingo Wash FIS Restudy**
100-Year Storm Flows at Cameron Street

The Effective FIS Model has been revised to reflect the Red Rock Detention Basin Expansion and the Upper Flamingo Wash Detention Basin LOMR. In effect, the Red Rock Detention Basin Expansion reduces the tributary watershed to the Flamingo Wash. However, the reduction in runoff due to the decrease in area is somewhat offset by the associated increase in the Depth Area Reduction Factor (DARF). The Upper Flamingo Wash Detention Basin LOMR increased the volume of the detention basin, which further reduces the downstream peak flows.

The resultant 100-year peak storm flow in the Flamingo Wash at Cameron Street is approximately 3,900 cfs. This memorandum supersedes the August 8, 1997 memorandum. If any further refinement of the hydrology is performed, the CCRFCD will be notified.

If you have any questions, please do not hesitate to call me at 363-1200 ext. 129.

pc: Calvin Black, GCW
Noel Laughlin, GCW
John Martinez, Martin & Martin
John Shields, Summit Engineering

G.C. WALLACE, INC.

MEMORANDUM

550.030

To: Kevin Eubanks, P.E.
Assistant General Manager

From: Jerry Pruitt, P.E. JP

Date: August 8, 1997

Subject: **FLAMINGO WASH FIS RESTUDY**
100-YEAR STORM FLOWS AT CAMERON STREET

The Effective FIS Model has been revised to reflect the Red Rock Detention Basin Expansion and the Upper Flamingo Wash Detention Basin LOMR. In effect, the Red Rock Detention Basin Expansion reduces the tributary watershed to the Flamingo Wash. However, the reduction in runoff due to the decrease in area is somewhat offset by the associated increase in the Depth Area Reduction Factor (DARF). The Upper Flamingo Wash Detention Basin LOMR increased the volume of the detention basin, which further reduces the downstream peak flows.

The resultant 100-year peak storm flow at Cameron Street is approximately 3500 cfs. This hydrology is preliminary and may be revised further in the future. If any further refinement of the hydrology is performed, the CCRFCD will be notified.

If you have any questions, please do not hesitate to call me at 363-1200 ext. 129.

pc: Calvin Black, GCW
Noel Laughlin, GCW
John Martinez, Martin & Martin

31 MAR 97 1 -CCRFCD

Federal Emergency Management Agency

Washington, D.C. 20472

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

IN REPLY REFER TO:
Case No.: 97-09-137P

The Honorable Yvonne Atkinson Gates
Chairperson, Clark County Board
of Commissioners
225 East Bridger Avenue, Sixth Floor
Las Vegas, Nevada 89155

Community: Clark County, Nevada
Community No.: 320003
Panel Affected: 32003C2190 D
Effective Date of
This Revision: MAR 25 1997

102-D

Dear Ms. Atkinson Gates:

This responds to a request that the Federal Emergency Management Agency (FEMA) revise the effective Flood Insurance Rate Map (FIRM) for Clark County, Nevada and Incorporated Areas, in accordance with Part 65 of the National Flood Insurance Program (NFIP) regulations. In a letter dated October 22, 1996, Mr. Tim S. Moreno, P.E., Supervising Engineer, Willdan Associates, requested that FEMA revise the FIRM to show the effects of development of Woodland Park South Tracts A and B; Metropolitan's Woodland Park Subdivision; Greenbriar Tract 7-B; the construction of a culvert under South Mojave Road; and channelization along Flamingo Wash from South Mojave Road to approximately 2,500 feet downstream of South Mojave Road.

All data required to complete our review of this request were submitted with letters from Mr. Moreno, and Mr. Chris O. Stone, P.E., Associate Engineer, Willdan Associates.

We have completed our review of the submitted data and the flood data shown on the effective FIRM. We have revised the FIRM to modify the floodplain boundary delineations of the flood having a 1-percent chance of being equaled or exceeded in any given year (base flood) along Flamingo Wash from South Mojave Road to approximately 2,500 feet downstream of South Mojave Road. As a result of the modifications, the width of the Special Flood Hazard Area (SFHA), the area that would be inundated by the base flood, for Flamingo Wash along the revised reach, decreased. The modifications are shown on the enclosed annotated copy of FIRM Panel(s) 32003C2190 D. This Letter of Map Revision (LOMR) hereby revises the above-referenced panel(s) of the effective FIRM dated August 16, 1995.

The modifications are effective as of the date shown above. The map panel(s) as listed above and as modified by this letter will be used for all flood insurance policies and renewals issued for your community.

A review of the determination made by this LOMR and any requests to alter this determination should be made within 30 days. Any request to alter the determination must be based on scientific or technical data.

We will not physically revise and republish the FIRM and Flood Insurance Study (FIS) report for your community to reflect the modifications made by this LOMR at this time. When changes to the previously cited FIRM panel(s) and FIS report warrant physical revision and republication in the future, we will incorporate the modifications made by this LOMR at that time.

This LOMR is based on minimum floodplain management criteria established under the NFIP. Your community is responsible for approving all floodplain development, and for ensuring all necessary permits required by Federal or State law have been received. State, county, and community officials, based on knowledge of local conditions and in the interest of safety, may set higher standards for construction in the SFHA. If the State, county, or community has adopted more restrictive or comprehensive floodplain management criteria, these criteria take precedence over the minimum NFIP criteria.

The basis of this LOMR is, in whole or in part, a channel-modification/culvert project. NFIP regulations, as cited in Paragraph 60.3(b)(7), require that communities assure that the flood-carrying capacity within the altered or relocated portion of any watercourse is maintained. This provision is incorporated into your community's existing floodplain management regulations. Consequently, the ultimate responsibility for maintenance of the modified channel and culvert rests with your community.

Because this LOMR will not be printed and distributed to primary users, such as local insurance agents and mortgage lenders, your community will serve as a repository for these new data. We encourage you to disseminate the information reflected by this LOMR throughout the community, so that interested persons, such as property owners, local insurance agents, and mortgage lenders, may benefit from the information. We also encourage you to prepare an article for publication in your community's local newspaper. This article should describe the changes that have been made and the assistance that officials of your community will give to interested persons by providing these data and interpreting the NFIP maps.

This determination has been made pursuant to Section 206 of the Flood Disaster Protection Act of 1973 (Public Law 93-234) and is in accordance with the National Flood Insurance Act of 1968, as amended (Title XIII of the Housing and Urban Development Act of 1968, Public Law 90-448), 42 U.S.C. 4001-4128, and 44 CFR Part 65. Pursuant to Section 1361 of the National Flood Insurance Act of 1968, as amended, communities participating in the NFIP are required to adopt and enforce floodplain management regulations that meet or exceed NFIP criteria. These criteria are the minimum requirements and do not supersede any State or local requirements of a more stringent nature. This includes adoption of the effective FIRM and FIS report to which the regulations apply and the modifications described in this LOMR.

If you have any questions regarding floodplain management regulations for your community or the NFIP in general, please contact the Consultation Coordination Officer (CCO) for your community. Information on the CCO for your community may be obtained by contacting the Director, Mitigation Division of FEMA in San Francisco, California, at (415) 923-7177. If you have any technical questions regarding this LOMR, please contact Mr. Karl Mohr of our staff in Washington, DC, either by telephone at (202) 646-2770 or by facsimile at (202) 646-4596.

Sincerely,

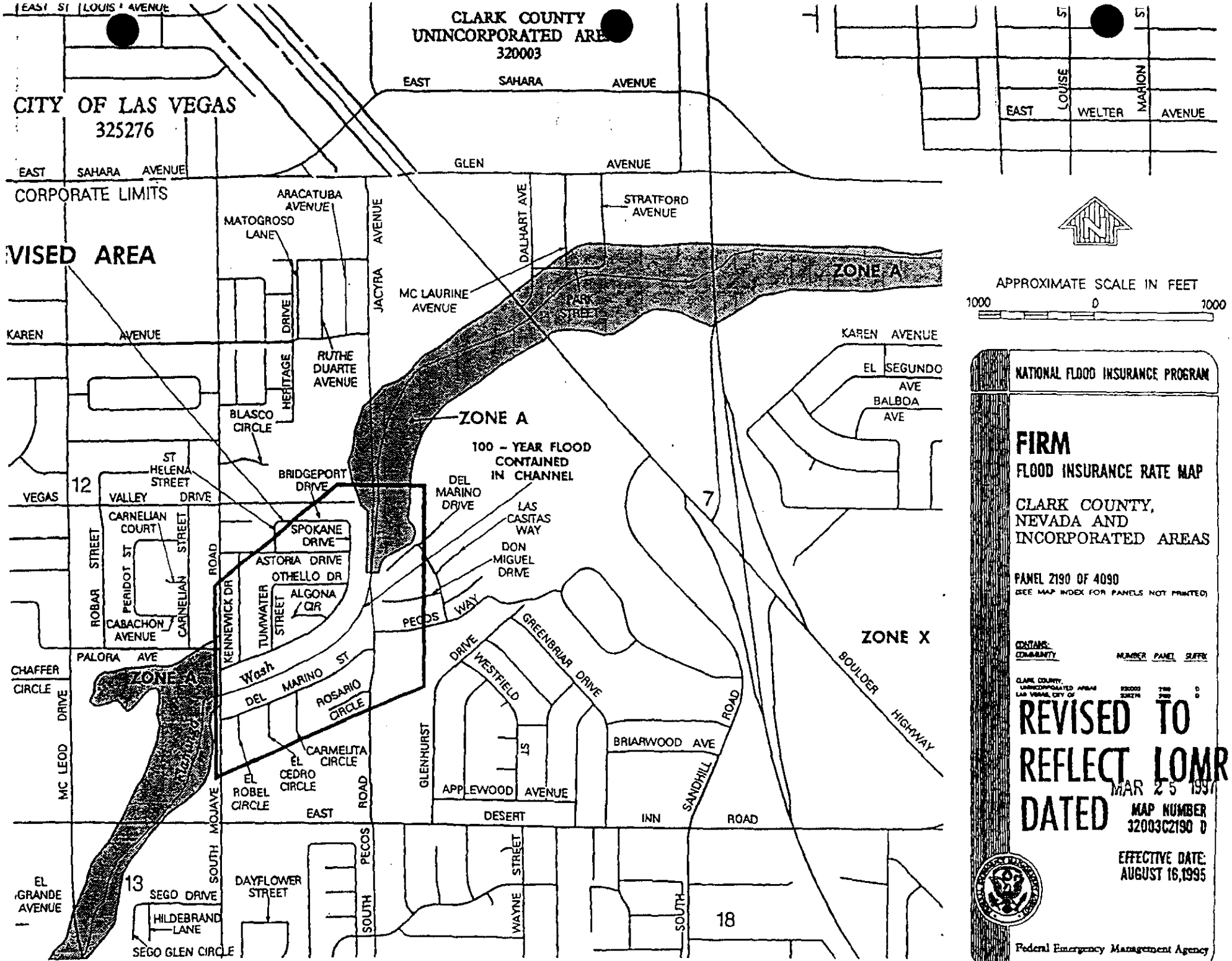
Frederick H. Sharrocks, Jr., Chief
Hazard Identification Branch
Mitigation Directorate

Enclosure(s)

cc: Mr. Kevin L. Eubanks, P.E.
Assistant General Manager
Clark County Regional Flood
Control District

Mr. Robert B. Thompson, P.E.
Civil Engineer III
Clark County Department of Public Works

Mr. Chris O. Stone
Associate Engineer
Willdan Associates


CLARK COUNTY
UNINCORPORATED AREA
320003
CITY OF LAS VEGAS
325276
CORPORATE LIMITS
VISED AREA
EAST SAHARA AVENUE
GLEN AVENUE
STRATFORD AVENUE
DALHART AVE
JACYRA AVENUE
ARACATUBA AVENUE
MATOGROSO LANE
MC LAURINE AVENUE
PARK STREET
ZONE A
KAREN AVENUE
RUTHE DUARTE AVENUE
HERITAGE DRIVE
BLASCO CIRCLE
EL SEGUNDO AVE
BALBOA AVE
ZONE A
100 - YEAR FLOOD CONTAINED IN CHANNEL
ST HELENA STREET
VALLEY DRIVE
BRIDGEPORT DRIVE
DEL MARINO DRIVE
LAS CASITAS WAY
DON MIGUEL DRIVE
SPOKANE DRIVE
ASTORIA DRIVE
OTHELLO DR
ALGONA CIR
CARNELIAN COURT
CARNELIAN STREET
PERIDOT ST
ROBAR STREET
CABACHON AVENUE
KENNEWICK DR
TUMWATER STREET
PECOS WAY
PALORA AVE
CHAFFER CIRCLE
ZONE A
Wash
DEL MARINO ST
ROSARIO CIRCLE
CARMELITA CIRCLE
EL CEDRO CIRCLE
EL ROBEL CIRCLE
MC LEOD DRIVE
SOUTH MOJAVE ROAD
EAST
GREENBRIAR DRIVE
WESTFIELD DRIVE
GLENHURST
APPLEWOOD AVENUE
DESERT INN ROAD
BRIARWOOD AVE
SANDHILL ROAD
BOULDER HIGHWAY
ZONE X
EL GRANDE AVENUE
SEGO DRIVE
HILDEBRAND LANE
SEGO GLEN CIRCLE
DAYFLOWER STREET
SOUTH PECOS ROAD
WAYNE STREET
SOUTH
12
13
7
18
EAST LOUISE ST
EAST WELTER AVENUE
MARION ST
APPROXIMATE SCALE IN FEET
1000 0 1000
NATIONAL FLOOD INSURANCE PROGRAM
FIRM
FLOOD INSURANCE RATE MAP
CLARK COUNTY, NEVADA AND INCORPORATED AREAS
PANEL 2190 OF 4090
(SEE MAP INDEX FOR PANELS NOT PRINTED)
CONTAINS:
COMMUNITY
NUMBER PANEL SUFFIX
CLARK COUNTY, UNINCORPORATED AREAS 320003 2190 D
LAS VEGAS, CITY OF 325276 2190 D
REVISED TO REFLECT LOMR DATED MAR 25 1997
MAP NUMBER 32003C2190 D
EFFECTIVE DATE: AUGUST 16,1995
Federal Emergency Management Agency

C L A R K C O U N T Y
REGIONAL FLOOD CONTROL DISTRICT

Gale Wm. Fraser, II, P.E.
General Manager / Chief Engineer

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December 2, 1996

Calvin Black, P.E.
G. C. Wallace, Inc.
1555 S Rainbow Blvd
Las Vegas, NV 89102

Dear Mr. Black:

Enclosed please find an executed copy of the Agreement for Professional Services to prepare a Master Plan Update for the Flamingo Wash in Clark County Flood Insurance Restudy, dated November 14, 1996.

This letter will serve as the notice to proceed with the services described in the Agreement. Please coordinate your efforts with Kevin Eubanks of this office who will serve as the District's representative for the services.

Thank you for submitting the Agreement and Scope of Services in such a timely manner. We look forward to working with G. C. Wallace, Inc. Please don't hesitate to contact me if you have any questions or require additional information.

Sincerely,

KE for

Gale Wm. Fraser, II, P.E.
General Manager/Chief Engineer

Enclosure

GWF:mak

File: FLAM.FIS

301 E. Clark Avenue, Suite 301 • Las Vegas, Nevada 89101
(702) 455-3139 • FAX: (702) 455-3870

AGREEMENT FOR PROFESSIONAL SERVICES

CLARK COUNTY REGIONAL FLOOD CONTROL DISTRICT

AND

G. C. Wallace, Inc.

THIS AGREEMENT is made and entered into this 14th day of November, 1996, by and between the CLARK COUNTY REGIONAL FLOOD CONTROL DISTRICT (hereinafter referred to as "DISTRICT") and G. C. Wallace, Inc. (hereinafter referred to as "GCW" or "CONSULTANT"), for the Flamingo Wash Flood Insurance Study Restudy (hereinafter referred to as the "PROJECT").

WITNESSETH

WHEREAS, the DISTRICT desires to complete a Flood Insurance Study (FIS) restudy for the PROJECT, and

WHEREAS, the CONSULTANT is experienced and is knowledgeable in the completion of such works, and

WHEREAS, the CONSULTANT and the DISTRICT recognize the need to coordinate the PROJECT with the Clark County Technical Review Committee established by the DISTRICT for this project, and

WHEREAS, the CONSULTANT represents that it is properly registered and qualified in accordance with the Nevada Revised Statutes and has the personnel and facilities necessary to accomplish the PROJECT with the required time, and

WHEREAS, the parties desire to set forth the responsibilities, terms, and conditions of completing the PROJECT,

NOW, THEREFORE, in consideration of the premises and terms contained herein, the parties agree as follows:

Section I

RESPONSIBILITY OF CONSULTANT

A. The CONSULTANT shall be responsible for the professional quality, technical accuracy, timely completion, and coordination of all services furnished by the CONSULTANT, its subcontractors and subconsultants and its and their principals, officers, employees, and agents under this AGREEMENT. In performing the specified services, CONSULTANT shall follow practices consistent with generally accepted current professional and technical engineering standards.

B. It shall be the duty of CONSULTANT to assure that all work products are technically sound and in conformance with all pertinent and current federal, State, and local statutes, codes ordinances, resolutions, and other regulations -- in particular, the federal Endangered Species Act. If, during the term of this contract, there are any changes or new laws, ordinances, statutes, rules or regulations not known or foreseeable at the time of signing this contract which become effective and which affect the cost or time of performance of the contract, CONSULTANT shall immediately notify DISTRICT in writing and submit detailed documentation of such effect in terms of both time and cost of performing the contract. Upon concurrence by DISTRICT as to the effect of such changes, and adjustment in time of performance and/or compensation for an increase or decrease in labor, materials, and equipment directly required to be in compliance will be made. Except for an extension of time, no payment or compensation of any kind shall be made to CONSULTANT for damages caused by such changes or new laws, ordinances, statutes, rules or regulations, including, but not limited to, those which may arise due to delay, disruption, acceleration, or inefficiency. If any discrepancy or inconsistency should be discovered between this contract and any law, ordinance, regulation, order, or decree, CONSULTANT shall immediately report the same in writing to DISTRICT, who will issue such instruction as may be necessary. The

CONSULTANT shall, without additional compensation, correct or revise any errors or deficiencies in its recommended plans, policies, designs, drawings, and other sections of the PROJECT. It is also understood and agreed by both parties that if any variation in measurements, calculations, or observations of a quantity due to mistakes, hereinafter referred to as "erroneous work" is found, the CONSULTANT will expeditiously perform the necessary work, at no expense to the DISTRICT, to correct the erroneous work. The reviewing process by the DISTRICT during the progress of the PROJECT will not relieve the CONSULTANT's obligation for erroneous work in the preparation of the different sections of the PROJECT. Any revisions or updates of the PROJECT after submittal would be considered outside the scope of services for this AGREEMENT.

C. The CONSULTANT will be responsible for holding monthly progress meetings with the DISTRICT. Minutes of these meetings and a summary of the PROJECT status will be submitted by the CONSULTANT to the DISTRICT with each monthly invoice for professional services.

D. It is agreed that any and all documents prepared and submitted by the CONSULTANT to the DISTRICT, and all information required of the CONSULTANT by the AGREEMENT, become the property of the DISTRICT. The CONSULTANT may retain copies and reproducible copies of all documents produced as a result of the PROJECT. In the event of the termination of the AGREEMENT, all documents produced shall be and become the property of the DISTRICT. The CONSULTANT agrees to surrender all such documents to the DISTRICT.

E. The CONSULTANT agrees that its officers and employees will cooperate with the DISTRICT in the performance of services under this AGREEMENT and will be available for consultation with the DISTRICT at such reasonable times and with advance notice so as to not conflict with their other responsibilities.

F. The rights and remedies of the DISTRICT provided for under this section are in addition to any other rights and remedies provided by law or under other sections of the AGREEMENT.

Section II
DISTRICT'S RESPONSIBILITY

A. The DISTRICT agrees that its officers and employees will cooperate with CONSULTANT in performance of services under this AGREEMENT and will be available for consultation with CONSULTANT at such reasonable times with advance notice as to not conflict with their other responsibilities.

B. The services performed by CONSULTANT under this AGREEMENT shall be subject to review and approval by DISTRICT General Manager. The DISTRICT General Manager may delegate any or all of the General Manager's responsibilities under this AGREEMENT to appropriate staff members, and shall so inform CONSULTANT by written notice before the effective date of each such delegation.

C. The services to be performed by the CONSULTANT under this AGREEMENT shall be subject to periodic review by DISTRICT's General Manager. The review comments of DISTRICT's General Manager shall be reported in writing to the CONSULTANT by the DISTRICT's General Manager. To prevent an unreasonable delay in the CONSULTANT's work, the DISTRICT's General Manager will endeavor to examine all documents and will make authorizations in writing to the CONSULTANT to proceed with work within 10 working days of receipt of such documents. It is understood that the DISTRICT's representative's review comments do not relieve the CONSULTANT from the responsibility for professional and technical accuracy of all work delivered under this AGREEMENT.

D. DISTRICT shall, without charge, furnish to or make available for examination or use by the CONSULTANT as it may request, any relevant data which the DISTRICT has available, including as examples only and not as a limitation:

1. Copies of reports, maps, plans, surveys, records, and other documents pertinent to flooding, flood control facilities, public properties, property developments, and other physical features related to the PROJECT.

2. Copies of previously prepared reports, publications, design hydrologic and hydraulic data, flooding information, flooding data, rainfall/runoff data, representative local drainage requirements (i.e., subdivision, planning and zoning regulations, ordinances, codes criteria, and special agreements or procedures), analyses, and computation manuals, computer programs, other documents and information related to the PROJECT and services specified by this AGREEMENT. CONSULTANT shall return original data provided by the DISTRICT.

E. Upon written request from the CONSULTANT, the DISTRICT shall reasonably assist CONSULTANT in obtaining data and documents from public officers or agencies and from private citizens and business firms whenever the DISTRICT determines that such material is necessary for the completion of the services specified by the AGREEMENT. DISTRICT shall provide the CONSULTANT with a list of names of individuals, agencies, or any other parties that should receive written communication related to the PROJECT from the CONSULTANT.

F. CONSULTANT will not be responsible for accuracy of information or data supplied by the DISTRICT or other sources, but will use such data to the extent such information or data would be relied upon by a reasonably prudent professional engineer.

Section III

SCOPE OF WORK

A. The CONSULTANT shall perform Tasks 1 through 4 including services discussed in the project description as specified in Exhibit A, which is attached hereto, and by this reference made a part of this AGREEMENT. In addition, the CONSULTANT will perform Task 5, "Supplemental Services" described in Exhibit A if, as, and when requested in writing by the General Manager. Exhibit B attached hereto and by this reference is also made a part of this agreement.

B. The DISTRICT may at any time, by written order, make changes within the general scope of this AGREEMENT and in the services or work to be performed by the CONSULTANT. If such changes cause an increase or decrease in the CONSULTANT's cost or time required for performance of any services under this AGREEMENT, an equitable adjustment shall be made and this AGREEMENT shall be modified in writing accordingly. Any claim of the CONSULTANT for adjustment under this clause must be asserted in writing within 30 days from the date of receipt by the CONSULTANT of notification of changes unless the DISTRICT grants a further period of time before the date of final payment under this AGREEMENT.

C. No services for which an additional compensation will be charged by the CONSULTANT shall be furnished without the written authorization of the DISTRICT.

Section IV

COMPENSATION AND TERMS OF PAYMENT

A. Once each month, the DISTRICT shall pay the CONSULTANT for services performed under Section III, Scope of Work. Invoices are prepared and submitted on a monthly basis and are due upon receipt. Payment is past due thirty (30) days from the invoice date. In the event the DISTRICT fails to make any payments, the CONSULTANT may cease work immediately until payment for the invoice and service charge is made. An additional charge at the rate of 1 1/2 percent per month will be charged against invoices which are past due.

B. Compensation and Method of Payment for Engineering Services are:

1. The DISTRICT shall pay the CONSULTANT on a time and materials basis under the CONSULTANT'S fee schedule, which is attached hereto as Exhibit D and by this reference made a part of this AGREEMENT.

2. The maximum cost to the DISTRICT for Task 1 through Task 4 including services discussed in Project Description accomplished under this AGREEMENT shall not exceed $184,822.00 unless the DISTRICT receives a written request, with justification, and the DISTRICT approves a change in scope and an increase in compensation. If approved, a supplement to this AGREEMENT must be executed. An estimated cost based on a detailed breakdown of the cost by tasks, and direct costs is shown on Exhibit B, which is attached hereto and by this reference made a part of this AGREEMENT. While the maximum cost to the District shall not exceed $184,822.00, the cost figures presented in Exhibit B are only estimates, and are not intended to limit the compensation to be paid for an individual task. Payments will be made to the CONSULTANT on a monthly basis upon receipt of a progress report and itemized invoices for work accomplished.

3. Supplemental services will be performed only upon written authorization by the General Manager and at the discretion of the General Manager. Payment for Supplemental Services will be made according to the terms described in this section for basic professional services. The maximum cost to the DISTRICT for Supplemental Services accomplished under this AGREEMENT shall not exceed $28,644.00. An estimated cost based on a detailed breakdown of the cost by tasks, and direct costs in shown on Exhibit B, which is attached hereto and by this reference made a part of this AGREEMENT. While the maximum cost to the District for supplemental services shall not exceed $28,644.00, the cost figures presented in Exhibit B are only estimates and are not intended to limit the compensation to be paid for an individual task. Payments will be made to the CONSULTANT on a monthly basis upon receipt of a progress report and itemized invoices for work accomplished.

Section V

TIME AND PERFORMANCE

A. The Project Time Schedule for work under this AGREEMENT is attached as Exhibit C and by this reference made a part of this AGREEMENT. The CONSULTANT will perform the work in accordance with said Project Time Schedule, and will provide the DISTRICT's representative a progress report in conjunction with the monthly invoice describing changes in schedule.

Work shall begin immediately upon receipt by the CONSULTANT of the Notice to Proceed by General Manager. All work necessary to prepare the project deliverables for submittal to the Federal Emergency Management Agency (FEMA) for review and publication shall be completed 270 calendar days from notice to proceed. Services required to coordinate with FEMA during the review and approval process will continue as required for up to 365 calendar days from notice to proceed. Supplemental services, if requested by the General Manager, will be completed within 270 calendar days from notice to proceed.

B. The DISTRICT and CONSULTANT recognize the scope of work as detailed in Exhibit A - SCOPE OF SERVICES and as outlined in Exhibit C - PROJECT TIME SCHEDULE can be altered by unforeseen events which may occur. Therefore, a supplement to this AGREEMENT will be prepared, negotiated, and executed when the CONSULTANT establishes, and the DISTRICT agrees, that there has been, or is to be a significant change, including but not limited to:

1. Scope, complexity, or character of the services to be performed such as additional meetings and coordination over those identified in Exhibit A, analysis of additional alternatives, or preparation of additional reports.

2. Conditions under which the work is required to be performed, such as a change in standards or a change in available base data which would require additional work.

3. Duration of work if the time period for completion of the work warrants such adjustment.

C. An alteration required by the DISTRICT which results in changes in the scope of work will also be specified in a supplemental AGREEMENT which will set forth the nature and scope thereof and payment therefor.

D. Neither party shall be considered in default in the performance of its obligations hereunder, or any of them, to the extent that performance of such obligations, or any of them is prevented or delayed by any cause, existing or future, which is beyond the reasonable control of such party. Delays arising from the actions or inactions of one or more of CONSULTANT's principals, officers, employees, agents, subcontractors, subconsultants, vendors, or suppliers are expressly recognized to be within the CONSULTANT's control.

Section VI

MISCELLANEOUS PROVISIONS

A. The CONSULTANT and its subconsultant(s) shall maintain all books, documents, papers, accounting reports, and other evidence pertaining to costs incurred and/or work performed and that such evidence shall be made available for inspection by the DISTRICT at all reasonable times during the AGREEMENT period for three (3) years from the date of final payment.

B. The DISTRICT has the right to terminate this AGREEMENT upon seven (7) days written notice to the CONSULTANT. This AGREEMENT may also be terminated by either party be seven (7) calendars days' written notice in the event of substantial failure to perform in accordance with the terms hereof by the one party through no fault of the other party. If said termination occurs prior to completion of the PROJECT, the CONSULTANT shall deliver to the DISTRICT all documents, calculations, and all other work performed whether complete or incomplete. Thereafter, the DISTRICT will reimburse the CONSULTANT for all services performed prior to such notice, provided the services performed are satisfactory to the DISTRICT. Termination shall be by written notice, which will be sent by certified mail or hand delivered. Such notice will be deemed effective after the third business day of the mailing post date, or hand delivered, in which case such notice will be deemed effective upon receipt of the written termination to the CONSULTANT or the DISTRICT.

C. The CONSULTANT does hereby agree to indemnify, defend, and save harmless the DISTRICT from loss, damage, liability, costs, or expense to the proportionate extent caused by the CONSULTANT, its employees, agents, or consultants and/or consultants arising out of its performance of this AGREEMENT, including, but not limited to the negligent acts, errors, omissions, or intentional misconduct of the CONSULTANT, its employees, agents or consultants and/or subconsultants in connection with this AGREEMENT.

D. During the life of this AGREEMENT, the CONSULTANT shall not engage the services of any person or persons who are currently employed by the DISTRICT without the DISTRICT's prior approval.

E. The CONSULTANT shall at all times maintain control over and have complete responsibility for all work performed under the AGREEMENT. Any attempted assignment of rights or delegation of duties under this AGREEMENT, without the written consent of the DISTRICT, shall be void.

F. The CONSULTANT shall submit for review and documentation purposes copies of all subconsultant agreements.

G. The CONSULTANT shall place his professional engineer stamp on the final FIS report substantiating that the work has been accomplished under the direct supervision of a professional engineer and in accordance with acceptable professional standards.

H. The CONSULTANT, at is own expense, shall obtain and maintain, for the duration of the Contract, insurance against claims for injuries to persons or damages to property or other losses which may arise from or in connection with CONSULTANT sole negligence or fault in the performance of work hereunder of the CONSULTANT, his agents, representatives, employees or subcontractors of any tier.

The CONSULTANT will provide the DISTRICT with certificates of insurance for coverage as listed below and endorsements, establishing coverage required by the Contract within ten (10) calendar days after approval of this Agreement by the DISTRICT's Board. The certificate of endorsements for each insurance policy are to be signed by a person authorized by the insurer and licensed by the State of Nevada.

The CONSULTANT will:

1. Maintain commercial general liability coverage at limits of no less than $1,000,000 combined single limit per occurrence and $1,000,000 annual aggregate for bodily injury (including death), personal injury and property damages. The coverage shall be on an "occurrence" basis only and not on a "claims made" basis; and the coverage must be provided on ISO commercial liability or on ISO broad form comprehensive general liability forms with not exceptions to the coverage for bodily injury, personal injury, broad form property damages, premises operations, severability of interest, products and completed operations, contractual and independent contractors. The DISTRICT, its officers, and employees must be expressly covered as additional insureds.

2. Maintain automobile coverage at limits of no less than $1,000,000 combined single limit "per accident" for bodily injury and property damage for all owned automobiles, non-owned automobiles, hired automobiles, or any automobile. The DISTRICT, its officers and employees must be expressly covered as additional insureds.

3. Maintain professional liability insurance at limits of no less that $1,000,000 per claim and $1,000,000 annual aggregate to insure against claims for losses arising out of the services rendered by the CONSULTANT, it agents, representatives or employees pursuant to the CONSULTANT's Contract with the DISTRICT. "Claims made" insurance coverage will continue for a period of three (3) years beyond the term of the Contract if available and affordable. Any retroactive date must coincide with or predate the date of the Contract and may not be advanced without the DISTRICT's consent. The CONSULTANT's professional liability insurance must provide coverage for the CONSULTANT's subcontractor if the subcontractor does not maintain

professional liability insurance in the same amounts and manner as required for the CONSULTANT.

All deductibles and self-insured retention shall be fully disclosed in the certificate of insurance. No deductible of self-insured retention may exceed $250,000 without the written approval of the DISTRICT. If aggregate limits are imposed on bodily injury and property damage, then the amount of such limits must not be less than twice the amount of the limits required herein. All aggregate must be fully disclosed and the amount entered on the required certificate of insurance. Any notice given to the CONSULTANT with respect to exhaustion of limits of insurance shall also be sent to the DISTRICT. the adequacy of the insurance supplied by the CONSULTANT, including the rating and financial health of each insurance company providing coverage, is subject to the approval of the DISTRICT.

4. Maintain Nevada Industrial Insurance and occupational Disease Acts; such insurance will protect it and the DISTRICT from claims made by the CONSULTANT due to work-related injuries.

5. The CONSULTANT's insurance shall be primary as respects to the DISTRICT, its officers, employees, and volunteers. Any other coverage available to the DISTRICT, its officers and employees shall be excess over the insurance required of the CONSULTANT.

The insurance requirements specified herein do not relieve the CONSULTANT of its responsibility or limit the amount of its liability to the DISTRICT or other persons, and the CONSULTANT is encouraged to purchase such additional insurance as it deems necessary.

6. The insurance certificate supplied by the CONSULTANT must provide for a 30-day notice to the DISTRICT before the implementation of a proposal to cancel the required insurance coverage. This notice requirement does not waive the insurance requirements contained herein. In addition, CONSULTANT shall notify DISTRICT within thirty (30) days of any reduction in coverage or limits.

7. If the CONSULTANT fails to maintain any of the insurance coverage required herein, then the DISTRICT will have the option to either terminate the Contract; declare the CONSULTANT in breach; purchase replacement insurance; or pay the premiums that are due on existing policies in order that the required coverage may be maintained. The CONSULTANT is responsible for any expenses paid by the DISTRICT to maintain such insurance, and the DISTRICT may collect the same from the CONSULTANT or deduct the amount paid from any sums due the CONSULTANT under this Contract.

I. Project Staffing

CONSULTANT shall provide the DISTRICT with a list of CONSULTANT's employees who will be performing work on the PROJECT. This list shall indicate the employee's name, classification, and hourly billing rate. This list will be used by the DISTRICT in reviewing and evaluating changes as a result of CONSULTANT's fiscal year increases (decreases).

J. Governing Law

Nevada law shall govern the interpretation of this AGREEMENT.

K. *Notice*

Any notice required to be given hereunder shall be deemed to have been given when received by the party to whom is directed by personal service, hand delivery, or U.S. mail at the following addresses:

To DISTRICT: Clark County Regional Flood Control District
301 East Clark Avenue, Suite 300
Las Vegas, Nevada 89101

To CONSULTANT: G. C. Wallace, Inc.
1555 South Rainbow Boulevard
Las Vegas, Nevada 89102
Attention: Calvin L. Black
Senior Vice President

IN WITNESS WHEREOF, the parties have caused this AGREEMENT to be executed the day and year first above written.

CLARK COUNTY REGIONAL FLOOD CONTROL DISTRICT

By: _____ Date: 11/14/96
Iris Bletsch
Chairman

G. C. Wallace, Inc.

By: _____ Date: 11-5-96
Calvin L. Black
Senior Vice President

ATTEST:

By: Deanna Lefko Date: 11/14/96

Deanna Lefko

Secretary

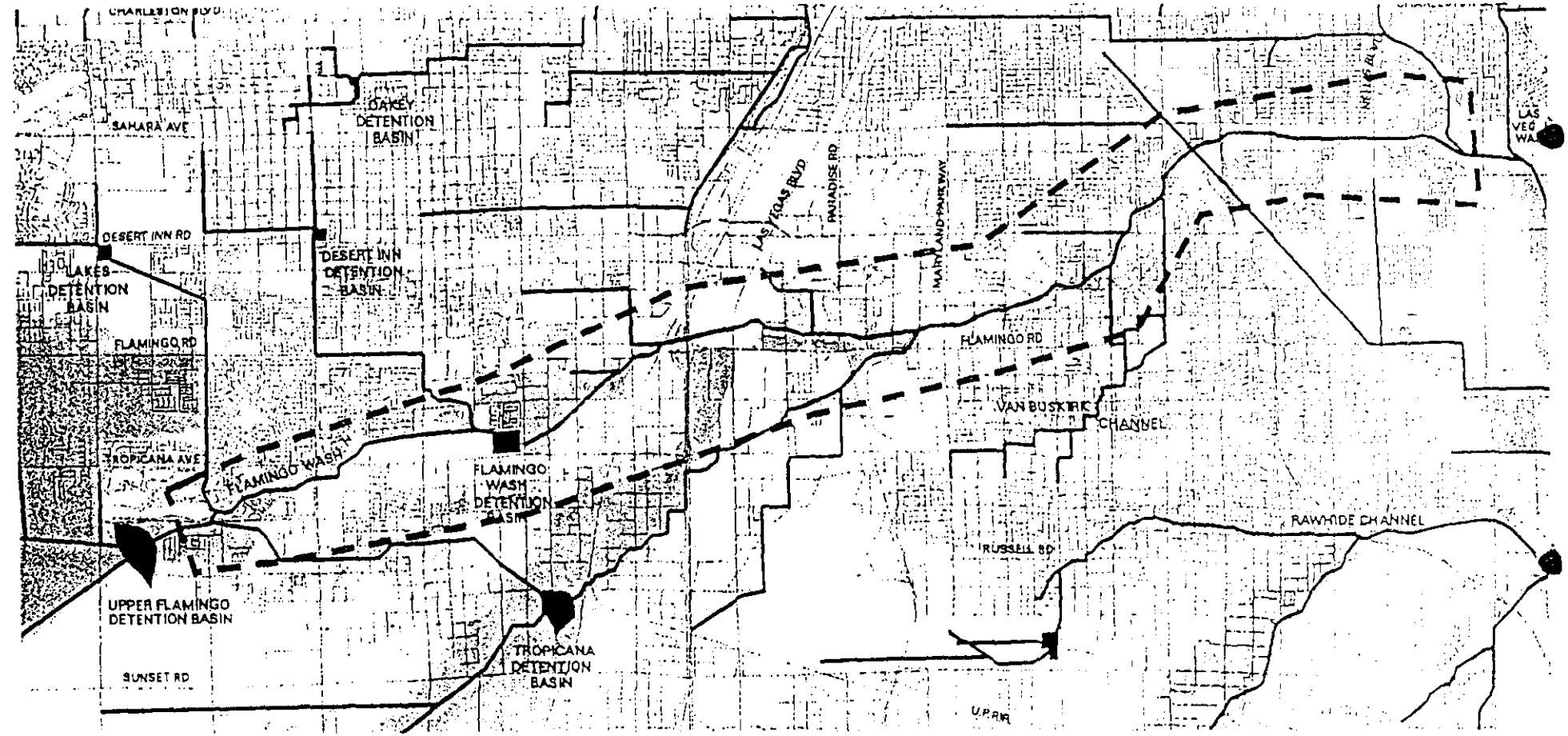
APPROVED AS TO LEGALITY ONLY:

By: Christopher D. Figgins Date: Nov 14, 96

Christopher D. Figgins

Deputy District Attorney

FLAMINGO WASH FIS STUDY AREA



LEGEND

CONVEYANCES CENTERLINE STUDY AREA BASINS FLOOD ZONES

EXHIBIT A
SCOPE OF SERVICES
FLAMINGO WASH - FLOOD INSURANCE STUDY RESTUDY

Project Description

The study includes an investigation to delineate floodplains and floodways and to determine base flood elevations for approximately 10.5 miles of the Flamingo Wash from the Las Vegas Wash to the Upper Flamingo Wash Detention Basin. Also included will be an investigation of the affects of the recently completed Red Rock Detention Basin Expansion on the 100-year flow for Upper Flamingo Wash Detention Basin and the Flamingo Wash. Shallow flooding delineations will be prepared for areas downstream and adjacent to the Upper Flamingo Wash Detention Basin which are associated with small tributary washes to the Flamingo Wash system.

G. C. Wallace (GCW, Consultant), in professional association with Nevada Aerial Mapping (NAM), will prepare new topographic maps for specific portions of the study area using the NGVD 29 vertical datum. GCW will convert the ground control to the NAVD 88 and Clark County vertical datum. The aerial mapping and ground control surveys will be performed in accordance with FEMA Document No. 37.

GCW will develop backwater models and supporting calculations for the study reaches to determine floodplain and, if determined necessary by the District, floodway delineations for the 100-year peak flow. The revised floodplain delineations will be reconciled with current applicable flood insurance study delineations. All work will be performed in accordance with FEMA Document No. 37, Flood Insurance Study Guidelines and Specifications for Study Contractors (FEMA Document No. 37), dated January 1995, and other published FEMA guidelines.

Task 1 Data Collection and Review

1.1 Collect and review studies, construction drawings, reports, mapping, etc. which pertain to the Flamingo Wash watershed to the confluence with the Las Vegas Wash (see Location Map). Sources of such information will include but are not limited to technical reports in support of LOMRs, flood control facility plans and design reports, "as built" plans, hydrologic and hydraulic reports and drainage studies from:

A. Federal agencies- FEMA
B. State Agencies- NDOT
C. County Public Works
   a. As-built certification for Red Rock Detention Basin Expansion
   b. As-built certification Upper Flamingo Wash Detention Basin
   c. Private development flood control improvements
D. Private consultants or developers

The District will furnish a copy of *Las Vegas Valley Flood Insurance Study Hydrology Report* and the *Technical Support Data Notebook for the Upper Flamingo Wash Detention Basin Letter of Map Revision* both with appendices and computer diskettes.

Design hydrology, hydraulics and sediment transport data (on computer diskette when available) for the Red Rock Detention Basin Expansion and Upper Flamingo Detention Basin will be provided by the District and Clark County Public Works. Review data to determine whether any additional calculations are warranted.

As-built certifications have been received and accepted by FEMA for the Red Rock Detention Basin Expansion and the Upper Flamingo Wash Detention Basin in conjunction with previous LOMR requests sponsored by the District.

Review reports to determine whether additional hydrologic calculations are warranted. Determine level of effort required to be performed under Task 5.1.

1.2 Perform a detailed field review of and document with photos:

1.2.1 Major hydraulic structures & bridges
1.2.2 Channel improvements
1.2.3 Natural channels

1.3 GCW will provide field surveys to obtain the physical dimensions of specific hydraulic structures within the study area in accordance with FEMA Document 37. The specific hydraulic structures will include:

- The Nellis Boulevard bridge.
- The Lamb Boulevard bridge.
- Two bridges under US 95.
- The private access bridge between Pecos Road and US 95.
- The Mojave Road bridge.

- The Desert Inn Road bridge.
- The Pecos-McLeod Interconnect bridge.
- The Eastern Avenue bridge.
- The Spencer Street bridge.
- The Maryland Parkway bridge.
- The Cambridge Street bridge.
- The Swenson Street bridge.
- The Palos Verdes Street bridge.
- The Paradise Road bridge.
- The Koval Lane Storm Drain inlet and outlet structures.
- The inlet and outlet structures for the culvert between the Imperial Palace parking garage and I 15.
- The culvert under Industrial Road and I 15.
- The UPRR bridge.
- The Flamingo Road bridge.
- The Valley View Boulevard culvert.
- The Arville Street bridge.
- The culvert through the Orleans parking lot.
- The Cameron Street bridge.
- The Decatur Boulevard bridge.
- The Jones Boulevard bridge.
- The Tropicana Avenue bridge.
- The Rainbow Boulevard bridge.
- The Hacienda Avenue culvert.
- The channelized portion of the Flamingo Wash between Tropicana Avenue and Rainbow Boulevard.

1.4 Prepare written summary of field review and data collection. Include preliminary bibliography for final report.

1.5 Prepare summary memorandum detailing the data summary and review effort, findings, and recommendations.

Task II **Floodplain Delineation**

2.1 GCW will obtain all necessary rights-of-entry for the study area. The District will assist as may be necessary.

2.2 Nevada Aerial Mapping (NAM) will be retained by GCW as part of this contract to perform aerial topographic mapping within specific portions of the restudy area. GCW will coordinate the work of NAM to ensure that the specifications of the surveying work are met. Quality control of aerial surveys will be per FEMA Document No. 37, Flood Insurance Study Guidelines and Specifications for Study Contractors, dated January 1995.

2.2.1 Prepare topographic mapping with a 4-foot contour interval at a scale of 1-inch = 400-feet. The width of the mapping will generally range from 600 feet to 1000 feet and will include the entire site for the future

Flamingo Wash Detention Basin (Decatur Blvd at Tropicana Ave). The limits of the topographic mapping will be as follows:

- From the confluence with the Las Vegas Wash to Pecos Road.
- From Mojave Road to a point upstream from Eastern Avenue.
- From a point downstream from Spencer Street to the Imperial Palace parking garage.
- From Industrial Road to a point upstream from Jones Boulevard.

2.2.2 Ground Control

a. GCW shall provide survey control using NGVD 29 datum for development of topographic mapping. The ground control will also be converted to NAVD 88 and Clark County vertical datum. Existing Clark County survey control markers will be identified and described for use as elevation reference markers (ERMs). ERM description, location and elevation will be tabulated and submitted with the FIS report.

b. GCW will systematically set panel points and establish horizontal and vertical control throughout the areas to be mapped for use in compilation by NAM. Where readily available, survey will be tied to the State Plane Coordinate System. Field control will use existing documented Clark County survey points where possible, and be of an adequate density and location to meet the requirements of the aerial surveying subcontractor and FEMA Document No. 37.

2.3 Prepare study base map from data gathered in Task 1.1 and Task 2.2.

2.4 Compile data from Task 1.1 and 5.1 to determine design flows for submittal to FEMA to support 100-year flow rates to be used for hydraulic analyses.

2.5 Prepare detailed methods hydraulic analyses.

2.5.1 Base flood elevations, floodplain, floodway and shallow flooding delineations will be based on the U.S. Army Corps of Engineer's HEC-2 backwater model and/or additional detailed and approximate method determinations deemed acceptable by FEMA. These delineations will simulate the effects of floodplain geomorphology, flow rate changes, bridges, culverts, hydraulic roughness, effective flow limitations, split flows, and other considerations to most realistically represent flooding conditions. The consultant will analyze riverine and shallow flooding areas and prepare the study and maps according to the guidelines outlined in FEMA Document No. 37.

2.5.2 GCW will prepare work maps and models of the 100-year floodplain during the course of the hydraulic analysis for review by the District and entities during progress meetings.

2.5.3 Prepare final Technical Data and workmaps.

2.5.4 Complete all applicable FEMA Forms.

2.6 Prepare final floodplain mapping study to include as a minimum the following outline.

I. Introduction
   a. Purpose of Study
   b. Authority for Study
   c. Coordination and Acknowledgements

II. Area Studied
   a. Scope of Study
   b. Community Description
   c. Principal Flood Problems
   d. Flood Protection Measures

III. Engineering Methods
   a. Hydrologic Analysis
   b. Hydraulic Analysis

IV. Insurance Applications

V. Other Studies

VI. Bibliography

VII. Appendices - Supporting Technical Data, FEMA Forms

Task 3 Coordination

3.1 GCW will coordinate and participate in regular progress meetings with the District and the impacted communities at least monthly, and at milestones in the development of the study. Consultant will prepare and distribute minutes of all meetings.

3.2 Through the District, GCW will submit maps, reports and technical data to all applicable government agency reviewers.

3.3 Throughout the restudy effort, GCW will coordinate with FEMA and FEMA's Technical Evaluation Contractor (TEC) in order to proceed in the most time efficient manner. GCW will be responsible for responding to and interacting with FEMA's TEC throughout the review and community appeals process as outlined in FEMA Document No. 37.

Task 4 Final Products

4.1 *Mapping*

4.1.1 GCW will provide the District with permanent non-erasable topographic mylar sheets 24" X 36" at the scale and contour interval specified in Task 2.2. A cover sheet will be provided with project title, date of topography, and sheet index. Each sheet of topography will include at a minimum a north arrow, scale, photo date, section and quarter corners, street names, State Plane Coordinate information, major drainage features, corporate and town boundaries, cross section lines, channel centerline station, 100-year flood limits, description and elevation of control points and ERMs and reference marks used in ground control.

4.1.2 Digital contour and planimetric data developed under Task 2.2 shall be delivered to the District in a digital format acceptable to FEMA and the District.

a. Available topography identified as acceptable under Task 1.1 and Task 2.2 will be reproduced from their source and delivered to the District in a durable reproducible form acceptable to the District.

b. Additional topographic maps, contact prints, photo mylars, digital data, etc. will be delivered to the District as required by the Supplemental Services Section and authorized per Task 1.4 and developed per Task 5.2.

4.2 Report

a. GCW will produce a final report incorporating all previous comments from the District, FEMA and other reviewers. Six (6) hard copies of the report and appendices will be delivered.

b. Report text in WordPerfect 5.1 format on a 3-1/2 inch, 1.44 Mb diskette compatible with IBM personal computers.

c. Six (6) copies of the Technical Support Data Notebook.

Task 5 Supplemental Services

5.1 GCW shall provide any additional technical analyses deemed necessary under Task 1.5.

5.1.1 Prepare additional hydrologic, hydraulic and sediment transport analyses.

5.2 Submit refinements/revisions to the District for approval. Prepare report for final study.

EXHIBIT B

FLAMINGO WASH FLOOD INSURANCE STUDY RESTUDY

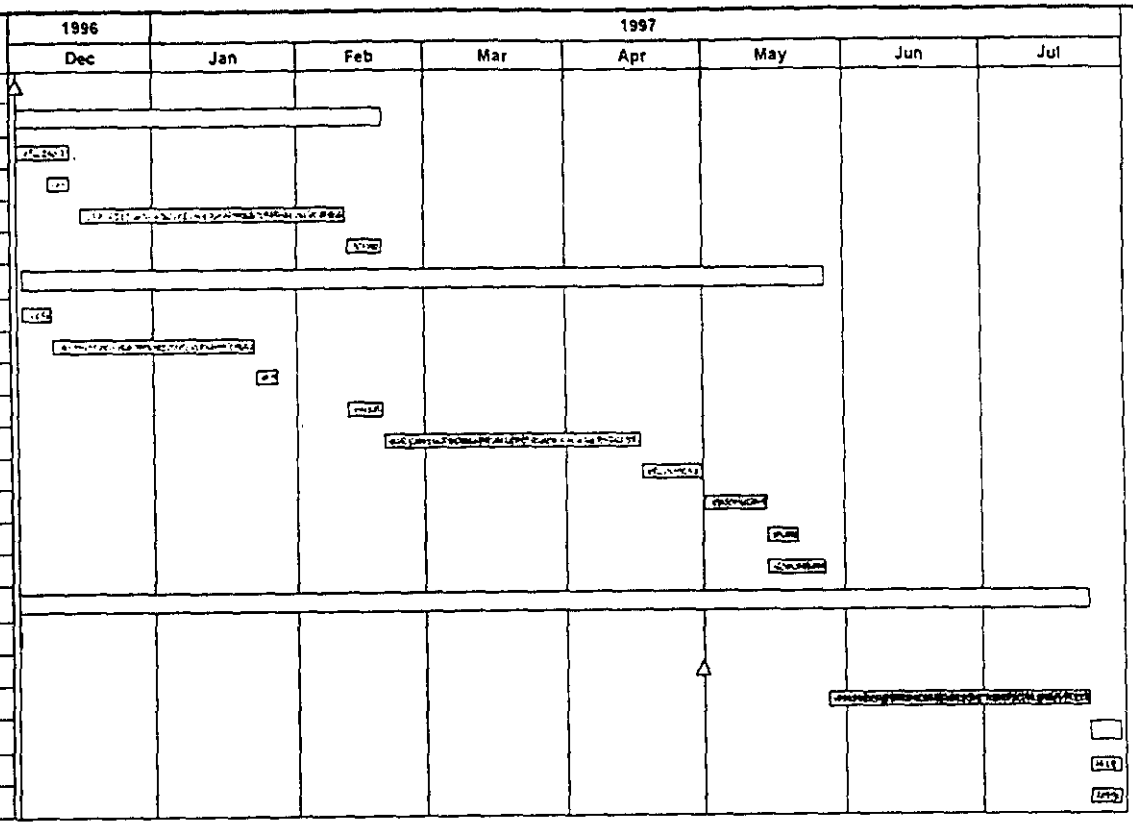
ENGINEERING FEE ESTIMATE

TASK	ITEM	ASSOC $120	SR. ENGR $95	ENGR $84	DES/DRA $72	SURVEY $151	COST	OUTSIDE SERVICES	
TASK 1 DATA COLLECTION									
1.1	Collect & Review Exst. Data	8	24	40	60		$10,920		
1.2	Field Recon/Stream Walk/Photo Doc.	0	8	16	16		$3,256	$50	
1.3	Structure/Stream Survey	8	8	24	24	160	$29,624		
1.4	Prep Summary Recon	2	4	12			$1,628		
1.5	Summary Data Review	2	4	8	16		$2,444		
	SUBTOTAL TASK 1	20	48	100	116	160	$47,872	$50	
TASK 2 FLOODPLAIN DELINEATION									
2.1	Rt. of Entry	2	8	8			$1,672		
2.2	Aerial Topo & Ground Control	2	4	4	8	132	$21,464	$15,000	
2.3	Prep. Base Maps	2	4	8	16		$2,444		
2.4	Summary Design Flows	4	8	24	40		$6,136		
2.5.1	Hydraulic Model	40	80	120	120		$31,120		
2.5.2	Wrk Maps for Prog Mtgs	8	16	40	40		$8,720	$100	
2.5.3	Prep TSDN	4	32	60	16		$9,712		
2.5.4	LOMR App.	4	8	24	40		$6,136		
2.6	Final Report	16	24	60	60		$13,560		
	SUBTOTAL TASK 2	80	176	340	340	132	$100,964	$15,100	
TASK 3 COORDINATION									
3.1	Progress Mtgs	40	40				$8,600		
3.2	Data Submittal to Local Entities		4	8	16		$2,204		
3.3	FEMA Coord.	8	12	40	16		$6,612		
	SUBTOTAL TASK 3	48	56	48	32	0	$17,416		
TASK 4 FINAL PRODUCTS									
4.1	Mapping			8	4		$960	$500	
4.2	TSDN & Reports			8	4		$960	$1,000	
	SUBTOTAL TASK 4	0	0	16	8	0	$1,920	$1,500	
						SUBTOTAL BASE CONTRACT	$168,172	$16,650	
						TOTAL BASE CONTRACT	$184,822		
TASK 5 SUPPLEMENTAL SERVICES									
5.1	Additional Technical Analysis	8	40	80	80	40	$23,280		
5.2	Submit Refinements to CCRFCD	6	12	28	16		$5,364		
	SUBTOTAL TASK 5	14	52	108	96	40	$28,644	$0	
						TOTAL SUPPLEMENTAL SERVICES	$28,644		
						GRAND TOTAL	$213,466		

FLAMINGO WASH F.I.S. RESTUDY

EXHIBIT C

Task Name	Start Date	End Date
Notice to Proceed	12/2/96	12/2/96
DATA COLLECTION	12/2/96	2/19/97
Collect & Review exist. data	12/2/96	12/13/96
Field Recon	12/9/96	12/13/96
Recon Summary	12/16/96	2/11/97
Summary Data Review	2/12/97	2/19/97
FLOODPLAIN DELINEATION	12/3/96	5/27/97
Rt. of Entry	12/3/96	12/9/96
Aerial Topographic mapping	12/10/96	1/22/97
Prep. Base Maps	1/23/97	1/27/97
Summary of design flows	2/12/97	2/19/97
Hydraulic model	2/20/97	4/16/97
Work Maps	4/17/97	4/30/97
Prep. TSDN	5/1/97	5/14/97
LOMR application	5/15/97	5/21/97
Final Report	5/15/97	5/27/97
COORDINATION	12/2/96	7/23/97
Progress Meetings	12/2/96	12/2/96
Data submittal to Local Entities	4/30/97	4/30/97
FEMA coordination	5/28/97	7/23/97
FINAL PRODUCTS	7/24/97	7/30/97
Mapping	7/24/97	7/30/97
TSDN & Reports	7/24/97	7/30/97



Printed: 11/4/96

Study Contractor: G. C. Wallace, Inc.

HYDROLOGIC ANALYSES INDEX

Clark County, Nevada
(COMMUNITY NAME, STATE)

FLOOD INSURANCE STUDY

HYDROLOGIC ANALYSES INDEX

FLOODING SOURCE/ STREAM NAME	HYDROLOGIC METHOD/ MODEL USED	METHOD/MODEL ANALYSIS DATE	EXHIBIT NO. PAPER COPY	EXHIBIT NO. FLOPPY DISKETTES
FLAMINGO WASH	LOMR 97-09-177P	JANUARY 14, 1997	ENCLOSED	—
FLAMINGO WASH	LOMR 97-09-138P	JANUARY 14, 1997	"	—
FLAMINGO WASH	HYDROLOGIC SUBAREAS	1991	"	—
FLAMINGO WASH	HEC-1/F100.DAT	DECEMBER 12, 1990	"	ENCLOSED
FLAMINGO WASH	HEC-1/F100R.DAT	OCTOBER 6, 1997	"	"
FLAMINGO WASH	HEC-1/F-FL.DAT	"	"	"
FLAMINGO WASH	HEC-1/F-FLC.DAT	"	"	"

Federal Emergency Management Agency

Washington, D.C. 20472

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

IN REPLY REFER TO:
Case No.: 97-09-177P

The Honorable Jan Laverty Jones
Mayor, City of Las Vegas
400 East Stewart Avenue
Las Vegas, Nevada 89101

Community: City of Las Vegas, Nevada
Community No.: 325276
Panels Affected: 32003C2145 D and 2150 D
Effective Date of
This Revision: JAN14 1997

102-D

Dear Mayor Jones:

This responds to a request that the Federal Emergency Management Agency (FEMA) revise the effective Flood Insurance Rate Map (FIRM) for Clark County, Nevada and Incorporated Areas, in accordance with Part 65 of the National Flood Insurance Program (NFIP) regulations. In a letter dated November 6, 1996, Mr. Gale Wm. Fraser II, P.E., General Manager/Chief Engineer, Clark County Regional Flood Control District, requested that FEMA revise the FIRM to show the effects of the modifications to the Red Rock Detention Basin along Red Rock Fan. This request follows up on a Conditional Letter of Map Revision issued on January 13, 1995.

All data required to complete our review of this request were submitted with letters from Mr. Fraser. Because this Letter of Map Revision (LOMR) shows the effects of a publicly sponsored flood-control project that reduces flooding to existing development, fees were not assessed for the review.

We have completed our review of the submitted data and the flood data shown on the effective FIRM. We have revised the FIRM to modify the floodplain boundary delineations and zone designations of the flood having a 1-percent chance of being equaled or exceeded in any given year (base flood) along Red Rock Fan from just upstream of West Desert Inn Road to just downstream of South Hualapai Way. As a result of the modifications, the Special Flood Hazard Area (SFHA), the area that would be inundated by the base flood, for Red Rock Fan was removed along the revised reach. The modifications are shown on the enclosed annotated copies of FIRM Panels 32003C2145 D and 32003C2150 D. This LOMR hereby revises the above-referenced panel(s) of the effective FIRM dated August 16, 1995.

The modifications are effective as of the date of this letter. The map panels as listed above and as modified by this letter will be used for all flood insurance policies and renewals issued for your community.

A review of the determination made by this LOMR and any requests to alter this determination should be made within 30 days. Any request to alter the determination must be based on scientific or technical data.

Because this project also affects the unincorporated areas of Clark County, Nevada, a separate LOMR was issued on the same date as this LOMR for that community.

We will not physically revise and republish the FIRM and FIS report for your community to reflect the modifications made by this LOMR at this time. When changes to the previously cited FIRM panels and FIS report warrant physical revision and republication in the future, we will incorporate the modifications made by this LOMR at that time.

This LOMR is based on minimum floodplain management criteria established under the NFIP. Your community is responsible for approving all floodplain development, and for ensuring all necessary permits required by Federal or State law have been received. State, county, and community officials, based on knowledge of local conditions and in the interest of safety, may set higher standards for construction in the SFHA. If the State, county, or community has adopted more restrictive or comprehensive floodplain management criteria, these criteria take precedence over the minimum NFIP criteria.

The basis of this LOMR is, in whole or in part, a channel-modification project. NFIP regulations, as cited in Paragraph 60.3(b)(7), require that communities assure that the flood-carrying capacity within the altered or relocated portion of any watercourse is maintained. This provision is incorporated into your community's existing floodplain management regulations. Consequently, the ultimate responsibility for maintenance of the modified channel rests with your community.

Because this LOMR will not be printed and distributed to primary users, such as local insurance agents and mortgage lenders, your community will serve as a repository for these new data. We encourage you to disseminate the information reflected by this LOMR throughout the community, so that interested persons, such as property owners, local insurance agents, and mortgage lenders, may benefit from the information. We also encourage you to prepare an article for publication in your community's local newspaper. This article should describe the changes that have been made and the assistance that officials of your community will give to interested persons by providing these data and interpreting the NFIP maps.

This determination has been made pursuant to Section 206 of the Flood Disaster Protection Act of 1973 (Public Law 93-234) and is in accordance with the National Flood Insurance Act of 1968, as amended (Title XIII of the Housing and Urban Development Act of 1968, Public Law 90-448), 42 U.S.C. 4001-4128, and 44 CFR Part 65. Pursuant to Section 1361 of the National Flood Insurance Act of 1968, as amended, communities participating in the NFIP are required to adopt and enforce floodplain management regulations that meet or exceed NFIP criteria. These criteria are the minimum requirements and do not supersede any State or local requirements of a more stringent nature. This includes adoption of the effective FIRM to which the regulations apply and the modifications described in this LOMR.

If you have any questions regarding floodplain management regulations for your community or the NFIP in general, please contact the Consultation Coordination Officer (CCO) for your community. Information on the CCO for your community may be obtained by contacting the Director, Mitigation Division of FEMA in San Francisco, California, at (415) 923-7177. If you have any technical questions regarding this LOMR, please contact Mr. Karl Mohr of our staff in Washington, DC, either by telephone at (202) 646-2770 or by facsimile at (202) 646-4596.

Sincerely,

Frederick H. Sharrocks, Jr., Chief
Hazard Identification Branch
Mitigation Directorate

Enclosures

cc: Mr. Randy L. Fultz, P.E.
Flood Control Project Manager
Department of Public Works
City of Las Vegas

The Honorable Yvonne Atkinson Gates
Chairperson, Clark County Board
of Commissioners

Mr. Gale Wm. Fraser II, P.E.
General Manager/Chief Engineer
Clark County Regional Flood
Control District

Mr. Kevin L. Eubanks, P.E.
Assistant General Manager
Clark County Regional Flood
Control District

Federal Emergency Management Agency

Washington, D.C. 20472

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

IN REPLY REFER TO:
Case No.: 97-09-177P

The Honorable Yvonne Atkinson Gates
Chairperson, Clark County
Board of Commissioners
225 Bridger Avenue, Sixth Floor
Las Vegas, Nevada 89155

Community: Clark County, Nevada
Community No.: 320003
Panels Affected: 32003C2145 D, 2150 D, 2535 D, and 2550 D
Effective Date of This Revision: JAN 14 1997

102-D

Dear Ms. Gates:

This responds to a request that the Federal Emergency Management Agency (FEMA) revise the effective Flood Insurance Rate Map (FIRM) for Clark County, Nevada and Incorporated Areas in accordance with Part 65 of the National Flood Insurance Program (NFIP) regulations. In a letter dated November 6, 1996, Mr. Gale Wm. Fraser II, P.E., General Manager/Chief Engineer, Clark County Regional Flood Control District, requested that FEMA revise the FIRM to show the effects of the modifications to the Red Rock Detention Basin along Red Rock Fan. This request follows up on a Conditional Letter of Map Revision issued on January 13, 1995.

All data required to complete our review of this request were submitted with letters from Mr. Fraser. Because this Letter of Map Revision (LOMR) shows the effects of a publicly sponsored flood-control project that reduces flooding to existing development, fees were not assessed for the review.

We have completed our review of the submitted data and the flood data shown on the effective FIRM. We have revised the FIRM to modify the floodplain boundary delineations and zone designations of the flood having a 1-percent chance of being equaled or exceeded in any given year (base flood) along Red Rock Fan from just upstream of South Buffalo Drive to just upstream of Red Rock Detention Basin. As a result of the modifications, the Special Flood Hazard Area (SFHA), the area that would be inundated by the base flood, for Red Rock Fan was removed along the revised reach. The modifications are shown on the enclosed annotated copies of FIRM Panels 32003C2145 D, 32003C2150 D, 32003C2535 D, and 32003C2550 D. This LOMR hereby revises the above-referenced panel(s) of the effective FIRM dated August 16, 1995.

The modifications are effective as of the date of this letter. The map panels as listed above and as modified by this letter will be used for all flood insurance policies and renewals issued for your community.

Because this project also affects the City of Las Vegas, Nevada, a separate LOMR was issued on the same date as this LOMR for that community.

A review of the determination made by this LOMR and any requests to alter this determination should be made within 30 days. Any request to alter the determination must be based on scientific or technical data.

We will not physically revise and republish the FIRM and Flood Insurance Study (FIS) report for your community to reflect the modifications made by this LOMR at this time. When changes to the previously cited FIRM panels and FIS report warrant physical revision and republication in the future, we will incorporate the modifications made by this LOMR at that time.

This LOMR is based on minimum floodplain management criteria established under the NFIP. Your community is responsible for approving all floodplain development, and for ensuring all necessary permits required by Federal or State law have been received. State, county, and community officials, based on knowledge of local conditions and in the interest of safety, may set higher standards for construction in the SFHA. If the State, county, or community has adopted more restrictive or comprehensive floodplain management criteria, these criteria take precedence over the minimum NFIP criteria.

The basis of this LOMR is, in whole or in part, a channel-modification project. NFIP regulations, as cited in Paragraph 60.3(b)(7), require that communities assure that the flood-carrying capacity within the altered or relocated portion of any watercourse is maintained. This provision is incorporated into your community's existing floodplain management regulations. Consequently, the ultimate responsibility for maintenance of the modified channel rests with your community.

Because this LOMR will not be printed and distributed to primary users, such as local insurance agents and mortgage lenders, your community will serve as a repository for these new data. We encourage you to disseminate the information reflected by this LOMR throughout the community, so that interested persons, such as property owners, local insurance agents, and mortgage lenders, may benefit from the information. We also encourage you to prepare an article for publication in your community's local newspaper. This article should describe the changes that have been made and the assistance that officials of your community will give to interested persons by providing these data and interpreting the NFIP maps.

This determination has been made pursuant to Section 206 of the Flood Disaster Protection Act of 1973 (Public Law 93-234) and is in accordance with the National Flood Insurance Act of 1968, as amended (Title XIII of the Housing and Urban Development Act of 1968, Public Law 90-448), 42 U.S.C. 4001-4128, and 44 CFR Part 65. Pursuant to Section 1361 of the National Flood Insurance Act of 1968, as amended, communities participating in the NFIP are required to adopt and enforce floodplain management regulations that meet or exceed NFIP criteria. These criteria are the minimum requirements and do not supersede any State or local requirements of a more stringent nature. This includes adoption of the effective FIRM and FIS report to which the regulations apply and the modifications described in this LOMR.

If you have any questions regarding floodplain management regulations for your community or the NFIP in general, please contact the Consultation Coordination Officer (CCO) for your community. Information on the CCO for your community may be obtained by contacting the Director, Mitigation Division of FEMA in San Francisco, California, at (415) 923-7177. If you have any technical questions regarding this LOMR, please contact Mr. Karl Mohr of our staff in Washington, DC, either by telephone at (202) 646-2770 or by facsimile at (202) 646-4596.

Sincerely,

Frederick H. Sharrocks, Jr., Chief
Hazard Identification Branch
Mitigation Directorate

Enclosures

cc: Mr. Gale Wm. Fraser II, P.E.
General Manager/Chief Engineer
Clark County Regional Flood Control District

Mr. Kevin L. Eubanks, P.E.
Assistant General Manager
Clark County Regional Flood Control District

Mr. Robert B. Thompson, P.E.
Civil Engineer III
Clark County Department of Public Works

The Honorable Jan Laverty Jones
Mayor, City of Las Vegas

Upper Flamingo DB

Federal Emergency Management Agency

Washington, D.C. 20472

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

IN REPLY REFER TO:
Case No.: 97-09-138P

The Honorable Yvonne Atkinson Gates
Chairperson, Clark County
Board of Commissioners
225 East Bridger Avenue
Las Vegas, Nevada 89155

Community: Clark County, Nevada
Community No.: 320003
Panel Affected: 32003C2535 D
Effective Date of
This Revision: JAN14 1997

102-I-C

Dear Ms. Gates:

This responds to a request that the Federal Emergency Management Agency (FEMA) revise the effective Flood Insurance Rate Map (FIRM) for Clark County, Nevada and Incorporated Areas in accordance with Part 65 of the National Flood Insurance Program (NFIP) regulations. In a letter dated October 21, 1996, Mr. Kevin L. Eubanks, P.E., Assistant General Manager, Clark County Regional Flood Control District, requested that FEMA revise the FIRM to show the effects of the construction of Upper Flamingo Wash Detention Basin along Flamingo Fan and Flamingo Wash. This request follows up on a Conditional Letter of Map Revision issued on August 27, 1993.

All data required to complete our review of this request were submitted with letters from Mr. Eubanks. Because this Letter of Map Revision (LOMR) shows the effects of a publicly sponsored flood-control project that reduces flooding to existing development, fees were not assessed for the review.

We have completed our review of the submitted data and the flood data shown on the effective FIRM. We have revised the FIRM to modify the floodplain boundary delineations and zone designations of the flood having a 1-percent chance of being equaled or exceeded in any given year (base flood) along Flamingo Fan and Flamingo Wash from just upstream of West Hacienda Avenue to just upstream of Upper Flamingo Detention Basin. As a result of the modifications, the width of the Special Flood Hazard Area (SFHA), the area that would be inundated by the base flood, for Flamingo Fan and Flamingo Wash increased in some areas and decreased in other areas along the revised reach. The modifications are shown on the enclosed annotated copy of FIRM Panel 32003C2535 D. This LOMR hereby revises the above-referenced panel(s) of the effective FIRM dated August 16, 1995.

The modifications are effective as of the date of this letter. The map panel as listed above and as modified by this letter will be used for all flood insurance policies and renewals issued for your community.

A review of the determination made by this LOMR and any requests to alter this determination should be made within 30 days. Any request to alter the determination must be based on scientific or technical data.

We will not physically revise and republish the FIRM and Flood Insurance Study (FIS) report for your community to reflect the modifications made by this LOMR at this time. When changes to the previously cited FIRM panels and FIS report warrant physical revision and republication in the future, we will incorporate the modifications made by this LOMR at that time.

This LOMR is based on minimum floodplain management criteria established under the NFIP. Your community is responsible for approving all floodplain development, and for ensuring all necessary permits required by Federal or State law have been received. State, county, and community officials, based on knowledge of local conditions and in the interest of safety, may set higher standards for construction in the

SFHA. If the State, county, or community has adopted more restrictive or comprehensive floodplain management criteria, these criteria take precedence over the minimum NFIP criteria.

The basis of this LOMR is, in whole or in part, a channel-modification project. NFIP regulations, as cited in Paragraph 60.3(b)(7), require that communities assure that the flood-carrying capacity within the altered or relocated portion of any watercourse is maintained. This provision is incorporated into your community's existing floodplain management regulations. Consequently, the ultimate responsibility for maintenance of the modified channel rests with your community.

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This determination has been made pursuant to Section 206 of the Flood Disaster Protection Act of 1973 (Public Law 93-234) and is in accordance with the National Flood Insurance Act of 1968, as amended (Title XIII of the Housing and Urban Development Act of 1968, Public Law 90-448), 42 U.S.C. 4001-4128, and 44 CFR Part 65. Pursuant to Section 1361 of the National Flood Insurance Act of 1968, as amended, communities participating in the NFIP are required to adopt and enforce floodplain management regulations that meet or exceed NFIP criteria. These criteria are the minimum requirements and do not supersede any State or local requirements of a more stringent nature. This includes adoption of the effective FIRM and FIS report to which the regulations apply and the modifications described in this LOMR.

A Consultation Coordination Officer (CCO) has been designated to assist your community. The CCO will be the primary liaison between your community and FEMA. For information regarding your CCO, please contact:

Ms. Dorothy M. Lacey
Director, Mitigation Division
Federal Emergency Management Agency, Region IX
The Presidio of San Francisco, Building 105
San Francisco, California 94129-1250
(415) 923-7177

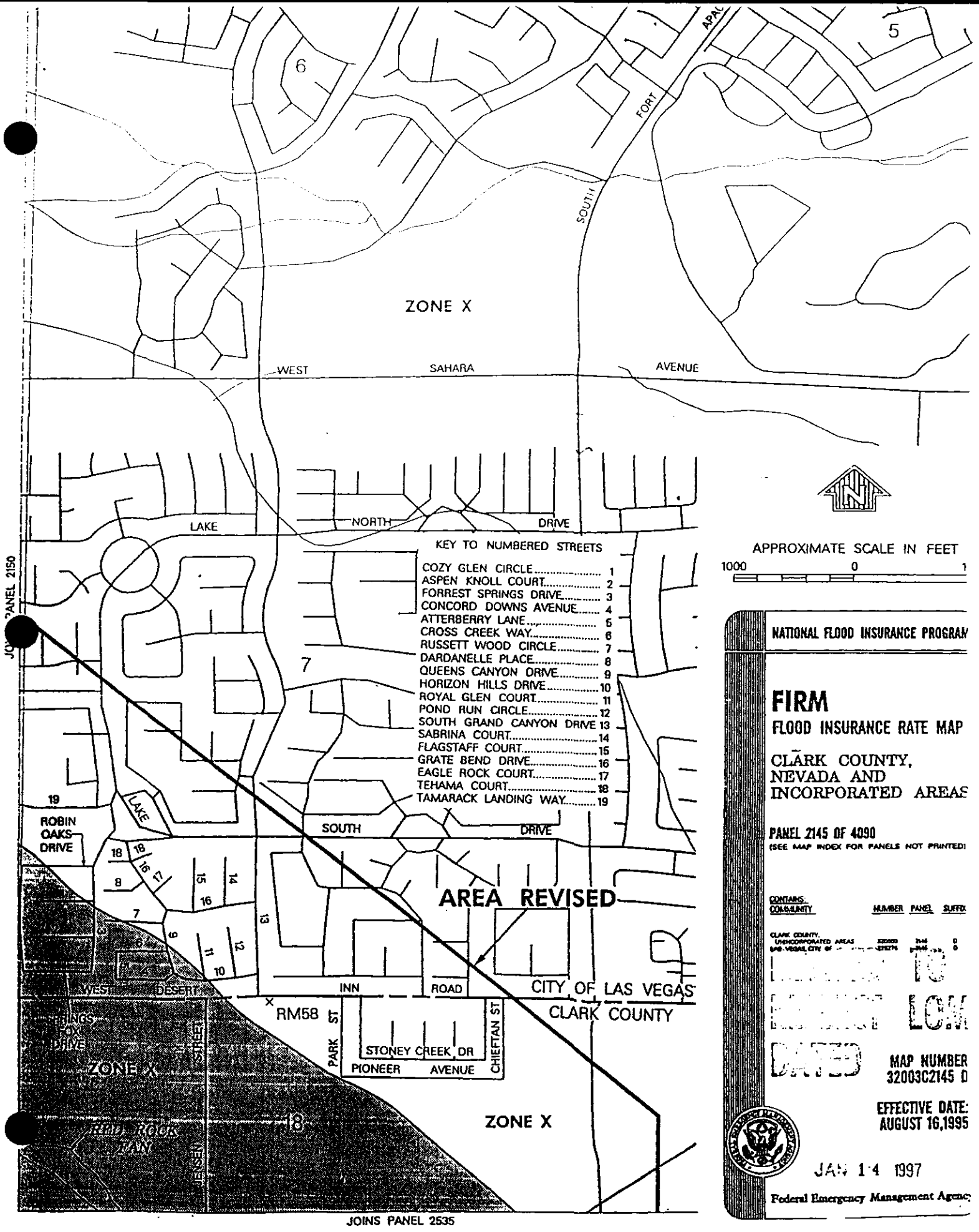
If you have any questions regarding floodplain management regulations for your community or the NFIP in general, please contact the CCO for your community at the telephone number cited above. If you have any technical questions regarding this LOMR, please contact Mr. Karl Mohr of our staff in Washington, DC, either by telephone at (202) 646-2770 or by facsimile at (202) 646-4596.

Sincerely,

Frederick H. Sharrocks, Jr., Chief
Hazard Identification Branch
Mitigation Directorate

Enclosure

cc: Mr. Kevin L. Eubanks, P.E.
Assistant General Manager
Clark County Regional Flood
Control District



NATIONAL FLOOD INSURANCE PROGRAM

FIRM

FLOOD INSURANCE RATE MAP

CLARK COUNTY, NEVADA AND INCORPORATED AREAS

PANEL 2145 OF 4090

(SEE MAP INDEX FOR PANELS NOT PRINTED)

CONTAINS: COMMUNITY	NUMBER	PANEL	SUFFIX
CLARK COUNTY, UNINCORPORATED AREAS	320003	2145	D
LAS VEGAS, CITY OF	320029	2145	D

[illegible] LOCK

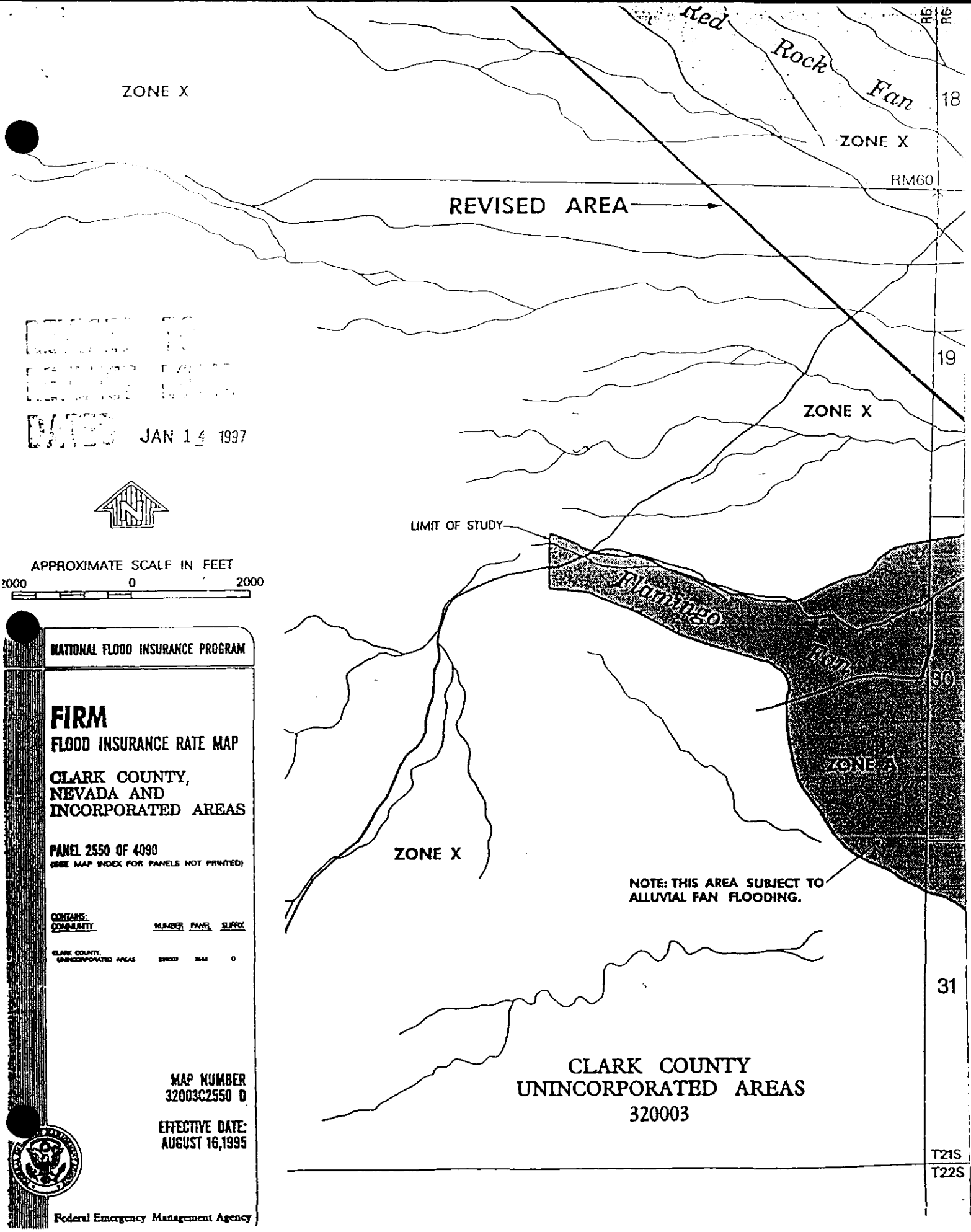
DATED

MAP NUMBER 32003C2145 D

EFFECTIVE DATE: AUGUST 16,1995

JAN 14 1997

Federal Emergency Management Agency



JAN 14 1997

APPROXIMATE SCALE IN FEET

2000 0 2000

NATIONAL FLOOD INSURANCE PROGRAM

FIRM

FLOOD INSURANCE RATE MAP

CLARK COUNTY, NEVADA AND INCORPORATED AREAS

PANEL 2550 OF 4090

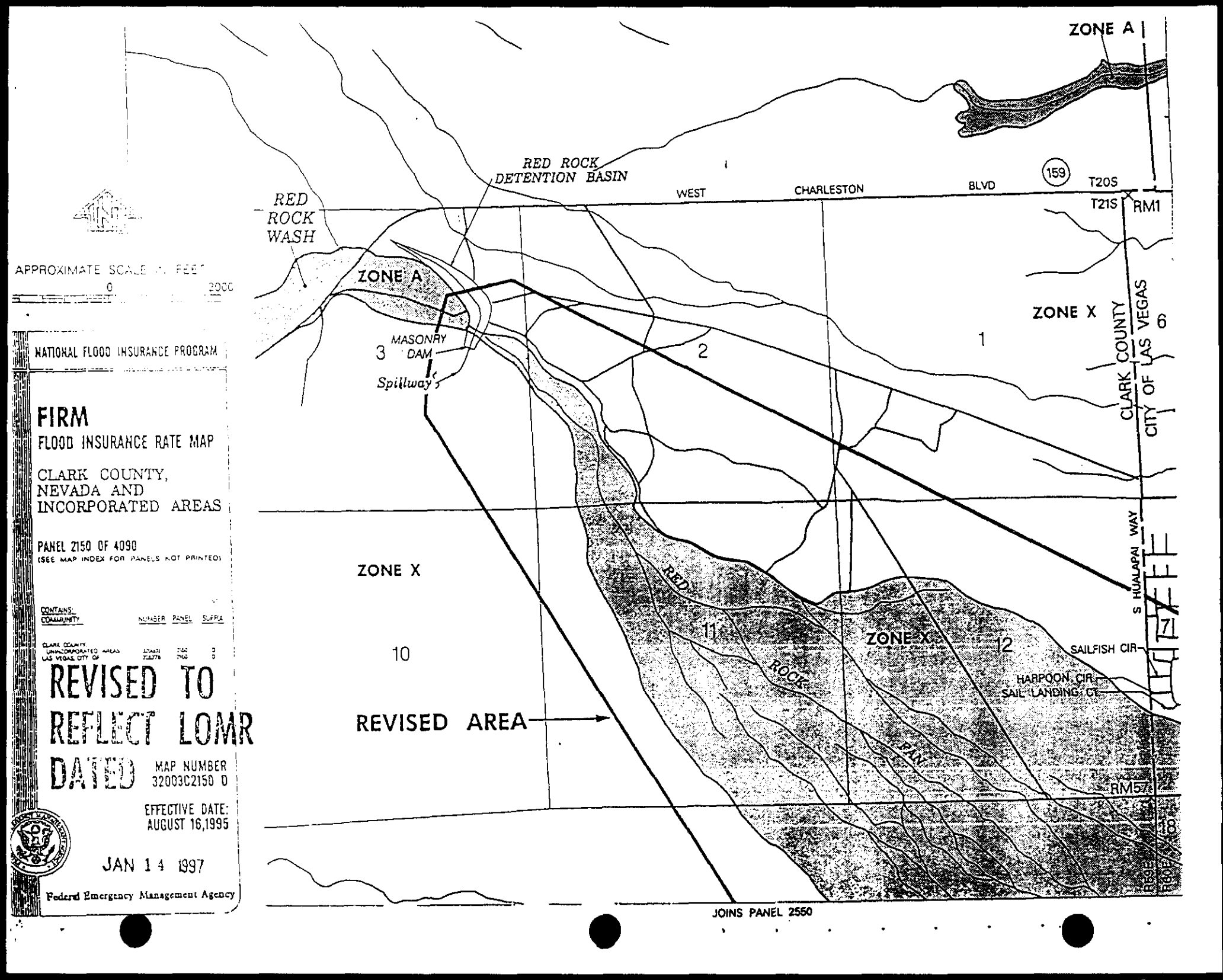
(SEE MAP INDEX FOR PANELS NOT PRINTED)

CONTAINS: COMMUNITY	NUMBER	PANEL	SUFFIX
CLARK COUNTY, UNINCORPORATED AREAS	320003	2550	D

MAP NUMBER
32003C2550 D

EFFECTIVE DATE:
AUGUST 16,1995

Federal Emergency Management Agency


ZONE A
RED ROCK DETENTION BASIN
WEST CHARLESTON BLVD
159
T20S
T21S
RM1
RED ROCK WASH
ZONE A
MASONRY DAM
Spillway
ZONE X
CLARK COUNTY
CITY OF LAS VEGAS
1
2
3
6
ZONE X
10
11
12
RED ROCK
ZONE X
REVISED AREA
S HUALAPAI WAY
SAILFISH CIR
HARPOON CIR
SAIL LANDING CT
RM57
JOINS PANEL 2550
APPROXIMATE SCALE IN FEET
0
2000
NATIONAL FLOOD INSURANCE PROGRAM
FIRM
FLOOD INSURANCE RATE MAP
CLARK COUNTY, NEVADA AND INCORPORATED AREAS
PANEL 2150 OF 4090
(SEE MAP INDEX FOR PANELS NOT PRINTED)
CONTAINS:
COMMUNITY
NUMBER
PANEL
SUFFIX
CLARK COUNTY, UNINCORPORATED AREAS
LAS VEGAS, CITY OF
320003
320276
2150
2160
D
D
REVISED TO REFLECT LOMR DATED
MAP NUMBER
32003C2150 D
EFFECTIVE DATE:
AUGUST 16,1995
JAN 14 1997
Federal Emergency Management Agency

CLARK COUNTY
REGIONAL FLOOD CONTROL DISTRICT

1991 FLOOD CONTROL MASTER PLAN UPDATE LAS VEGAS VALLEY

LEGEND

45 SUBAREA DESIGNATION

——— SUBAREA DELINEATION

0 7,500 15,000 22,500

(APPROXIMATE)

SOUTHWEST BASIN HYDROLOGIC SUBAREAS

FIGURE S-4

James M. Montgomery
Consulting Engineers, Inc.
Las Vegas, Nevada

ELEVATION REFERENCE MARKS

REFERENCE MARK	ELEVATION (FEET NGVD)	DESCRIPTION OF LOCATION
RM61	2551.32	BM C10SW16/railroad spike in power pole #15/11. Pile is 50 feet south and 35 feet from the intersection of Flamingo Road and Durango Drive.
RM62	2446.50	BM C10SW15/Concrete nail in AC pavement at the intersection of Flamingo Road and Buffalo Drive. Section Corner.
RM63	2484.35	Township 21 South, Range 60 East, BM C10SW32/BLM brass cap in large rock mound. East side of dirt road running north and south. Section Corner.
RM64	2588.01	Township 21 South Range 60 East, BM C10SW32/BLM brass cap about 200 feet north of Pipeline Road with large rock mound. Section Corner.

115°18'45" 36°07'30"

115°15'00" 36°07'30"

36°03'45" 115°18'45"

36°03'45" 115°15'00"

JOINS PANEL 2146

JOINS PANEL 2550

JOINS PANEL 2545

JOINS PANEL 2563

JOINS PANEL 2561

KEY TO NUMBERED STREETS

AMBER LANTERN CIRCLE	1
BAHAMA BAY COURT	2
BARRELWOOD DRIVE	3
BENVIEW DRIVE	4
CALICO BROOK COURT	5
CALICO COVE COURT	6
DUTCH VALLEY DRIVE	7
EMERALD BAY CIRCLE	8
FAWN GROVE DRIVE	9
LONE MESA DRIVE	10
MOSS RIDGE COURT	11
SOUTH EL CAPITAN WAY	12
WINDANSEA	13

KEY TO NUMBERED STREETS

ASPENGLEN DRIVE	14
EXOTIC PLUM AVE	15
GOLDEN ELM STREET	16
LAUREL BROOK DRIVE	17
MEADOWOAK LANE	18
MOUNTAIN BIRCH STREET	19
NARROW LEAF WAY	20
ROBUST JUNIPER AVE	21
SEA MIST LANE	22
WEST KATIE AVE	23
WHITE IVORY COURT	24
WHITE PEPPERMINT DRIVE	25

NOTE: THIS AREA SUBJECT TO ALLUVIAL FAN FLOODING.

NOTE: THIS AREA SUBJECT TO ALLUVIAL FAN FLOODING.

NOTE: MAP AREA SHOWN ON THIS PANEL IS LOCATED WITHIN TOWNSHIP 21 SOUTH, RANGE 60 EAST AND TOWNSHIP 22 SOUTH, RANGE 60 EAST.

CLARK COUNTY
UNINCORPORATED AREAS
320003

ZONE A
ZONE X
RM61
RM62
RM63
RM64
LIMIT OF STUDY
Red Rock Wash
Flamingo Wash
Upper Flamingo Detention Basin
TROPICANA WASH
T21S
T22S

LEGEND

SPECIAL FLOOD HAZARD AREAS INUNDATED BY 100-YEAR FLOOD

- **ZONE A** No base flood elevations determined.
- **ZONE AE** Base flood elevations determined.
- **ZONE AH** Flood depths of 1 to 3 feet (usually areas of ponding); base flood elevations determined.
- **ZONE AO** Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
- **ZONE A99** To be protected from 100-year flood by Federal flood protection system under construction; no base elevations determined.
- **ZONE V** Coastal flood with velocity hazard (wave action); no base flood elevations determined.
- **ZONE VE** Coastal flood with velocity hazard (wave action); base flood elevations determined.

FLOODWAY AREAS IN ZONE AE

OTHER FLOOD AREAS

- **ZONE X** Areas of 500-year flood; areas of 100-year flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 100-year flood.

OTHER AREAS

- **ZONE X** Areas determined to be outside 500-year floodplain.
- **ZONE D** Areas in which flood hazards are undetermined.

UNDEVELOPED COASTAL BARRIERS

Identified 1983 | Identified 1990 | Otherwise Protected Areas

Coastal barrier areas are normally located within or adjacent to Special Flood Hazard Areas.

Flood Boundary

Floodway Boundary

Zone D Boundary

Boundary Dividing Special Flood Hazard Zones, and Boundary Dividing Areas of Different Coastal Base Flood Elevations Within Special Flood Hazard Zones.

513 — Base Flood Elevation Line; Elevation in Feet. See Map Index for Elevation Datum.

D — D — Cross Section Line

(EL. 987) — Base Flood Elevation in Feet Where Uniform Within Zone. See Map Index for Elevation Datum.

RM7 — Elevation Reference Mark

M2 — River Mile

97°07'30", 32°22'30" — Horizontal Coordinates Based on North American Datum of 1927 (NAD 27) Projection.

NOTES

This map is for use in administering the National Flood Insurance Program; it does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size, or all planimetric features outside Special Flood Hazard Areas.

Coastal base flood elevations apply only landward of 0.0 NGVD, and include the effects of wave action; these elevations may also differ significantly from those developed by the National Weather Service for hurricane evacuation planning.

Areas of Special Flood Hazard (100-year flood) include Zones A, AE, AH, AO, A99, V, and VE.

Certain areas not in Special Flood Hazard Areas may be protected by flood control structures.

Boundaries of the floodways were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the Federal Emergency Management Agency.

Floodway widths in some areas may be too narrow to show to scale. Floodway widths are provided in the Flood Insurance Study Report.

This map may incorporate approximate boundaries of Coastal Barrier Resource System Units and /or Otherwise Protected Areas established under the Coastal Barrier Improvement Act of 1990 (PL 101-591).

Corporate limits shown are current as of the date of this map. The user should contact appropriate community officials to determine if corporate limits have changed subsequent to the issuance of this map.

For community map revision history prior to countywide mapping, see Section 6.0 of the Flood Insurance Study Report.

For adjoining map panels and base map source see separately printed Map Index.

MAP REPOSITORY
Refer to Repository Listing on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP:
AUGUST 16,1995

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL:

Refer to the FLOOD INSURANCE RATE MAP EFFECTIVE DATE shown on this map to determine when actuarial rates apply to structures in zones where elevations or depths have been established.

To determine if flood insurance is available, contact an insurance agent or call the National Flood Insurance Program at (800) 638-6620.

APPROXIMATE SCALE IN FEET
1000 0 1000

NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP

CLARK COUNTY, NEVADA AND INCORPORATED AREAS

PANEL 2535 OF 4080
(SEE MAP INDEX FOR PANELS NOT PRINTED)

CONTAINS: COMMUNITY	NUMBER	PANEL	SUFFIX
CLARK COUNTY, UNINCORPORATED AREAS	320003	2535	D

MAP NUMBER 32003C2535 D

EFFECTIVE DATE: AUGUST 16,1995

Federal Emergency Management Agency

ORIGINAL EFFECTIVE FIS HEC-1 MODEL
FILE NAME: F100.DAT

ORIGINAL EFFECTIVE FIS HEC-1 MODEL
AUGUST 1988 VERSION
FILE NAME: F100.DAT

This HEC-1 model was copied directly from the 1991 Las Vegas Valley FIS Hydrology Report for the Flamingo/Tropicana Wash. The purpose of including this model is to show consistency between the August 1988 and the September 1990 versions of HEC-1.

HEC1 S/N: 10905[illegible]4 HMVersion: 5.20 Data File: f100.dat

```
*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*            FEBRUARY 1981              *
*          REVISED 02 AUG 88            *
*                                       *
*  RUN DATE  12/12/1990  TIME  11:28:54 *
*                                       *
*****************************************
```

```
*************************************
*                                   *
*    U.S. ARMY CORPS OF ENGINEERS   *
*  THE HYDROLOGIC ENGINEERING CENTER *
*         609 SECOND STREET         *
*       DAVIS, CALIFORNIA 95616     *
*                                   *
*                                   *
*************************************
```

```
X     X  XXXXXXX   XXXXX           X
X     X  X        X     X         XX
X     X  X        X                X
XXXXXXX  XXXX     X        XXXXX   X
X     X  X        X                X
X     X  X        X     X          X
X     X  XXXXXXX   XXXXX           XXX
```

```
::::::::::::::::::::::::::::::::::::::::::::
::::::::::::::::::::::::::::::::::::::::::::
:::                                      :::
:::  Full Microcomputer Implementation   :::
:::                 by                   :::
:::        Haestad Methods, Inc.         :::
:::                                      :::
::::::::::::::::::::::::::::::::::::::::::::
::::::::::::::::::::::::::::::::::::::::::::
```

37 Brookside Road * Waterbury, Connecticut 06708 * (203) 755-1666

THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.
THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION
NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL LOSS RATE:GREEN AND AMPT INFILTRATION
KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM

```
LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

          *DIAGRAM
    1     ID    INPUT FILE = FLEX100.DAT
    2     ID     CLARK COUNTY FLOOD CONTROL DISTRICT MASTER PLAN UPDATE
    3     ID     RED ROCK/FLAMINGO/TROPICANA WATERSHED
    4     ID     EXISTING DRAINAGE SYSTEM WITH PRESENT DEVELOPMENT
    5     ID     FLAMINGO/TROPICANA STORM (NO UPPER BLUE DIAMOND)- MAIN CHANNEL RUN
    6     ID         100-YEAR 6-HR STORM (SDN #5)
    7     ID         JMM    OCTOBER 1990
    8     ID
    9     ID         BASIC DATA FILE BASED ON COE FILE S10P40X.
   10     ID         MODIFICATIONS ADDED FROM B&V RED ROCK BASIN AND UPPER FLAMINGO
   11     ID         BASIN HEC-1 RUNS; NIMBUS NORTHWEST MCCARRAN AIRPORT HEC-1 RUNS;
   12     ID         AND SUBBASIN MODIFICATIONS DUE TO RECENT DEVELOPMENT.
   13     ID
   14     ID         COE MUSKINGUM ROUTING CONVERTED TO KINEMATIC FOR EXISTING
   15     ID         IMPROVED CHANNELS FROM FACILITY INVENTORY.
   16     ID
   17     ID     PB CARDS CONTAIN POINT PRECIPITATION.  DARF'S FROM CCRFCD MANUAL
   18     ID     BASED ON STORM AREAS FOR CONCENTRATION POINTS AS FOLLOWS:
   19     ID
   20     ID         SUBBASIN          AREA (SQMI)          DARF
   21     ID         --------          -----------          ----
   22     ID          T12,F5            20.8,15.9           0.81
   23     ID            RR14               53               0.68
   24     ID       F7,F14,F16,F16OF     92,103,105           0.60
   25     ID       F17,F20B,F22,F23   127,139,143,145       0.565
   26     ID
   27     ID
   28     IT       5       0       0     200
   29     IO       5
   30     JR    PREC    0.81    0.68    0.60   0.565

   31     KK     RR1 RUNOFF FROM RR1
   32     KM         RR1-RR14 DATA TAKEN FROM B&V TR-20 MODEL FOR UPPER FLAMINGO BASIN
   33     KM         NEW MUSKINGUM ROUTING PARAMETERS, CN'S AND LAGS USED FOR BETTER
   34     KM         AGREEMENT WITH COE FLOWS
   35     BA    3.83
   36     PC    .000    .020    .059    .080    .110    .144    .150    .160    .168    .171
   37     PC    .180    .182    .187    .190    .197    .202    .210    .220    .230    .241
   38     PC    .250    .259    .265    .280    .290    .300    .305    .309    .310    .317
   39     PC    .321    .327    .333    .346    .361    .381    .408    .430    .477    .514
   40     PC    .561    .630    .710    .720    .731    .752    .779    .790    .795    .804
   41     PC    .810    .820    .826    .840    .859    .889    .910    .938    .966    .970
   42     PC    .974    .979    .981    .983    .985    .989    .990    .992    .993    .996
   43     PC    .997    .999    1.00
   44     PB    4.08
   45     LS              84
   46     UD    0.34

   47     KK     RR4 ROUTE RR1 THRU RR4
   48     RM       2    0.36    0.15
```

```
LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  91      KK     RR7 COMBINE RR6+RR7
  92      HC       2

  93      KK     RR8 ROUTE RR7 THRU RR8
  94      RM       2    0.51    0.15

  95      KK     RR8 RUNOFF FROM RR8
  96      BA    1.75
  97      PB    3.49
  98      LS              81
  99      UD    1.57

 100      KK     RR9 RUNOFF FROM RR9
 101      BA    3.71
 102      PB    3.37
 103      LS              84
 104      UD    0.79

 105      KK     RR8 COMBINE RR4+RR5+RR7+RR8+RR9
 106      HC       5

 107      KK    RR10 ROUTE RR8 THRU RR10
 108      RM       2    0.25    0.15

 109      KK    RR10 RUNOFF FROM RR10
 110      BA    3.30
 111      PB    3.40
 112      LS              81
 113      UD    1.19

 114      KK    RR10 COMBINE RR8+RR10
 115      HC       2

 116      KK    RR12 ROUTE RR10 THRU RR12
 117      RM       2    0.28    0.15

 118      KK    RR11 RUNOFF FROM RR11
 119      BA    3.40
 120      PB    3.46
 121      LS              83
 122      UD     .82

 123      KK    RR12 ROUTE RR11 THRU RR12
 124      RM       2    0.18    0.15

 125      KK    RR12 RUNOFF FROM RR12
 126      BA    4.25
 127      PB    3.43
 128      LS              84
 129      UD     .77
```

```
LINE          ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  130         KK    RR12 COMBINE RR10+RR11+RR12
  131         HC       3

  132         KK    RR13 ROUTE RR12 THRU RR13
  133         RM       2    0.24    0.15

  134         KK    RR13 RUNOFF FROM RR13
  135         BA    2.26
  136         PB    3.32
  137         LS              80
  138         UD    0.51

  139         KK    RR13 COMBINE RR12+RR13
  140         HC       2

  141         KK    RR14 ROUTE RR13 THRU RR14
  142         RM       2     .10     .15

  143         KK    RR14 RUNOFF FROM RR14
  144         BA    6.22
  145         PB    3.60
  146         LS              83
  147         UD    1.53

  148         KK    RR14 COMBINE RR13+RR14
  149         HC       2
              * ******** END OF DATA FROM B&V REPORT *******

  150         KK   RR.DB ROUTE THRU RED ROCK DETENTION BASIN
  151         KM         USE STORAGE-OUTFLOW DATA FROM COE FEASIBILITY REPORT
  152         RS       1    STOR       0
  153         SV       0     150     600    1100    1860    1900    2250    2630    2800
  154         SQ       0     750    1100    1250    1410    1420   22650   72500   97500
  155         SE    3159    3170    3190    3200    3210  3210.5    3215    3220    3222

  156         KK    RR23 ROUTE RED ROCK OUTFLOW THRU RR23
  157         RM       6    0.53    0.15

  158         KK    RR23 RUNOFF FROM RR23
  159         BA    2.03
  160         PB    3.20
  161         LS       0    74.9
  162         UK     500    .025    0.15     100
  163         RK    5500    .025    .030    0.09                        1
  164         RK   15500    .023    .030            TRAP     100       5      NO

  165         KK    RR23 COMBINE RED ROCK OUTFLOW WITH RR23
  166         HC       2
```

```
LINE          ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  167         KK      R1 RUNOFF FROM R1
  168         BA    1.12
  169         PB    3.17
  170         LS       0    87.7
  171         UD    0.47

  172         KK    RR23 COMBINE R1+RR23
  173         HC       2

  174         KK      R5 ROUTE RR23 THRU R5
  175         RM       5    0.39    0.15

  176         KK    RR20 RUNOFF FROM RR20
  177         BA    1.37
  178         PB    3.22
  179         LS       0      88
  180         UD    0.69

  181         KK      R5 ROUTE RR20 THRU R5
  182         RM       7    0.61    0.15

  183         KK    RR21 RUNOFF FROM RR21
  184         BA    6.27
  185         PB    3.26
  186         LS       0      87
  187         UD    1.00

  188         KK      R5 ROUTE RR21 THRU R5
  189         RM       8    0.64    0.15

  190         KK    RR22 RUNOFF FROM RR22
  191         BA    2.15
  192         PB    3.20
  193         LS       0      87
  194         UD    0.62

  195         KK      R5 ROUTE RR22 THRU R5
  196         RM       8    0.70    0.15

  197         KK      R5 RUNOFF FROM R5
  198         BA    5.77
  199         PB    3.00
  200         LS       0    75.5
  201         UK     600    .025     .15     100
  202         RK    7920    .023    .030     .20                        1
  203         RK   13000    .019    .030             TRAP      40      2

  204         KK      R5 COMBINE R5+RR23+RR22+RR21+RR20
  205         HC       5
```

```
LINE          ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  206         KK      R6 ROUTE R5 THRU R6
  207         RM       3    0.22    0.15

  208         KK      R6 RUNOFF FROM R6
  209         BA    1.51
  210         PB    2.77
  211         LS       0    73.2
  212         UK     500    .015     .15     100
  213         RK    5200    .016    .030     .13                              1
  214         RK    8000   .0044    .030             TRAP      40        1       NO

  215         KK      R6 COMBINE R5 WITH R6
  216         HC       2

  217         KK      F1 RUNOFF FROM F1
  218         BA    4.63
  219         PB    3.23
  220         LS       0       88
  221         UD    0.78

  222         KK      F5 ROUTE F1 THRU F5
  223         RM      12    0.99    0.15

  224         KK      F2 RUNOFF FROM F2
  225         BA    1.28
  226         PB    3.19
  227         LS       0       88
  228         UD     .43

  229         KK      F5 ROUTE F2 THRU F5
  230         RM       9    0.76    0.15

  231         KK      F3 RUNOFF FROM F3
  232         BA    2.60
  233         PB    3.09
  234         LS       0       87
  235         UD     .34

  236         KK      F5 ROUTE F3 THRU F5
  237         RM       5    0.40    0.15

  238         KK      F4 RUNOFF FROM F4
  239         BA    1.30
  240         PB    3.03
  241         LS       0       86
  242         UD     .41

  243         KK      F5 ROUTE F4 THRU F5
  244         RM       8    0.69    0.15
```

```
LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  245     KK     F5N RUNOFF FROM F5N
  246     BA    4.04
  247     PB    3.00
  248     LS       0      85
  249     UK     300    .025     .15     100
  250     RK    3200    .025    .030     .20                          1
  251     RK   18000    .023    .030             TRAP      70        5       NO

  252     KK     F5S RUNOFF FROM F5S
  253     BA    2.00
  254     PB    2.86
  255     LS       0      85
  256     UK     400    .020     .25     100
  257     RK    3500    .020    .030     .16                          1
  258     RK   14500    .017    .030             TRAP      50        5       NO

  259     KK      F5 COMBINE F5N AND F5S
  260     HC       2

  261     KK      F5 F5 WITH ROUTED F1, F2, F3, AND F4
  262     HC       5

  263     KK  UFL.DB UPPER FLAMINGO DETENTION BASIN
  264     KM         STORAGE-OUTFLOW DATA FROM B&V DESIGN PLANS
  265     RS       1    STOR       0
  266     SV       0      10       25      100      220      560      950     1000     1130     1430
  267     SV    2070
  268     SQ       0      75      300      675      910     1100     1260     1280     5170    20600
  269     SQ   50300
  270     SE    2445  2447.5     2450     2455     2460     2465     2470  2470.5     2472     2475
  271     SE    2480

  272     KK     F5R ROUTE UPPER FLAMINGO DB OUTFLOW THRU OUTFALL CHANNEL
  273     KM         CHANNEL GEOMETRY FROM B&V PREDESIGN MEMORANDUM
  274     RK    3500    .010    .020             TRAP      30        3

  275     KK     F6A RUNOFF FROM F6A
  276     BA     .55
  277     PB    2.86
  278     LS       0      88
  279     UD    0.35

  280     KK     F6B ROUTE F6A THRU F6B
  281     RM       4    0.35    0.15

  282     KK     F6B RUNOFF FROM F6B
  283     BA    0.85
  284     PB    2.77
  285     LS       0      88
  286     UD    0.30
```

```
LINE          ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  287         KK     F6B COMBINE F6A AND F6B
  288         HC       2

  289         KK      F7 ROUTE F6 THRU F7
  290         RM       3    0.28    0.15

  291         KK      F7 RUNOFF FROM F7
  292         BA    1.50
  293         PB    2.77
  294         LS       0    85.5
  295         UK     700    .015     .15     100
  296         RK    4000   .0114    .030     .65                          1
  297         RK    7500   .0116    .030            TRAP      50        5       NO

  298         KK      F7 COMBINE F7 WITH ROUTED F6
  299         HC       2

  300         KK      F7 COMBINED F7 WITH R6 AND F5R
  301         HC       3

  302         KK     F7R ROUTE F7 THRU F8 (FLWA1267-1335)
  303         RK    5230    .011    .030            TRAP      40        1

  304         KK      F8 RUNOFF FROM F8
  305         BA     .48
  306         LS       0    66.1       0       0      98        0
  307         UK    1500    .014     .28      83
  308         UK      50    .020     .10      17
  309         RK    1800     .01    .020    .048
  310         RK    7200    .010    .030                    30        2       NO

  311         KK      F8 COMBINE F8 AND F7R
  312         HC       2

  313         KK      F9 ROUTE F8 THRU F9 (FLWA1203)
  314         RK    1740   .0138    .015            TRAP      40        2

  315         KK       . (FLWA1152)
  316         RK    2640   .0044    .040            TRAP      50        3

  317         KK      F9 RUNOFF FROM F9
  318         BA     .90
  319         LS       0    63.0       0       0      98        0
  320         UK     500    .010     .25      73
  321         UK      40    .015     .10      27
  322         RK    2400    .007    .020     .35                          1
  323         RK    2300    .008    .020    .015                          1
  324         RK   10800    .013    .023            TRAP      50        3       NO
```

```
LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  325     KK      F9 COMBINE F8 WITH F9
  326     HC       2

  327     KK     F14 ROUTE F9 THRU F14
  328     RM       2    0.16    0.20

  329     KK     F10 RUNOFF FROM F10
  330     BA    1.17
  331     LS       0    62.6       0       0      98       0
  332     UK     600    .010     .25      67
  333     UK      40    .015     .10      33
  334     RK    1300    .010    .020    .019                      1
  335     RK    1300    .006     .02    .080    TRAP              1
  336     RK    8200   .0117     .02            TRAP      40      1
          * *** SUBAREAS R2 - R8 NOW ASSUMED TO BE DIVERTED INTO FLAMINGO WASH BY
          *     RAINBOW AND FLAMINGO RD ****

  337     KK      R2 RUNOFF FROM R2
  338     BA    2.01
  339     PB    3.00
  340     LS      .0    79.4
  341     UD    0.21

  342     KK      R3 ROUTE R2 THRU R3
  343     RM       5    0.38    0.15

  344     KK      R3 RUNOFF FROM R3
  345     BA    2.63
  346     PB    2.77
  347     LS       0    68.2
  348     UD    0.61

  349     KK      R3 COMBINE R2+R3
  350     HC       2

  351     KK      R3 ROUTE THRU EXISTING GRAVEL PIT
  352     RS       1    STOR     480
  353     SV       0     480    1290    3150    3420
  354     SE       0      20      60     110     120
  355     SQ       0       0    1800    1800   37500

  356     KK      R8 ROUTE R3 THRU R8
  357     RK    2750    .019    .020            TRAP      40      1

  358     KK      R7 RUNOFF FROM R7
  359     BA    1.39
  360     LS       0    79.5
  361     UD    0.51
```

```
LINE          ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  362         KK      R7 DIVERT Q IN EXCESS OF PIPE CAPACITY
  363         KM         LIMITING CAPACITY OF RAINBOW STORM DRAIN = 324 CFS (FLLA0307)
  364         KM         OVERFLOW RUNS DOWN DESERT INN AND EDNA INTO CENTRAL BASIN
  365         DT    R7OF
  366         DI       0     324    1000    5000
  367         DQ       0       0     676    4676

  368         KK      R8 ROUTE R7 THRU R8 (90"-96" RCP IN RAINBOW)
  369         RK    5280    .004    .015            CIRC     8.0

  370         KK      R8 RUNOFF FROM R8
  371         BA     .51
  372         LS       0    73.3
  373         UD    0.37

  374         KK      R8 COMBINE R3+R7+R8
  375         HC       3

  376         KK     F10 ROUTE R8 THRU F10 (114" RCP IN FLAMINGO RD)
  377         RK    5280    .010    .015            CIRC     9.5

  378         KK     F10 COMBINE R8+F10
  379         HC       2

  380         KK     F14 ROUTE F10 THRU F14 (FLLA0000)
  381         RK    4010   .0075    .015            TRAP      20       1

  382         KK     F12 RUNOFF FROM F12
  383         BA     .88
  384         LS       0    87.9
  385         UK     700    .012     .15     100
  386         RK    3500   .0120    .030     .21                      1
  387         RK    8200   .0130    .030            TRAP      10       5      NO

  388         KK    F12R    ROUT     F12    THRU     F13
  389         RM       2    0.20    0.15

  390         KK     F13 RUNOFF FROM F13
  391         BA     .55
  392         LS       0    87.5       0       0      98       0
  393         UK     750    .010     .25      83
  394         UK      50    .015     .10      17
  395         RK    1100     .01    .023     .04                      1
  396         RK    2300     .01    .023     .10                      1
  397         RK    5900    .012    .026            TRAP      40       2      NO

  398         KK     F13 COMBINE     F13     AND     F1R
  399         HC       2
```

```
LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  400     KK     F14 ROUTE F13 THRU F14 (UNIMPROVED)
  401     RM       2    0.15    0.15

  402     KK     F14 RUNOFF FROM F14
  403     BA     .78
  404     LS       0    76.5       0       0      98       0
  405     UK     500    .010     .25      86
  406     UK     400    .015     .10      12
  407     RK    1200   .0090    .023    .024                      1
  408     RK    2400   .0075    .025     .12    TRAP      20       1
  409     RK    5200   .0090    .033            TRAP      75       4      NO

  410     KK     F14 COMBINE F9, F10, F13, AND F14
  411     HC       4

  412     KK    F14R ROUTE F14 THRU F15 (FLWA0990-1049)
  413     RK    3110    .020    .040            TRAP      50       3

  414     KK       .  (FLWA0924)
  415     RK    3490    .010    .040            TRAP      60       1

  416     KK       .  (FLWA0891-0923)
  417     RK    1580   .0076    .030            TRAP      90       1

  418     KK     F15 RUNOFF FROM F15
  419     BA    1.32
  420     LS       0    78.0       0       0      98       0
  421     UK     640    .013     .15      77
  422     UK     400    .014     .10      23
  423     RK    2500    .013    .020    0.08                      1
  424     RK    4500    .006    .020    0.25                      1
  425     RK    8500   0.012    .030            TRAP      40       3      NO

  426     KK     F15 COMBINE     F15     AND    F14R
  427     HC       2

  428     KK   F15OF DIVERT OVERFLOWS
  429     KM         DIVERSION RATING CURVE FROM COE FEASIBILITY STUDY
  430     DT   F15OF
  431     DI       0    4100    7000   10500   35000
  432     DQ       0       0    1700    4640   15500

  433     KK     F16 RUNOFF FROM F16
  434     BA     .52
  435     LS       0    75.5       0       0      98       0
  436     UK     600    .010    0.15      56
  437     UK     400    .015     .10      44
  438     RK    1000    .010    .025    .030                      1
  439     RK    2400    .015    .025     .10                      1
  440     RK    6000    .004    .020                              1
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  441     KK     F16 COMBINE F15 WITH F16
  442     HC       2

  443     KK   F16OF DIVERT OVERFLOWS
  444     KM         LIMIT FLOW TO 6000 CFS AT CEASARS PALACE/LVB/IMPERIAL PALACE CULVERT
  445     KM         BASED ON COE ASSUMED CAPACITY
  446     DT   F16OP
  447     DI       0    6000   12000   20000
  448     DQ       0       0    6000   14000

  449     KK     F16 ROUT F16 THRU F17 (FLWA0798-0823)
  450     RK    3550    .009    .015            TRAP      48       0

  451     KK       .  (FLWA0773)
  452     RK    1320   .0091    .020            TRAP      80      10

  453     KK       .  (FLWA0648-0798)
  454     RK    7760   .0064    .040            TRAP      30       2

  455     KK     F17 RUNOFF FROM F17
  456     BA     .65
  457     LS       0    75.5       0       0      98       0
  458     UK     900    .057     .15      51
  459     UK     600    .010     .10      49
  460     RK    1000    .010    .025    .040                      1
  461     RK    1500    .010    .027     .09                      1
  462     RK   11400   .0110    .030            TRAP     100       5      NO

  463     KK     F17 COMBINE     F17     AND  F16
  464     HC       2
          *  *** NO CONTRIBUTION FROM UPPER BLUE DIAMOND FOR FLAMINGO/RED ROCK STORM ***

  465     KK      T8 RUNOFF FROM T8
  466     BA    1.22
  467     LS       0    65.6
  468     UK     600    .015    0.15     100
  469     RK    2000    .018    .030     .14                      1
  470     RK   18000   .0161    .030            TRAP      75       5      NO

  471     KK      T9 ROUTE T8 TO T9
  472     RM       2     .52    0.15

  473     KK      T9 RUNOFF FROM T9
  474     BA    0.87
  475     LS       0    73.1
  476     UK     600    .010    0.15     100
  477     RK    4000    .010    .030    0.12                      1
  478     RK   10200   .0134    .030            TRAP      30       5
```

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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

 479      KK      T9 COMBINE T8 AND T9
 480      HC       2

 481      KK    T9OF DIVERT OVERFLOW
 482      DT    T9OF
 483      DI       0    5480   11000   15000
 484      DQ       0       0    2700    2700

 485      KK     T10 ROUTE T9 THRU T10
 486      RM       3    0.21    0.10

 487      KK      T4 RUNOFF FROM T4
 488      BA    3.22
 489      LS       0    87.6
 490      UK     500    .015    0.15     100
 491      RK    2700   .0190    .030    0.25                                1
 492      RK   20000   .0185    .030            TRAP      75        5      NO

 493      KK      T5 ROUTE T4 TO T5
 494      RK    6500    .013    .030            TRAP      30        2

 495      KK      T5 RUNOFF FROM T5
 496      BA    1.00
 497      LS       0    87.0
 498      UK     600    .010    0.15     100
 499      RK    2500    .012    .030    0.21                                1
 500      RK    6500    .013    .030            TRAP      30        2

 501      KK      T5 COMBINE T4 AND T5
 502      HC       2

 503      KK      T6 ROUTE T5 TO T6
 504      RK   10800    .012    .030            TRAP      30        5

 505      KK      T6 RUNOFF FROM T6
 506      BA    1.30
 507      LS       0    86.9
 508      UK     600    .010    0.15     100
 509      RK    6000    .012    .030    .400                                1
 510      RK   10800    .012    .030            TRAP      30        5

 511      KK      T6 COMBINE T5 AND T6
 512      HC       2

 513      KK    T9OF RECALL T9OF
 514      DR    T9OF

 515      KK      T6 ROUTE T9OF THRU T6
 516      RM       3    0.23    0.15
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LINE          ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  556         KK     T10 RUNOFF FROM T10
  557         BA    0.82
  558         LS       0    78.0       0      .0      98       0
  559         UK     700    .013    0.15      78
  560         UK     400    .011     .10      22
  561         RK    1100    .012    .020    .120                      1
  562         RK    3000    .008    .020     .50                      1
  563         RK    3500   0.010    .030             TRAP      30       2

  564         KK     T10 COMBINE T3, T6, T9 AND T10
  565         HC       4

  566         KK    T10R ROUT T10 THRU T11 (TRWA0235)
  567         RK    1160    .010    .015             TRAP      32       0

  568         KK       .   (TRWA0145-0218)
  569         RK    4700   .0095    .030             TRAP      90     1.5

  570         KK     T11 RUNOFF FROM T11
  571         BA    1.09
  572         LS       0    68.6       0       0      98       0
  573         UK     800    .010    0.30      61
  574         UK     500    .010    0.10      39
  575         RK    3200   .0080    .020    0.17                      1
  576         RK    5400   .0104    .030             TRAP     100       5      NO

  577         KK     T11 COMBINE T11 AND T10R
  578         HC       2

  579         KK    T11R ROUT  T11 THRU T12 (TRWA0117)
  580         RK    1130   .0088    .015             TRAP     1.5       2

  581         KK       .   (TRWA0000-0034+)
  582         RK    6500    .012    .040             TRAP     100     2.5

  583         KK     T12 RUNOFF FROM T12
  584         BA    0.77
  585         LS       0    74.4       0       0      98       0
  586         UK     500    .008    0.18      65
  587         UK     200    0.01    0.10      35
  588         RK    2200    .008    .023    0.12                      1
  589         RK    3000    .007    .025     .24              20       2
  590         RK    6600   .0103    .032                      30       5

  591         KK     T12 ADD T12 AND T11R
  592         HC       2

  593         KK    T3OF RECALL DIVERSION FROM T3
  594         DR    T3OF
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LINE          ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

 595          KK     T12 ROUTE T3OF TO T12
 596          RM      20    1.99    0.10

 597          KK     T12 COMBINE T3OF AND T12
 598          HC       2
              *  *** DATA FOR SUBAREAS MNW-B THRU MNW-M TAKEN FROM NIMBUS HEC-1 ANALYSIS
              *      FOR NORTHWEST MCCARRAN AIRPORT DRAINAGE STUDY (WITH SMALL MODIFICATIONS)

 599          KK   MNW-B RUNOFF FROM B
 600          BA    0.68
 601          LS              65      10
 602          UD     2.4

 603          KK    DIVB FLOW SPLIT AT I-15; BCULV IS FLOW CONVEYED BY CULVERT
 604          DT   BCULV
 605          DI       0      22     100     500
 606          DQ       0      22      22      22

 607          KK   RDIVB ROUTE DIVB TO CULVERT AT I15 AND C
 608          RK     600    .004     .05       0       0       5

 609          KK   MNW-C RUNOFF AT C
 610          BA    0.69
 611          LS              65      17
 612          UD     2.0

 613          KK   MNW-C COMBINE DIVB+C
 614          HC       2

 615          KK   MNW-C PONDING STORAGE ROUTING AT I-15
 616          RS       1    STOR       0
 617          SA       0     .28     .92    2.02    3.19    3.44    5.37    9.09
 618          SQ       0       8      25      35      40      78     360    1342
 619          SE      54      55      56      57   57.43      58      59      60

 620          KK    DIVC FLOW SPLIT AT C THRU AND AROUND CULVERT
 621          DT   CCULV
 622          DI       0       8      25      35      40      78     360    1342
 623          DQ       0       8      25      35      40      45      55      65

 624          KK   RDIVC ROUTE DIVC NORTH TO D
 625          RK     650    .004     .05       0       0       0      20

 626          KK   MNW-D RUNOFF FROM D
 627          BA     .05
 628          LS              66      10
 629          UD     .40

 630          KK   MNW-D COMBINE DIVC AND D
 631          HC       2
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

 632      KK    DIVD DIVERT FLOW TO NORTH; DCULV CROSSES I-15
 633      DT   DCULV
 634      DI       0      28     100     500
 635      DQ       0      28      28      28

 636      KK   RDIVD ROUTE DIVERTED FLOW NORTH TO E
 637      RK     800    .004     .05       0       0       0      20

 638      KK   MNW-E RUNOFF FROM E
 639      BA    0.05
 640      LS              65      18
 641      UD    0.38

 642      KK   MNW-E COMBINE DIVD + E
 643      HC       2

 644      KK   ECULV DIVIDE FLOW AT I-15 CULVERT; ECULV CROSSES I-15 INTO MNW-I
 645      DT   ECULV
 646      DI       0      28     100     500
 647      DQ       0      28      28      28

 648      KK   RDIVE ROUTE FLOW FROM DIVE NORTH ALONG I-15
 649      RK    1200    .007     .05       0       0       0       4

 650      KK  MNW-FG RUNOFF FROM FG
 651      BA    0.36
 652      LS              66      17
 653      UD    1.24

 654      KK  MNW-FG COMBINE EDIV + FG
 655      HC       2

 656      KK    DIVG DIVERT FLOW NORTH; GCULV CROSSES I-15 INTO SUBAREA I
 657      DT   GCULV
 658      DI       0      50      60     100     150     250
 659      DQ       0      50      60      60      60      60

 660      KK   RDIVG ROUTE DIVG NORTH TO AIRPORT CHANNEL
 661      RK    2200    .009    .040       0       0       0      10

 662      KK  MNW-J1 RUNOFF FROM J1
 663      BA    2.37
 664      LS              70
 665      UD    2.67

 666      KK  MNW-J2 ROUTE J1 TO J2
 667      RK   10000    .012     .04                       10       2

 668      KK  MNW-J2 RUNOFF FROM J2
 669      BA    1.21
 670      LS              70      10
 671      UD    1.22
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

 672      KK  MNW-J2 COMBINE J1+J2
 673      HC       2

 674      KK     CP1 COMBINE J2 + RDIVG
 675      HC       2

 676      KK    RCP1 ROUTE CP1 TO LAS VEGAS BLVD (CP3)
 677      RK    2600    .008     .04       0       0      20       1

 678      KK    RTNE RETURN FLOW FROM CULVERT E
 679      DR   ECULV

 680      KK    RTNE DUMMY SUBAREA TO GET 1988 HEC1 TO RUN (NEEDS NON-ZERO AREA)
 681      BA    0.01
 682      LS       0      50
 683      UD     0.1

 684      KK    RTNE COMBINE DIVERSION RECALL WITH DUMMY SUBAREA
 685      HC       2

 686      KK   RRTNE ROUTE ECULV TO OUTLET OF I
 687      RK    3900    .013     .05       0       0       0      50

 688      KK    RTNG RETURN FLOW FROM CULVERT G
 689      DR   GCULV

 690      KK    RTNG DUMMY SUBAREA TO GET 1988 HEC1 TO RUN (NEEDS NON-ZERO AREA)
 691      BA    0.01
 692      LS       0      50
 693      UD     0.1

 694      KK    RTNG COMBINE DIVERSION RECALL WITH DUMMY SUBAREA
 695      HC       2

 696      KK   RRTNG ROUTE GCULV TO OUTLET OF I
 697      RK    2500    .013    0.05       0       0       0      50

 698      KK  MNW-I1 RUNOFF FROM I1
 699      BA    0.25
 700      LS               78      15
 701      UD    0.58

 702      KK     CP2 COMBINE HYDROGRAPHS AT LAS VEGAS BLVD AND UPRR
 703      HC       3

 704      KK    RCP2 ROUTE CP2 TO AIRPORT CHANNEL AND LAS VEGAS BLVD (CP3)
 705      RK    2500    .009     .05       0       0       0       4

 706      KK  MNW-I2 RUNOFF FROM I2
 707      BA    0.14
 708      LS               77       1
 709      UD    0.38
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LINE          ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

 710          KK     CP3 COMBINE FLOW FROM B-I2 AT LAS VEGAS BLVD AND AIRPORT CHANNEL
 711          HC       3

 712          KK    RCP3 ROUTE CPE TO OUTLET OF K
 713          RK    7300     .01     .04       0       0       5       2

 714          KK   MNW-K RUNOFF FROM K
 715          BA    1.43
 716          LS              66      25
 717          UD    1.55

 718          KK     CP4 COMBINE HYDROGRAPHS FOR AIRPORT CHANNEL AND TAXIWAY S
 719          HC       2

 720          KK    RCP4 ROUTE FLOW TO TROPICANA BLVD
 721          RK    3300     .01     .03       0       0      20       4

 722          KK   MNW-L RUNOFF FROM L
 723          BA    0.27
 724          LS              77      60
 725          UD    0.42

 726          KK   MNW-M RUNOFF FROM M
 727          BA    0.49
 728          LS              84      56
 729          UD    0.83

 730          KK     CP5 COMBINE ALL HYDROGRAPHS AT OUTLET AT BOX CULVERT AT TROPICANA
 731          HC       3
              *  *** END OF DATA FROM NIMBUS NORTHWEST MCCARRAN HEC-1 DATA ***
              *

 732          KK     T12 ROUTE MNW-L TO T12 (TRMC0009)
 733          RK    2640   .0045    .040            TRAP      18     1.5

 734          KK       .   (TRWA0000-0034)
 735          RK    5000    .012    .040            TRAP     100     2.5

 736          KK     T12 COMBINE MNW-L AND T12
 737          KM         AIRPORT CHANNEL + TROPICANA WASH
 738          HC       2

 739          KK     F17 COMBINE F17 AND T12
 740          KM         FLAMINGO WASH + TROPICANA WASH
 741          HC       2

 742          KK     F18 ROUTE F17 AND T12 THRU F18
 743          KM           (FLWA0593)
 744          RK    1430   .0182    .040            TRAP      50       1
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LINE          ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

 745          KK       .   (FLWA0564+FLWA0620) COMBINED DUE TO RK PROBLEMS WITH NEW HEC1
 746          RK    1695   .0045    .015            TRAP      50       1

 747          KK      R4 RUNOFF FROM R4
 748          BA    2.28
 749          LS       0    86.5
 750          UD    0.34

 751          KK    F15OF RECALL F15 OVERFLOW
 752          DR    F15OF

 753          KK  F150FR ROUT F150F THRU R4
 754          RM       3    0.24       0

 755          KK      R4 COMBINE R4 AND F15 OVERFLOW
 756          HC       2

 757          KK    F16OF RECALL F16 OVERFLOW
 758          DR    F16OF

 759          KK  F160FR ROUT F160F THRU R4
 760          RM       3    0.24       0

 761          KK      R4 COMBINE R4 AND F16 OVERFLOW
 762          HC       2

 763          KK     F18 ROUT R4 THRU F18
 764          RM      11    0.88    0.10

 765          KK     F18 RUNOFF FROM F18
 766          BA    0.87
 767          LS       0    72.0       0       0      98       0
 768          UK     500    .010    0.20      52
 769          UK     200    .015    0.10      48
 770          RK    1000    .010    .023    .014                       1
 771          RK    1000   .0010    .023    .050                       1
 772          RK   15900   .0090    .020            TRAP      30       1

 773          KK     F18 COMBINE R4 AND F18
 774          HC       2

 775          KK     F24 RUNOFF FROM F24
 776          BA    1.03
 777          LS       0    66.3       0       0      98       0
 778          UK     300    .010    0.20      46
 779          UK     100    .015    0.10      54
 780          RK    1300    .013    .020    .035                       1
 781          RK    3000   .0075    .020    .014                       1
 782          RK    4400    .018    .030            TRAP      50       3      NO
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  783     KK     F18 COMBINE F18, F24, AND F17
  784     HC       3

  785     KK    F18R ROUT F18 THRU F20A (FLWA0400-0493)
  786     RK    7970   .0065    .040            TRAP      60       2

  787     KK    F20A RUNOFF FROM F20A
  788     BA    0.81
  789     LS       0    70.7       0       0      98       0
  790     UK    1000    .010    0.25      77
  791     UK     250     .02    0.15      23
  792     RK    1900    .001    .020    0.05                      1
  793     RK    2000    .015    .020    0.14
  794     RK    5600   .0108    .033                      40       4

  795     KK    F20A COMBINE F20A AND F18R
  796     HC       2

  797     KK    F20B ROUTE F20A THRU F20B (FLWA0376)
  798     RK    1210   .0148    .040            TRAP      50       1

  799     KK       .   (FLWA0348)
  800     RK    1430    .007    .015            TRAP      60       1

  801     KK     F19 RUNOFF FROM F19
  802     BA    1.54
  803     LS       0    70.8       0       0      98       0
  804     UK     500    .008    0.25      51
  805     UK     100    .015    0.10      49
  806     RK    1300    .010    .020     .04                      1
  807     RK    2500    .010    .020    .019                      1
  808     RK   11400   .0118    .020            TRAP      40       1      NO

  809     KK    F20B ROUTE F19 THRU F20B
  810     RM       2    0.20    0.20

  811     KK    F20B RUNOFF FROM F20B
  812     BA    0.73
  813     LS       0      82
  814     UD    0.25

  815     KK    F20B COMBINE F19 AND F20B
  816     HC       2

  817     KK      VB VAN BUSKIRK DRAINAGE AREA
  818     KM         SINGLE SUBAREA TO SIMULATE RUNOFF FROM ENTIRE VAN BUSKIRK WATERSHED.
  819     KM         CN AND LAG SELECTED TO MATCH PEAK Q AND TIME-TO-PEAK
  820     KM         FROM VAN BUSKIRK PREDESIGN STUDY BY JMM.
  821     BA    4.58
  822     LS            78
  823     UD    0.50
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

 824      KK    F20B COMBINE VAN BUSKIRK AREA, F20A AND F20B
 825      HC       3

 826      KK     F22 ROUTE F20B THRU F22 (FLWA0258-0274)
 827      RK    4700   .0110    .030                      70     2.5

 828      KK     F21 RUNOFF FROM F21
 829      BA    1.27
 830      LS       0    77.1       0       0      98       0
 831      UK     300    .010    0.25      49
 832      UK      60    .020     .10      51
 833      RK    1300    .010    .020    .019                       1
 834      RK    1750    .008    .020    0.08                       1
 835      RK   16000   .0128    .020            TRAP      40       1      NO

 836      KK     F21 DIVERT ACROSS BLDR HWY AT OAKEY
 837      DT   OAKEY
 838      DI       0   10000
 839      DQ       0    5000

 840      KK     F22 ROUTE F21 THRU F22
 841      RM       1    0.06    0.20

 842      KK     F22 RUNOFF FROM F22
 843      BA    3.43
 844      LS       0    74.9       0       0      98       0
 845      UK     700    .008    0.25      51
 846      UK      60    .015     .10      49
 847      RK    1500    .010    .020    .093                       1
 848      RK    3000    .008    .020    0.37                       1
 849      RK   29500   .0115    .020            TRAP      40       1      NO

 850      KK     F22 COMBINE F20B, F21 AND F22
 851      HC       3

 852      KK     F23 ROUTE F22 THRU F23 (FLWA0228)
 853      RK    1430    .014    .040            TRAP      50       1

 854      KK       .   (FLWA0175)
 855      RK    2690   .0007    .040            TRAP     100       1

 856      KK       .   (FLWA0079)
 857      RK    5020   .0096    .040            TRAP      50       1

 858      KK       .   (FLWA0000)
 859      RK    4120   .0049    .040            TRAP     107       2

 860      KK     F23 RUNOFF FROM F23
 861      BA    1.92
 862      LS       0    74.4                      98
 863      UK     500     .01    0.25      70
 864      UK     100    .015     .10      30
 865      RK    2600    .005     .02    .037    TRAP      20       1
 866      RK    2200   .0018     .02    0.21    TRAP      40       1
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LINE          ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

 867          RK   13700   .0075    .032            TRAP      50       2      NO

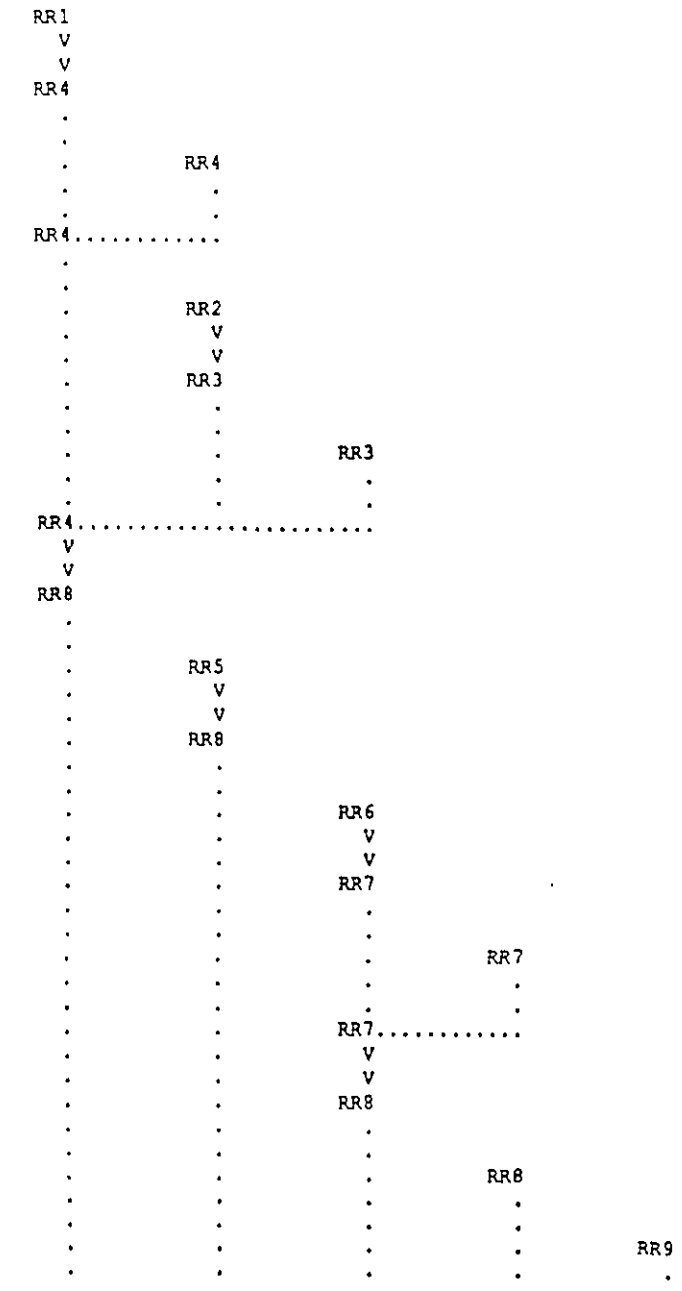
 868          KK     F23 COMBINE F22 AND F23
 869          KM         CONFLUENCE OF FLAMINGO WASH WITH LAS VEGAS WASH
 870          HC       2
 871          ZZ
```

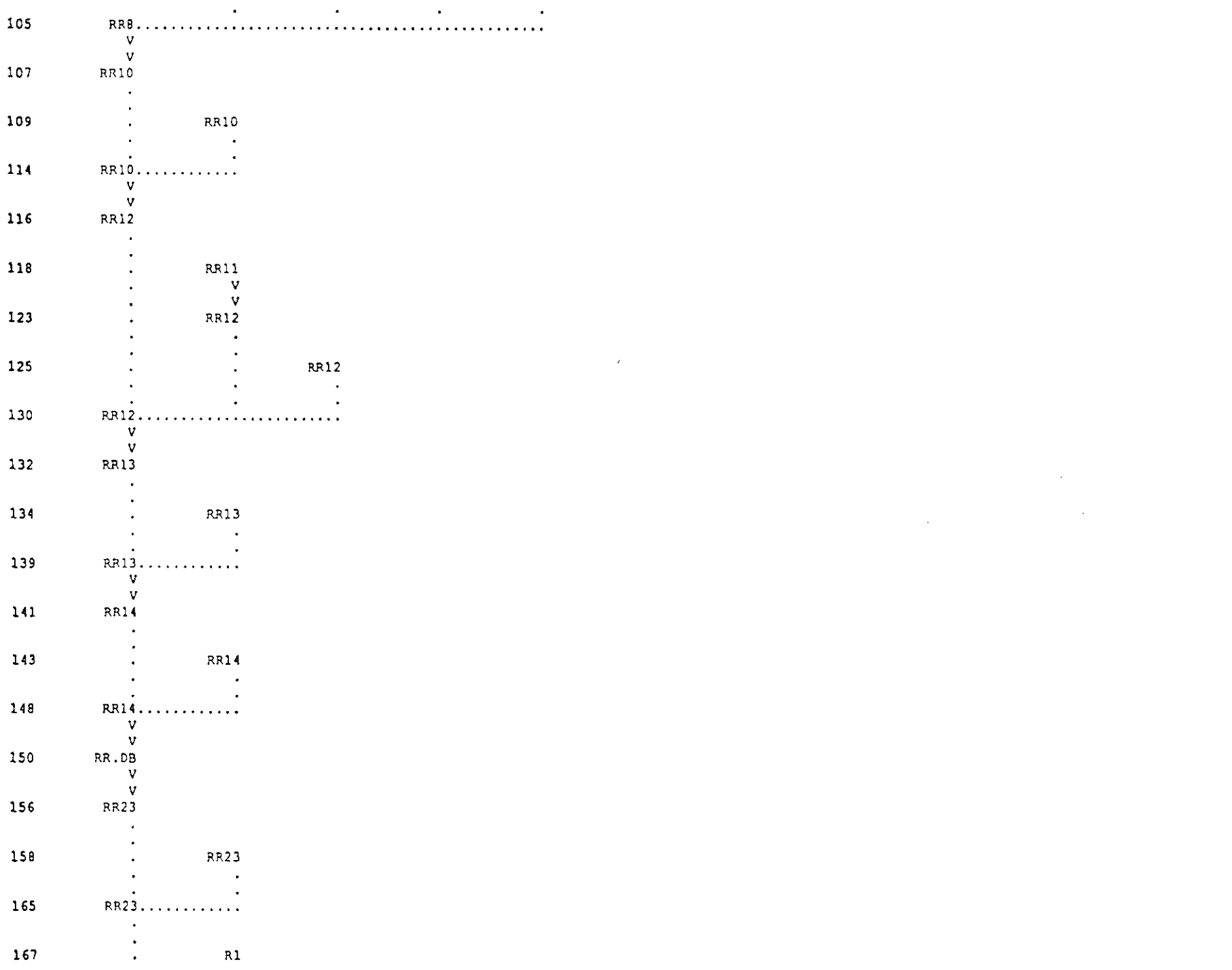
SCHEMATIC DIAGRAM OF STREAM NETWORK

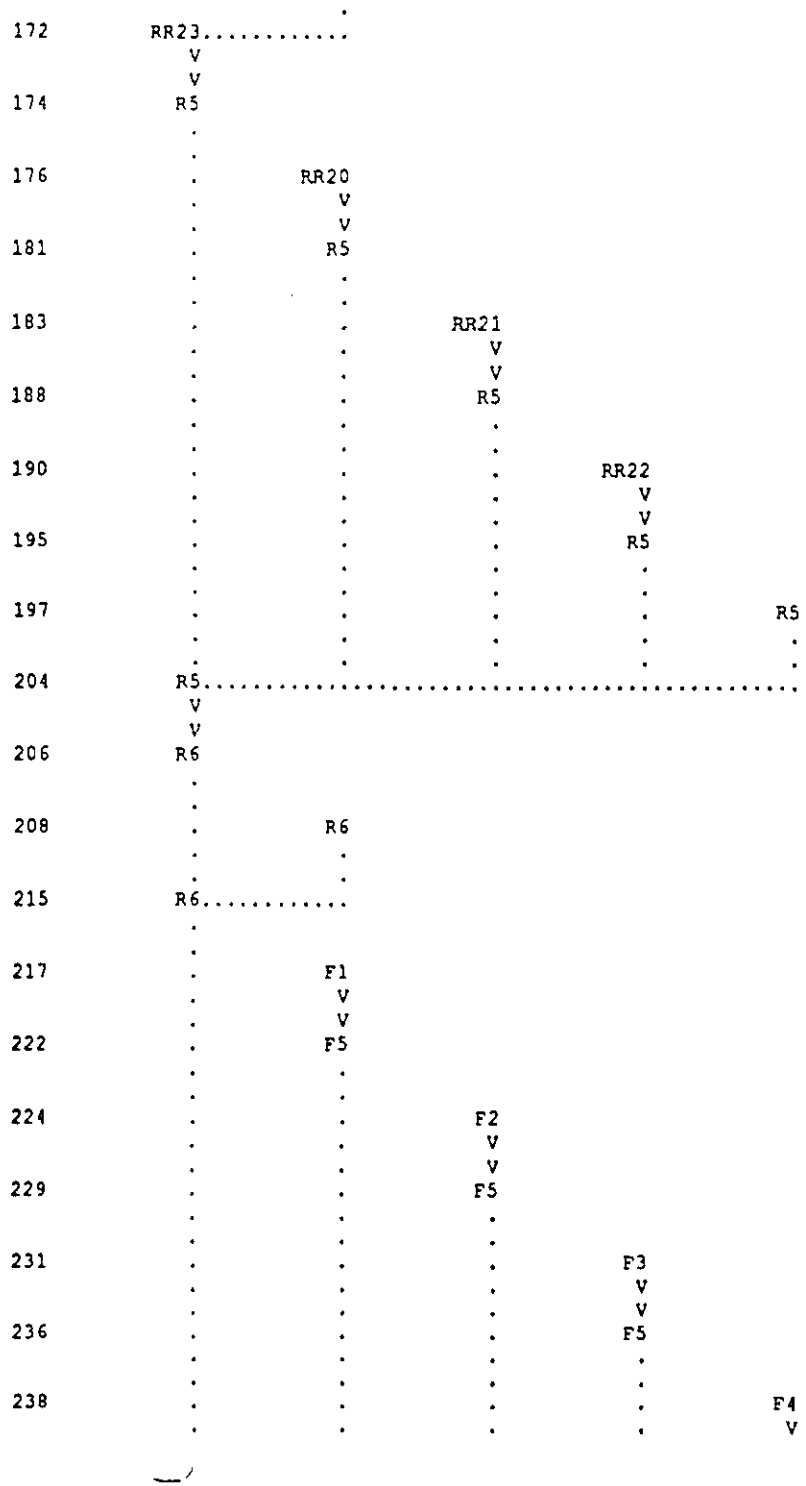
INPUT LINE NO.

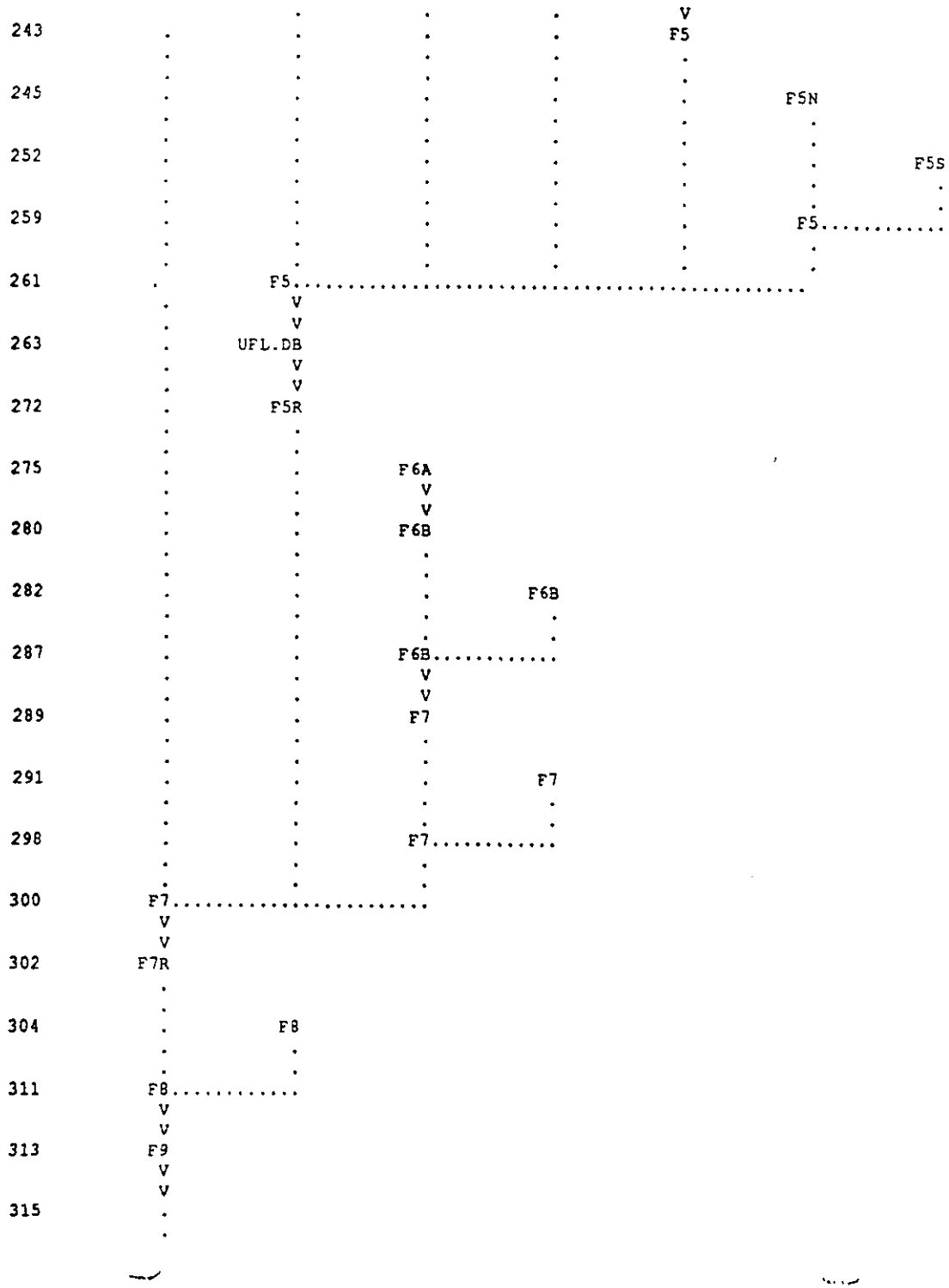
(V) ROUTING (---->) DIVERSION OR PUMP FLOW

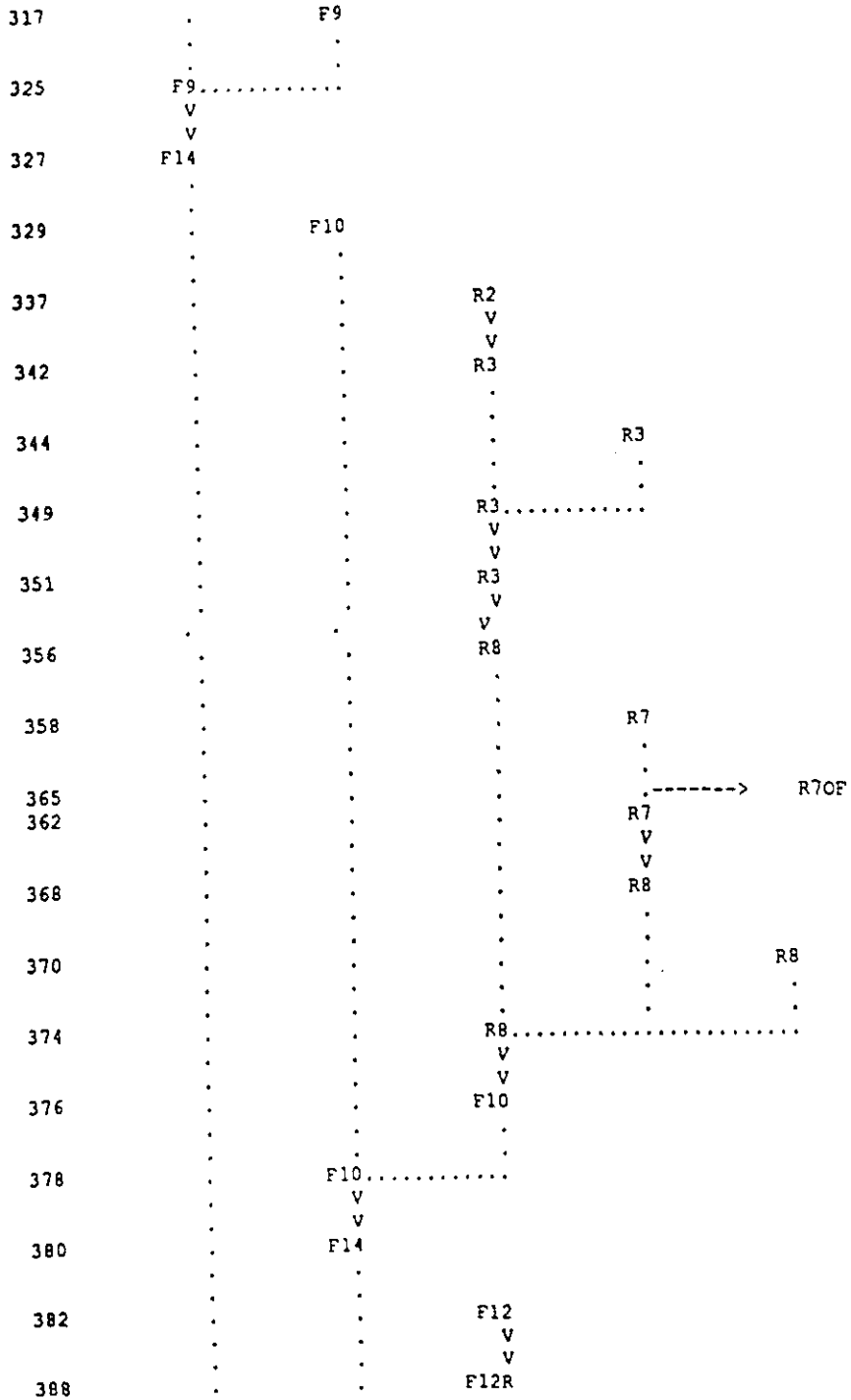
(.) CONNECTOR (<----) RETURN OF DIVERTED OR PUMPED FLOW

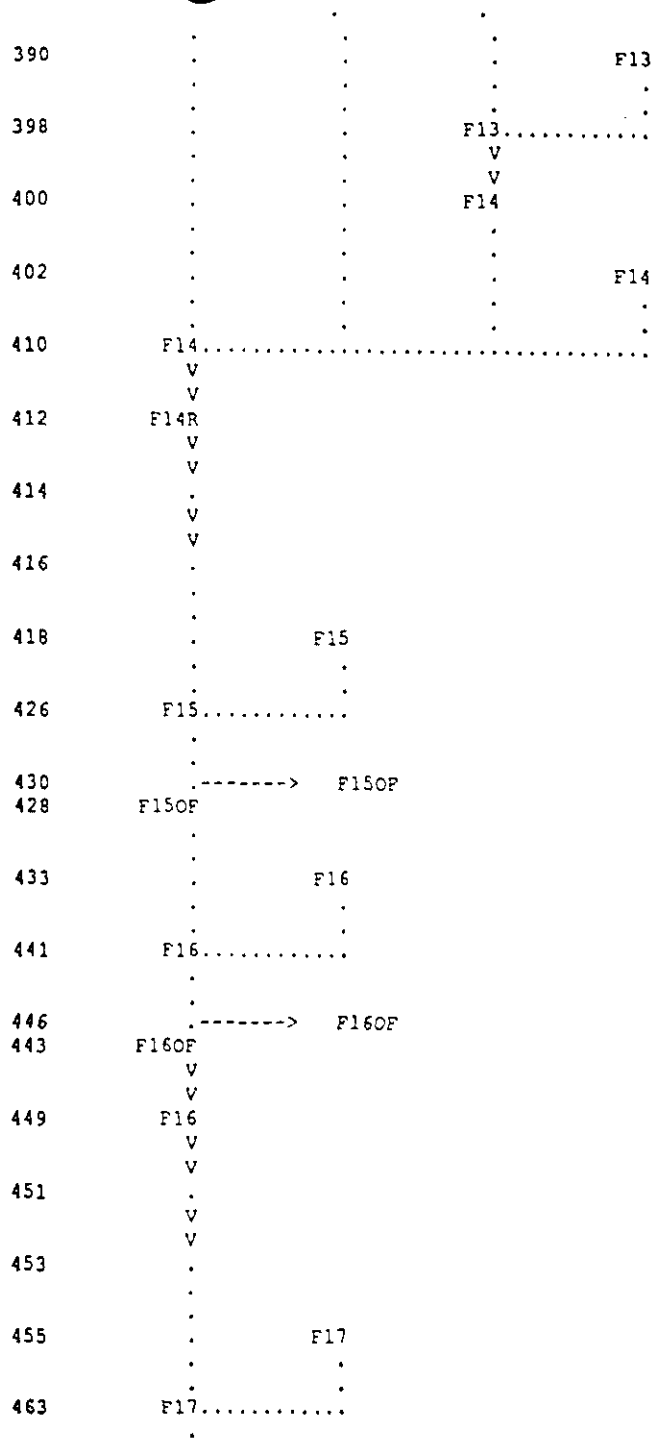


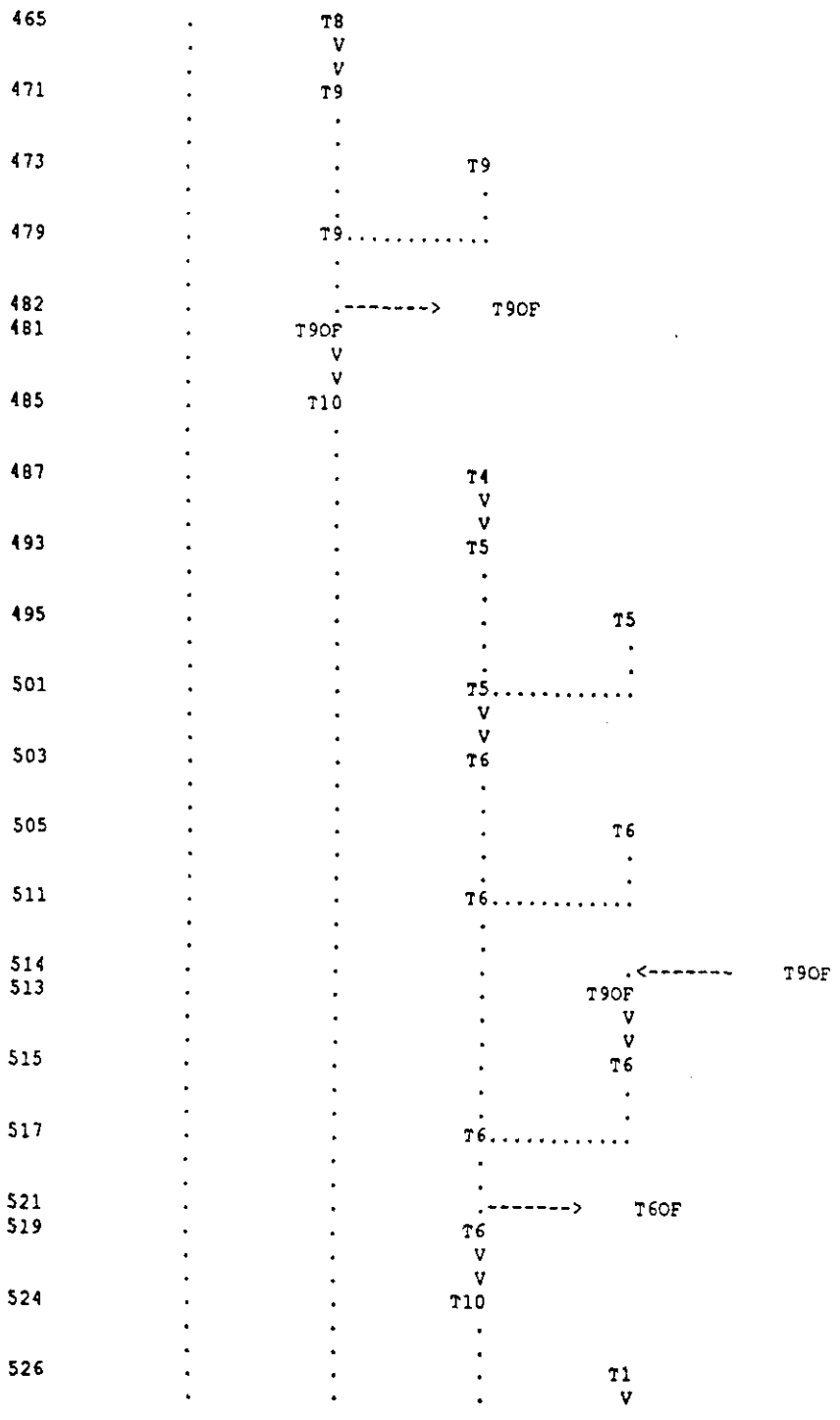

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107 RR10
109 RR10
114 RR10
116 RR12
118 RR11
123 RR12
125 RR12
130 RR12
132 RR13
134 RR13
139 RR13
141 RR14
143 RR14
148 RR14
150 RR.DB
156 RR23
158 RR23
165 RR23
167 R1

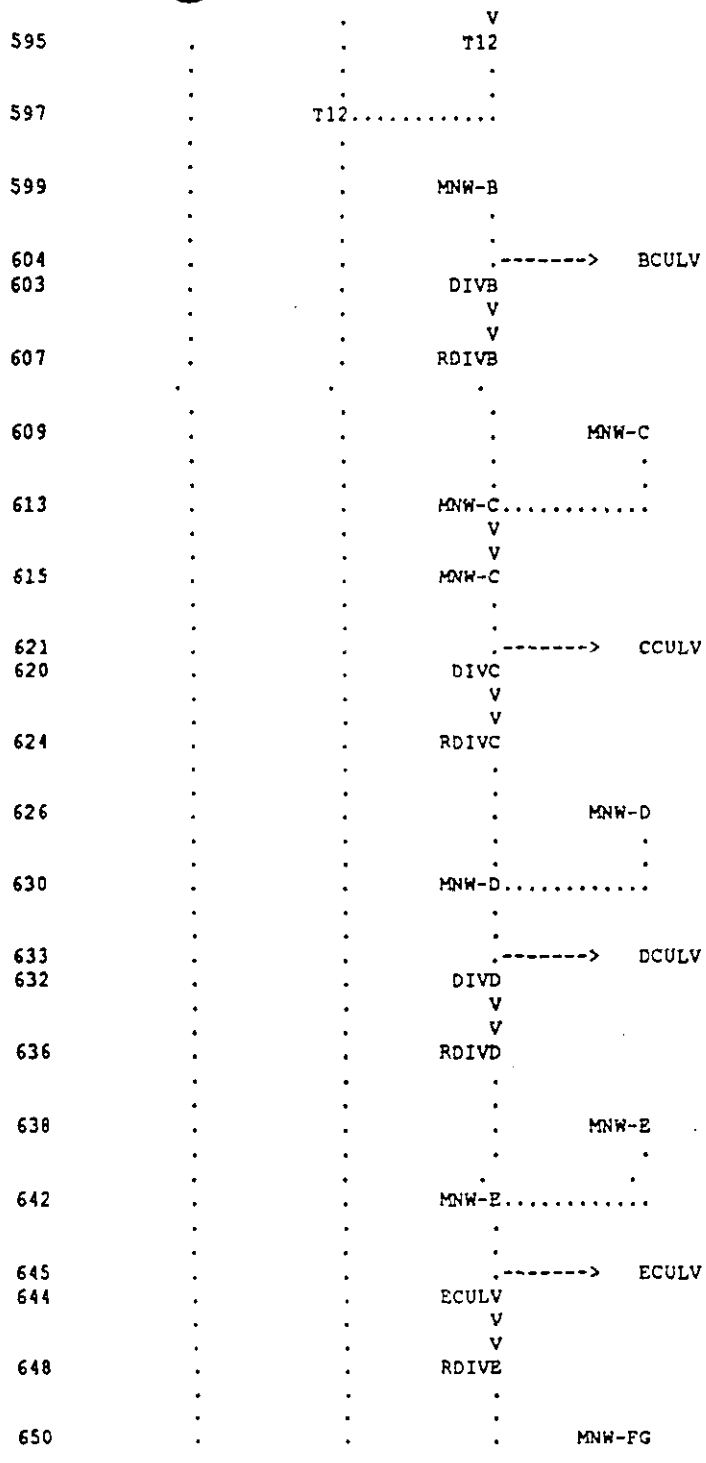

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RR23
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R5
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RR20
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R5
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RR21
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R5
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RR22
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R5
204
R5
206
R6
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R6
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R6
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F1
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F5
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F3
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F4

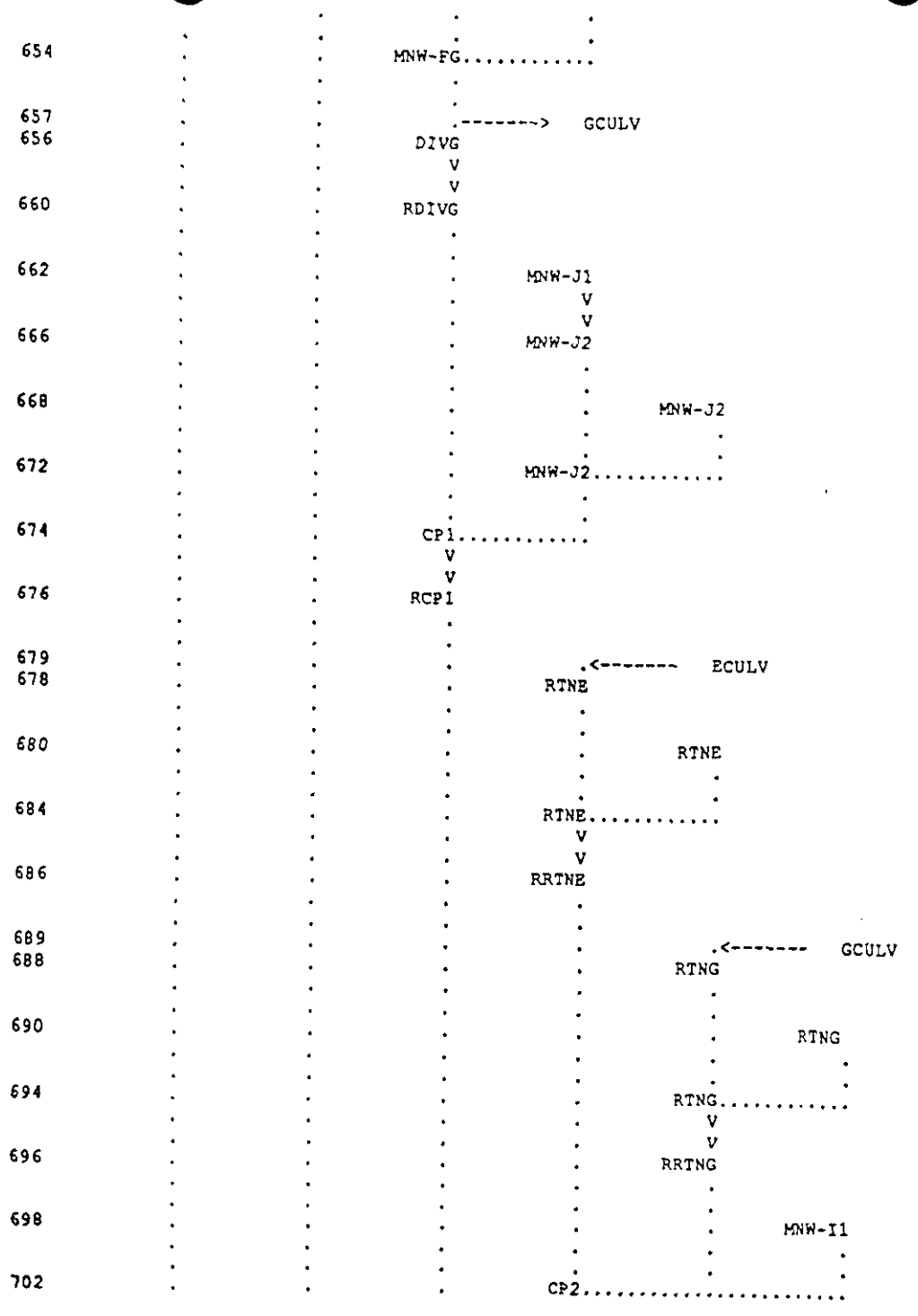

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F5
F5N
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F5R
F6A
F6B
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F7R
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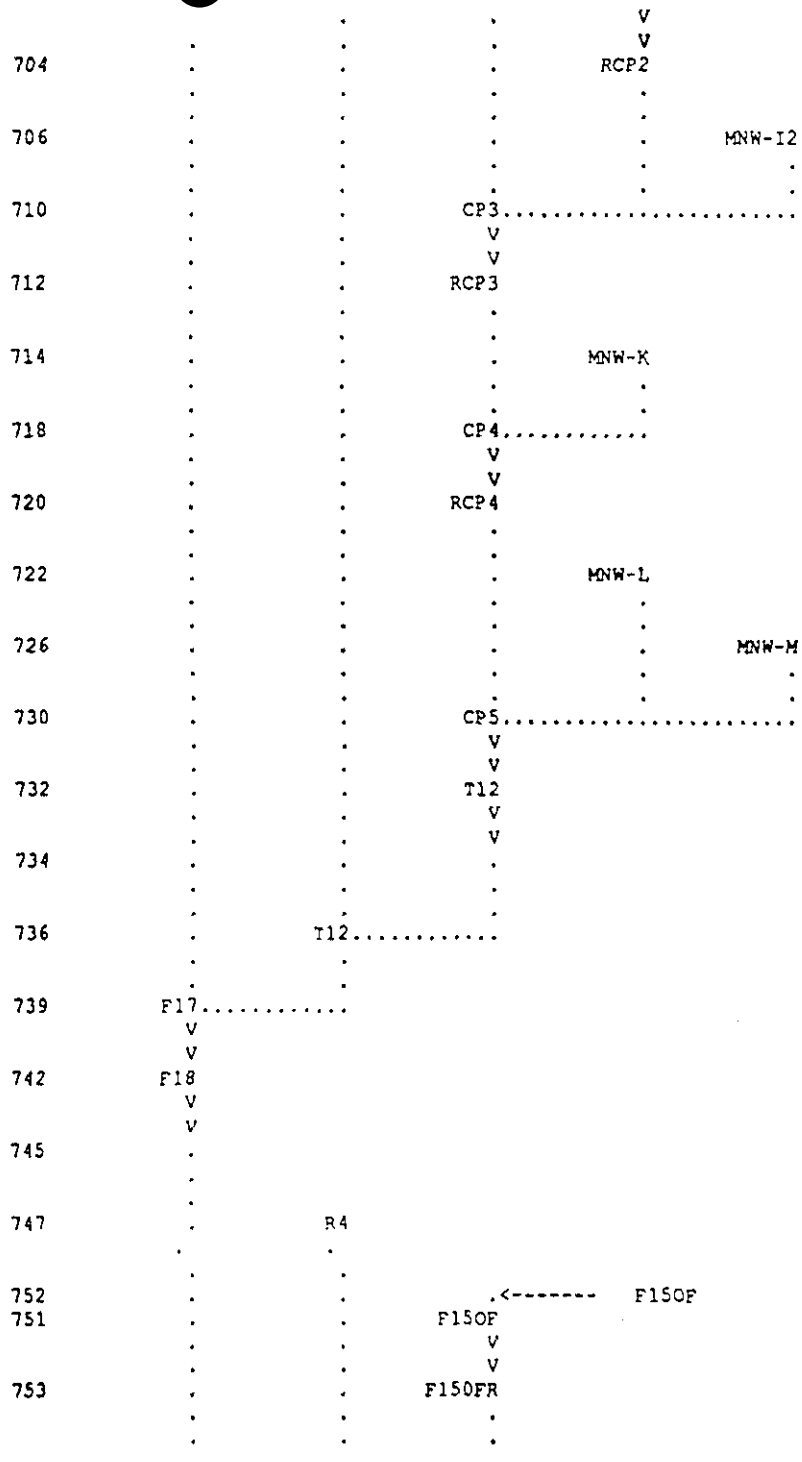

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F14
F12
F12R

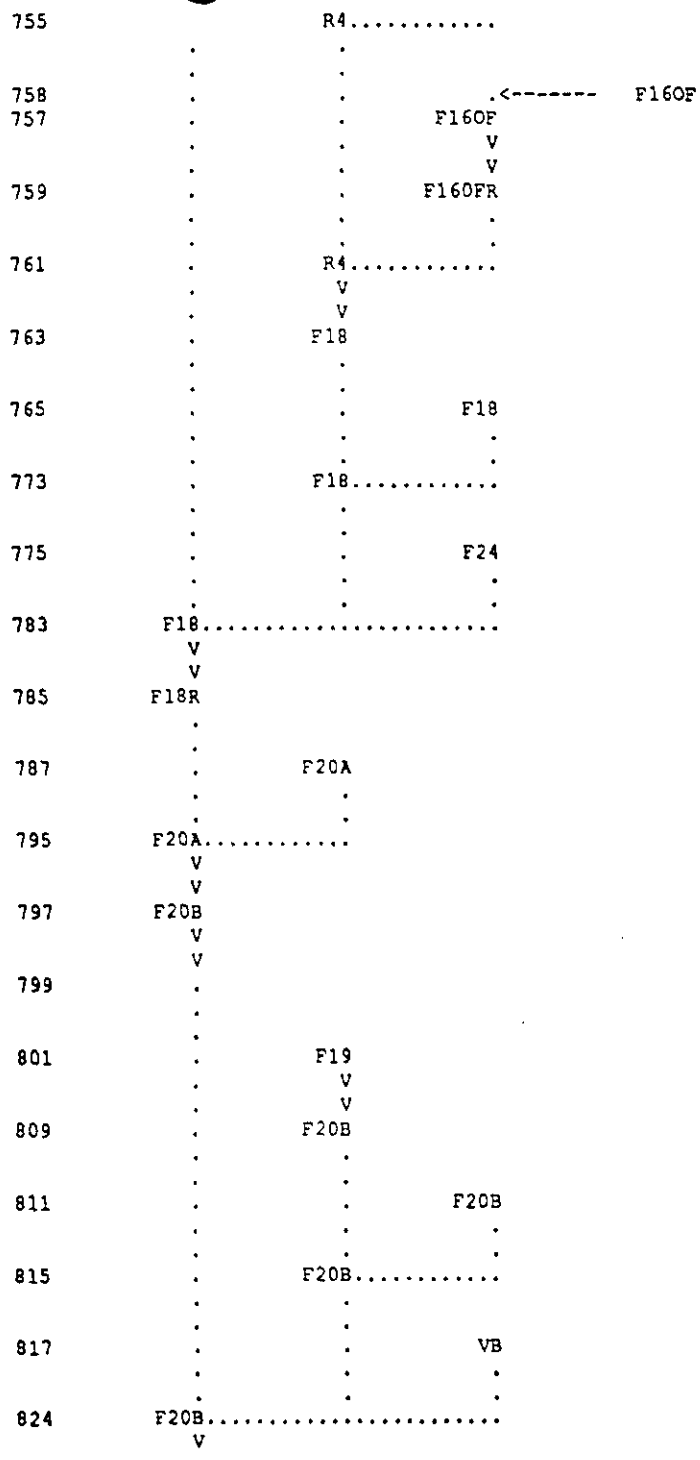

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F14R
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426
F15
430
F15OF
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F15OF
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F16
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F17

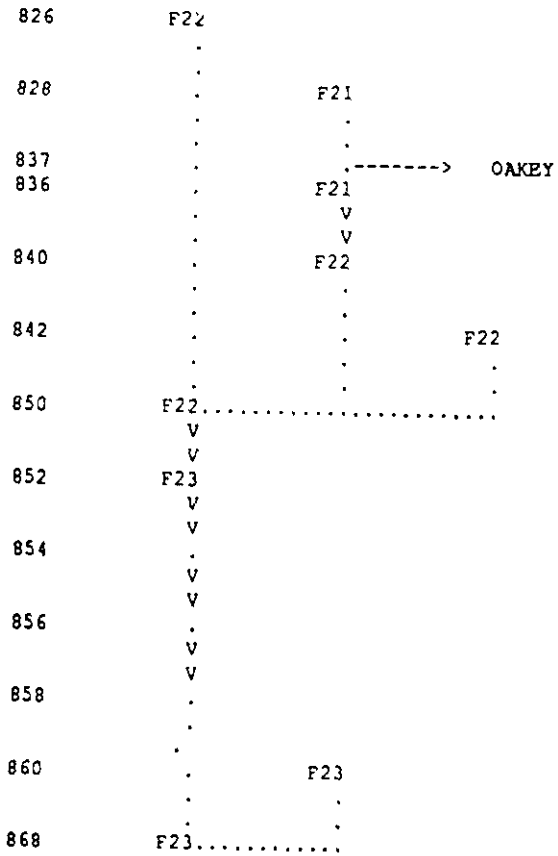

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T8
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BCULV
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CCULV
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DIVC
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RDIVC
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MNW-D
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DIVD
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RDIVD
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MNW-E
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MNW-E
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ECULV
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ECULV
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RDIVE
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MNW-FG


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GCULV
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RDIVG
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MNW-J1
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MNW-J2
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RCP3
MNW-K
CP4
RCP4
MNW-L
MNW-M
CP5
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F18
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F150F
F150F
F150FR


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R4
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F160F
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F160F
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F160FR
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R4
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F18
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F18
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F18
775
F24
783
F18
785
F18R
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F20A
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F20A
797
F20B
799
801
F19
809
F20B
811
F20B
815
F20B
817
VB
824
F20B



(***) RUNOFF ALSO COMPUTED AT THIS LOCATION

```
*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*            FEBRUARY 1981              *
*          REVISED 02 AUG 88            *
*                                       *
*  RUN DATE  12/12/1990  TIME  11:28:54 *
*                                       *
*****************************************
```


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*****************************************
*                                       *
*    U.S. ARMY CORPS OF ENGINEERS       *
*  THE HYDROLOGIC ENGINEERING CENTER    *
*         609 SECOND STREET             *
*        DAVIS, CALIFORNIA 95616        *
*                                       *
*****************************************
```


```
INPUT FILE = FLEX100.DAT
 CLARK COUNTY FLOOD CONTROL DISTRICT MASTER PLAN UPDATE
 RED ROCK/FLAMINGO/TROPICANA WATERSHED
 EXISTING DRAINAGE SYSTEM WITH PRESENT DEVELOPMENT
 FLAMINGO/TROPICANA STORM (NO UPPER BLUE DIAMOND)- MAIN CHANNEL RUN
     100-YEAR 6-HR STORM (SDN #5)
     JMM    OCTOBER 1990

     BASIC DATA FILE BASED ON COE FILE S10P40X.
     MODIFICATIONS ADDED FROM B&V RED ROCK BASIN AND UPPER FLAMINGO
     BASIN HEC-1 RUNS; NIMBUS NORTHWEST MCCARRAN AIRPORT HEC-1 RUNS;
     AND SUBBASIN MODIFICATIONS DUE TO RECENT DEVELOPMENT.

     COE MUSKINGUM ROUTING CONVERTED TO KINEMATIC FOR EXISTING
     IMPROVED CHANNELS FROM FACILITY INVENTORY.

 PB CARDS CONTAIN POINT PRECIPITATION.  DARF'S FROM CCRFCD MANUAL
 BASED ON STORM AREAS FOR CONCENTRATION POINTS AS FOLLOWS:

     SUBBASIN          AREA (SQMI)          DARF
     --------          -----------          ----
      T12,F5            20.8,15.9           0.81
        RR14               53                0.68
  F7,F14,F16,F16OF     92,103,105            0.60
  F17,F20B,F22,F23   127,139,143,145         0.565


29 IO          OUTPUT CONTROL VARIABLES
                    IPRNT          5  PRINT CONTROL
                    IPLOT          0  PLOT CONTROL
                    QSCAL          0.  HYDROGRAPH PLOT SCALE

   IT          HYDROGRAPH TIME DATA
                     NMIN          5  MINUTES IN COMPUTATION INTERVAL
                    IDATE      1   0  STARTING DATE
                    ITIME       0000  STARTING TIME
                       NQ        200  NUMBER OF HYDROGRAPH ORDINATES
                   NDDATE      1   0  ENDING DATE
                   NDTIME       1635  ENDING TIME
                   ICENT         19  CENTURY MARK

     COMPUTATION INTERVAL      .08 HOURS
```

TOTAL TIME BASE 16.58 HOURS

ENGLISH UNITS

DRAINAGE AREA	SQUARE MILES
PRECIPITATION DEPTH	INCHES
LENGTH, ELEVATION	FEET
FLOW	CUBIC FEET PER SECOND
STORAGE VOLUME	ACRE-FEET
SURFACE AREA	ACRES
TEMPERATURE	DEGREES FAHRENHEIT

JP MULTI-PLAN OPTION

NPLAN 1 NUMBER OF PLANS

JR MULTI-RATIO OPTION

RATIOS OF PRECIPITATION

.81 .68 .60 .56

*** ROFGRD - MAXIMUM NUMBER OF DX INTERVALS REACHED. MDX= 51
THIS MAY AFFECT ACCURACY OF KW SOLUTION TO REDUCE ERRORS SHORTEN OVERLANDFLOW LENGTH PLANE 1.

*** ROFGRD - MAXIMUM NUMBER OF DX INTERVALS REACHED. MDX= 51
THIS MAY AFFECT ACCURACY OF KW SOLUTION TO REDUCE ERRORS SHORTEN OVERLANDFLOW LENGTH PLANE 1.

*** FDKRUT - NEWTON RAPHSON FAILEDFIXED POINT ITERATION USED - ITERATION= 2

PEAK FLOW AND STAGE (END-OF-PERIOD) SUMMARY FOR MULTIPLE PLAN-RATIO ECONOMIC COMPUTATIONS
FLOWS IN CUIC FEET PER SECOND, AREA IN SQUARE MILES
TIME TO PEAK IN HOURS

OPERATION	STATION	AREA	PLAN		RATIOS APPLIED TO PRECIPITATION RATIO 1 .81	RATIO 2 .68	RATIO 3 .60	RATIO 4 .56
HYDROGRAPH AT	RR1	3.83	1	FLOW	2889.	2202.	1790.	1614.
				TIME	3.75	3.75	3.75	3.75
ROUTED TO	RR4	3.83	1	FLOW	2429.	1848.	1499.	1350.
				TIME	4.08	4.08	4.08	4.08
HYDROGRAPH AT	RR4	2.74	1	FLOW	835.	614.	487.	434.
				TIME	4.83	4.92	5.08	5.17
2 COMBINED AT	RR4	6.57	1	FLOW	2980.	2236.	1798.	1612.
				TIME	4.08	4.08	4.17	4.17
HYDROGRAPH AT	RR2	3.35	1	FLOW	2186.	1649.	1329.	1193.
				TIME	3.83	3.83	3.83	3.83
ROUTED TO	RR3	3.35	1	FLOW	1912.	1440.	1159.	1039.
				TIME	4.17	4.17	4.17	4.17
HYDROGRAPH AT	RR3	3.19	1	FLOW	1609.	1182.	931.	824.
				TIME	3.92	3.92	3.92	3.92
3 COMBINED AT	RR4	13.11	1	FLOW	6318.	4727.	3784.	3383.
				TIME	4.08	4.08	4.08	4.08
ROUTED TO	RR8	13.11	1	FLOW	5393.	4027.	3221.	2881.
				TIME	4.58	4.58	4.67	4.67
HYDROGRAPH AT	RR5	7.32	1	FLOW	2004.	1475.	1168.	1039.
				TIME	5.33	5.42	5.42	5.50
ROUTED TO	RR8	7.32	1	FLOW	1994.	1466.	1160.	1031.
				TIME	5.58	5.67	5.67	5.67
HYDROGRAPH AT	RR6	2.85	1	FLOW	1873.	1405.	1127.	1008.
				TIME	3.75	3.75	3.75	3.75
ROUTED TO	RR7	2.85	1	FLOW	1530.	1147.	920.	823.
				TIME	4.17	4.17	4.17	4.17
HYDROGRAPH AT	RR7	4.87	1	FLOW	1404.	1020.	797.	704.
				TIME	4.67	4.67	4.75	4.75
2 COMBINED AT	RR7	7.72	1	FLOW	2722.	1998.	1573.	1394.
				TIME	4.25	4.25	4.25	4.25
ROUTED TO	RR8	7.72	1	FLOW	2439.	1791.	1411.	1251.
				TIME	4.83	4.83	4.83	4.83
HYDROGRAPH AT	RR8	1.75	1	FLOW	422.	310.	245.	218.

				TIME	5.50	5.58	5.58	8
HYDROGRAPH AT	RR9	3.71	1	FLOW	1368.	1015.	807.	719.
				TIME	4.25	4.25	4.25	4.25
5 COMBINED AT	RR8	33.61	1	FLOW	10712.	7909.	6270.	5577.
				TIME	4.67	4.75	4.75	4.75
ROUTED TO	RR10	33.61	1	FLOW	10542.	7792.	6176.	5499.
				TIME	5.00	5.00	5.08	5.08
HYDROGRAPH AT	RR10	3.30	1	FLOW	842.	608.	474.	420.
				TIME	4.75	4.83	5.08	5.17
2 COMBINED AT	RR10	36.91	1	FLOW	11373.	8398.	6651.	5919.
				TIME	5.00	5.00	5.08	5.08
ROUTED TO	RR12	36.91	1	FLOW	11196.	8278.	6574.	5855.
				TIME	5.33	5.33	5.42	5.42
HYDROGRAPH AT	RR11	3.40	1	FLOW	1223.	900.	710.	630.
				TIME	4.25	4.25	4.25	4.25
ROUTED TO	RR12	3.40	1	FLOW	1202.	884.	698.	620.
				TIME	4.42	4.42	4.50	4.50
HYDROGRAPH AT	RR12	4.25	1	FLOW	1636.	1214.	967.	862.
				TIME	4.17	4.17	4.25	4.25
3 COMBINED AT	RR12	44.56	1	FLOW	13274.	9878.	7875.	7026.
				TIME	5.33	5.33	5.33	5.33
ROUTED TO	RR13	44.56	1	FLOW	13149.	9786.	7802.	6969.
				TIME	5.58	5.58	5.58	5.67
HYDROGRAPH AT	RR13	2.26	1	FLOW	833.	590.	449.	390.
				TIME	3.92	3.92	3.92	3.92
2 COMBINED AT	RR13	46.82	1	FLOW	13498.	10027.	7990.	7130.
				TIME	5.50	5.50	5.58	5.58
ROUTED TO	RR14	46.82	1	FLOW	13476.	10011.	7981.	7121.
				TIME	5.58	5.67	5.67	5.67
HYDROGRAPH AT	RR14	6.22	1	FLOW	1740.	1305.	1048.	940.
				TIME	5.42	5.42	5.50	5.50
2 COMBINED AT	RR14	53.04	1	FLOW	15197.	11303.	9018.	8052.
				TIME	5.58	5.58	5.67	5.67
ROUTED TO	RR.DB	53.04	1	FLOW	12101.	5740.	1381.	1335.
				TIME	6.58	7.25	8.33	8.33
			** PEAK STAGES IN FEET **					
			1	STAGE	3212.76	3211.42	3208.20	3205.32
				TIME	6.58	7.25	8.33	8.33
ROUTED TO	RR23	53.04	1	FLOW	11598.	5299.	1381.	1335.
				TIME	7.17	7.83	8.92	8.83

HYDROGRAPH AT	RR23	2.03	1	FLOW	402.	241.	182.	,.
				TIME	4.33	5.25	5.25	5.33
2 COMBINED AT	RR23	55.07	1	FLOW	11655.	5329.	1396.	1349.
				TIME	7.17	7.83	8.58	8.58
HYDROGRAPH AT	R1	1.12	1	FLOW	584.	446.	363.	328.
				TIME	3.83	3.83	3.83	3.83
2 COMBINED AT	RR23	56.19	1	FLOW	11658.	5329.	1396.	1349.
				TIME	7.17	7.83	8.58	8.58
ROUTED TO	R5	56.19	1	FLOW	11363.	5120.	1395.	1349.
				TIME	7.58	8.25	9.00	8.92
HYDROGRAPH AT	RR20	1.37	1	FLOW	610.	468.	382.	346.
				TIME	4.08	4.08	4.08	4.08
ROUTED TO	R5	1.37	1	FLOW	569.	437.	357.	323.
				TIME	4.75	4.75	4.75	4.75
HYDROGRAPH AT	RR21	6.27	1	FLOW	2202.	1672.	1355.	1221.
				TIME	4.42	4.42	4.50	4.50
ROUTED TO	R5	6.27	1	FLOW	2130.	1618.	1315.	1185.
				TIME	5.08	5.08	5.17	5.17
HYDROGRAPH AT	RR22	2.15	1	FLOW	959.	728.	589.	530.
				TIME	4.00	4.00	4.00	4.00
ROUTED TO	R5	2.15	1	FLOW	878.	667.	540.	486.
				TIME	4.75	4.75	4.75	4.75
HYDROGRAPH AT	R5	5.77	1	FLOW	1040.	649.	482.	417.
				TIME	4.17	5.08	5.17	5.25
5 COMBINED AT	R5	71.75	1	FLOW	11916.	5292.	3472.	3141.
				TIME	7.50	8.25	5.33	5.50
ROUTED TO	R6	71.75	1	FLOW	11776.	5196.	3463.	3134.
				TIME	7.75	8.50	5.58	5.75
HYDROGRAPH AT	R6	1.51	1	FLOW	180.	114.	73.	57.
				TIME	5.17	5.33	5.58	5.75
2 COMBINED AT	R6	73.26	1	FLOW	11798.	5208.	3536.	3190.
				TIME	7.75	8.50	5.58	5.75
HYDROGRAPH AT	F1	4.63	1	FLOW	1938.	1485.	1213.	1096.
				TIME	4.17	4.17	4.17	4.17
ROUTED TO	F5	4.63	1	FLOW	1780.	1366.	1118.	1011.
				TIME	5.17	5.25	5.25	5.25
HYDROGRAPH AT	F2	1.28	1	FLOW	709.	545.	446.	403.
				TIME	3.83	3.83	3.83	3.83
ROUTED TO	F5	1.28	1	FLOW	615.	472.	386.	349.
				TIME	4.58	4.58	4.58	4.58

HYDROGRAPH AT	F3	2.60	1	FLOW	1459.	1107.	897.	..
				TIME	3.75	3.75	3.75	3.75
ROUTED TO	F5	2.60	1	FLOW	1304.	990.	802.	721.
				TIME	4.17	4.17	4.17	4.17
HYDROGRAPH AT	F4	1.30	1	FLOW	618.	462.	370.	331.
				TIME	3.75	3.83	3.83	3.83
ROUTED TO	F5	1.30	1	FLOW	538.	402.	321.	287.
				TIME	4.50	4.50	4.50	4.50
HYDROGRAPH AT	F5N	4.04	1	FLOW	1319.	877.	644.	567.
				TIME	4.17	4.42	4.58	4.83
HYDROGRAPH AT	F5S	2.00	1	FLOW	665.	436.	308.	261.
				TIME	4.08	4.17	4.33	4.50
2 COMBINED AT	F5	6.04	1	FLOW	1960.	1290.	935.	818.
				TIME	4.17	4.33	4.58	4.83
5 COMBINED AT	F5	15.85	1	FLOW	4565.	3427.	2831.	2576.
				TIME	4.33	5.17	5.25	5.25
ROUTED TO	UFL.DB	15.85	1	FLOW	1159.	1059.	990.	962.
				TIME	6.92	6.83	6.75	6.75
			** PEAK STAGES IN FEET **					
			1	STAGE	2466.85	2463.92	2462.11	2461.37
				TIME	6.92	6.83	6.75	6.75
ROUTED TO	F5R	15.85	1	FLOW	1159.	1059.	990.	962.
				TIME	7.00	6.92	6.83	6.83
HYDROGRAPH AT	F6A	.55	1	FLOW	285.	216.	176.	158.
				TIME	3.75	3.75	3.75	3.75
ROUTED TO	F6B	.55	1	FLOW	257.	195.	158.	142.
				TIME	4.08	4.08	4.08	4.08
HYDROGRAPH AT	F6B	.85	1	FLOW	452.	342.	276.	248.
				TIME	3.67	3.67	3.67	3.67
2 COMBINED AT	F6B	1.40	1	FLOW	591.	445.	359.	322.
				TIME	3.75	3.75	3.75	3.75
ROUTED TO	F7	1.40	1	FLOW	558.	422.	340.	306.
				TIME	4.08	4.08	4.08	4.08
HYDROGRAPH AT	F7	1.50	1	FLOW	459.	296.	210.	191.
				TIME	4.08	4.17	4.42	5.00
2 COMBINED AT	F7	2.90	1	FLOW	1017.	714.	533.	458.
				TIME	4.08	4.17	4.17	4.25
3 COMBINED AT	F7	92.01	1	FLOW	12975.	6239.	4816.	4384.
				TIME	7.75	8.50	5.50	5.58
ROUTED TO	F7R	92.01	1	FLOW	12943.	6222.	4812.	4384.
				TIME	7.83	8.50	5.50	5.67

HYDROGRAPH AT	F8	.48	1	FLOW	64.	51.	44.	40.
				TIME	3.67	3.67	3.67	3.67
2 COMBINED AT	F8	92.49	1	FLOW	12950.	6225.	4823.	4392.
				TIME	7.83	8.50	5.50	5.67
ROUTED TO	F9	92.49	1	FLOW	12949.	6217.	4821.	4391.
				TIME	7.83	8.50	5.50	5.67
ROUTED TO	.	92.49	1	FLOW	12942.	6209.	4821.	4388.
				TIME	7.83	8.58	5.58	5.67
HYDROGRAPH AT	F9	.90	1	FLOW	190.	152.	130.	119.
				TIME	3.67	3.75	3.75	3.75
2 COMBINED AT	F9	93.39	1	FLOW	12955.	6214.	4852.	4414.
				TIME	7.83	8.58	5.58	5.67
ROUTED TO	F14	93.39	1	FLOW	12856.	6154.	4841.	4406.
				TIME	8.00	8.75	5.75	5.83
HYDROGRAPH AT	F10	1.17	1	FLOW	401.	317.	270.	251.
				TIME	3.58	3.58	3.58	3.58
HYDROGRAPH AT	R2	2.01	1	FLOW	881.	607.	451.	386.
				TIME	3.58	3.58	3.58	3.58
ROUTED TO	R3	2.01	1	FLOW	729.	503.	374.	320.
				TIME	4.00	4.00	4.00	4.00
HYDROGRAPH AT	R3	2.63	1	FLOW	249.	156.	105.	84.
				TIME	5.25	5.25	5.25	5.25
2 COMBINED AT	R3	4.64	1	FLOW	924.	588.	412.	343.
				TIME	4.00	4.00	4.00	4.00
ROUTED TO	R3	4.64	1	FLOW	208.	136.	98.	83.
				TIME	5.92	5.92	5.92	5.92
			** PEAK STAGES IN FEET **					
			1	STAGE	24.61	23.02	22.17	21.83
				TIME	5.92	5.92	5.92	5.92
ROUTED TO	R8	4.64	1	FLOW	208.	136.	98.	83.
				TIME	5.92	5.92	6.00	6.00
HYDROGRAPH AT	R7	1.39	1	FLOW	346.	232.	169.	144.
				TIME	3.92	3.92	4.00	4.00
DIVERSION TO	R7OF	1.39	1	FLOW	22.	0.	0.	0.
				TIME	3.92	.08	.08	.08
HYDROGRAPH AT	R7	1.39	1	FLOW	324.	232.	169.	144.
				TIME	3.83	3.92	4.00	4.00
ROUTED TO	R8	1.39	1	FLOW	324.	232.	169.	144.
				TIME	4.00	4.00	4.08	4.08
HYDROGRAPH AT	R8	.51	1	FLOW	90.	54.	40.	34.

				TIME	3.83	5.00	5.00	.0
3 COMBINED AT	R8	6.54	1	FLOW	489.	338.	254.	220.
				TIME	5.17	5.17	5.17	5.17
ROUTED TO	F10	6.54	1	FLOW	487.	337.	254.	220.
				TIME	5.25	5.25	5.25	5.25
2 COMBINED AT	F10	7.71	1	FLOW	600.	431.	334.	296.
				TIME	5.00	3.67	3.67	3.67
ROUTED TO	F14	7.71	1	FLOW	599.	428.	332.	293.
				TIME	5.08	5.08	5.08	5.08
HYDROGRAPH AT	F12	.88	1	FLOW	306.	209.	153.	131.
				TIME	4.00	4.17	4.33	4.42
ROUTED TO	F12R	.88	1	FLOW	296.	203.	150.	129.
				TIME	4.25	4.33	4.50	4.67
HYDROGRAPH AT	F13	.55	1	FLOW	160.	121.	94.	80.
				TIME	4.92	5.00	5.00	5.08
2 COMBINED AT	F13	1.43	1	FLOW	417.	287.	234.	208.
				TIME	4.25	4.92	5.00	5.08
ROUTED TO	F14	1.43	1	FLOW	412.	285.	231.	206.
				TIME	4.42	5.08	5.17	5.17
HYDROGRAPH AT	F14	.78	1	FLOW	130.	80.	54.	48.
				TIME	5.17	5.33	4.08	4.08
4 COMBINED AT	F14	103.31	1	FLOW	13082.	6561.	5310.	4787.
				TIME	8.00	5.50	5.58	5.75
ROUTED TO	F14R	103.31	1	FLOW	13064.	6557.	5308.	4785.
				TIME	8.00	5.50	5.67	5.75
ROUTED TO	.	103.31	1	FLOW	13029.	6546.	5305.	4781.
				TIME	8.08	5.50	5.67	5.83
ROUTED TO	.	103.31	1	FLOW	13029.	6545.	5302.	4781.
				TIME	8.08	5.58	5.67	5.83
HYDROGRAPH AT	F15	1.32	1	FLOW	302.	208.	161.	145.
				TIME	3.92	3.92	4.00	4.00
2 COMBINED AT	F15	104.63	1	FLOW	13047.	6692.	5412.	4868.
				TIME	8.08	5.50	5.67	5.83
DIVERSION TO	F15OF	104.63	1	FLOW	5769.	1519.	769.	450.
				TIME	8.08	5.50	5.67	5.83
HYDROGRAPH AT	F15OF	104.63	1	FLOW	7278.	5173.	4643.	4418.
				TIME	8.08	5.50	5.67	5.83
HYDROGRAPH AT	F16	.52	1	FLOW	186.	142.	123.	110.
				TIME	3.67	3.67	3.75	3.75
2 COMBINED AT	F16	105.15	1	FLOW	7283.	5227.	4681.	4449.

				TIME	8.08	5.50	5.67	.5
DIVERSION TO	F16OF	105.15	1	FLOW	1283.	0.	0.	0.
				TIME	8.08	.08	.08	.08
HYDROGRAPH AT	F16OF	105.15	1	FLOW	6000.	5227.	4681.	4449.
				TIME	7.67	5.50	5.67	5.75
ROUTED TO	F16	105.15	1	FLOW	6000.	5225.	4680.	4448.
				TIME	7.75	5.50	5.67	5.75
ROUTED TO	.	105.15	1	FLOW	6000.	5223.	4679.	4447.
				TIME	7.83	5.50	5.67	5.83
ROUTED TO	.	105.15	1	FLOW	6000.	5222.	4677.	4447.
				TIME	8.00	5.67	5.75	5.92
HYDROGRAPH AT	F17	.65	1	FLOW	201.	149.	120.	106.
				TIME	4.08	4.17	4.25	4.33
2 COMBINED AT	F17	105.80	1	FLOW	6013.	5305.	4745.	4504.
				TIME	8.00	5.58	5.75	5.92
HYDROGRAPH AT	T8	1.22	1	FLOW	59.	23.	10.	6.
				TIME	6.08	7.00	8.08	8.83
ROUTED TO	T9	1.22	1	FLOW	54.	22.	9.	6.
				TIME	6.67	7.50	8.58	9.42
HYDROGRAPH AT	T9	.87	1	FLOW	101.	58.	34.	25.
				TIME	5.25	5.58	5.92	6.17
2 COMBINED AT	T9	2.09	1	FLOW	112.	60.	35.	26.
				TIME	5.33	5.58	6.00	6.25
DIVERSION TO	T9OF	2.09	1	FLOW	0.	0.	0.	0.
				TIME	.08	.08	.08	.08
HYDROGRAPH AT	T9OF	2.09	1	FLOW	112.	60.	35.	26.
				TIME	5.33	5.58	6.00	6.25
ROUTED TO	T10	2.09	1	FLOW	111.	60.	35.	26.
				TIME	5.58	5.83	6.17	6.42
HYDROGRAPH AT	T4	3.22	1	FLOW	1208.	829.	615.	529.
				TIME	4.00	4.17	4.25	4.33
ROUTED TO	T5	3.22	1	FLOW	1201.	826.	610.	525.
				TIME	4.08	4.25	4.33	4.42
HYDROGRAPH AT	T5	1.00	1	FLOW	339.	227.	165.	140.
				TIME	4.00	4.08	4.25	4.92
2 COMBINED AT	T5	4.22	1	FLOW	1532.	1045.	774.	665.
				TIME	4.08	4.25	4.33	4.42
ROUTED TO	T6	4.22	1	FLOW	1524.	1044.	770.	663.
				TIME	4.25	4.42	4.58	4.67
HYDROGRAPH AT	T6	1.30	1	FLOW	422.	281.	205.	179.

				TIME	4.08	4.25	4.50	.0
2 COMBINED AT	T6	5.52	1	FLOW	1931.	1317.	972.	840.
				TIME	4.25	4.42	4.58	4.67
YDROGRAPH AT	T90F	.00	1	FLOW	0.	0.	0.	0.
				TIME	.08	.08	.08	.08
OUTED TO	T6	.00	1	FLOW	0.	0.	0.	0.
				TIME	.08	.08	.08	.08
2 COMBINED AT	T6	5.52	1	FLOW	1931.	1317.	972.	840.
				TIME	4.25	4.42	4.58	4.67
IVERSION TO	T60F	5.52	1	FLOW	1181.	567.	222.	90.
				TIME	4.25	4.42	4.58	4.67
YDROGRAPH AT	T6	5.52	1	FLOW	750.	750.	750.	750.
				TIME	3.83	4.08	4.33	4.50
OUTED TO	T10	5.52	1	FLOW	750.	750.	750.	750.
				TIME	4.92	5.17	5.42	5.17
YDROGRAPH AT	T1	1.56	1	FLOW	612.	427.	322.	276.
				TIME	4.00	4.08	4.17	4.25
OUTED TO	T3	1.56	1	FLOW	608.	426.	320.	273.
				TIME	4.17	4.33	4.42	4.50
YDROGRAPH AT	T3	.99	1	FLOW	170.	116.	86.	73.
				TIME	4.33	5.08	5.25	5.33
2 COMBINED AT	T3	2.55	1	FLOW	765.	500.	359.	304.
				TIME	4.25	4.33	4.50	4.58
YDROGRAPH AT	T60F	.00	1	FLOW	1181.	567.	222.	90.
				TIME	4.25	4.42	4.58	4.67
OUTED TO	T3	.00	1	FLOW	1148.	548.	212.	83.
				TIME	4.33	4.50	4.67	4.75
2 COMBINED AT	T3	2.55	1	FLOW	1887.	1030.	556.	377.
				TIME	4.33	4.50	4.67	4.75
IVERSION TO	T30F	2.55	1	FLOW	409.	0.	0.	0.
				TIME	4.33	.08	.08	.08
YDROGRAPH AT	T30F	2.55	1	FLOW	1478.	1030.	556.	377.
				TIME	4.33	4.50	4.67	4.75
OUTED TO	T10	2.55	1	FLOW	1477.	1026.	554.	375.
				TIME	4.33	4.50	4.67	4.83
YDROGRAPH AT	T10	.82	1	FLOW	183.	127.	104.	95.
				TIME	3.75	3.75	3.75	3.75
4 COMBINED AT	T10	10.98	1	FLOW	2382.	1859.	1370.	1185.
				TIME	4.33	4.50	4.75	4.83
OUTED TO	T10R	10.98	1	FLOW	2382.	1857.	1369.	1183.

				TIME	4.42	4.58	4.75	.92
ROUTED TO	.	10.98	1	FLOW	2381.	1853.	1369.	1183.
				TIME	4.42	4.58	4.83	5.00
HYDROGRAPH AT	T11	1.09	1	FLOW	295.	227.	199.	177.
				TIME	3.75	3.75	3.83	3.92
2 COMBINED AT	T11	12.07	1	FLOW	2514.	1954.	1451.	1261.
				TIME	4.42	4.58	4.83	5.00
ROUTED TO	T11R	12.07	1	FLOW	2513.	1949.	1449.	1261.
				TIME	4.42	4.67	4.83	5.00
ROUTED TO	.	12.07	1	FLOW	2511.	1948.	1446.	1259.
				TIME	4.50	4.75	5.00	5.17
HYDROGRAPH AT	T12	.77	1	FLOW	225.	172.	144.	136.
				TIME	3.75	3.75	3.83	3.83
2 COMBINED AT	T12	12.84	1	FLOW	2611.	2018.	1515.	1327.
				TIME	4.50	4.75	5.00	5.17
HYDROGRAPH AT	T3OF	.00	1	FLOW	409.	0.	0.	0.
				TIME	4.33	.08	.08	.08
ROUTED TO	T12	.00	1	FLOW	141.	0.	0.	0.
				TIME	6.25	.08	.08	.08
2 COMBINED AT	T12	12.84	1	FLOW	2611.	2018.	1515.	1327.
				TIME	4.50	4.75	5.00	5.17
HYDROGRAPH AT	MNW-B	.68	1	FLOW	41.	27.	20.	17.
				TIME	6.50	6.42	6.42	6.42
DIVERSION TO	BCULV	.68	1	FLOW	22.	22.	20.	17.
				TIME	4.83	5.50	6.42	6.42
HYDROGRAPH AT	DIVB	.68	1	FLOW	19.	5.	0.	0.
				TIME	6.50	6.42	.08	.08
ROUTED TO	RDIVB	.68	1	FLOW	0.	0.	0.	0.
				TIME	.08	.08	.08	.08
HYDROGRAPH AT	MNW-C	.69	1	FLOW	59.	42.	33.	29.
				TIME	6.00	6.00	5.92	5.92
2 COMBINED AT	MNW-C	1.37	1	FLOW	59.	42.	33.	29.
				TIME	6.00	6.00	5.92	5.92
ROUTED TO	MNW-C	1.37	1	FLOW	49.	34.	29.	27.
				TIME	6.83	6.83	6.58	6.50
			** PEAK STAGES IN FEET **					
			1	STAGE	57.56	56.93	56.37	56.17
				TIME	6.83	6.83	6.58	6.50
DIVERSION TO	CCULV	1.37	1	FLOW	41.	34.	29.	27.
				TIME	6.83	6.83	6.58	6.50

HYDROGRAPH AT	DIVC	1.37	1	FLOW	8.	0.	0.	0.
				TIME	6.83	.08	.08	.08
ROUTED TO	RDIVC	1.37	1	FLOW	8.	0.	0.	0.
				TIME	6.92	.08	.08	.08
HYDROGRAPH AT	MNW-D	.05	1	FLOW	7.	4.	3.	3.
				TIME	3.83	5.08	5.08	3.75
2 COMBINED AT	MNW-D	1.42	1	FLOW	8.	4.	3.	3.
				TIME	6.92	5.08	5.08	3.75
DIVERSION TO	DCULV	1.42	1	FLOW	8.	4.	3.	3.
				TIME	6.92	5.08	5.08	3.75
HYDROGRAPH AT	DIVD	1.42	1	FLOW	0.	0.	0.	0.
				TIME	.08	.08	.08	.08
ROUTED TO	RDIVD	1.42	1	FLOW	0.	0.	0.	0.
				TIME	.08	.08	.08	.08
HYDROGRAPH AT	MNW-E	.05	1	FLOW	9.	6.	5.	5.
				TIME	3.75	3.75	3.75	3.75
2 COMBINED AT	MNW-E	1.47	1	FLOW	9.	6.	5.	5.
				TIME	3.75	3.75	3.75	3.75
DIVERSION TO	ECULV	1.47	1	FLOW	9.	6.	5.	5.
				TIME	3.75	3.75	3.75	3.75
HYDROGRAPH AT	ECULV	1.47	1	FLOW	0.	0.	0.	0.
				TIME	.08	.08	.08	.08
ROUTED TO	RDIVE	1.47	1	FLOW	0.	0.	0.	0.
				TIME	.08	.08	.08	.08
HYDROGRAPH AT	MNW-FG	.36	1	FLOW	38.	26.	20.	18.
				TIME	5.25	5.33	4.83	4.83
2 COMBINED AT	MNW-FG	1.83	1	FLOW	38.	26.	20.	18.
				TIME	5.25	5.33	4.83	4.83
DIVERSION TO	GCULV	1.83	1	FLOW	38.	26.	20.	18.
				TIME	5.25	5.33	4.83	4.83
HYDROGRAPH AT	DIVG	1.83	1	FLOW	0.	0.	0.	0.
				TIME	.08	.08	.08	.08
ROUTED TO	RDIVG	1.83	1	FLOW	0.	0.	0.	0.
				TIME	.08	.08	.08	.08
HYDROGRAPH AT	MNW-J1	2.37	1	FLOW	128.	75.	49.	39.
				TIME	6.92	7.00	7.08	7.17
ROUTED TO	MNW-J2	2.37	1	FLOW	128.	75.	49.	39.
				TIME	7.17	7.33	7.50	7.58
HYDROGRAPH AT	MNW-J2	1.21	1	FLOW	130.	88.	65.	56.
				TIME	5.42	5.50	5.50	5.50

2 COMBINED AT	A-J2	3.58	1	FLOW	199.	121.	81.	65.
				TIME	6.00	6.00	6.00	6.00
2 COMBINED AT	CP1	5.41	1	FLOW	199.	121.	81.	65.
				TIME	6.00	6.00	6.00	6.00
ROUTED TO	RCP1	5.41	1	FLOW	199.	121.	81.	65.
				TIME	6.08	6.08	6.17	6.17
HYDROGRAPH AT	RTNE	.00	1	FLOW	9.	6.	5.	5.
				TIME	3.75	3.75	3.75	3.75
HYDROGRAPH AT	RTNE	.01	1	FLOW	0.	0.	0.	0.
				TIME	4.92	.08	.08	.08
2 COMBINED AT	RTNE	.01	1	FLOW	9.	6.	5.	5.
				TIME	3.75	3.75	3.75	3.75
ROUTED TO	RRTNE	.01	1	FLOW	8.	6.	5.	4.
				TIME	4.42	4.50	4.33	4.42
HYDROGRAPH AT	RTNG	.00	1	FLOW	38.	26.	20.	18.
				TIME	5.25	5.33	4.83	4.83
HYDROGRAPH AT	RTNG	.01	1	FLOW	0.	0.	0.	0.
				TIME	4.92	.08	.08	.08
2 COMBINED AT	RTNG	.01	1	FLOW	38.	26.	20.	18.
				TIME	5.25	5.33	4.83	4.83
ROUTED TO	RRTNG	.01	1	FLOW	38.	26.	20.	18.
				TIME	5.50	5.50	5.08	5.08
HYDROGRAPH AT	MNW-I1	.25	1	FLOW	67.	47.	37.	32.
				TIME	4.00	4.00	4.00	4.00
3 COMBINED AT	CP2	.27	1	FLOW	88.	64.	51.	46.
				TIME	5.17	5.17	5.17	5.17
ROUTED TO	RCP2	.27	1	FLOW	88.	64.	51.	46.
				TIME	5.25	5.25	5.25	5.25
HYDROGRAPH AT	MNW-I2	.14	1	FLOW	34.	22.	15.	13.
				TIME	3.75	3.83	3.83	3.83
3 COMBINED AT	CP3	5.82	1	FLOW	272.	173.	125.	109.
				TIME	5.58	5.58	5.25	5.25
ROUTED TO	RCP3	5.82	1	FLOW	272.	173.	125.	109.
				TIME	5.75	5.75	5.42	5.42
HYDROGRAPH AT	MNW-K	1.43	1	FLOW	175.	129.	105.	96.
				TIME	5.50	5.42	5.33	5.25
2 COMBINED AT	CP4	7.25	1	FLOW	445.	301.	230.	205.
				TIME	5.58	5.58	5.42	5.42
ROUTED TO	RCP4	7.25	1	FLOW	444.	301.	230.	204.
				TIME	5.67	5.67	5.50	5.50

HYDROGRAPH AT	MNW-L	.27	1	FLOW	136.	109.	93.	7.
				TIME	3.75	3.75	3.75	3.75
HYDROGRAPH AT	MNW-M	.49	1	FLOW	191.	154.	131.	121.
				TIME	4.17	4.25	4.25	4.25
3 COMBINED AT	CP5	8.01	1	FLOW	608.	441.	357.	324.
				TIME	5.25	5.17	5.17	5.17
ROUTED TO	T12	8.01	1	FLOW	607.	441.	357.	323.
				TIME	5.33	5.25	5.25	5.17
ROUTED TO	.	8.01	1	FLOW	606.	441.	356.	323.
				TIME	5.50	5.42	5.42	5.42
2 COMBINED AT	T12	20.85	1	FLOW	3147.	2426.	1853.	1642.
				TIME	4.50	4.75	5.00	5.17
2 COMBINED AT	F17	126.65	1	FLOW	8595.	7396.	6424.	6003.
				TIME	5.08	5.50	5.58	5.67
ROUTED TO	F18	126.65	1	FLOW	8595.	7394.	6422.	6002.
				TIME	5.08	5.50	5.58	5.67
ROUTED TO	.	126.65	1	FLOW	8594.	7392.	6420.	6001.
				TIME	5.08	5.50	5.58	5.67
HYDROGRAPH AT	R4	2.28	1	FLOW	1051.	783.	624.	557.
				TIME	3.75	3.75	3.75	3.75
HYDROGRAPH AT	F150F	.00	1	FLOW	5769.	1519.	769.	450.
				TIME	8.08	5.50	5.67	5.83
ROUTED TO	F150FR	.00	1	FLOW	5664.	1481.	745.	435.
				TIME	8.33	5.83	5.92	6.08
2 COMBINED AT	R4	2.28	1	FLOW	5664.	1569.	800.	557.
				TIME	8.33	5.75	5.92	3.75
HYDROGRAPH AT	F160F	.00	1	FLOW	1283.	0.	0.	0.
				TIME	8.08	.08	.08	.08
ROUTED TO	F160FR	.00	1	FLOW	1159.	0.	0.	0.
				TIME	8.33	.08	.08	.08
2 COMBINED AT	R4	2.28	1	FLOW	6823.	1569.	800.	557.
				TIME	8.33	5.75	5.92	3.75
ROUTED TO	F18	2.28	1	FLOW	6271.	1489.	747.	446.
				TIME	9.25	6.67	6.83	4.67
HYDROGRAPH AT	F18	.87	1	FLOW	316.	246.	208.	192.
				TIME	3.75	3.83	3.83	3.83
2 COMBINED AT	F18	3.15	1	FLOW	6277.	1519.	769.	519.
				TIME	9.25	6.67	6.83	4.67
HYDROGRAPH AT	F24	1.03	1	FLOW	526.	425.	372.	344.
				TIME	3.58	3.67	3.67	3.67

3 COMBINED A	F18	130.83	1	FLOW	12089.	8068.	6845.	5.
				TIME	9.17	5.92	5.67	5.67
ROUTED TO	F18R	130.83	1	FLOW	12080.	8068.	6844.	6381.
				TIME	9.25	6.00	5.75	5.75
HYDROGRAPH AT	F20A	.81	1	FLOW	139.	111.	92.	85.
				TIME	3.83	3.83	3.83	3.92
2 COMBINED AT	F20A	131.64	1	FLOW	12092.	8095.	6873.	6407.
				TIME	9.25	6.00	5.75	5.75
ROUTED TO	F20B	131.64	1	FLOW	12089.	8094.	6872.	6406.
				TIME	9.25	6.00	5.75	5.75
ROUTED TO	.	131.64	1	FLOW	12086.	8094.	6872.	6405.
				TIME	9.25	6.00	5.75	5.75
HYDROGRAPH AT	F19	1.54	1	FLOW	692.	565.	492.	449.
				TIME	3.67	3.67	3.67	3.67
ROUTED TO	F20B	1.54	1	FLOW	620.	503.	435.	399.
				TIME	3.83	3.83	3.83	3.83
HYDROGRAPH AT	F20B	.73	1	FLOW	300.	212.	161.	140.
				TIME	3.67	3.67	3.67	3.67
2 COMBINED AT	F20B	2.27	1	FLOW	855.	663.	558.	507.
				TIME	3.75	3.83	3.83	3.83
HYDROGRAPH AT	VB	4.58	1	FLOW	1034.	676.	481.	401.
				TIME	3.92	4.00	4.00	4.00
3 COMBINED AT	F20B	138.49	1	FLOW	12097.	8707.	7312.	6717.
				TIME	9.25	5.17	5.33	5.50
ROUTED TO	F22	138.49	1	FLOW	12078.	8702.	7305.	6711.
				TIME	9.25	5.25	5.42	5.58
HYDROGRAPH AT	F21	1.27	1	FLOW	593.	465.	389.	365.
				TIME	3.67	3.67	3.67	3.67
DIVERSION TO	OAKEY	1.27	1	FLOW	297.	233.	195.	182.
				TIME	3.67	3.67	3.67	3.67
HYDROGRAPH AT	F21	1.27	1	FLOW	297.	233.	195.	182.
				TIME	3.67	3.67	3.67	3.67
ROUTED TO	F22	1.27	1	FLOW	289.	225.	190.	178.
				TIME	3.67	3.67	3.75	3.75
HYDROGRAPH AT	F22	3.43	1	FLOW	1293.	1010.	850.	785.
				TIME	3.67	3.75	3.75	3.75
3 COMBINED AT	F22	143.19	1	FLOW	12118.	9272.	7704.	7013.
				TIME	9.25	5.17	5.33	5.50
ROUTED TO	F23	143.19	1	FLOW	12108.	9264.	7695.	7008.
				TIME	9.25	5.17	5.33	5.50

ROUTED TO	.	143.19	1	FLOW	12104.	9259.	7692.	4.
				TIME	9.33	5.25	5.42	5.58
ROUTED TO	.	143.19	1	FLOW	12079.	9240.	7679.	6992.
				TIME	9.33	5.33	5.50	5.67
ROUTED TO	.	143.19	1	FLOW	12075.	9238.	7670.	6990.
				TIME	9.42	5.33	5.50	5.67
HYDROGRAPH AT	F23	1.92	1	FLOW	379.	287.	239.	219.
				TIME	4.00	4.08	4.17	4.17
2 COMBINED AT	F23	145.11	1	FLOW	12098.	9431.	7814.	7111.
				TIME	9.42	5.33	5.50	5.67

*** NORMAL END OF HEC-1 ***
NORMAL END OF HEC-1

DUPLICATE EFFECTIVE HEC-1 MODEL
FILE NAME: F100R.DAT

DUPLICATE EFFECTIVE FIS HEC-1 MODEL
SEPTEMBER 1990 VERSION
FILE NAME: F100R.DAT

The Original Effective FIS HEC-1 model (F100.DAT) did not run on the September 1990 version without some minor routing modifications. See Special Problem Report 1. The revised model is referred to as the Duplicate Effective FIS HEC-1 model (F100R.DAT). Upon review of the two models results, it was determined that the differences in peak discharges was not significant. Therefore, the newer HEC-1 version could be used in further analyses and still maintain continuity with the older hydrology.

```
*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*          SEPTEMBER 1990               *
*            VERSION 4.0                *
*                                       *
*  RUN DATE  10/06/1997  TIME  12:46:16 *
*                                       *
*****************************************
```


```
*****************************************
*                                       *
*    U.S. ARMY CORPS OF ENGINEERS       *
*    HYDROLOGIC ENGINEERING CENTER      *
*          609 SECOND STREET            *
*       DAVIS, CALIFORNIA 95616         *
*          (916) 756-1104               *
*                                       *
*****************************************
```


```
X      X  XXXXXXX   XXXXX           X
X      X  X        X     X         XX
X      X  X        X               X
XXXXXXX   XXXX     X       XXXXX   X
X      X  X        X               X
X      X  X        X     X         X
X      X  XXXXXXX  XXXXX           XXX
```

THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.
THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION
NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL LOSS RATE:GREEN AND AMPT INFILTRATION
KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM

```
LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

          *DIAGRAM
    1     ID    INPUT FILE = F100R.DAT       BY: JEP       DATE:  10/06/97
    2     ID    REVISED ORIGINAL FIS MODEL TO RUN ON THE SEPTEMBER 1990 VERSION OF HEC-1
    3     ID    BY CHANGING 4 RK ROUTINGS TO RD ROUTINGS & COMMENTING OUT THE "RDIVC" RK
    4     ID    ROUTING
    5     ID
    6     ID     CLARK COUNTY FLOOD CONTROL DISTRICT MASTER PLAN UPDATE
    7     ID     RED ROCK/FLAMINGO/TROPICANA WATERSHED
    8     ID     EXISTING DRAINAGE SYSTEM WITH PRESENT DEVELOPMENT
    9     ID     FLAMINGO/TROPICANA STORM (NO UPPER BLUE DIAMOND)- MAIN CHANNEL RUN
   10     ID         100-YEAR 6-HR STORM (SDN #5)
   11     ID         JMM    OCTOBER 1990
   12     ID
   13     ID         BASIC DATA FILE BASED ON COE FILE S10P40X.
   14     ID         MODIFICATIONS ADDED FROM B&V RED ROCK BASIN AND UPPER FLAMINGO
   15     ID         BASIN HEC-1 RUNS; NIMBUS NORTHWEST MCCARRAN AIRPORT HEC-1 RUNS;
   16     ID         AND SUBBASIN MODIFICATIONS DUE TO RECENT DEVELOPMENT.
   17     ID
   18     ID         COE MUSKINGUM ROUTING CONVERTED TO KINEMATIC FOR EXISTING
   19     ID         IMPROVED CHANNELS FROM FACILITY INVENTORY.
   20     ID
   21     ID    PB CARDS CONTAIN POINT PRECIPITATION.  DARF'S FROM CCRFCD MANUAL
   22     ID    BASED ON STORM AREAS FOR CONCENTRATION POINTS AS FOLLOWS:
   23     ID
   24     ID        SUBBASIN          AREA (SQMI)          DARF
   25     ID        --------          -----------          ----
   26     ID         T12,F5            20.8,15.9           0.81
   27     ID           RR14              53                0.68
   28     ID      F7,F14,F16,F16OF     92,103,105           0.60
   29     ID      F17,F20B,F22,F23   127,139,143,145       0.565
   30     ID
   31     ID
   32     IT      5       0       0      200
   33     IO      5
   34     JR    PREC    0.81     .68     .60     .565

   35     KK     RR1 RUNOFF FROM RR1
   36     KM         RR1-RR14 DATA TAKEN FROM B&V TR-20 MODEL FOR UPPER FLAMINGO BASIN
   37     KM         NEW MUSKINGUM ROUTING PARAMETERS, CN'S AND LAGS USED FOR BETTER
   38     KM         AGREEMENT WITH COE FLOWS
   39     BA    3.83
   40     PC    .000    .020    .059    .080    .110    .144    .150    .160    .168    .171
   41     PC    .180    .182    .187    .190    .197    .202    .210    .220    .230    .241
   42     PC    .250    .259    .265    .280    .290    .300    .305    .309    .310    .317
   43     PC    .321    .327    .333    .346    .361    .381    .408    .430    .477    .514
   44     PC    .561    .630    .710    .720    .731    .752    .779    .790    .795    .804
   45     PC    .810    .820    .826    .840    .859    .889    .910    .938    .966    .970
   46     PC    .974    .979    .981    .983    .985    .989    .990    .992    .993    .996
   47     PC    .997    .999   1.00
   48     PB    4.08
   49     LS              84
   50     UD    0.34
```

```
LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  51      KK     RR4 ROUTE RR1 THRU RR4
  52      RM       2    0.36    0.15

  53      KK     RR4 RUNOFF FROM RR4
  54      BA    2.74
  55      PB    3.82
  56      LS              81
  57      UD    1.26

  58      KK     RR4 COMBINE RR1+RR4
  59      HC       2

  60      KK     RR2 RUNOFF FROM RR2
  61      BA    3.35
  62      PB    4.10
  63      LS              83
  64      UD    0.44

  65      KK     RR3 ROUTE RR2 THRU RR3
  66      RM       2    0.36    0.15

  67      KK     RR3 RUNOFF FROM RR3
  68      BA    3.19
  69      PB    3.83
  70      LS              81
  71      UD    0.50

  72      KK     RR4 COMBINE RR2+RR3+RR4
  73      HC       3

  74      KK     RR8 ROUTE RR4 THRU RR8
  75      RM       2    0.52    0.15

  76      KK     RR5 RUNOFF FROM RR5
  77      BA    7.32
  78      PB    3.79
  79      LS              80
  80      UD    1.44

  81      KK     RR8 ROUTE RR5 THRU RR8
  82      RM       2    0.26    0.15

  83      KK     RR6 RUNOFF FROM RR6
  84      BA    2.85
  85      PB    3.88
  86      LS              83
  87      UD    0.36

  88      KK     RR7 ROUTE RR6 THRU RR7
  89      RM       2    0.41    0.15
```

```
LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

   90     KK     RR7 RUNOFF FROM RR7
   91     BA    4.87
   92     PB    3.59
   93     LS              81
   94     UD    1.13

   95     KK     RR7 COMBINE RR6+RR7
   96     HC       2

   97     KK     RR8 ROUTE RR7 THRU RR8
   98     RM       2    0.51    0.15

   99     KK     RR8 RUNOFF FROM RR8
  100     BA    1.75
  101     PB    3.49
  102     LS              81
  103     UD    1.57

  104     KK     RR9 RUNOFF FROM RR9
  105     BA    3.71
  106     PB    3.37
  107     LS              84
  108     UD    0.79

  109     KK     RR8 COMBINE RR4+RR5+RR7+RR8+RR9
  110     HC       5

  111     KK    RR10 ROUTE RR8 THRU RR10
  112     RM       2    0.25    0.15

  113     KK    RR10 RUNOFF FROM RR10
  114     BA    3.30
  115     PB    3.40
  116     LS              81
  117     UD    1.19

  118     KK    RR10 COMBINE RR8+RR10
  119     HC       2

  120     KK    RR12 ROUTE RR10 THRU RR12
  121     RM       2    0.28    0.15

  122     KK    RR11 RUNOFF FROM RR11
  123     BA    3.40
  124     PB    3.46
  125     LS              83
  126     UD     .82

  127     KK    RR12 ROUTE RR11 THRU RR12
  128     RM       2    0.18    0.15
```

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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  129     KK    RR12 RUNOFF FROM RR12
  130     BA    4.25
  131     PB    3.43
  132     LS             84
  133     UD     .77

  134     KK    RR12 COMBINE RR10+RR11+RR12
  135     HC       3

  136     KK    RR13 ROUTE RR12 THRU RR13
  137     RM       2    0.24    0.15

  138     KK    RR13 RUNOFF FROM RR13
  139     BA    2.26
  140     PB    3.32
  141     LS             80
  142     UD    0.51

  143     KK    RR13 COMBINE RR12+RR13
  144     HC       2

  145     KK    RR14 ROUTE RR13 THRU RR14
  146     RM       2     .10     .15

  147     KK    RR14 RUNOFF FROM RR14
  148     BA    6.22
  149     PB    3.60
  150     LS             83
  151     UD    1.53

  152     KK    RR14 COMBINE RR13+RR14
  153     HC       2
          * ******** END OF DATA FROM B&V REPORT *******

  154     KK   RR.DB ROUTE THRU RED ROCK DETENTION BASIN
  155     KM         USE STORAGE-OUTFLOW DATA FROM COE FEASIBILITY REPORT
  156     RS       1    STOR       0
  157     SV       0     150     600    1100    1860    1900    2250    2630    2800
  158     SQ       0     750    1100    1250    1410    1420   22650   72500   97500
  159     SE    3159    3170    3190    3200    3210  3210.5    3215    3220    3222

  160     KK    RR23 ROUTE RED ROCK OUTFLOW THRU RR23
  161     RM       6    0.53    0.15

  162     KK    RR23 RUNOFF FROM RR23
  163     BA    2.03
  164     PB    3.20
  165     LS       0    74.9
  166     UK     500    .025    0.15     100
  167     RK    5500    .025    .030    0.09                      1
  168     RK   15500    .023    .030            TRAP     100      5      NO
```

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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  169     KK    RR23 COMBINE RED ROCK OUTFLOW WITH RR23
  170     HC       2

  171     KK       R1 RUNOFF FROM R1
  172     BA     1.12
  173     PB     3.17
  174     LS        0    87.7
  175     UD     0.47

  176     KK    RR23 COMBINE R1+RR23
  177     HC       2

  178     KK       R5 ROUTE RR23 THRU R5
  179     RM        5    0.39    0.15

  180     KK    RR20 RUNOFF FROM RR20
  181     BA     1.37
  182     PB     3.22
  183     LS        0      88
  184     UD     0.69

  185     KK       R5 ROUTE RR20 THRU R5
  186     RM        7    0.61    0.15

  187     KK    RR21 RUNOFF FROM RR21
  188     BA     6.27
  189     PB     3.26
  190     LS        0      87
  191     UD     1.00

  192     KK       R5 ROUTE RR21 THRU R5
  193     RM        8    0.64    0.15

  194     KK    RR22 RUNOFF FROM RR22
  195     BA     2.15
  196     PB     3.20
  197     LS        0      87
  198     UD     0.62

  199     KK       R5 ROUTE RR22 THRU R5
  200     RM        8    0.70    0.15

  201     KK       R5 RUNOFF FROM R5
  202     BA     5.77
  203     PB     3.00
  204     LS        0    75.5
  205     UK      600    .025     .15     100
  206     RK     7920    .023    .030     .20                          1
  207     RK    13000    .019    .030             TRAP      40        2
```

```
LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  208     KK      R5 COMBINE R5+RR23+RR22+RR21+RR20
  209     HC       5

  210     KK      R6 ROUTE R5 THRU R6
  211     RM       3    0.22    0.15

  212     KK      R6 RUNOFF FROM R6
  213     BA    1.51
  214     PB    2.77
  215     LS       0    73.2
  216     UK     500    .015     .15     100
  217     RK    5200    .016    .030     .13                      1
  218     RK    8000   .0044    .030            TRAP      40      1      NO

  219     KK      R6 COMBINE R5 WITH R6
  220     HC       2

  221     KK      F1 RUNOFF FROM F1
  222     BA    4.63
  223     PB    3.23
  224     LS       0      88
  225     UD    0.78

  226     KK      F5 ROUTE F1 THRU F5
  227     RM      12    0.99    0.15

  228     KK      F2 RUNOFF FROM F2
  229     BA    1.28
  230     PB    3.19
  231     LS       0      88
  232     UD     .43

  233     KK      F5 ROUTE F2 THRU F5
  234     RM       9    0.76    0.15

  235     KK      F3 RUNOFF FROM F3
  236     BA    2.60
  237     PB    3.09
  238     LS       0      87
  239     UD     .34

  240     KK      F5 ROUTE F3 THRU F5
  241     RM       5    0.40    0.15

  242     KK      F4 RUNOFF FROM F4
  243     BA    1.30
  244     PB    3.03
  245     LS       0      86
  246     UD     .41
```

```
LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  247     KK      F5 ROUTE F4 THRU F5
  248     RM       8    0.69    0.15

  249     KK     F5N RUNOFF FROM F5N
  250     BA    4.04
  251     PB    3.00
  252     LS       0      85
  253     UK     300    .025     .15     100
  254     RK    3200    .025    .030     .20                      1
  255     RK   18000    .023    .030             TRAP      70      5      NO

  256     KK     F5S RUNOFF FROM F5S
  257     BA    2.00
  258     PB    2.86
  259     LS       0      85
  260     UK     400    .020     .25     100
  261     RK    3500    .020    .030     .16                      1
  262     RK   14500    .017    .030             TRAP      50      5      NO

  263     KK      F5 COMBINE F5N AND F5S
  264     HC       2

  265     KK      F5 F5 WITH ROUTED F1, F2, F3, AND F4
  266     HC       5

  267     KK  UFL.DB UPPER FLAMINGO DETENTION BASIN
  268     KM         STORAGE-OUTFLOW DATA FROM B&V DESIGN PLANS
  269     RS       1    STOR       0
  270     SV       0      10      25     100     220     560     950    1000    1130    1430
  271     SV    2070
  272     SQ       0      75     300     675     910    1100    1260    1280    5170   20600
  273     SQ   50300
  274     SE    2445  2447.5    2450    2455    2460    2465    2470  2470.5    2472    2475
  275     SE    2480

  276     KK     F5R ROUTE UPPER FLAMINGO DB OUTFLOW THRU OUTFALL CHANNEL
  277     KM         CHANNEL GEOMETRY FROM B&V PREDESIGN MEMORANDUM
  278     RK    3500    .010    .020             TRAP      30      3

  279     KK     F6A RUNOFF FROM F6A
  280     BA     .55
  281     PB    2.86
  282     LS       0      88
  283     UD    0.35

  284     KK     F6B ROUTE F6A THRU F6B
  285     RM       4    0.35    0.15

  286     KK     F6B RUNOFF FROM F6B
  287     BA    0.85
  288     PB    2.77
  289     LS       0      88
  290     UD    0.30
```

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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  291     KK     F6B COMBINE F6A AND F6B
  292     HC       2

  293     KK     F7 ROUTE F6 THRU F7
  294     RM       3    0.28    0.15

  295     KK     F7 RUNOFF FROM F7
  296     BA    1.50
  297     PB    2.77
  298     LS       0    85.5
  299     UK     700    .015     .15     100
  300     RK    4000   .0114    .030     .65                          1
  301     RK    7500   .0116    .030          TRAP      50       5      NO

  302     KK     F7 COMBINE F7 WITH ROUTED F6
  303     HC       2

  304     KK     F7 COMBINED F7 WITH R6 AND F5R
  305     HC       3

  306     KK     F7R ROUTE F7 THRU F8 (FLWA1267-1335)
  307     RK    5230    .011    .030          TRAP      40       1

  308     KK     F8 RUNOFF FROM F8
  309     BA    .48
  310     LS       0    66.1       0       0     98       0
  311     UK    1500    .014     .28      83
  312     UK      50    .020     .10      17
  313     RK    1800     .01    .020    .048
  314     RK    7200    .010    .030                    30       2      NO

  315     KK     F8 COMBINE F8 AND F7R
  316     HC       2

  317     KK     F9 ROUTE F8 THRU F9 (FLWA1203)
  318     RK    1740   .0138    .015          TRAP      40       2

  319     KK      . (FLWA1152)
  320     RK    2640   .0044    .040          TRAP      50       3

  321     KK     F9 RUNOFF FROM F9
  322     BA    .90
  323     LS       0    63.0       0       0     98       0
  324     UK     500    .010     .25      73
  325     UK      40    .015     .10      27
  326     RK    2400    .007    .020     .35                          1
  327     RK    2300    .008    .020    .015                          1
  328     RK   10800    .013    .023          TRAP      50       3      NO
```

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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  329     KK      F9 COMBINE F8 WITH F9
  330     HC       2

  331     KK      F14 ROUTE F9 THRU F14
  332     RM       2    0.16    0.20

  333     KK      F10 RUNOFF FROM F10
  334     BA    1.17
  335     LS       0    62.6       0       0      98       0
  336     UK     600    .010     .25      67
  337     UK      40    .015     .10      33
  338     RK    1300    .010    .020    .019                      1
  339     RK    1300    .006     .02    .080    TRAP              1
  340     RK    8200   .0117     .02            TRAP      40      1
          * *** SUBAREAS R2 - R8 NOW ASSUMED TO BE DIVERTED INTO FLAMINGO WASH BY
          *     RAINBOW AND FLAMINGO RD ****

  341     KK      R2 RUNOFF FROM R2
  342     BA    2.01
  343     PB    3.00
  344     LS       0    79.4
  345     UD    0.21

  346     KK      R3 ROUTE R2 THRU R3
  347     RM       5    0.38    0.15

  348     KK      R3 RUNOFF FROM R3
  349     BA    2.63
  350     PB    2.77
  351     LS       0    68.2
  352     UD    0.61

  353     KK      R3 COMBINE R2+R3
  354     HC       2

  355     KK      R3 ROUTE THRU EXISTING GRAVEL PIT
  356     RS       1    STOR     480
  357     SV       0     480    1290    3150    3420
  358     SE       0      20      60     110     120
  359     SQ       0       0    1800    1800   37500

  360     KK      R8 ROUTE R3 THRU R8
  361     RK    2750    .019    .020            TRAP      40      1

  362     KK      R7 RUNOFF FROM R7
  363     BA    1.39
  364     LS       0    79.5
  365     UD    0.51
```

```
LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  366     KK      R7 DIVERT Q IN EXCESS OF PIPE CAPACITY
  367     KM         LIMITING CAPACITY OF RAINBOW STORM DRAIN = 324 CFS (FLLA0307)
  368     KM         OVERFLOW RUNS DOWN DESERT INN AND EDNA INTO CENTRAL BASIN
  369     DT    R7OF
  370     DI       0     324    1000    5000
  371     DQ       0       0     676    4676

  372     KK      R8 ROUTE R7 THRU R8 (90"-96" RCP IN RAINBOW)
  373     RK    5280    .004    .015            CIRC     8.0

  374     KK      R8 RUNOFF FROM R8
  375     BA     .51
  376     LS       0    73.3
  377     UD    0.37

  378     KK      R8 COMBINE R3+R7+R8
  379     HC       3

  380     KK     F10 ROUTE R8 THRU F10 (114" RCP IN FLAMINGO RD)
  381     RK    5280    .010    .015            CIRC     9.5

  382     KK     F10 COMBINE R8+F10
  383     HC       2

  384     KK     F14 ROUTE F10 THRU F14 (FLLA0000)
  385     RK    4010   .0075    .015            TRAP      20       1

  386     KK     F12 RUNOFF FROM F12
  387     BA     .88
  388     LS       0    87.9
  389     UK     700    .012     .15     100
  390     RK    3500   .0120    .030     .21                      1
  391     RK    8200   .0130    .030           TRAP      10       5      NO

  392     KK    F12R    ROUT     F12    THRU     F13
  393     RM       2    0.20    0.15

  394     KK     F13 RUNOFF FROM F13
  395     BA     .55
  396     LS       0    87.5       0       0      98       0
  397     UK     750    .010     .25      83
  398     UK      50    .015     .10      17
  399     RK    1100     .01    .023     .04                      1
  400     RK    2300     .01    .023     .10                      1
  401     RK    5900    .012    .026            TRAP      40       2      NO

  402     KK     F13 COMBINE     F13     AND     F1R
  403     HC       2
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

 404      KK     F14 ROUTE F13 THRU F14 (UNIMPROVED)
 405      RM       2    0.15    0.15

 406      KK     F14 RUNOFF FROM F14
 407      BA     .78
 408      LS       0    76.5       0       0      98       0
 409      UK     500    .010     .25      86
 410      UK     400    .015     .10      12
 411      RK    1200   .0090    .023    .024                     1
 412      RK    2400   .0075    .025     .12    TRAP      20      1
 413      RK    5200   .0090    .033            TRAP      75      4      NO

 414      KK     F14 COMBINE F9, F10, F13, AND F14
 415      HC       4

 416      KK    F14R ROUTE F14 THRU F15 (FLWA0990-1049)
 417      RK    3110    .020    .040            TRAP      50      3

 418      KK       .  (FLWA0924)
 419      RK    3490    .010    .040            TRAP      60      1

 420      KK       .  (FLWA0891-0923)
 421      RK    1580   .0076    .030            TRAP      90      1

 422      KK     F15 RUNOFF FROM F15
 423      BA    1.32
 424      LS       0    78.0       0       0      98       0
 425      UK     640    .013     .15      77
 426      UK     400    .014     .10      23
 427      RK    2500    .013    .020    0.08                     1
 428      RK    4500    .006    .020    0.25                     1
 429      RK    8500   0.012    .030            TRAP      40      3      NO

 430      KK     F15 COMBINE     F15     AND    F14R
 431      HC       2

 432      KK   F15OF DIVERT OVERFLOWS
 433      KM         DIVERSION RATING CURVE FROM COE FEASIBILITY STUDY
 434      DT   F15OF
 435      DI       0    4100    7000   10500   35000
 436      DQ       0       0    1700    4640   15500

 437      KK     F16 RUNOFF FROM F16
 438      BA     .52
 439      LS       0    75.5       0       0      98       0
 440      UK     600    .010    0.15      56
 441      UK     400    .015     .10      44
 442      RK    1000    .010    .025    .030                     1
 443      RK    2400    .015    .025     .10                     1
 444      RK    6000    .004    .020                             1
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  445     KK     F16 COMBINE F15 WITH F16
  446     HC       2

  447     KK   F16OF DIVERT OVERFLOWS
  448     KM        LIMIT FLOW TO 6000 CFS AT CEASARS PALACE/LVB/IMPERIAL PALACE CULVERT
  449     KM        BASED ON COE ASSUMED CAPACITY
  450     DT   F16OI
  451     DI       0    6000   12000   20000
  452     DQ       0       0    6000   14000

  453     KK     F16 ROUT F16 THRU F17 (FLWA0798-0823)
  454     RK    3550    .009    .015           TRAP      48       0

  455     KK       .  (FLWA0773)
  456     RK    1320   .0091    .020           TRAP      80      10

  457     KK       .  (FLWA0648-0798)
  458     RK    7760   .0064    .040           TRAP      30       2

  459     KK     F17 RUNOFF FROM F17
  460     BA     .65
  461     LS       0    75.5       0       0     98       0
  462     UK     900    .057     .15      51
  463     UK     600    .010     .10      49
  464     RK    1000    .010    .025    .040                      1
  465     RK    1500    .010    .027     .09                      1
  466     RK   11400   .0110    .030           TRAP     100       5      NO

  467     KK     F17 COMBINE     F17    AND  F16
  468     HC       2
          *  *** NO CONTRIBUTION FROM UPPER BLUE DIAMOND FOR FLAMINGO/RED ROCK STORM ***

  469     KK      T8 RUNOFF FROM T8
  470     BA    1.22
  471     LS       0    65.6
  472     UK     600    .015    0.15     100
  473     RK    2000    .018    .030     .14                      1
  474     RK   18000   .0161    .030           TRAP      75       5      NO

  475     KK      T9 ROUTE T8 TO T9
  476     RM       2     .52    0.15

  477     KK      T9 RUNOFF FROM T9
  478     BA    0.87
  479     LS       0    73.1
  480     UK     600    .010    0.15     100
  481     RK    4000    .010    .030    0.12                      1
  482     RK   10200   .0134    .030           TRAP      30       5
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

 483      KK      T9 COMBINE T8 AND T9
 484      HC       2

 485      KK    T90F DIVERT OVERFLOW
 486      DT    T90F
 487      DI       0    5480   11000   15000
 488      DQ       0       0    2700    2700

 489      KK     T10 ROUTE T9 THRU T10
 490      RM       3    0.21    0.10

 491      KK      T4 RUNOFF FROM T4
 492      BA    3.22
 493      LS       0    87.6
 494      UK     500    .015    0.15     100
 495      RK    2700   .0190    .030    0.25                          1
 496      RK   20000   .0185    .030            TRAP      75        5      NO

 497      KK      T5 ROUTE T4 TO T5
 498      RK    6500    .013    .030            TRAP      30        2

 499      KK      T5 RUNOFF FROM T5
 500      BA    1.00
 501      LS       0    87.0
 502      UK     600    .010    0.15     100
 503      RK    2500    .012    .030    0.21                          1
 504      RK    6500    .013    .030            TRAP      30        2

 505      KK      T5 COMBINE T4 AND T5
 506      HC       2

 507      KK      T6 ROUTE T5 TO T6
 508      RK   10800    .012    .030            TRAP      30        5

 509      KK      T6 RUNOFF FROM T6
 510      BA    1.30
 511      LS       0    86.9
 512      UK     600    .010    0.15     100
 513      RK    6000    .012    .030    .400                          1
 514      RK   10800    .012    .030            TRAP      30        5

 515      KK      T6 COMBINE T5 AND T6
 516      HC       2

 517      KK    T90F RECALL T90F
 518      DR    T90F

 519      KK      T6 ROUTE T90F THRU T6
 520      RM       3    0.23    0.15
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  521     KK      T6 COMBINE T6 AND T9OF
  522     HC       2

  523     KK      T6 DIVERT OVERFLOW ALONG UPRR
  524     KM         UPRR 114" CMP CULVERT - 750 CFS CAPACITY
  525     DT    T6OF
  526     DI       0     750    1500   10000
  527     DQ       0       0     750    9250

  528     KK     T10 ROUTE T6 THRU T10
  529     RM       2    0.18    0.15

  530     KK      T1 RUNOFF FROM T1
  531     BA    1.56
  532     LS       0      88
  533     UK     600    .020    0.15     100
  534     RK    4000   .0200    .030    0.28                          1
  535     RK   13200    .017    .030            TRAP      50        5      NO

  536     KK      T3 ROUTE T1 TO T3
  537     RK   10000   .0106    .032            TRAP      30        5

  538     KK      T3 RUNOFF FROM T3
  539     BA    0.99
  540     LS       0    78.9
  541     UK     500    .010    0.15     100
  542     RK    3000    .010    .030    0.16                          1
  543     RK   10000   .0106    .032            TRAP      30        5

  544     KK      T3 COMBINE T1 AND T3
  545     HC       2

  546     KK    T6OF RECALL DIVERTED OVERFLOW FROM T6
  547     DR    T6OF

  548     KK      T3 ROUTE T6OF THRU T3
  549     RM       1    0.08    0.15

  550     KK      T3 COMBINE T6OF AND T3
  551     HC       2

  552     KK    T3OF DIVERT FLOW IN EXCESS OF CULVERT CAPACITY
  553     KM         BASED ON COE RATING CURVE FROM FEASIBILITY STUDY
  554     KM         DQ FLOWS NORTHEASTERLY, REJOINING FW NEAR PARADISE RD
  555     DT    T3OF
  556     DI       0    1400    1900    3200    5500   19000
  557     DQ       0       0     420    1650    3650   14700

  558     KK     T10 ROUTE T3 THRU T10 (TRWA0272)
  559     RK    3800   .0132    .040            TRAP    17.5        2
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  560     KK     T10 RUNOFF FROM T10
  561     BA   0.82
  562     LS      0    78.0       0       0      98       0
  563     UK    700    .013    0.15      78
  564     UK    400    .011     .10      22
  565     RK   1100    .012    .020    .120                        1
  566     RK   3000    .008    .020     .50                        1
  567     RK   3500   0.010    .030            TRAP      30       2

  568     KK     T10 COMBINE T3, T6, T9 AND T10
  569     HC       4

  570     KK     T10R ROUT T10 THRU T11 (TRWA0235)
  571     RK   1160    .010    .015            TRAP      32       0

  572     KK        .   (TRWA0145-0218)
  573     RK   4700   .0095    .030            TRAP      90     1.5

  574     KK     T11 RUNOFF FROM T11
  575     BA   1.09
  576     LS      0    68.6       0       0      98       0
  577     UK    800    .010    0.30      61
  578     UK    500    .010    0.10      39
  579     RK   3200   .0080    .020    0.17                        1
  580     RK   5400   .0104    .030            TRAP     100       5      NO

  581     KK     T11 COMBINE T11 AND T10R
  582     HC       2

  583     KK     T11R ROUT  T11 THRU T12 (TRWA0117)
  584     RK   1130   .0088    .015            TRAP     1.5       2

  585     KK        .   (TRWA0000-0034+)
  586     RK   6500    .012    .040            TRAP     100     2.5

  587     KK     T12 RUNOFF FROM T12
  588     BA   0.77
  589     LS      0    74.4       0       0      98       0
  590     UK    500    .008    0.18      65
  591     UK    200    0.01    0.10      35
  592     RK   2200    .008    .023    0.12                        1
  593     RK   3000    .007    .025     .24                20       2
  594     RK   6600   .0103    .032                        30       5

  595     KK     T12 ADD T12 AND T11R
  596     HC       2

  597     KK     T30F RECALL DIVERSION FROM T3
  598     DR     T30F
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

599       KK     T12 ROUTE T3OF TO T12
600       RM      20    1.99    0.10

601       KK     T12 COMBINE T3OF AND T12
602       HC       2
          *  *** DATA FOR SUBAREAS MNW-B THRU MNW-M TAKEN FROM NIMBUS HEC-1 ANALYSIS
          *      FOR NORTHWEST MCCARRAN AIRPORT DRAINAGE STUDY (WITH SMALL MODIFICATIONS)

603       KK   MNW-B RUNOFF FROM B
604       BA    0.68
605       LS              65      10
606       UD     2.4

607       KK    DIVB FLOW SPLIT AT I-15; BCULV IS FLOW CONVEYED BY CULVERT
608       DT   BCULV
609       DI       0      22     100     500
610       DQ       0      22      22      22

611       KK   RDIVB ROUTE DIVB TO CULVERT AT I15 AND C
612       KM        CHANGED RK TO RD SO 9/90 HEC-1 VERSION WOULD RUN
613       RD     600    .004     .05       0       0       5

614       KK   MNW-C RUNOFF AT C
615       BA    0.69
616       LS              65      17
617       UD     2.0

618       KK   MNW-C COMBINE DIVB+C
619       HC       2

620       KK   MNW-C PONDING STORAGE ROUTING AT I-15
621       RS       1    STOR       0
622       SA       0     .28     .92    2.02    3.19    3.44    5.37    9.09
623       SQ       0       8      25      35      40      78     360    1342
624       SE      54      55      56      57   57.43      58      59      60

625       KK    DIVC FLOW SPLIT AT C THRU AND AROUND CULVERT
626       DT   CCULV
627       DI       0       8      25      35      40      78     360    1342
628       DQ       0       8      25      35      40      45      55      65
          *  KK RDIVC ROUTE DIVC NORTH TO D
          *  COMMENTED OUT ROUTING SO 9/90 HEC-1 VERSION WOULD RUN
          *  RK   650    .004     .05       0       0       0      20

629       KK   MNW-D RUNOFF FROM D
630       BA     .05
631       LS              66      10
632       UD     .40
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  633     KK   MNW-D COMBINE DIVC AND D
  634     HC       2

  635     KK    DIVD DIVERT FLOW TO NORTH; DCULV CROSSES I-15
  636     DT   DCULV
  637     DI       0      28     100     500
  638     DQ       0      28      28      28

  639     KK   RDIVD ROUTE DIVERTED FLOW NORTH TO E
  640     KM         CHANGED RK TO RD SO 9/90 HEC-1 VERSION WOULD RUN
  641     RD     800    .004     .05       0       0       0      20

  642     KK   MNW-E RUNOFF FROM E
  643     BA    0.05
  644     LS              65      18
  645     UD    0.38

  646     KK   MNW-E COMBINE DIVD + E
  647     HC       2

  648     KK   ECULV DIVIDE FLOW AT I-15 CULVERT; ECULV CROSSES I-15 INTO MNW-I
  649     DT   ECULV
  650     DI       0      28     100     500
  651     DQ       0      28      28      28

  652     KK   RDIVE ROUTE FLOW FROM DIVE NORTH ALONG I-15
  653     KM         CHANGED RK TO RD SO 9/90 HEC-1 VERSION WOULD RUN
  654     RD    1200    .007     .05       0       0       0       4

  655     KK  MNW-FG RUNOFF FROM FG
  656     BA    0.36
  657     LS              66      17
  658     UD    1.24

  659     KK  MNW-FG COMBINE EDIV + FG
  660     HC       2

  661     KK    DIVG DIVERT FLOW NORTH; GCULV CROSSES I-15 INTO SUBAREA I
  662     DT   GCULV
  663     DI       0      50      60     100     150     250
  664     DQ       0      50      60      60      60      60

  665     KK   RDIVG ROUTE DIVG NORTH TO AIRPORT CHANNEL
  666     KM         CHANGED RK TO RD SO 9/90 HEC-1 VERSION WOULD RUN
  667     RD    2200    .009    .040       0       0       0      10

  668     KK  MNW-J1 RUNOFF FROM J1
  669     BA    2.37
  670     LS              70
  671     UD    2.67
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

672       KK  MNW-J2 ROUTE J1 TO J2
673       RK   10000    .012     .04                      10       2

674       KK  MNW-J2 RUNOFF FROM J2
675       BA    1.21
676       LS              70      10
677       UD    1.22

678       KK  MNW-J2 COMBINE J1+J2
679       HC       2

680       KK     CP1 COMBINE J2 + RD1VG
681       HC       2

682       KK    RCP1 ROUTE CP1 TO LAS VEGAS BLVD (CP3)
683       RK    2600    .008     .04       0       0      20       1

684       KK    RTNE RETURN FLOW FROM CULVERT E
685       DR   ECULV

686       KK    RTNE DUMMY SUBAREA TO GET 1988 HEC1 TO RUN (NEEDS NON-ZERO AREA)
687       BA    0.01
688       LS       0      50
689       UD     0.1

690       KK    RTNE COMBINE DIVERSION RECALL WITH DUMMY SUBAREA
691       HC       2

692       KK   RRTNE ROUTE ECULV TO OUTLET OF I
693       RK    3900    .013     .05       0       0       0      50

694       KK    RTNG RETURN FLOW FROM CULVERT G
695       DR   GCULV

696       KK    RTNG DUMMY SUBAREA TO GET 1988 HEC1 TO RUN (NEEDS NON-ZERO AREA)
697       BA    0.01
698       LS       0      50
699       UD     0.1

700       KK    RTNG COMBINE DIVERSION RECALL WITH DUMMY SUBAREA
701       HC       2

702       KK   RRTNG ROUTE GCULV TO OUTLET OF I
703       RK    2500    .013    0.05       0       0       0      50

704       KK  MNW-I1 RUNOFF FROM I1
705       BA    0.25
706       LS              78      15
707       UD    0.58
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  708     KK     CP2 COMBINE HYDROGRAPHS AT LAS VEGAS BLVD AND UPRR
  709     HC       3

  710     KK    RCP2 ROUTE CP2 TO AIRPORT CHANNEL AND LAS VEGAS BLVD (CP3)
  711     RK    2500    .009     .05       0       0       0       4

  712     KK  MNW-I2 RUNOFF FROM I2
  713     BA    0.14
  714     LS              77       1
  715     UD    0.38

  716     KK     CP3 COMBINE FLOW FROM B-12 AT LAS VEGAS BLVD AND AIRPORT CHANNEL
  717     HC       3

  718     KK    RCP3 ROUTE CPE TO OUTLET OF K
  719     RK    7300     .01     .04       0       0       5       2

  720     KK   MNW-K RUNOFF FROM K
  721     BA    1.43
  722     LS              66      25
  723     UD    1.55

  724     KK     CP4 COMBINE HYDROGRAPHS FOR AIRPORT CHANNEL AND TAXIWAY S
  725     HC       2

  726     KK    RCP4 ROUTE FLOW TO TROPICANA BLVD
  727     RK    3300     .01     .03       0       0      20       4

  728     KK   MNW-L RUNOFF FROM L
  729     BA    0.27
  730     LS              77      60
  731     UD    0.42

  732     KK   MNW-M RUNOFF FROM M
  733     BA    0.49
  734     LS              84      56
  735     UD    0.83

  736     KK     CP5 COMBINE ALL HYDROGRAPHS AT OUTLET AT BOX CULVERT AT TROPICANA
  737     HC       3
          *  *** END OF DATA FROM NIMBUS NORTHWEST MCCARRAN HEC-1 DATA ***
          *

  738     KK     T12 ROUTE MNW-L TO T12 (TRMC0009)
  739     RK    2640   .0045    .040            TRAP      18     1.5

  740     KK       .   (TRWA0000-0034)
  741     RK    5000    .012    .040            TRAP     100     2.5
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  742     KK     T12 COMBINE MNW-L AND T12
  743     KM         AIRPORT CHANNEL + TROPICANA WASH
  744     HC       2

  745     KK     F17 COMBINE F17 AND T12
  746     KM         FLAMINGO WASH + TROPICANA WASH
  747     HC       2

  748     KK     F18 ROUTE F17 AND T12 THRU F18
  749     KM           (FLWA0593)
  750     RK    1430   .0182    .040            TRAP      50       1

  751     KK       .   (FLWA0564+FLWA0620) COMBINED DUE TO RK PROBLEMS WITH NEW HEC1
  752     RK    1695   .0045    .015            TRAP      50       1

  753     KK      R4 RUNOFF FROM R4
  754     BA    2.28
  755     LS       0    86.5
  756     UD    0.34

  757     KK   F15OF RECALL F15 OVERFLOW
  758     DR   F15OF

  759     KK  F15OFR ROUT F15OF THRU R4
  760     RM       3    0.24       0

  761     KK      R4 COMBINE R4 AND F15 OVERFLOW
  762     HC       2

  763     KK   F16OF RECALL F16 OVERFLOW
  764     DR   F16OF

  765     KK  F16OFR ROUT F16OF THRU R4
  766     RM       3    0.24       0

  767     KK      R4 COMBINE R4 AND F16 OVERFLOW
  768     HC       2

  769     KK     F18 ROUT R4 THRU F18
  770     RM      11    0.88    0.10

  771     KK     F18 RUNOFF FROM F18
  772     BA    0.87
  773     LS       0    72.0       0       0      98       0
  774     UK     500    .010    0.20      52
  775     UK     200    .015    0.10      48
  776     RK    1000    .010    .023    .014                       1
  777     RK    1000   .0010    .023    .050                       1
  778     RK   15900   .0090    .020            TRAP      30       1
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  779     KK     F18 COMBINE R4 AND F18
  780     HC       2

  781     KK     F24 RUNOFF FROM F24
  782     BA    1.03
  783     LS       0    66.3       0       0      98       0
  784     UK     300    .010    0.20      46
  785     UK     100    .015    0.10      54
  786     RK    1300    .013    .020    .035                      1
  787     RK    3000   .0075    .020    .014                      1
  788     RK    4400    .018    .030            TRAP      50      3      NO

  789     KK     F18 COMBINE F18, F24, AND F17
  790     HC       3

  791     KK    F18R ROUT F18 THRU F20A (FLWA0400-0493)
  792     RK    7970   .0065    .040            TRAP      60      2

  793     KK    F20A RUNOFF FROM F20A
  794     BA    0.81
  795     LS       0    70.7       0       0      98       0
  796     UK    1000    .010    0.25      77
  797     UK     250     .02    0.15      23
  798     RK    1900    .001    .020    0.05                      1
  799     RK    2000    .015    .020    0.14
  800     RK    5600   .0108    .033                      40      4

  801     KK    F20A COMBINE F20A AND F18R
  802     HC       2

  803     KK    F20B ROUTE F20A THRU F20B (FLWA0376)
  804     RK    1210   .0148    .040            TRAP      50      1

  805     KK       .   (FLWA0348)
  806     RK    1430    .007    .015            TRAP      60      1

  807     KK     F19 RUNOFF FROM F19
  808     BA    1.54
  809     LS       0    70.8       0       0      98       0
  810     UK     500    .008    0.25      51
  811     UK     100    .015    0.10      49
  812     RK    1300    .010    .020     .04                      1
  813     RK    2500    .010    .020    .019                      1
  814     RK   11400   .0118    .020            TRAP      40      1      NO

  815     KK    F20B ROUTE F19 THRU F20B
  816     RM       2    0.20    0.20

  817     KK    F20B RUNOFF FROM F20B
  818     BA    0.73
  819     LS       0      82
  820     UD    0.25
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

821       KK    F20B COMBINE F19 AND F20B
822       HC      2

823       KK     VB VAN BUSKIRK DRAINAGE AREA
824       KM        SINGLE SUBAREA TO SIMULATE RUNOFF FROM ENTIRE VAN BUSKIRK WATERSHED.
825       KM        CN AND LAG SELECTED TO MATCH PEAK Q AND TIME-TO-PEAK
826       KM        FROM VAN BUSKIRK PREDESIGN STUDY BY JMM.
827       BA   4.58
828       LS            78
829       UD   0.50

830       KK    F20B COMBINE VAN BUSKIRK AREA, F20A AND F20B
831       HC      3

832       KK     F22 ROUTE F20B THRU F22 (FLWA0258-0274)
833       RK   4700   .0110    .030                    70    2.5

834       KK     F21 RUNOFF FROM F21
835       BA   1.27
836       LS      0    77.1       0       0     98      0
837       UK    300    .010    0.25      49
838       UK     60    .020     .10      51
839       RK   1300    .010    .020    .019                    1
840       RK   1750    .008    .020    0.08                    1
841       RK  16000   .0128    .020            TRAP    40      1     NO

842       KK     F21 DIVERT ACROSS BLDR HWY AT OAKEY
843       DT   OAKEY
844       DI      0   10000
845       DQ      0    5000

846       KK     F22 ROUTE F21 THRU F22
847       RM      1    0.06    0.20

848       KK     F22 RUNOFF FROM F22
849       BA   3.43
850       LS      0    74.9       0       0     98      0
851       UK    700    .008    0.25      51
852       UK     60    .015     .10      49
853       RK   1500    .010    .020    .093                    1
854       RK   3000    .008    .020    0.37                    1
855       RK  29500   .0115    .020            TRAP    40      1     NO

856       KK     F22 COMBINE F20B, F21 AND F22
857       HC      3

858       KK     F23 ROUTE F22 THRU F23 (FLWA0228)
859       RK   1430    .014    .040            TRAP    50      1
```

```
LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  860     KK        .    (FLWA0175)
  861     PK     2690   .0007    .040           TRAP     100       1

  862     KK        .    (FLWA0079)
  863     KK     5020   .0096    .040           TRAP      50       1

  864     KK        .    (FLWA0000)
  865     KK     4120   .0049    .040           TRAP     107       2

  866     KK     F23 RUNOFF FROM F23
  867     BA    1.92
  868     LS        0    74.4                    98
  869     UK      500     .01    0.25      70
  870     UK      100    .015     .10      30
  871     RK     2600    .005     .02    .037   TRAP      20       1
  872     RK     2200   .0018     .02    0.21   TRAP      40       1
  873     RK    13700   .0075    .032           TRAP      50       2      NO

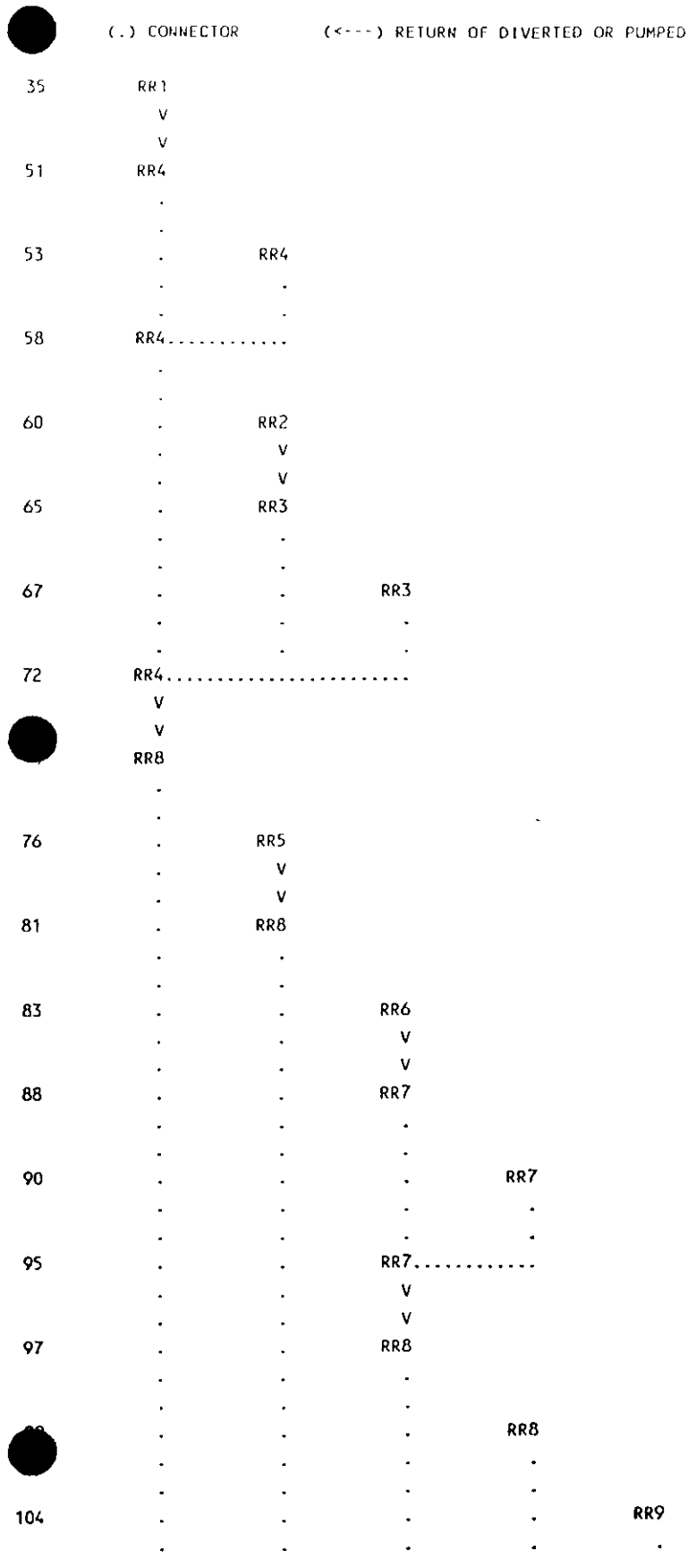
  874     KK     F23 COMBINE F22 AND F23
  875     KM         CONFLUENCE OF FLAMINGO WASH WITH LAS VEGAS WASH
  876     HC         2
  877     ZZ
```

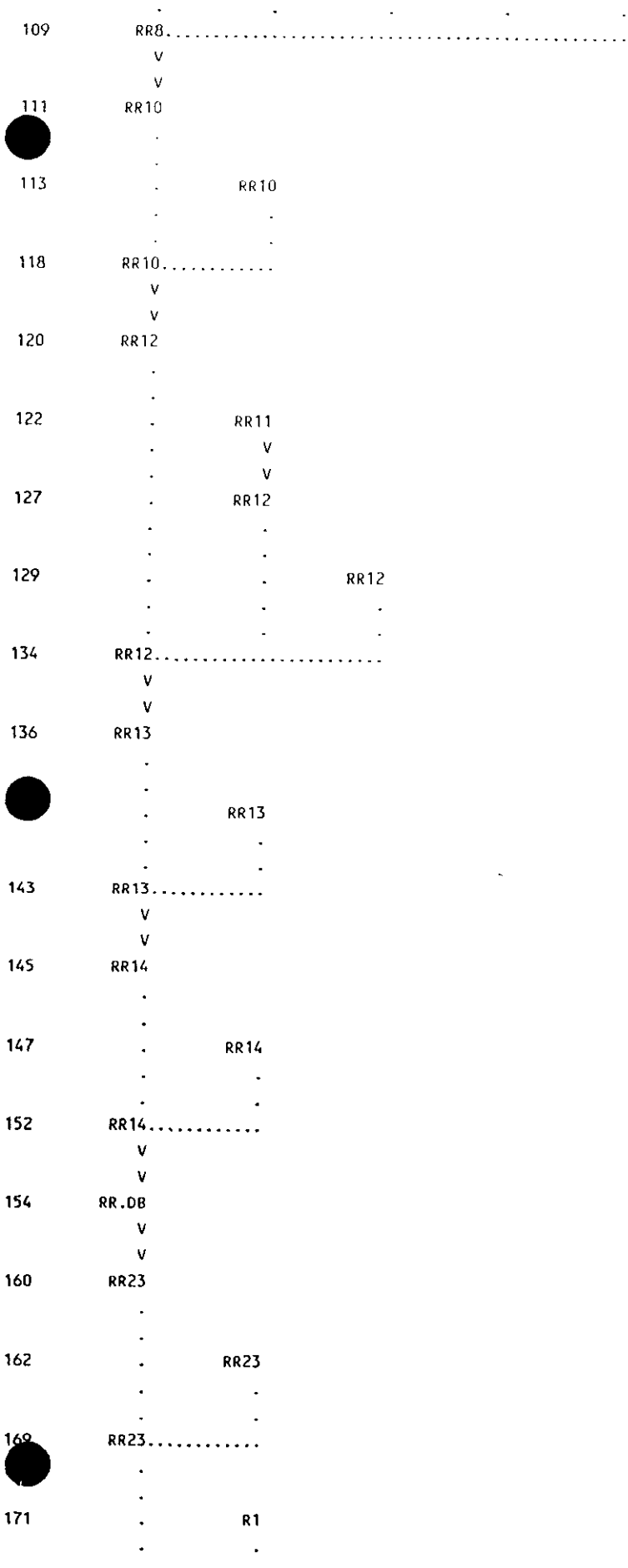
SCHEMATIC DIAGRAM OF STREAM NETWORK

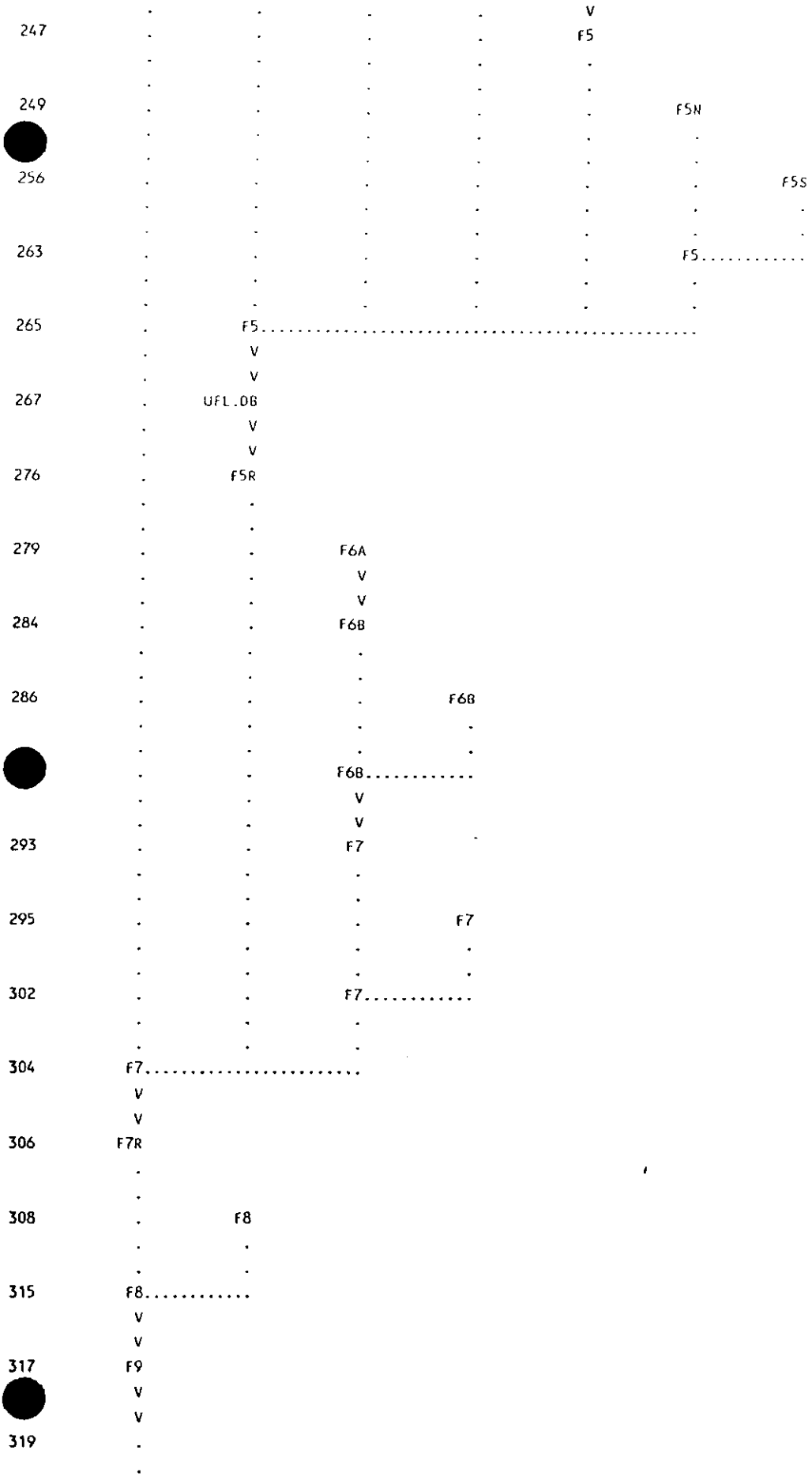
INPUT LINE

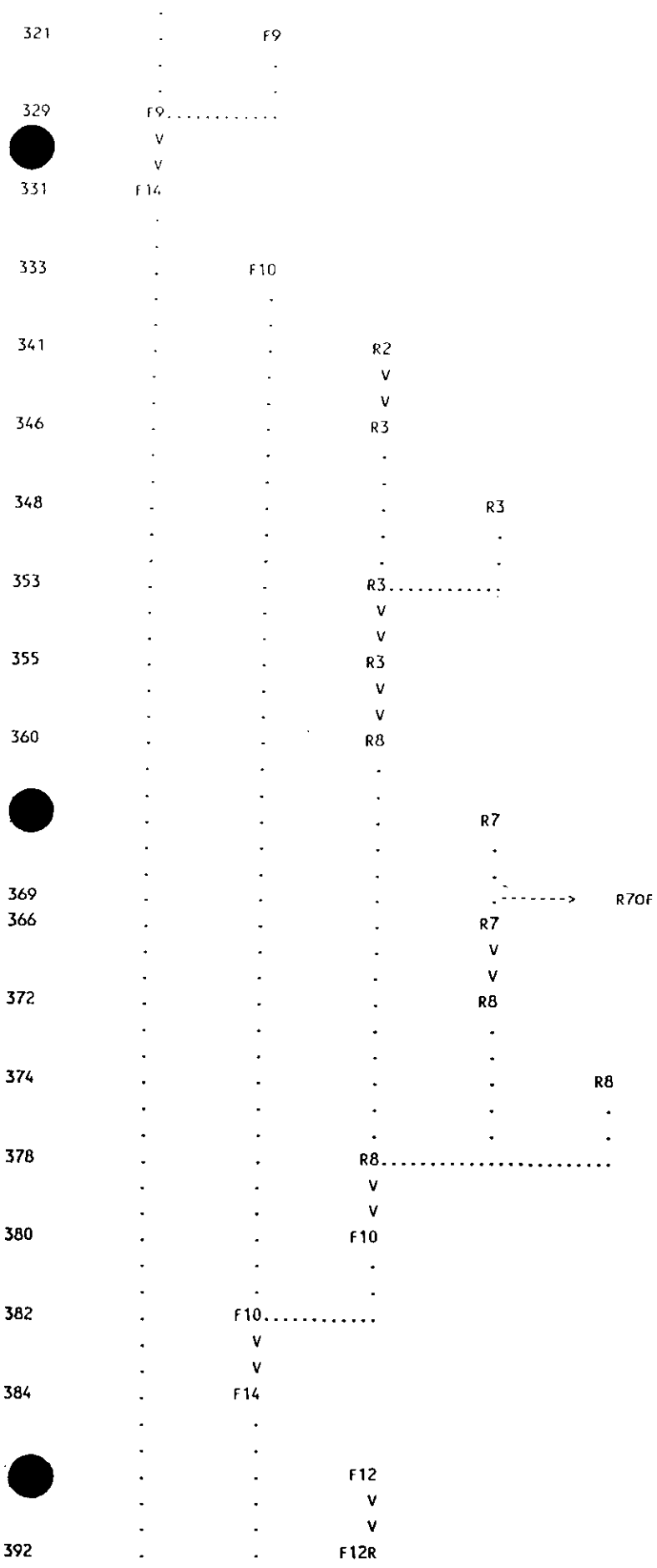
(V) ROUTING (---->) DIVERSION OR PUMP FLOW

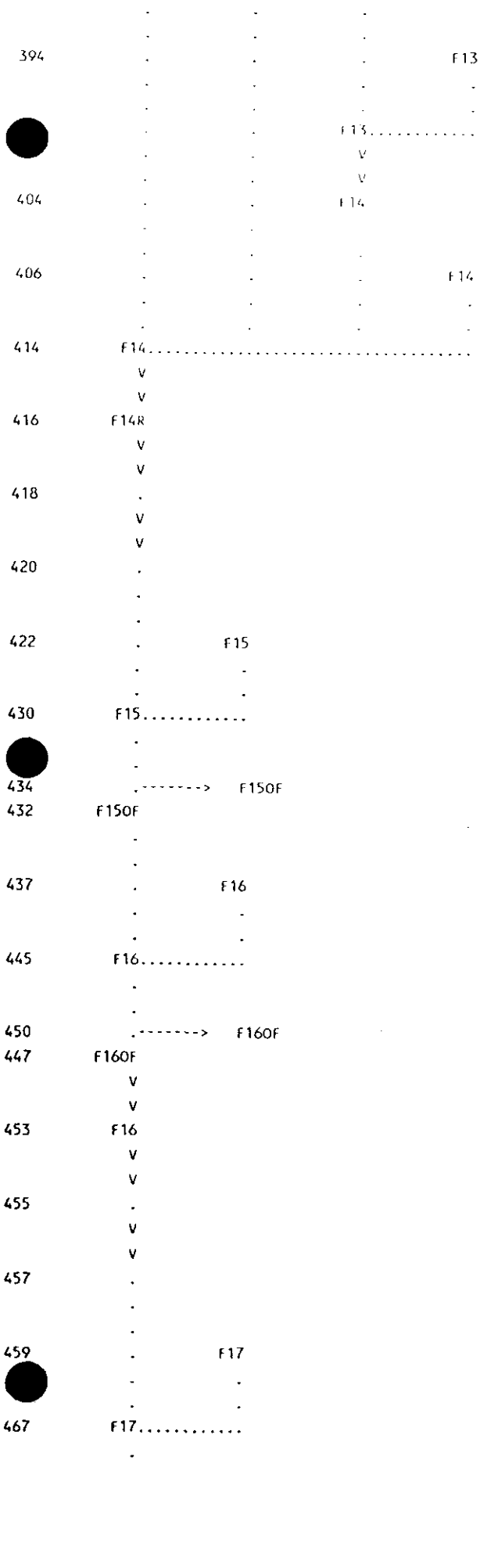
(.) CONNECTOR (<----) RETURN OF DIVERTED OR PUMPED FLOW

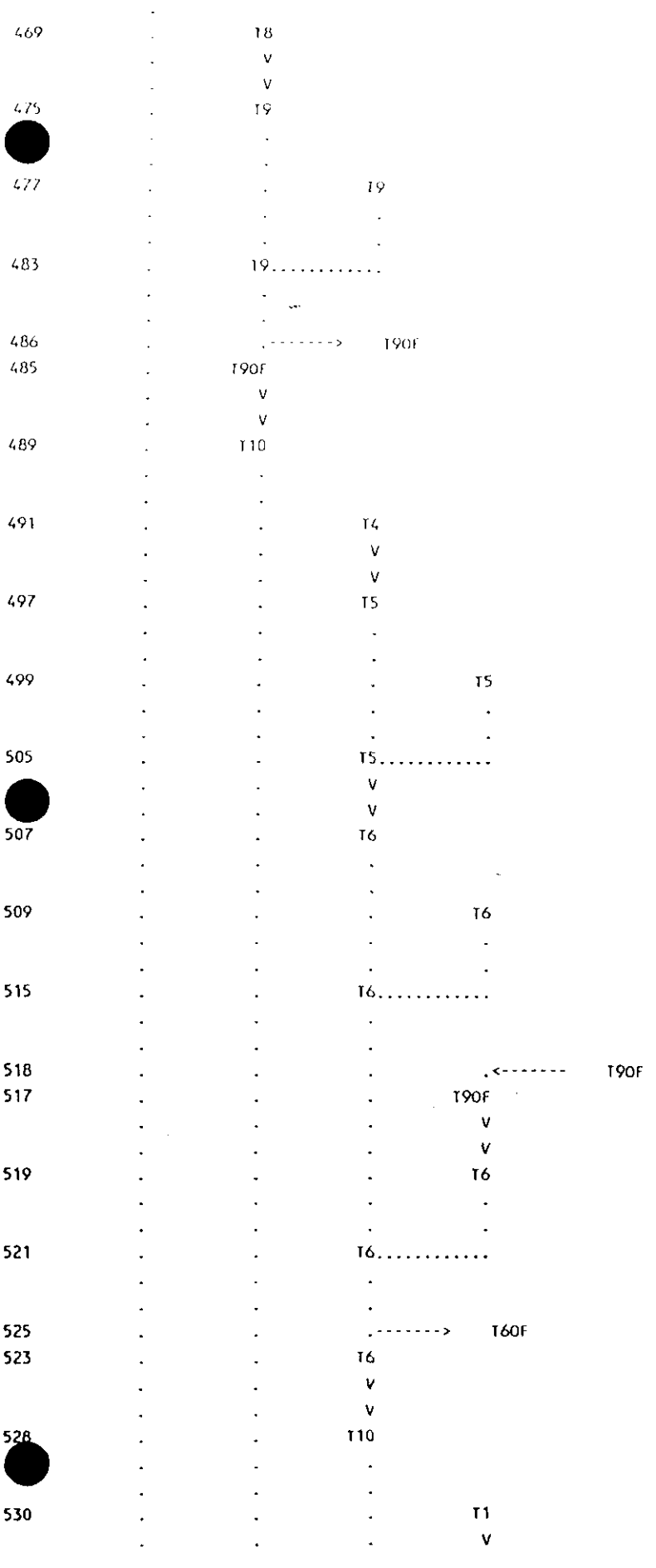


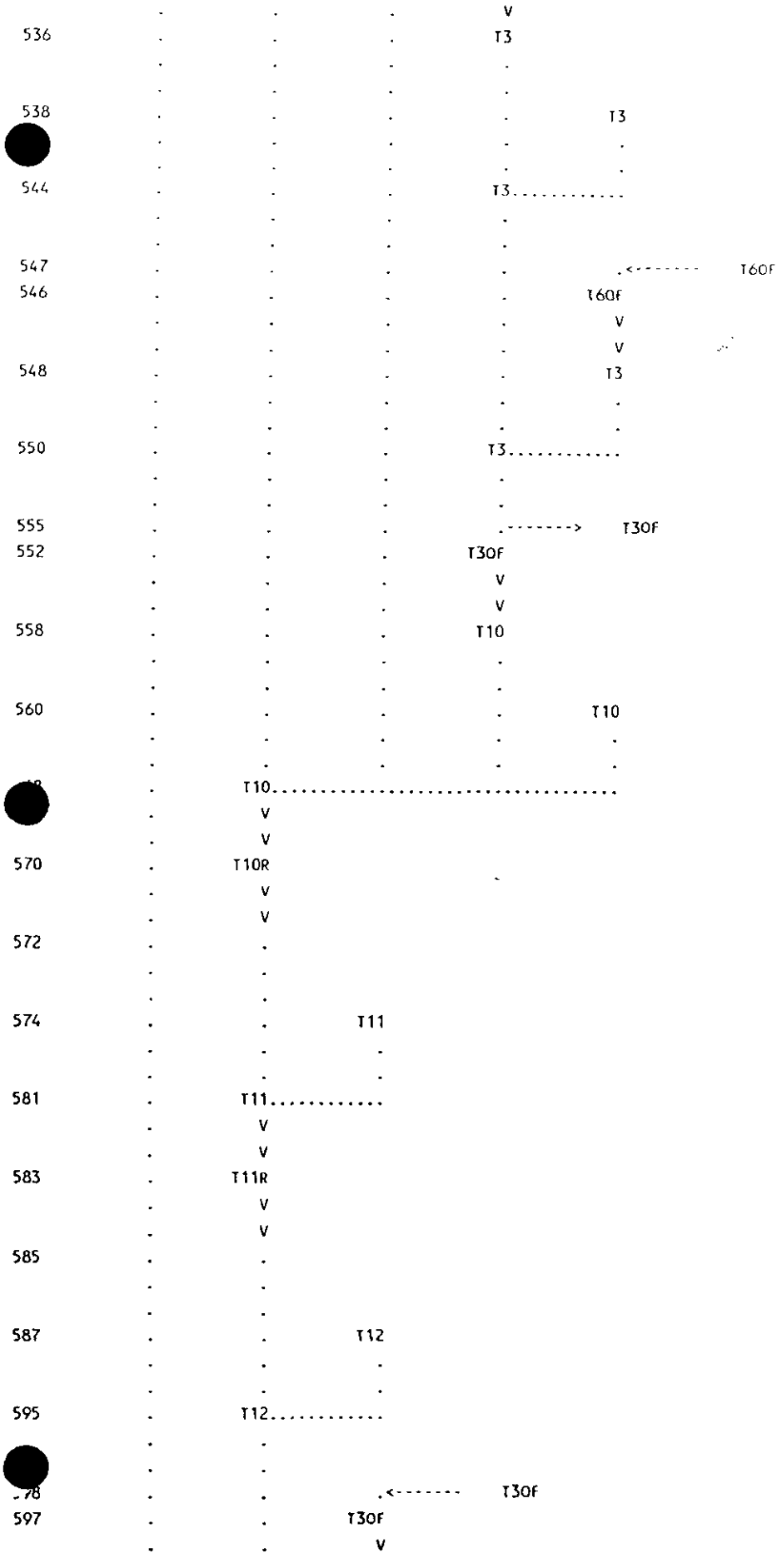

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RR8
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RR10
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RR10
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RR10
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RR12
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RR11
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RR12
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RR12
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RR12
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RR13
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RR13
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RR14
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RR14
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RR14
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RR.DB
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RR23
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RR23
169
RR23
171
R1

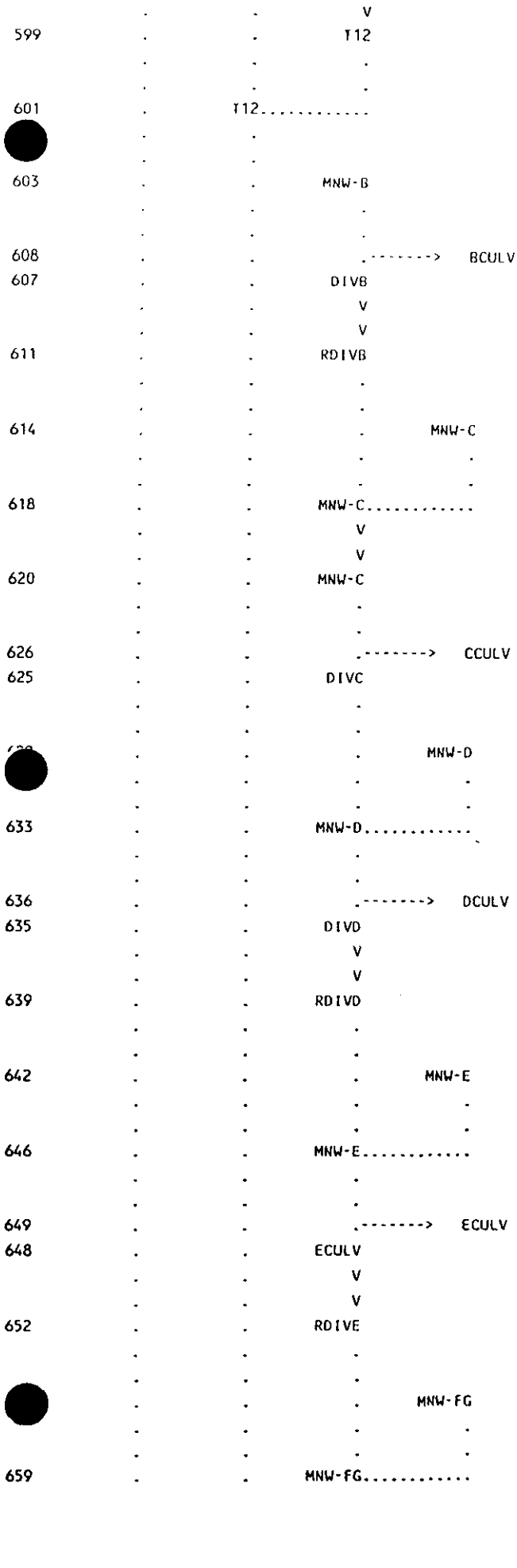

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F5
F5N
F5S
F5R
F6A
F6B
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F7R
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UFL.DB

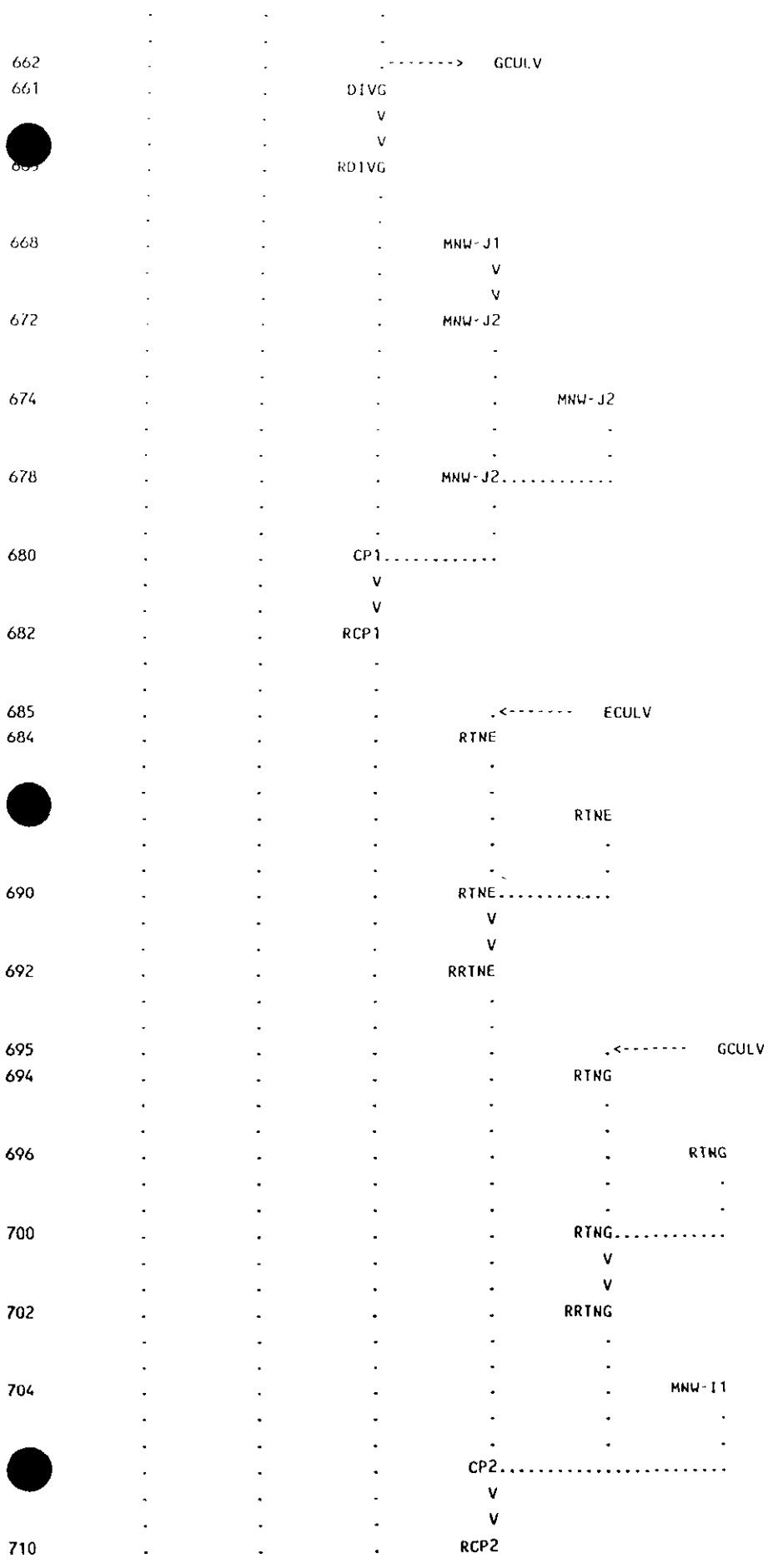

321
F9
329
F9
V
V
331
F14
333
F10
341
R2
V
V
346
R3
348
R3
353
R3
V
V
355
R3
V
V
360
R8
R7
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R7OF
366
R7
V
V
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R8
374
R8
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R8
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F10
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F10
V
V
384
F14
F12
V
V
392
F12R

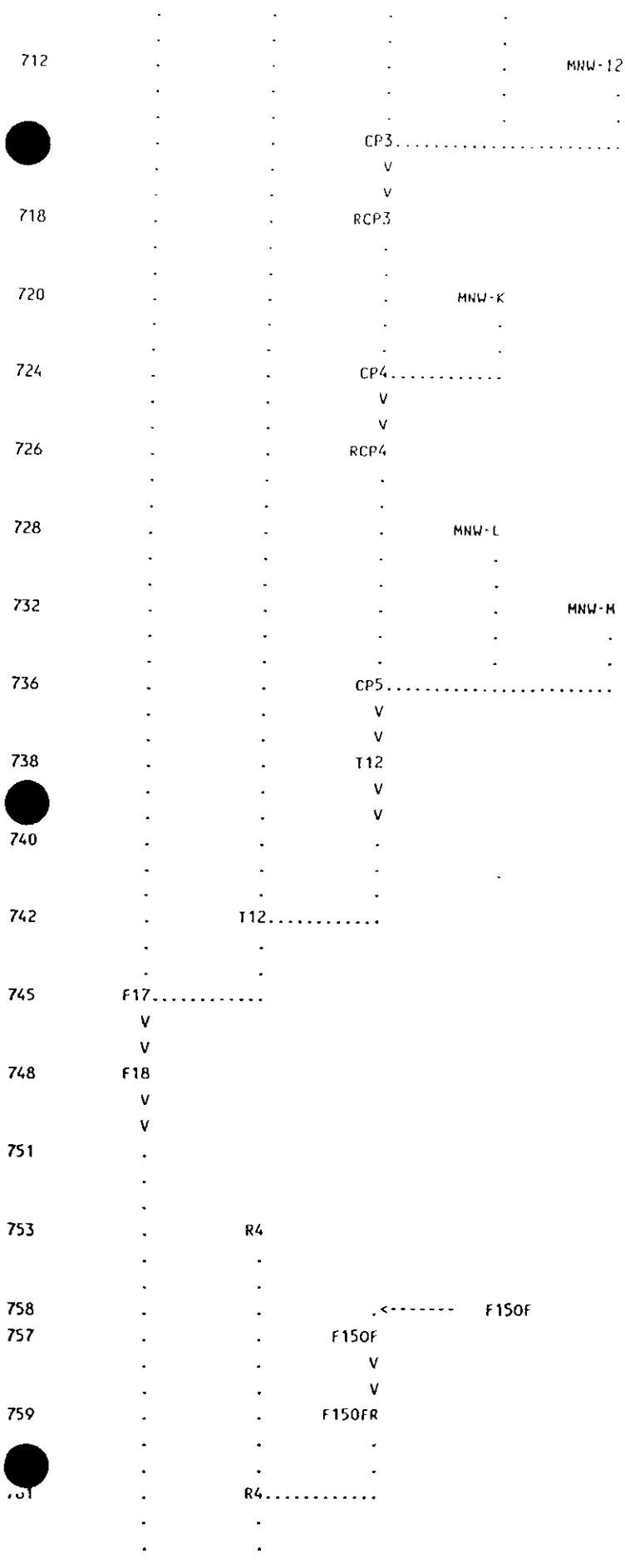

394
F13
F13
404
F14
406
F14
414
F14
416
F14R
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422
F15
430
F15
434
F15OF
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F15OF
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F17

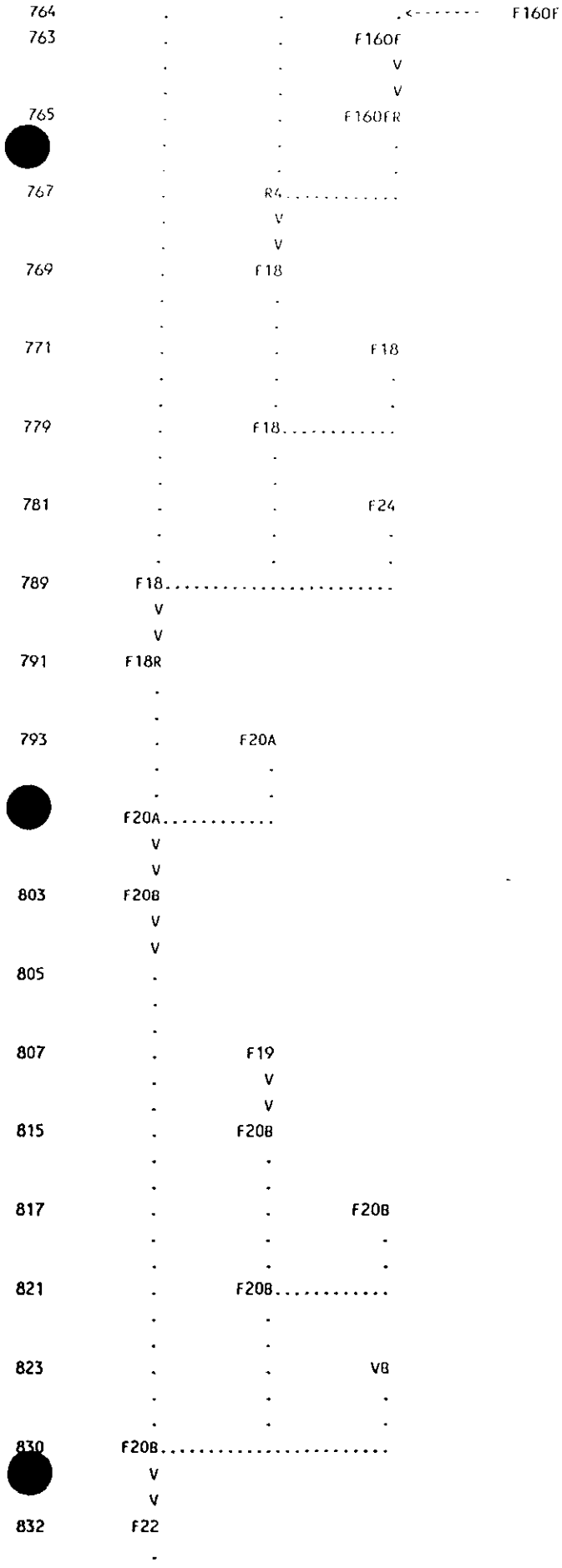

469
T8
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T90F
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T60F
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T1

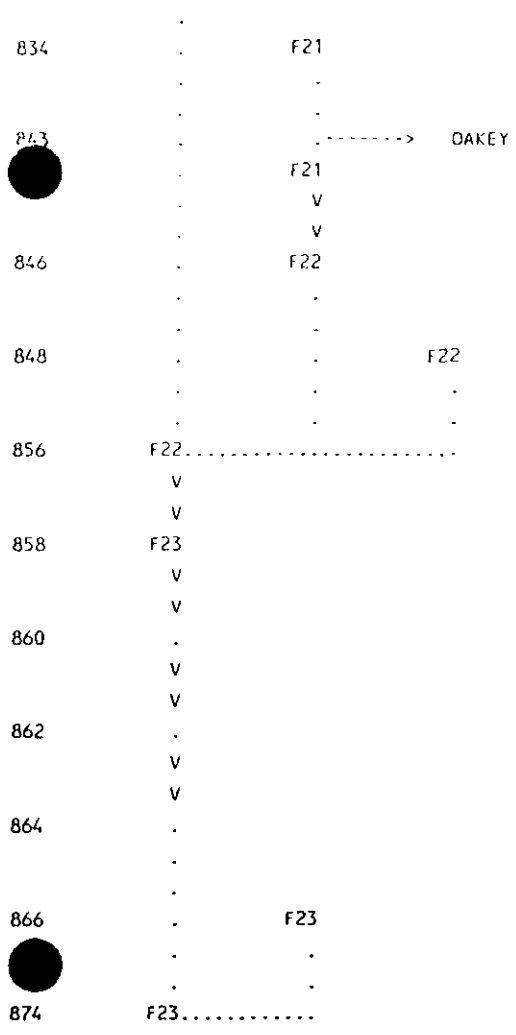

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T60F
T30F
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T10R
T11
T11R
T12


599 T12
601 T12
603 MNW-B
608 BCULV
607 DIVB
611 RDIVB
614 MNW-C
618 MNW-C
620 MNW-C
626 CCULV
625 DIVC
MNW-D
633 MNW-D
636 DCULV
635 DIVD
639 RDIVD
642 MNW-E
646 MNW-E
649 ECULV
648 ECULV
652 RDIVE
MNW-FG
659 MNW-FG


662 GCULV
661 DIVG
V
V
RDIVG
668 MNW-J1
V
V
672 MNW-J2
674 MNW-J2
678 MNW-J2
680 CP1
V
V
682 RCP1
685 ECULV
684 RTNE
RTNE
690 RTNE
V
V
692 RRTNE
695 GCULV
694 RTNG
696 RTNG
700 RTNG
V
V
702 RRTNG
704 MNW-I1
CP2
V
V
710 RCP2


712
MNW-12
CP3
718
RCP3
720
MNW-K
724
CP4
726
RCP4
728
MNW-L
732
MNW-M
736
CP5
738
T12
740
742
T12
745
F17
748
F18
751
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R4
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F150F
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F150F
759
F150FR
R4


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F160F
F160F
F160FR
R4
F18
F18
F18
F24
F18
F20A
F20A
F20B
F19
F20B
F20B
F20B
VB
F20B
F22



(***) RUNOFF ALSO COMPUTED AT THIS LOCATION

```
*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*         SEPTEMBER 1990                *
*          VERSION 4.0                  *
*                                       *
*  RUN DATE  10/06/1997  TIME  12:46:16 *
*                                       *
*****************************************
```

```
*****************************************
*                                       *
*    U.S. ARMY CORPS OF ENGINEERS       *
*    HYDROLOGIC ENGINEERING CENTER      *
*         609 SECOND STREET             *
*       DAVIS, CALIFORNIA 95616         *
*         (916) 756-1104                *
*                                       *
*****************************************
```

INPUT FILE = F100R.DAT BY: JEP DATE: 10/06/97
REVISED ORIGINAL FIS MODEL TO RUN ON THE SEPTEMBER 1990 VERSION OF HEC-1
BY CHANGING 4 RK ROUTINGS TO RD ROUTINGS & COMMENTING OUT THE "RDIVC" RK
ROUTING

CLARK COUNTY FLOOD CONTROL DISTRICT MASTER PLAN UPDATE
RED ROCK/FLAMINGO/TROPICANA WATERSHED
EXISTING DRAINAGE SYSTEM WITH PRESENT DEVELOPMENT
FLAMINGO/TROPICANA STORM (NO UPPER BLUE DIAMOND)- MAIN CHANNEL RUN
100-YEAR 6-HR STORM (SDN #5)
JMM OCTOBER 1990

BASIC DATA FILE BASED ON COE FILE S10P40X.
MODIFICATIONS ADDED FROM B&V RED ROCK BASIN AND UPPER FLAMINGO
BASIN HEC-1 RUNS; NIMBUS NORTHWEST MCCARRAN AIRPORT HEC-1 RUNS;
AND SUBBASIN MODIFICATIONS DUE TO RECENT DEVELOPMENT.

COE MUSKINGUM ROUTING CONVERTED TO KINEMATIC FOR EXISTING
IMPROVED CHANNELS FROM FACILITY INVENTORY.

PB CARDS CONTAIN POINT PRECIPITATION. DARF'S FROM CCRFCD MANUAL
BASED ON STORM AREAS FOR CONCENTRATION POINTS AS FOLLOWS:

SUBBASIN	AREA (SQMI)	DARF
T12,F5	20.8,15.9	0.81
RR14	53	0.68
F7,F14,F16,F160F	92,103,105	0.60
F17,F20B,F22,F23	127,139,143,145	0.565

```
33 IO        OUTPUT CONTROL VARIABLES
                IPRNT        5  PRINT CONTROL
                IPLOT        0  PLOT CONTROL
                OSCAL       0.  HYDROGRAPH PLOT SCALE

   IT        HYDROGRAPH TIME DATA
                NMIN        5  MINUTES IN COMPUTATION INTERVAL
                IDATE     1    0  STARTING DATE
                ITIME      0000  STARTING TIME
                  NQ       200  NUMBER OF HYDROGRAPH ORDINATES
               NODATE     1    0  ENDING DATE
               NOTIME      1635  ENDING TIME
               ICENT       19  CENTURY MARK
```

COMPUTATION INTERVAL .08 HOURS
TOTAL TIME BASE 16.58 HOURS

ENGLISH UNITS

DRAINAGE AREA	SQUARE MILES
PRECIPITATION DEPTH	INCHES
LENGTH, ELEVATION	FEET
FLOW	CUBIC FEET PER SECOND
STORAGE VOLUME	ACRE-FEET
SURFACE AREA	ACRES
TEMPERATURE	DEGREES FAHRENHEIT

JP MULTI-PLAN OPTION
NPLAN 1 NUMBER OF PLANS

JR MULTI-RATIO OPTION
RATIOS OF PRECIPITATION
.81 .68 .60 .56

*** FDKRUT - NEWTON RAPHSON FAILEDFIXED POINT ITERATION USED - ITERATION= 2

*** FDKRUT - NEWTON RAPHSON FAILEDFIXED POINT ITERATION USED - ITERATION= 1

*** FDKRUT - NEWTON RAPHSON FAILEDFIXED POINT ITERATION USED - ITERATION= 1

*** FDKRUT - NEWTON RAPHSON FAILEDFIXED POINT ITERATION USED - ITERATION= 1

*** FDKRUT - NEWTON RAPHSON FAILEDFIXED POINT ITERATION USED - ITERATION= 1

*** FDKRUT - NEWTON RAPHSON FAILEDFIXED POINT ITERATION USED - ITERATION= 1

*** FDKRUT - NEWTON RAPHSON FAILEDFIXED POINT ITERATION USED - ITERATION= 1

*** FDKRUT - NEWTON RAPHSON FAILEDFIXED POINT ITERATION USED - ITERATION= 1

*** FDKRUT - NEWTON RAPHSON FAILEDFIXED POINT ITERATION USED - ITERATION= 2

*** FDKRUT - NEWTON RAPHSON FAILEDFIXED POINT ITERATION USED - ITERATION= 2

*** FDKRUT - NEWTON RAPHSON FAILEDFIXED POINT ITERATION USED - ITERATION= 1

*** FDKRUT - NEWTON RAPHSON FAILEDFIXED POINT ITERATION USED - ITERATION= 1

*** FDKRUT WARNING TIME STEP CALCULATION FAILED TO CONVERGE. STABILITY PROBLEMS MAY RESULT

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*** FDKRUT WARNING TIME STEP CALCULATION FAILED TO CONVERGE. STABILITY PROBLEMS MAY RESULT

*** FDKRUT - NEWTON RAPHSON FAILEDFIXED POINT ITERATION USED - ITERATION= 1

*** FDKRUT - NEWTON RAPHSON FAILEDFIXED POINT ITERATION USED - ITERATION= 1

*** FDKRUT - NEWTON RAPHSON FAILEDFIXED POINT ITERATION USED - ITERATION= 2

*** FDKRUT - NEWTON RAPHSON FAILEDFIXED POINT ITERATION USED - ITERATION= 1

*** FDKRUT WARNING TIME STEP CALCULATION FAILED TO CONVERGE. STABILITY PROBLEMS MAY RESULT

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*** FDKRUT WARNING TIME STEP CALCULATION FAILED TO CONVERGE. STABILITY PROBLEMS MAY RESULT

PEAK FLOW AND STAGE (END-OF-PERIOD) SUMMARY FOR MULTIPLE PLAN-RATIO ECONOMIC COMPUTATIONS
FLOWS IN CUBIC FEET PER SECOND, AREA IN SQUARE MILES
TIME TO PEAK IN HOURS

OPERATION	STATION	AREA	PLAN		RATIOS APPLIED TO PRECIPITATION RATIO 1 .81	RATIO 2 .68	RATIO 3 .60	RATIO 4 .56
HYDROGRAPH AT	RR1	3.83	1	FLOW	2889.	2202.	1790.	1614.
				TIME	3.75	3.75	3.75	3.75
ROUTED TO	RR4	3.83	1	FLOW	2429.	1848.	1499.	1350.
				TIME	4.08	4.08	4.08	4.08
HYDROGRAPH AT	RR4	2.74	1	FLOW	835.	614.	487.	434.
				TIME	4.83	4.92	5.08	5.17
2 COMBINED AT	RR4	6.57	1	FLOW	2980.	2236.	1798.	1612.
				TIME	4.08	4.08	4.17	4.17
HYDROGRAPH AT	RR2	3.35	1	FLOW	2186.	1649.	1329.	1193.
				TIME	3.83	3.83	3.83	3.83
ROUTED TO	RR3	3.35	1	FLOW	1912.	1440.	1159.	1039.
				TIME	4.17	4.17	4.17	4.17
HYDROGRAPH AT	RR3	3.19	1	FLOW	1609.	1182.	931.	824.
				TIME	3.92	3.92	3.92	3.92
3 COMBINED AT	RR4	13.11	1	FLOW	6318.	4727.	3784.	3383.
				TIME	4.08	4.08	4.08	4.08
ROUTED TO	RR8	13.11	1	FLOW	5393.	4027.	3221.	2881.
				TIME	4.58	4.58	4.67	4.67
HYDROGRAPH AT	RR5	7.32	1	FLOW	2004.	1475.	1168.	1039.
				TIME	5.33	5.42	5.42	5.50
ROUTED TO	RR8	7.32	1	FLOW	1994.	1466.	1160.	1031.
				TIME	5.58	5.67	5.67	5.67
HYDROGRAPH AT	RR6	2.85	1	FLOW	1873.	1405.	1127.	1008.
				TIME	3.75	3.75	3.75	3.75
ROUTED TO	RR7	2.85	1	FLOW	1530.	1147.	920.	823.
				TIME	4.17	4.17	4.17	4.17
HYDROGRAPH AT	RR7	4.87	1	FLOW	1404.	1020.	797.	704.
				TIME	4.67	4.67	4.75	4.75
2 COMBINED AT	RR7	7.72	1	FLOW	2722.	1998.	1573.	1394.
				TIME	4.25	4.25	4.25	4.25
[redacted] TO	RR8	7.72	1	FLOW	2439.	1791.	1411.	1251.
				TIME	4.83	4.83	4.83	4.83
HYDROGRAPH AT	RR8	1.75	1	FLOW	422.	310.	245.	218.

				TIME	5.50	5.58	5.58	5.58
YDROGRAPH AT	RR9	3.71	1	FLOW	1368.	1015.	807.	719.
				TIME	4.25	4.25	4.25	4.25
[redacted]INED AT	RR8	33.61	1	FLOW	10712.	7909.	6270.	5577.
				TIME	4.67	4.75	4.75	4.75
OUTED TO	RR10	33.61	1	FLOW	10542.	7792.	6176.	5499.
				TIME	5.00	5.00	5.08	5.08
YDROGRAPH AT	RR10	3.30	1	FLOW	842.	608.	474.	420.
				TIME	4.75	4.83	5.08	5.17
2 COMBINED AT	RR10	36.91	1	FLOW	11373.	8398.	6651.	5919.
				TIME	5.00	5.00	5.08	5.08
OUTED TO	RR12	36.91	1	FLOW	11196.	8278.	6574.	5855.
				TIME	5.33	5.33	5.42	5.42
YDROGRAPH AT	RR11	3.40	1	FLOW	1223.	900.	710.	630.
				TIME	4.25	4.25	4.25	4.25
OUTED TO	RR12	3.40	1	FLOW	1202.	884.	698.	620.
				TIME	4.42	4.42	4.50	4.50
YDROGRAPH AT	RR12	4.25	1	FLOW	1636.	1214.	967.	862.
				TIME	4.17	4.17	4.25	4.25
3 COMBINED AT	RR12	44.56	1	FLOW	13274.	9878.	7875.	7026.
[redacted]				TIME	5.33	5.33	5.33	5.33
OUTED TO	RR13	44.56	1	FLOW	13149.	9786.	7802.	6969.
				TIME	5.58	5.58	5.58	5.67
YDROGRAPH AT	RR13	2.26	1	FLOW	833.	590.	449.	390.
				TIME	3.92	3.92	3.92	3.92
2 COMBINED AT	RR13	46.82	1	FLOW	13498.	10027.	7990.	7130.
				TIME	5.50	5.50	5.58	5.58
OUTED TO	RR14	46.82	1	FLOW	13476.	10011.	7981.	7121.
				TIME	5.58	5.67	5.67	5.67
YDROGRAPH AT	RR14	6.22	1	FLOW	1740.	1305.	1048.	940.
				TIME	5.42	5.42	5.50	5.50
2 COMBINED AT	RR14	53.04	1	FLOW	15197.	11303.	9018.	8052.
				TIME	5.58	5.58	5.67	5.67
OUTED TO	RR.OB	53.04	1	FLOW	12101.	5740.	1381.	1335.
				TIME	6.58	7.25	8.33	8.33
			** PEAK STAGES IN FEET **					
			1	STAGE	3212.76	3211.42	3208.20	3205.32
				TIME	6.58	7.25	8.33	8.33
[redacted]								
ROUTED TO	RR23	53.04	1	FLOW	11598.	5299.	1381.	1335.
				TIME	7.17	7.83	8.92	8.83

HYDROGRAPH AT	RR23	2.03	1	FLOW	403.	242.	182.	155.
				TIME	4.33	5.25	5.25	5.33
2 COMBINED AT	RR23	55.07	1	FLOW	11655.	5329.	1395.	1349.
				TIME	7.17	7.83	8.58	8.58
HYDROGRAPH AT	R1	1.12	1	FLOW	584.	446.	363.	328.
				TIME	3.83	3.83	3.83	3.83
2 COMBINED AT	RR23	56.19	1	FLOW	11658.	5329.	1395.	1349.
				TIME	7.17	7.83	8.58	8.58
ROUTED TO	R5	56.19	1	FLOW	11363.	5120.	1395.	1349.
				TIME	7.58	8.25	9.00	8.92
HYDROGRAPH AT	RR20	1.37	1	FLOW	610.	468.	382.	346.
				TIME	4.08	4.08	4.08	4.08
ROUTED TO	R5	1.37	1	FLOW	569.	437.	357.	323.
				TIME	4.75	4.75	4.75	4.75
HYDROGRAPH AT	RR21	6.27	1	FLOW	2202.	1672.	1355.	1221.
				TIME	4.42	4.42	4.50	4.50
ROUTED TO	R5	6.27	1	FLOW	2130.	1618.	1315.	1185.
				TIME	5.08	5.08	5.17	5.17
HYDROGRAPH AT	RR22	2.15	1	FLOW	959.	728.	589.	530.
				TIME	4.00	4.00	4.00	4.00
R[redacted]TO	R5	2.15	1	FLOW	878.	667.	540.	486.
				TIME	4.75	4.75	4.75	4.75
HYDROGRAPH AT	R5	5.77	1	FLOW	1038.	650.	482.	417.
				TIME	4.25	5.17	5.17	5.25
5 COMBINED AT	R5	71.75	1	FLOW	11917.	5292.	3475.	3142.
				TIME	7.50	8.25	5.33	5.50
ROUTED TO	R6	71.75	1	FLOW	11776.	5196.	3466.	3135.
				TIME	7.75	8.50	5.58	5.75
HYDROGRAPH AT	R6	1.51	1	FLOW	180.	115.	73.	57.
				TIME	5.17	5.33	5.58	5.75
2 COMBINED AT	R6	73.26	1	FLOW	11799.	5208.	3539.	3191.
				TIME	7.75	8.50	5.58	5.75
HYDROGRAPH AT	F1	4.63	1	FLOW	1938.	1485.	1213.	1096.
				TIME	4.17	4.17	4.17	4.17
ROUTED TO	F5	4.63	1	FLOW	1780.	1366.	1118.	1011.
				TIME	5.17	5.25	5.25	5.25
HYDROGRAPH AT	F2	1.28	1	FLOW	709.	545.	446.	403.
				TIME	3.83	3.83	3.83	3.83
ROUTED TO	F5	1.28	1	FLOW	615.	472.	386.	349.
				TIME	4.58	4.58	4.58	4.58

YDROGRAPH AT	F3	2.60	1	FLOW	1459.	1107.	897.	808.
				TIME	3.75	3.75	3.75	3.75
OUTED TO	F5	2.60	1	FLOW	1304.	990.	802.	721.
				TIME	4.17	4.17	4.17	4.17
YDROGRAPH AT	F4	1.30	1	FLOW	618.	462.	370.	331.
				TIME	3.75	3.83	3.83	3.83
OUTED TO	F5	1.30	1	FLOW	538.	402.	321.	287.
				TIME	4.50	4.50	4.50	4.50
YDROGRAPH AT	F5N	4.04	1	FLOW	1329.	875.	644.	568.
				TIME	4.17	4.42	4.58	4.75
YDROGRAPH AT	F5S	2.00	1	FLOW	664.	436.	309.	262.
				TIME	4.08	4.17	4.33	4.50
2 COMBINED AT	F5	6.04	1	FLOW	1972.	1290.	936.	821.
				TIME	4.17	4.33	4.58	4.75
5 COMBINED AT	F5	15.85	1	FLOW	4568.	3428.	2831.	2575.
				TIME	4.33	5.17	5.25	5.25
OUTED TO	UFL.DB	15.85	1	FLOW	1159.	1059.	990.	962.
				TIME	6.92	6.83	6.75	6.75
			** PEAK STAGES IN FEET **					
			1	STAGE	2466.85	2463.92	2462.11	2461.37
				TIME	6.92	6.83	6.75	6.75
TO	F5R	15.85	1	FLOW	1159.	1059.	990.	962.
				TIME	7.00	6.92	6.83	6.83
YDROGRAPH AT	F6A	.55	1	FLOW	285.	216.	176.	158.
				TIME	3.75	3.75	3.75	3.75
OUTED TO	F6B	.55	1	FLOW	257.	195.	158.	142.
				TIME	4.08	4.08	4.08	4.08
YDROGRAPH AT	F6B	.85	1	FLOW	452.	342.	276.	248.
				TIME	3.67	3.67	3.67	3.67
2 COMBINED AT	F6B	1.40	1	FLOW	591.	445.	359.	322.
				TIME	3.75	3.75	3.75	3.75
OUTED TO	F7	1.40	1	FLOW	558.	422.	340.	306.
				TIME	4.08	4.08	4.08	4.08
YDROGRAPH AT	F7	1.50	1	FLOW	460.	296.	211.	191.
				TIME	4.08	4.25	4.42	5.00
2 COMBINED AT	F7	2.90	1	FLOW	1018.	713.	532.	458.
				TIME	4.08	4.17	4.25	4.25
3 COMBINED AT	F7	92.01	1	FLOW	12976.	6239.	4818.	4385.
				TIME	7.75	8.50	5.50	5.58
ROUTED TO	F7R	92.01	1	FLOW	12944.	6222.	4814.	4385.
				TIME	7.83	8.50	5.50	5.67

HYDROGRAPH AT	F8	.48	1	FLOW	66.	52.	44.	41.
				TIME	3.75	3.75	3.75	3.75
2 COMBINED AT	F8	92.49	1	FLOW	12950.	6225.	4827.	4394.
				TIME	7.83	8.50	5.50	5.67
ROUTED TO	F9	92.49	1	FLOW	12950.	6217.	4825.	4394.
				TIME	7.83	8.50	5.50	5.67
ROUTED TO	.	92.49	1	FLOW	12942.	6209.	4825.	4391.
				TIME	7.83	8.58	5.58	5.67
HYDROGRAPH AT	F9	.90	1	FLOW	192.	154.	130.	119.
				TIME	3.83	3.83	3.83	3.92
2 COMBINED AT	F9	93.39	1	FLOW	12955.	6214.	4864.	4423.
				TIME	7.83	8.58	5.58	5.67
ROUTED TO	F14	93.39	1	FLOW	12856.	6154.	4852.	4414.
				TIME	8.00	8.75	5.75	5.83
HYDROGRAPH AT	F10	1.17	1	FLOW	384.	320.	277.	259.
				TIME	3.75	3.75	3.75	3.75
HYDROGRAPH AT	R2	2.01	1	FLOW	881.	607.	451.	386.
				TIME	3.58	3.58	3.58	3.58
ROUTED TO	R3	2.01	1	FLOW	729.	503.	374.	320.
				TIME	4.00	4.00	4.00	4.00
HYDROGRAPH AT	R3	2.63	1	FLOW	249.	156.	105.	84.
				TIME	5.25	5.25	5.25	5.25
2 COMBINED AT	R3	4.64	1	FLOW	924.	588.	412.	343.
				TIME	4.00	4.00	4.00	4.00
ROUTED TO	R3	4.64	1	FLOW	208.	136.	98.	83.
				TIME	5.92	5.92	5.92	5.92
			** PEAK STAGES IN FEET **					
			1	STAGE	24.61	23.02	22.17	21.83
				TIME	5.92	5.92	5.92	5.92
ROUTED TO	R8	4.64	1	FLOW	208.	136.	98.	83.
				TIME	5.92	5.92	6.00	6.00
HYDROGRAPH AT	R7	1.39	1	FLOW	346.	232.	169.	144.
				TIME	3.92	3.92	4.00	4.00
DIVERSION TO	R7OF	1.39	1	FLOW	22.	0.	0.	0.
				TIME	3.92	.08	.08	.08
HYDROGRAPH AT	R7	1.39	1	FLOW	324.	232.	169.	144.
				TIME	3.83	3.92	4.00	4.00
[redacted] TO	R8	1.39	1	FLOW	324.	231.	169.	143.
				TIME	3.92	4.00	4.08	4.08
HYDROGRAPH AT	R8	.51	1	FLOW	90.	54.	40.	34.

				TIME	3.83	5.00	5.00	5.00
3 COMBINED AT	R8	6.54	1	FLOW	488.	338.	255.	220.
				TIME	5.17	5.17	5.17	5.17
C[redacted]TO	F10	6.54	1	FLOW	486.	337.	255.	220.
				TIME	5.25	5.25	5.25	5.25
2 COMBINED AT	F10	7.71	1	FLOW	719.	516.	397.	351.
				TIME	3.75	3.75	3.75	3.75
OUTED TO	F14	7.71	1	FLOW	698.	502.	390.	344.
				TIME	3.83	3.83	3.83	3.83
YDROGRAPH AT	F12	.88	1	FLOW	306.	209.	154.	132.
				TIME	4.00	4.17	4.33	4.42
OUTED TO	F12R	.88	1	FLOW	297.	203.	151.	130.
				TIME	4.25	4.42	4.50	4.67
YDROGRAPH AT	F13	.55	1	FLOW	160.	124.	98.	85.
				TIME	5.00	5.08	5.08	5.08
2 COMBINED AT	F13	1.43	1	FLOW	425.	289.	237.	213.
				TIME	4.25	5.08	5.08	5.08
OUTED TO	F14	1.43	1	FLOW	419.	287.	234.	210.
				TIME	4.42	5.17	5.25	5.25
YDROGRAPH AT	F14	.78	1	FLOW	132.	84.	57.	50.
[redacted]				TIME	5.25	5.42	4.17	4.17
4 COMBINED AT	F14	103.31	1	FLOW	13083.	6595.	5335.	4805.
				TIME	8.00	5.50	5.58	5.75
OUTED TO	F14R	103.31	1	FLOW	13065.	6592.	5332.	4803.
				TIME	8.00	5.50	5.67	5.75
OUTED TO	.	103.31	1	FLOW	13030.	6583.	5330.	4799.
				TIME	8.08	5.50	5.67	5.83
OUTED TO	.	103.31	1	FLOW	13029.	6579.	5327.	4799.
				TIME	8.08	5.58	5.67	5.83
YDROGRAPH AT	F15	1.32	1	FLOW	324.	223.	172.	154.
				TIME	4.00	4.00	4.08	4.08
2 COMBINED AT	F15	104.63	1	FLOW	13048.	6740.	5445.	4895.
				TIME	8.08	5.50	5.67	5.75
IVERSION TO	F15OF	104.63	1	FLOW	5769.	1547.	789.	466.
				TIME	8.08	5.50	5.67	5.75
YDROGRAPH AT	F15OF	104.63	1	FLOW	7279.	5192.	4657.	4429.
				TIME	8.08	5.50	5.67	5.75
[redacted]RAPH AT	F16	.52	1	FLOW	209.	163.	136.	121.
				TIME	3.83	3.83	3.83	3.83
2 COMBINED AT	F16	105.15	1	FLOW	7284.	5254.	4699.	4464.

				TIME	8.08	5.50	5.67	5.75
DIVERSION TO	F160F	105.15	1	FLOW	1284.	0.	0.	0.
				TIME	8.08	.08	.08	.08
[redacted]GRAPH AT	F160F	105.15	1	FLOW	6000.	5254.	4699.	4464.
				TIME	7.67	5.50	5.67	5.75
ROUTED TO	F16	105.15	1	FLOW	6000.	5253.	4699.	4463.
				TIME	7.75	5.50	5.67	5.75
ROUTED TO	.	105.15	1	FLOW	6000.	5250.	4698.	4462.
				TIME	7.83	5.50	5.67	5.75
ROUTED TO	.	105.15	1	FLOW	6000.	5249.	4697.	4461.
				TIME	8.00	5.58	5.75	5.83
HYDROGRAPH AT	F17	.65	1	FLOW	212.	154.	123.	112.
				TIME	4.17	4.25	4.33	4.33
2 COMBINED AT	F17	105.80	1	FLOW	6014.	5344.	4771.	4526.
				TIME	7.92	5.58	5.75	5.83
HYDROGRAPH AT	T8	1.22	1	FLOW	59.	23.	10.	6.
				TIME	6.08	7.00	8.08	8.83
ROUTED TO	T9	1.22	1	FLOW	54.	22.	9.	6.
				TIME	6.67	7.50	8.58	9.42
HYDROGRAPH AT	T9	.87	1	FLOW	102.	58.	34.	26.
[redacted]				TIME	5.25	5.58	5.92	6.17
2 COMBINED AT	T9	2.09	1	FLOW	113.	60.	35.	26.
				TIME	5.33	5.58	6.00	6.25
DIVERSION TO	T90F	2.09	1	FLOW	0.	0.	0.	0.
				TIME	.08	.08	.08	.08
HYDROGRAPH AT	T90F	2.09	1	FLOW	113.	60.	35.	26.
				TIME	5.33	5.58	6.00	6.25
ROUTED TO	T10	2.09	1	FLOW	112.	60.	35.	26.
				TIME	5.58	5.83	6.17	6.42
HYDROGRAPH AT	T4	3.22	1	FLOW	1204.	830.	616.	529.
				TIME	4.00	4.17	4.25	4.33
ROUTED TO	T5	3.22	1	FLOW	1197.	830.	612.	526.
				TIME	4.08	4.25	4.33	4.42
HYDROGRAPH AT	T5	1.00	1	FLOW	341.	228.	165.	141.
				TIME	4.00	4.08	4.25	4.42
2 COMBINED AT	T5	4.22	1	FLOW	1529.	1051.	777.	667.
				TIME	4.08	4.25	4.33	4.42
[redacted]D TO	T6	4.22	1	FLOW	1511.	1042.	768.	661.
				TIME	4.25	4.42	4.50	4.67
HYDROGRAPH AT	T6	1.30	1	FLOW	422.	281.	206.	179.

				TIME	4.08	4.33	4.50	5.00
2 COMBINED AT	T6	5.52	1	FLOW	1920.	1320.	974.	839.
				TIME	4.25	4.33	4.50	4.67
[illegible]GRAPH AT	T90F	.00	1	FLOW	0.	0.	0.	0.
				TIME	.08	.08	.08	.08
ROUTED TO	T6	.00	1	FLOW	0.	0.	0.	0.
				TIME	.08	.08	.08	.08
2 COMBINED AT	T6	5.52	1	FLOW	1920.	1320.	974.	839.
				TIME	4.25	4.33	4.50	4.67
DIVERSION TO	T60F	5.52	1	FLOW	1170.	570.	224.	89.
				TIME	4.25	4.33	4.50	4.67
HYDROGRAPH AT	T6	5.52	1	FLOW	750.	750.	750.	750.
				TIME	3.83	4.08	4.33	4.50
ROUTED TO	T10	5.52	1	FLOW	750.	750.	750.	750.
				TIME	4.92	5.17	5.33	5.17
HYDROGRAPH AT	T1	1.56	1	FLOW	613.	428.	320.	277.
				TIME	4.00	4.08	4.17	4.25
ROUTED TO	T3	1.56	1	FLOW	611.	427.	318.	274.
				TIME	4.17	4.33	4.42	4.50
HYDROGRAPH AT	T3	.99	1	FLOW	170.	116.	86.	73.
[illegible]				TIME	4.42	5.08	5.25	5.33
2 COMBINED AT	T3	2.55	1	FLOW	762.	501.	359.	305.
				TIME	4.17	4.33	4.50	4.58
HYDROGRAPH AT	T60F	.00	1	FLOW	1170.	570.	224.	89.
				TIME	4.25	4.33	4.50	4.67
ROUTED TO	T3	.00	1	FLOW	1143.	550.	212.	83.
				TIME	4.33	4.50	4.58	4.75
2 COMBINED AT	T3	2.55	1	FLOW	1892.	1050.	565.	382.
				TIME	4.25	4.42	4.58	4.67
DIVERSION TO	T30F	2.55	1	FLOW	413.	0.	0.	0.
				TIME	4.25	.08	.08	.08
HYDROGRAPH AT	T30F	2.55	1	FLOW	1479.	1050.	565.	382.
				TIME	4.25	4.42	4.58	4.67
ROUTED TO	T10	2.55	1	FLOW	1477.	1044.	563.	379.
				TIME	4.33	4.50	4.67	4.75
HYDROGRAPH AT	T10	.82	1	FLOW	205.	146.	116.	102.
				TIME	3.75	3.83	3.83	3.83
[illegible]MBINED AT	T10	10.98	1	FLOW	2392.	1882.	1370.	1181.
				TIME	4.33	4.50	4.67	4.83
ROUTED TO	T10R	10.98	1	FLOW	2391.	1879.	1367.	1180.

				TIME	4.33	4.50	4.67	4.83
OUTED TO	.	10.98	1	FLOW	2389.	1875.	1364.	1178.
				TIME	4.42	4.58	4.75	4.92
[illegible]RAPH AT	T11	1.09	1	FLOW	297.	237.	196.	183.
				TIME	3.92	3.92	4.00	4.00
2 COMBINED AT	T11	12.07	1	FLOW	2558.	1981.	1447.	1256.
				TIME	4.33	4.58	4.75	4.92
OUTED TO	T11R	12.07	1	FLOW	2557.	1979.	1444.	1255.
				TIME	4.33	4.58	4.75	4.92
OUTED TO	.	12.07	1	FLOW	2552.	1970.	1443.	1254.
				TIME	4.42	4.67	4.92	5.08
YDROGRAPH AT	T12	.77	1	FLOW	230.	178.	148.	135.
				TIME	3.92	3.92	3.92	3.92
2 COMBINED AT	T12	12.84	1	FLOW	2674.	2041.	1499.	1316.
				TIME	4.42	4.67	4.92	5.17
YDROGRAPH AT	T3OF	.00	1	FLOW	413.	0.	0.	0.
				TIME	4.25	.08	.08	.08
ROUTED TO	T12	.00	1	FLOW	144.	0.	0.	0.
				TIME	6.25	.08	.08	.08
2 COMBINED AT	T12	12.84	1	FLOW	2674.	2041.	1499.	1316.
				TIME	4.42	4.67	4.92	5.17
YDROGRAPH AT	MNW-B	.68	1	FLOW	41.	27.	20.	17.
				TIME	6.50	6.42	6.42	6.42
DIVERSION TO	BCULV	.68	1	FLOW	22.	22.	20.	17.
				TIME	4.83	5.50	6.42	6.42
YDROGRAPH AT	DIVB	.68	1	FLOW	19.	5.	0.	0.
				TIME	6.50	6.42	.08	.08
ROUTED TO	RDIVB	.68	1	FLOW	19.	5.	0.	0.
				TIME	6.50	6.50	.08	.08
YDROGRAPH AT	MNW-C	.69	1	FLOW	59.	42.	33.	29.
				TIME	6.00	6.00	5.92	5.92
2 COMBINED AT	MNW-C	1.37	1	FLOW	76.	45.	33.	29.
				TIME	6.17	6.17	5.92	5.92
ROUTED TO	MNW-C	1.37	1	FLOW	66.	36.	29.	27.
				TIME	6.83	7.00	6.58	6.50
			** PEAK STAGES IN FEET **					
			1	STAGE	57.82	57.08	56.37	56.17
				TIME	6.83	7.00	6.58	6.50
DIVERSION TO	CCULV	1.37	1	FLOW	43.	36.	29.	27.
				TIME	6.83	7.00	6.58	6.50

HYDROGRAPH AT	DIVC	1.37	1	FLOW	23.	0.	0.	0.
				TIME	6.83	.08	.08	.08
HYDROGRAPH AT	MNW-D	.05	1	FLOW	7.	4.	3.	3.
				TIME	3.83	5.08	5.08	3.75
2 COMBINED AT	MNW-D	1.42	1	FLOW	23.	4.	3.	3.
				TIME	6.83	5.08	5.08	3.75
DIVERSION TO	DCULV	1.42	1	FLOW	23.	4.	3.	3.
				TIME	6.83	5.08	5.08	3.75
HYDROGRAPH AT	DIVD	1.42	1	FLOW	0.	0.	0.	0.
				TIME	.08	.08	.08	.08
ROUTED TO	RDIVD	1.42	1	FLOW	0.	0.	0.	0.
				TIME	.08	.08	.08	.08
HYDROGRAPH AT	MNW-E	.05	1	FLOW	9.	6.	5.	5.
				TIME	3.75	3.75	3.75	3.75
2 COMBINED AT	MNW-E	1.47	1	FLOW	9.	6.	5.	5.
				TIME	3.75	3.75	3.75	3.75
DIVERSION TO	ECULV	1.47	1	FLOW	9.	6.	5.	5.
				TIME	3.75	3.75	3.75	3.75
HYDROGRAPH AT	ECULV	1.47	1	FLOW	0.	0.	0.	0.
				TIME	.08	.08	.08	.08
R TO	RDIVE	1.47	1	FLOW	0.	0.	0.	0.
				TIME	.08	.08	.08	.08
HYDROGRAPH AT	MNW-FG	.36	1	FLOW	38.	26.	20.	18.
				TIME	5.25	5.33	4.83	4.83
2 COMBINED AT	MNW-FG	1.83	1	FLOW	38.	26.	20.	18.
				TIME	5.25	5.33	4.83	4.83
DIVERSION TO	GCULV	1.83	1	FLOW	38.	26.	20.	18.
				TIME	5.25	5.33	4.83	4.83
HYDROGRAPH AT	DIVG	1.83	1	FLOW	0.	0.	0.	0.
				TIME	.08	.08	.08	.08
ROUTED TO	RDIVG	1.83	1	FLOW	0.	0.	0.	0.
				TIME	.08	.08	.08	.08
HYDROGRAPH AT	MNW-J1	2.37	1	FLOW	128.	75.	49.	39.
				TIME	6.92	7.00	7.08	7.17
ROUTED TO	MNW-J2	2.37	1	FLOW	128.	75.	49.	39.
				TIME	7.17	7.33	7.50	7.58
HYDROGRAPH AT	MNW-J2	1.21	1	FLOW	130.	88.	65.	56.
				TIME	5.42	5.50	5.50	5.50
2 COMBINED AT	MNW-J2	3.58	1	FLOW	198.	119.	80.	64.
				TIME	6.08	6.08	6.00	6.00

2 COMBINED AT	CP1	5.41	1	FLOW	198.	119.	80.	64.
				TIME	6.08	6.08	6.00	6.00
ROUTED TO	RCP1	5.41	1	FLOW	197.	119.	79.	64.
				TIME	6.08	6.17	6.17	6.17
HYDROGRAPH AT	RTNE	.00	1	FLOW	9.	6.	5.	5.
				TIME	3.75	3.75	3.75	3.75
HYDROGRAPH AT	RTNE	.01	1	FLOW	0.	0.	0.	0.
				TIME	4.92	.08	.08	.08
2 COMBINED AT	RTNE	.01	1	FLOW	9.	6.	5.	5.
				TIME	3.75	3.75	3.75	3.75
ROUTED TO	RRTNE	.01	1	FLOW	9.	6.	5.	4.
				TIME	4.42	4.50	4.50	4.50
HYDROGRAPH AT	RTNG	.00	1	FLOW	38.	26.	20.	18.
				TIME	5.25	5.33	4.83	4.83
HYDROGRAPH AT	RTNG	.01	1	FLOW	0.	0.	0.	0.
				TIME	4.92	.08	.08	.08
2 COMBINED AT	RTNG	.01	1	FLOW	38.	26.	20.	18.
				TIME	5.25	5.33	4.83	4.83
ROUTED TO	RRTNG	.01	1	FLOW	38.	26.	20.	18.
				TIME	5.50	5.58	5.17	5.08
H[redacted]RAPH AT	MNW-I1	.25	1	FLOW	67.	47.	37.	32.
				TIME	4.00	4.00	4.00	4.00
3 COMBINED AT	CP2	.27	1	FLOW	88.	64.	51.	46.
				TIME	5.17	5.17	5.17	5.17
ROUTED TO	RCP2	.27	1	FLOW	88.	64.	51.	46.
				TIME	5.25	5.25	5.25	5.25
HYDROGRAPH AT	MNW-I2	.14	1	FLOW	34.	22.	15.	13.
				TIME	3.75	3.83	3.83	3.83
3 COMBINED AT	CP3	5.82	1	FLOW	269.	171.	125.	109.
				TIME	5.58	5.50	5.25	5.17
ROUTED TO	RCP3	5.82	1	FLOW	269.	171.	125.	109.
				TIME	5.75	5.67	5.42	5.42
HYDROGRAPH AT	MNW-K	1.43	1	FLOW	175.	129.	105.	96.
				TIME	5.50	5.42	5.33	5.25
2 COMBINED AT	CP4	7.25	1	FLOW	442.	299.	230.	205.
				TIME	5.58	5.58	5.42	5.42
ROUTED TO	RCP4	7.25	1	FLOW	442.	299.	230.	204.
				TIME	5.67	5.67	5.50	5.50
HYDROGRAPH AT	MNW-L	.27	1	FLOW	136.	109.	93.	87.
				TIME	3.75	3.75	3.75	3.75

YDROGRAPH AT	MNW-M	.49	1	FLOW	191.	154.	131.	121.
				TIME	4.17	4.25	4.25	4.25
3 COMBINED AT	CP5	8.01	1	FLOW	607.	441.	356.	323.
				TIME	5.25	5.17	5.17	5.17
OUTED TO	T12	8.01	1	FLOW	607.	441.	356.	323.
				TIME	5.33	5.25	5.25	5.25
OUTED TO	.	8.01	1	FLOW	606.	440.	355.	323.
				TIME	5.42	5.42	5.33	5.33
2 COMBINED AT	T12	20.85	1	FLOW	3202.	2448.	1833.	1633.
				TIME	4.42	4.67	4.92	5.25
2 COMBINED AT	F17	126.65	1	FLOW	8647.	7462.	6478.	6051.
				TIME	5.42	5.50	5.58	5.58
OUTED TO	F18	126.65	1	FLOW	8647.	7460.	6477.	6049.
				TIME	5.42	5.50	5.58	5.58
OUTED TO	.	126.65	1	FLOW	8646.	7458.	6475.	6048.
				TIME	5.42	5.50	5.58	5.67
YDROGRAPH AT	R4	2.28	1	FLOW	1051.	783.	624.	557.
				TIME	3.75	3.75	3.75	3.75
YDROGRAPH AT	F150F	.00	1	FLOW	5769.	1547.	789.	466.
				TIME	8.08	5.50	5.67	5.75
TO	F150FR	.00	1	FLOW	5665.	1505.	763.	448.
				TIME	8.33	5.75	5.92	6.08
2 COMBINED AT	R4	2.28	1	FLOW	5665.	1593.	819.	557.
				TIME	8.33	5.75	5.92	3.75
YDROGRAPH AT	F160F	.00	1	FLOW	1284.	0.	0.	0.
				TIME	8.08	.08	.08	.08
OUTED TO	F160FR	.00	1	FLOW	1159.	0.	0.	0.
				TIME	8.33	.08	.08	.08
2 COMBINED AT	R4	2.28	1	FLOW	6824.	1593.	819.	557.
				TIME	8.33	5.75	5.92	3.75
OUTED TO	F18	2.28	1	FLOW	6274.	1507.	763.	452.
				TIME	9.25	6.67	6.83	6.92
HYDROGRAPH AT	F18	.87	1	FLOW	321.	251.	210.	195.
				TIME	3.75	3.75	3.83	3.83
2 COMBINED AT	F18	3.15	1	FLOW	6279.	1538.	785.	518.
				TIME	9.25	6.67	6.83	4.67
HYDROGRAPH AT	F24	1.03	1	FLOW	533.	441.	383.	355.
				TIME	3.58	3.67	3.67	3.67
3 COMBINED AT	F18	130.83	1	FLOW	12063.	8069.	6895.	6430.
				TIME	9.17	5.83	5.58	5.67

OUTED TO	F18R	130.83	1	FLOW	12044.	8068.	6893.	6428.
				TIME	9.25	5.92	5.67	5.75
YDROGRAPH AT	F20A	.81	1	FLOW	141.	113.	94.	88.
				TIME	3.83	3.83	3.83	3.92
2 COMBINED AT	F20A	131.64	1	FLOW	12056.	8098.	6924.	6455.
				TIME	9.25	5.83	5.67	5.67
OUTED TO	F20B	131.64	1	FLOW	12054.	8098.	6922.	6454.
				TIME	9.25	5.83	5.67	5.75
OUTED TO	.	131.64	1	FLOW	12052.	8097.	6921.	6454.
				TIME	9.25	5.92	5.67	5.75
YDROGRAPH AT	F19	1.54	1	FLOW	707.	572.	490.	456.
				TIME	3.67	3.67	3.67	3.67
OUTED TO	F20B	1.54	1	FLOW	629.	508.	434.	403.
				TIME	3.83	3.83	3.83	3.83
YDROGRAPH AT	F20B	.73	1	FLOW	300.	212.	161.	140.
				TIME	3.67	3.67	3.67	3.67
2 COMBINED AT	F20B	2.27	1	FLOW	860.	667.	557.	511.
				TIME	3.75	3.83	3.83	3.83
YDROGRAPH AT	VB	4.58	1	FLOW	1034.	676.	481.	401.
				TIME	3.92	4.00	4.00	4.00
BINED AT	F20B	138.49	1	FLOW	12062.	8703.	7348.	6782.
				TIME	9.25	5.25	5.33	5.50
OUTED TO	F22	138.49	1	FLOW	12047.	8700.	7347.	6775.
				TIME	9.25	5.25	5.42	5.58
YDROGRAPH AT	F21	1.27	1	FLOW	593.	466.	392.	362.
				TIME	3.67	3.67	3.67	3.67
IVERSION TO	OAKEY	1.27	1	FLOW	296.	233.	196.	181.
				TIME	3.67	3.67	3.67	3.67
YDROGRAPH AT	F21	1.27	1	FLOW	296.	233.	196.	181.
				TIME	3.67	3.67	3.67	3.67
OUTED TO	F22	1.27	1	FLOW	289.	225.	191.	177.
				TIME	3.67	3.75	3.75	3.75
YDROGRAPH AT	F22	3.43	1	FLOW	1299.	1016.	853.	791.
				TIME	3.67	3.67	3.75	3.75
3 COMBINED AT	F22	143.19	1	FLOW	12087.	9264.	7748.	7082.
				TIME	9.25	5.17	5.33	5.50
OUTED TO	F23	143.19	1	FLOW	12078.	9257.	7742.	7079.
				TIME	9.25	5.17	5.33	5.50
OUTED TO	.	143.19	1	FLOW	12071.	9255.	7738.	7073.
				TIME	9.33	5.25	5.42	5.58

UTED TO	.	143.19	1	FLOW	12051.	9242.	7725.	7062.
				TIME	9.33	5.33	5.50	5.58
UTED TO	.	143.19	1	FLOW	12041.	9238.	7722.	7061.
				TIME	9.42	5.33	5.50	5.67
DROGRAPH AT	F23	1.92	1	FLOW	377.	288.	239.	219.
				TIME	4.00	4.08	4.17	4.17
COMBINED AT	F23	145.11	1	FLOW	12064.	9432.	7866.	7183.
				TIME	9.42	5.33	5.50	5.67

SUMMARY OF KINEMATIC WAVE - MUSKINGUM-CUNGE ROUTING
(FLOW IS DIRECT RUNOFF WITHOUT BASE FLOW)

ISTAO	ELEMENT	DT	PEAK	TIME TO PEAK	VOLUME	INTERPOLATED TO COMPUTATION INTERVAL DT	PEAK	TIME TO PEAK	VOLUME
		(MIN)	(CFS)	(MIN)	(IN)	(MIN)	(CFS)	(MIN)	(IN)
FOR PLAN = 1 RATIO= .81									
	RR23 MANE	5.00	766.30	243.37	1.08	5.00	757.34	245.00	1.08

NTINUITY SUMMARY (AC-FT) - INFLOW= .0000E+00 EXCESS= .1178E+03 OUTFLOW= .1165E+03 BASIN STORAGE= .2933E+00 PERCENT ERROR= .8

FOR PLAN = 1 RATIO= .81									
	RR23 MANE	5.00	406.42	256.83	.69	5.00	402.56	260.00	.69

NTINUITY SUMMARY (AC-FT) - INFLOW= .0000E+00 EXCESS= .7583E+02 OUTFLOW= .7464E+02 BASIN STORAGE= .3271E+00 PERCENT ERROR= 1.1

FOR PLAN = 1 RATIO= .68									
	RR23 MANE	4.87	242.01	313.10	.46	5.00	241.73	315.00	.46

NTINUITY SUMMARY (AC-FT) - INFLOW= .0000E+00 EXCESS= .5054E+02 OUTFLOW= .4947E+02 BASIN STORAGE= .3330E+00 PERCENT ERROR= 1.5

FOR PLAN = 1 RATIO= .60									
	RR23 MANE	4.79	182.28	315.42	.33	5.00	182.14	315.00	.33

ONTINUITY SUMMARY (AC-FT) - INFLOW= .0000E+00 EXCESS= .3675E+02 OUTFLOW= .3590E+02 BASIN STORAGE= .3132E+00 PERCENT ERROR= 1.5

FOR PLAN = 1 RATIO= .56									
	RR23 MANE	5.00	155.71	321.20	.28	5.00	155.45	320.00	.28

CONTINUITY SUMMARY (AC-FT) - INFLOW= .0000E+00 EXCESS= .3122E+02 OUTFLOW= .3046E+02 BASIN STORAGE= .2979E+00 PERCENT ERROR= 1.5

FOR PLAN = 1 RATIO= .81									
	R5 MANE	3.28	1993.78	240.86	.98	5.00	1992.70	240.00	.98

CONTINUITY SUMMARY (AC-FT) - INFLOW= .0000E+00 EXCESS= .3039E+03 OUTFLOW= .3007E+03 BASIN STORAGE= .4356E+00 PERCENT ERROR= .9

FOR PLAN = 1 RATIO= .81									
	R5 MANE	4.16	1038.81	250.77	.62	5.00	1037.60	255.00	.62

CONTINUITY SUMMARY (AC-FT) - INFLOW= .0000E+00 EXCESS= .1942E+03 OUTFLOW= .1913E+03 BASIN STORAGE= .4372E+00 PERCENT ERROR= 1.3

FOR PLAN = 1 RATIO= .68

FOR PLAN = 1 RATIO= .60

.	MANE	1.71	7723.19	331.41	.48	5.00	7721.53	330.00	.48

...NUITY SUMMARY (AC-FT) - INFLOW= .3705E+04 EXCESS= .0000E+00 OUTFLOW= .3687E+04 BASIN STORAGE= .1747E+02 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .56

.	MANE	1.78	7060.95	339.98	.44	5.00	7060.94	340.00	.44

NTINUITY SUMMARY (AC-FT) - INFLOW= .3377E+04 EXCESS= .0000E+00 OUTFLOW= .3362E+04 BASIN STORAGE= .1688E+02 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .81

F23	MANE	5.00	547.72	240.08	1.29	5.00	547.57	240.00	1.29

ONTINUITY SUMMARY (AC-FT) - INFLOW= .0000E+00 EXCESS= .1343E+03 OUTFLOW= .1323E+03 BASIN STORAGE= .8572E+00 PERCENT ERROR= .8

FOR PLAN = 1 RATIO= .81

F23	MANE	5.00	380.46	240.98	.93	5.00	377.34	240.00	.93

ONTINUITY SUMMARY (AC-FT) - INFLOW= .0000E+00 EXCESS= .9664E+02 OUTFLOW= .9485E+02 BASIN STORAGE= .7965E+00 PERCENT ERROR= 1.0

FOR PLAN = 1 RATIO= .68

F23	MANE	5.00	288.50	243.60	.70	5.00	288.38	245.00	.70

ONTINUITY SUMMARY (AC-FT) - INFLOW= .0000E+00 EXCESS= .7306E+02 OUTFLOW= .7136E+02 BASIN STORAGE= .8523E+00 PERCENT ERROR= 1.2

FOR PLAN = 1 RATIO= .60

F23	MANE	5.81	239.87	249.36	.57	5.00	239.04	250.00	.57

CONTINUITY SUMMARY (AC-FT) - INFLOW= .0000E+00 EXCESS= .5963E+02 OUTFLOW= .5797E+02 BASIN STORAGE= .8364E+00 PERCENT ERROR= 1.4

FOR PLAN = 1 RATIO= .56

F23	MANE	5.00	219.71	249.39	.51	5.00	219.30	250.00	.51

CONTINUITY SUMMARY (AC-FT) - INFLOW= .0000E+00 EXCESS= .5406E+02 OUTFLOW= .5246E+02 BASIN STORAGE= .8033E+00 PERCENT ERROR= 1.5

*** NORMAL END OF HEC-1 ***

OVERALL STORM HEC-1 MODEL
FILE NAME: F-FL.DAT

OVERALL STORM HEC-1 MODEL
SEPTEMBER 1990 VERSION
FILE NAME: F-FL.DAT

This model is developed by deleting the Red Rock Detention Basin drainage area from the Duplicate Effective FIS HEC-1 model (F100R.DAT) and updating the rating curve for the Upper Flamingo Wash Detention Basin. The justification of these revisions come from the Red Rock Detention Basin Expansion project (LOMR Case No. 97-09-177P) and the Upper Flamingo Wash Detention Basin project (LOMR Case No. 97-09-138P).

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*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*         SEPTEMBER 1990                *
*         VERSION 4.0                   *
*                                       *
*  RUN DATE  10/06/1997  TIME  12:17:06 *
*                                       *
*****************************************
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*****************************************
*                                       *
*    U.S. ARMY CORPS OF ENGINEERS       *
*    HYDROLOGIC ENGINEERING CENTER      *
*         609 SECOND STREET             *
*       DAVIS, CALIFORNIA 95616         *
*         (916) 756-1104                *
*                                       *
*****************************************
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X     X  XXXXXXX   XXXXX          X
X     X  X        X     X        XX
X     X  X        X              X
XXXXXXX  XXXX     X        XXXXX  X
X     X  X        X              X
X     X  X        X     X        X
X     X  XXXXXXX   XXXXX         XXX
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THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.
THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION
NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL LOSS RATE:GREEN AND AMPT INFILTRATION
KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM

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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

          *DIAGRAM
    1     ID        INPUT FILE = F-FL.DAT       BY: JEP        DATE:  10/06/97
    2     ID        FLAMINGO WASH FIS RESTUDY GCW MODIFICATIONS
    3     ID
    4     ID        REVISED DUPLICATED FIS MODEL F100R.DAT
    5     ID        DELETE RED ROCK WATERSHED TO SIMULATE EXPANSION OF RR DET. BASIN
    6     ID        MODIFY UFWDB PER B & V LOMR REQUEST;BASIN R6 NOT ROUTED THRU UFWDB
    7     ID
    8     ID     CLARK COUNTY FLOOD CONTROL DISTRICT MASTER PLAN UPDATE
    9     ID     RED ROCK/FLAMINGO/TROPICANA WATERSHED
   10     ID     EXISTING DRAINAGE SYSTEM WITH PRESENT DEVELOPMENT
   11     ID     FLAMINGO/TROPICANA STORM (NO UPPER BLUE DIAMOND)- MAIN CHANNEL RUN
   12     ID         100-YEAR 6-HR STORM (SDN #5)
   13     ID         JMM    OCTOBER 1990
   14     ID
   15     ID         BASIC DATA FILE BASED ON COE FILE S10P40X.
   16     ID         MODIFICATIONS ADDED FROM B&V RED ROCK BASIN AND UPPER FLAMINGO
   17     ID         BASIN HEC-1 RUNS; NIMBUS NORTHWEST MCCARRAN AIRPORT HEC-1 RUNS;
   18     ID         AND SUBBASIN MODIFICATIONS DUE TO RECENT DEVELOPMENT.
   19     ID
   20     ID         COE MUSKINGUM ROUTING CONVERTED TO KINEMATIC FOR EXISTING
   21     ID         IMPROVED CHANNELS FROM FACILITY INVENTORY.
   22     ID
   23     ID     PB CARDS CONTAIN POINT PRECIPITATION.  DARF'S FROM CCRFCD MANUAL
   24     ID     BASED ON STORM AREAS FOR CONCENTRATION POINTS AS FOLLOWS:
   25     ID
   26     ID         SUBBASIN          AREA (SQMI)              DARF
   27     ID         --------          -----------              ----
   28     ID         RAINBOW            37.94                   0.72
   29     ID           JONES           40.35                   0.71
   30     ID         DECATUR,          50.27                   0.68
   31     ID        UPPR,I15,CAESARS,  51-53
   32     ID        WINNICK,HUGHES
   33     ID        FL/TROP CONF.,     73-78                   0.64
   34     ID         SPENCER
   35     ID        D/S FROM DI        85.45                   0.62
   36     ID        BLDR HWY,NELLIS,   90-92                   0.61
   37     ID        DESERT ROSE
   38     ID
   39     IT      5       0       0     200
   40     IO      5
   41     JR   PREC     .72     .71     .68     .64     .62     .61

   42     KK   RR23 RUNOFF FROM RR23
   43     BA   2.03
   44     PC   .000    .020    .059    .080    .110    .144    .150    .160    .168    .171
   45     PC   .180    .182    .187    .190    .197    .202    .210    .220    .230    .241
   46     PC   .250    .259    .265    .280    .290    .300    .305    .309    .310    .317
   47     PC   .321    .327    .333    .346    .361    .381    .408    .430    .477    .514
   48     PC   .561    .630    .710    .720    .731    .752    .779    .790    .795    .804
   49     PC   .810    .820    .826    .840    .859    .889    .910    .938    .966    .970
   50     PC   .974    .979    .981    .983    .985    .989    .990    .992    .993    .996
   51     PC   .997    .999   1.00
   52     PB   3.20
   53     LS     0    74.9
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  54      UK     500    .025    0.15     100
  55      RK    5500    .025    .030    0.09                        1
  56      RK   15500    .023    .030            TRAP     100       5      NO

  57      KK      R1 RUNOFF FROM R1
  58      BA    1.12
  59      PB    3.17
  60      LS       0    87.7
  61      UD    0.47

  62      KK    RR23 COMBINE R1+RR23
  63      HC       2

  64      KK      R5 ROUTE RR23 THRU R5
  65      RM       5    0.39    0.15

  66      KK    RR20 RUNOFF FROM RR20
  67      BA    1.37
  68      PB    3.22
  69      LS       0      88
  70      UD    0.69

  71      KK      R5 ROUTE RR20 THRU R5
  72      RM       7    0.61    0.15

  73      KK    RR21 RUNOFF FROM RR21
  74      BA    6.27
  75      PB    3.26
  76      LS       0      87
  77      UD    1.00

  78      KK      R5 ROUTE RR21 THRU R5
  79      RM       8    0.64    0.15

  80      KK    RR22 RUNOFF FROM RR22
  81      BA    2.15
  82      PB    3.20
  83      LS       0      87
  84      UD    0.62

  85      KK      R5 ROUTE RR22 THRU R5
  86      RM       8    0.70    0.15

  87      KK      R5 RUNOFF FROM R5
  88      BA    5.77
  89      PB    3.00
  90      LS       0    75.5
  91      UK     600    .025     .15     100
  92      RK    7920    .023    .030     .20                        1
  93      RK   13000    .019    .030            TRAP      40       2
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  94      KK      R5 COMBINE R5+RR23+RR22+RR21+RR20
  95      HC       5

  96      KK      F1 RUNOFF FROM F1
  97      BA    4.63
  98      PB    3.23
  99      LS       0      88
 100      UD    0.78

 101      KK      F5 ROUTE F1 THRU F5
 102      RM      12    0.99    0.15

 103      KK      F2 RUNOFF FROM F2
 104      BA    1.28
 105      PB    3.19
 106      LS       0      88
 107      UD     .43

 108      KK      F5 ROUTE F2 THRU F5
 109      RM       9    0.76    0.15

 110      KK      F3 RUNOFF FROM F3
 111      BA    2.60
 112      PB    3.09
 113      LS       0      87
 114      UD     .34

 115      KK      F5 ROUTE F3 THRU F5
 116      RM       5    0.40    0.15

 117      KK      F4 RUNOFF FROM F4
 118      BA    1.30
 119      PB    3.03
 120      LS       0      86
 121      UD     .41

 122      KK      F5 ROUTE F4 THRU F5
 123      RM       8    0.69    0.15

 124      KK     F5N RUNOFF FROM F5N
 125      BA    4.04
 126      PB    3.00
 127      LS       0      85
 128      UK     300    .025     .15     100
 129      RK    3200    .025    .030     .20                          1
 130      RK   18000    .023    .030             TRAP      70       5      NO

 131      KK     F5S RUNOFF FROM F5S
 132      BA    2.00
 133      PB    2.86
 134      LS       0      85
 135      UK     400    .020     .25     100
 136      RK    3500    .020    .030     .16                          1
 137      RK   14500    .017    .030             TRAP      50       5      NO
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  138     KK      F5 COMBINE F5N AND F5S
  139     HC       2

  140     KK      F5 F5 WITH ROUTED F1, F2, F3, F4 AND R5
  141     HC       6

  142     KK  UFL.DB UPPER FLAMINGO DETENTION BASIN
  143     KM        MODIFIED TO AGREE WITH UFLDB LOMR SUBMITTAL BY B & V
  144     KM         STORAGE-OUTFLOW DATA FROM B&V DESIGN PLANS
  145     RS       1    STOR       0
  146     SV       0      10       25      100      220      585     1005     1045     1195     1515
  147     SV    2244
  148     SQ       0      75      300      675      910     1100     1260     1280     5170    20600
  149     SQ   50300
  150     SE    2445  2447.5     2450     2455     2460     2465     2470   2470.5     2472     2475
  151     SE    2480

  152     KK     F5R ROUTE UPPER FLAMINGO DB OUTFLOW THRU OUTFALL CHANNEL
  153     KM         CHANNEL GEOMETRY FROM B&V PREDESIGN MEMORANDUM
  154     RK    3500    .010    .020           TRAP      30       3

  155     KK     F6A RUNOFF FROM F6A
  156     BA     .55
  157     PB    2.86
  158     LS       0      88
  159     UD    0.35

  160     KK     F6B ROUTE F6A THRU F6B
  161     RM       4    0.35    0.15

  162     KK     F6B RUNOFF FROM F6B
  163     BA    0.85
  164     PB    2.77
  165     LS       0      88
  166     UD    0.30

  167     KK     F6B COMBINE F6A AND F6B
  168     HC       2

  169     KK      F7 ROUTE F6 THRU F7
  170     RM       3    0.28    0.15

  171     KK      F7 RUNOFF FROM F7
  172     BA    1.50
  173     PB    2.77
  174     LS       0    85.5
  175     UK     700    .015     .15     100
  176     RK    4000   .0114    .030     .65                      1
  177     RK    7500   .0116    .030          TRAP      50       5      NO
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  178     KK      F7 COMBINE F7 WITH ROUTED F6
  179     HC       2

  180     KK      F7 COMBINED F7 WITH F5R
  181     HC       2

  182     KK     F7R ROUTE F7 THRU F8 (FLWA1267-1335)
  183     RK    5230    .011    .030            TRAP      40       1

  184     KK      F8 RUNOFF FROM F8
  185     BA    .48
  186     LS       0    66.1       0       0      98       0
  187     UK    1500    .014     .28      83
  188     UK      50    .020     .10      17
  189     RK    1800     .01    .020    .048
  190     RK    7200    .010    .030                    30       2      NO

  191     KK      F8 COMBINE F8 AND F7R
  192     KM         RAINBOW
  193     HC       2

  194     KK      F9 ROUTE F8 THRU F9 (FLWA1203)
  195     RK    1740   .0138    .015            TRAP      40       2

  196     KK       . (FLWA1152)
  197     RK    2640   .0044    .040            TRAP      50       3

  198     KK      R6 RUNOFF FROM R6
  199     KM        MOVED HYDROGRAPH
  200     BA    1.51
  201     PB    2.77
  202     LS       0    73.2
  203     UK     500    .015     .15     100
  204     RK    5200    .016    .030     .13                      1
  205     RK    8000   .0044    .030            TRAP      40       1      NO

  206     KK      F9ROUTE R6 THRU F9
  207     KM        ADDED ROUTING
  208     RK    1740   .0138    .015            TRAP      40       2

  209     KK      F9 RUNOFF FROM F9
  210     BA    .90
  211     LS       0    63.0       0       0      98       0
  212     UK     500    .010     .25      73
  213     UK      40    .015     .10      27
  214     RK    2400    .007    .020     .35                      1
  215     RK    2300    .008    .020    .015                      1
  216     RK   10800    .013    .023            TRAP      50       3      NO
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  217     KK      F9 COMBINE R6 WITH F9
  218     KM        ADDED COMBINATION
  219     HC       2

  220     KK      F9 COMBINE F8 WITH F9
  221     KM           JONES
  222     HC       2

  223     KK     F14 ROUTE F9 THRU F14
  224     RM       2    0.16    0.20

  225     KK     F10 RUNOFF FROM F10
  226     BA    1.17
  227     LS       0    62.6       0       0      98       0
  228     UK     600    .010     .25      67
  229     UK      40    .015     .10      33
  230     RK    1300    .010    .020    .019                      1
  231     RK    1300    .006     .02    .080    TRAP              1
  232     RK    8200   .0117     .02            TRAP      40      1
          * *** SUBAREAS R2 - R8 NOW ASSUMED TO BE DIVERTED INTO FLAMINGO WASH BY
          *     RAINBOW AND FLAMINGO RD ****

  233     KK      R2 RUNOFF FROM R2
  234     BA    2.01
  235     PB    3.00
  236     LS       0    79.4
  237     UD    0.21

  238     KK      R3 ROUTE R2 THRU R3
  239     RM       5    0.38    0.15

  240     KK      R3 RUNOFF FROM R3
  241     BA    2.63
  242     PB    2.77
  243     LS       0    68.2
  244     UD    0.61

  245     KK      R3 COMBINE R2+R3
  246     HC       2

  247     KK      R3 ROUTE THRU EXISTING GRAVEL PIT
  248     RS       1    STOR     480
  249     SV       0     480    1290    3150    3420
  250     SE       0      20      60     110     120
  251     SQ       0       0    1800    1800   37500

  252     KK      R8 ROUTE R3 THRU R8
  253     RK    2750    .019    .020            TRAP      40      1
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  254     KK      R7 RUNOFF FROM R7
  255     BA    1.39
  256     LS       0    79.5
  257     UD    0.51

  258     KK      R7 DIVERT Q IN EXCESS OF PIPE CAPACITY
  259     KM         LIMITING CAPACITY OF RAINBOW STORM DRAIN = 324 CFS (FLLA0307)
  260     KM         OVERFLOW RUNS DOWN DESERT INN AND EDNA INTO CENTRAL BASIN
  261     DT    R7OF
  262     DI       0     324    1000    5000
  263     DQ       0       0     676    4676

  264     KK      R8 ROUTE R7 THRU R8 (90"-96" RCP IN RAINBOW)
  265     RK    5280    .004    .015            CIRC     8.0

  266     KK      R8 RUNOFF FROM R8
  267     BA     .51
  268     LS       0    73.3
  269     UD    0.37

  270     KK      R8 COMBINE R3+R7+R8
  271     HC       3

  272     KK     F10 ROUTE R8 THRU F10 (114" RCP IN FLAMINGO RD)
  273     RK    5280    .010    .015            CIRC     9.5

  274     KK     F10 COMBINE R8+F10
  275     HC       2

  276     KK     F14 ROUTE F10 THRU F14 (FLLA0000)
  277     RK    4010   .0075    .015            TRAP      20       1

  278     KK     F12 RUNOFF FROM F12
  279     BA     .88
  280     LS       0    87.9
  281     UK     700    .012     .15     100
  282     RK    3500   .0120    .030     .21                      1
  283     RK    8200   .0130    .030             TRAP      10       5      NO

  284     KK    F12R    ROUT     F12    THRU     F13
  285     RM       2    0.20    0.15

  286     KK     F13 RUNOFF FROM F13
  287     BA     .55
  288     LS       0    87.5       0       0      98       0
  289     UK     750    .010     .25      83
  290     UK      50    .015     .10      17
  291     RK    1100     .01    .023     .04                      1
  292     RK    2300     .01    .023     .10                      1
  293     RK    5900    .012    .026             TRAP      40       2      NO
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  294     KK     F13 COMBINE     F13     AND     F1R
  295     HC       2

  296     KK     F14 ROUTE F13 THRU F14 (UNIMPROVED)
  297     RM       2    0.15    0.15

  298     KK     F14 RUNOFF FROM F14
  299     BA     .78
  300     LS       0    76.5       0       0      98       0
  301     UK     500    .010     .25      86
  302     UK     400    .015     .10      12
  303     RK    1200   .0090    .023    .024                       1
  304     RK    2400   .0075    .025     .12    TRAP      20       1
  305     RK    5200   .0090    .033            TRAP      75       4      NO

  306     KK     F14 COMBINE F9, F10, F13, AND F14
  307     KM        DECATUR
  308     HC       4

  309     KK    F14R ROUTE F14 THRU F15 (FLWA0990-1049)
  310     RK    3110    .020    .040            TRAP      50       3

  311     KK       .  (FLWA0924)
  312     RK    3490    .010    .040            TRAP      60       1

  313     KK       .  (FLWA0891-0923)
  314     RK    1580   .0076    .030            TRAP      90       1

  315     KK     F15 RUNOFF FROM F15
  316     BA    1.32
  317     LS       0    78.0       0       0      98       0
  318     UK     640    .013     .15      77
  319     UK     400    .014     .10      23
  320     RK    2500    .013    .020    0.08                       1
  321     RK    4500    .006    .020    0.25                       1
  322     RK    8500   0.012    .030            TRAP      40       3      NO

  323     KK     F15 COMBINE     F15     AND    F14R
  324     KM           UPPR
  325     HC       2

  326     KK   F15OF DIVERT OVERFLOWS
  327     KM         DIVERSION RATING CURVE FROM COE FEASIBILITY STUDY
  328     DT   F15OF
  329     DI       0    4100    7000   10500   35000
  330     DQ       0       0    1700    4640   15500

  331     KK     F16 RUNOFF FROM F16
  332     BA     .52
  333     LS       0    75.5       0       0      98       0
  334     UK     600    .010    0.15      56
  335     UK     400    .015     .10      44
  336     RK    1000    .010    .025    .030                       1
  337     RK    2400    .015    .025     .10                       1
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  338     RK    6000    .004    .020                                  1

  339     KK     F16 COMBINE F15 WITH F16
  340     KM             115
  341     HC       2

  342     KK   F16OF DIVERT OVERFLOWS
  343     KM         LIMIT FLOW TO 6000 CFS AT CAESARS PALACE/LVB/IMPERIAL PALACE CULVERT
  344     KM         BASED ON COE ASSUMED CAPACITY
  345     KM         CAESARS
  346     DT   F16OF
  347     DI       0    6000   12000   20000
  348     DQ       0       0    6000   14000

  349     KK     F16 ROUT F16 THRU F17 (FLWA0798-0823)
  350     RK    3550    .009    .015            TRAP      48       0

  351     KK       .  (FLWA0773)
  352     RK    1320   .0091    .020            TRAP      80      10

  353     KK       .  (FLWA0648-0798)
  354     RK    7760   .0064    .040            TRAP      30       2

  355     KK     F17 RUNOFF FROM F17
  356     BA    .65
  357     LS       0    75.5       0       0      98       0
  358     UK     900    .057     .15      51
  359     UK     600    .010     .10      49
  360     RK    1000    .010    .025    .040                       1
  361     RK    1500    .010    .027     .09                       1
  362     RK   11400   .0110    .030            TRAP     100       5      NO

  363     KK     F17 COMBINE     F17     AND  F16
  364     KM        WINNICK,HUGHES
  365     HC       2
          *  *** NO CONTRIBUTION FROM UPPER BLUE DIAMOND FOR FLAMINGO/RED ROCK STORM ***

  366     KK      T8 RUNOFF FROM T8
  367     BA    1.22
  368     LS       0    65.6
  369     UK     600    .015    0.15     100
  370     RK    2000    .018    .030     .14                       1
  371     RK   18000   .0161    .030            TRAP      75       5      NO

  372     KK      T9 ROUTE T8 TO T9
  373     RM       2     .52    0.15

  374     KK      T9 RUNOFF FROM T9
  375     BA    0.87
  376     LS       0    73.1
  377     UK     600    .010    0.15     100
  378     RK    4000    .010    .030    0.12                       1
  379     RK   10200   .0134    .030            TRAP      30       5
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  380     KK      T9 COMBINE T8 AND T9
  381     HC       2

  382     KK    T9OF DIVERT OVERFLOW
  383     DT    T9OF
  384     DI       0    5480   11000   15000
  385     DQ       0       0    2700    2700

  386     KK     T10 ROUTE T9 THRU T10
  387     RM       3    0.21    0.10

  388     KK      T4 RUNOFF FROM T4
  389     BA    3.22
  390     LS       0    87.6
  391     UK     500    .015    0.15     100
  392     RK    2700   .0190    .030    0.25                          1
  393     RK   20000   .0185    .030            TRAP      75        5      NO

  394     KK      T5 ROUTE T4 TO T5
  395     RK    6500    .013    .030            TRAP      30        2

  396     KK      T5 RUNOFF FROM T5
  397     BA    1.00
  398     LS       0    87.0
  399     UK     600    .010    0.15     100
  400     RK    2500    .012    .030    0.21                          1
  401     RK    6500    .013    .030            TRAP      30        2

  402     KK      T5 COMBINE T4 AND T5
  403     HC       2

  404     KK      T6 ROUTE T5 TO T6
  405     RK   10800    .012    .030            TRAP      30        5

  406     KK      T6 RUNOFF FROM T6
  407     BA    1.30
  408     LS       0    86.9
  409     UK     600    .010    0.15     100
  410     RK    6000    .012    .030    .400                          1
  411     RK   10800    .012    .030            TRAP      30        5

  412     KK      T6 COMBINE T5 AND T6
  413     HC       2

  414     KK    T9OF RECALL T9OF
  415     DR    T9OF

  416     KK      T6 ROUTE T9OF THRU T6
  417     RM       3    0.23    0.15
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  418     KK      T6 COMBINE T6 AND T9OF
  419     HC       2

  420     KK      T6 DIVERT OVERFLOW ALONG UPRR
  421     KM         UPRR 114" CMP CULVERT - 750 CFS CAPACITY
  422     DT    T6OF
  423     DI       0     750    1500   10000
  424     DQ       0       0     750    9250

  425     KK     T10 ROUTE T6 THRU T10
  426     RM       2    0.18    0.15

  427     KK      T1 RUNOFF FROM T1
  428     BA    1.56
  429     LS       0      88
  430     UK     600    .020    0.15     100
  431     RK    4000   .0200    .030    0.28                          1
  432     RK   13200    .017    .030            TRAP      50        5      NO

  433     KK      T3 ROUTE T1 TO T3
  434     RK   10000   .0106    .032            TRAP      30        5

  435     KK      T3 RUNOFF FROM T3
  436     BA    0.99
  437     LS       0    78.9
  438     UK     500    .010    0.15     100
  439     RK    3000    .010    .030    0.16                          1
  440     RK   10000   .0106    .032            TRAP      30        5

  441     KK      T3 COMBINE T1 AND T3
  442     HC       2

  443     KK    T6OF RECALL DIVERTED OVERFLOW FROM T6
  444     DR    T6OF

  445     KK      T3 ROUTE T6OF THRU T3
  446     RM       1    0.08    0.15

  447     KK      T3 COMBINE T6OF AND T3
  448     HC       2

  449     KK    T3OF DIVERT FLOW IN EXCESS OF CULVERT CAPACITY
  450     KM         BASED ON COE RATING CURVE FROM FEASIBILITY STUDY
  451     KM         DQ FLOWS NORTHEASTERLY, REJOINING FW NEAR PARADISE RD
  452     DT    T3OF
  453     DI       0    1400    1900    3200    5500   19000
  454     DQ       0       0     420    1650    3650   14700

  455     KK     T10 ROUTE T3 THRU T10 (TRWA0272)
  456     RK    3800   .0132    .040            TRAP    17.5        2
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  457     KK     T10 RUNOFF FROM T10
  458     BA   0.82
  459     LS     0    78.0       0       0      98       0
  460     UK   700    .013    0.15      78
  461     UK   400    .011     .10      22
  462     RK  1100    .012    .020    .120                      1
  463     RK  3000    .008    .020     .50                      1
  464     RK  3500   0.010    .030             TRAP      30      2

  465     KK     T10 COMBINE T3, T6, T9 AND T10
  466     HC     4

  467     KK     T10R ROUT T10 THRU T11 (TRWA0235)
  468     RK  1160    .010    .015             TRAP      32      0

  469     KK       .   (TRWA0145-0218)
  470     RK  4700   .0095    .030             TRAP      90    1.5

  471     KK     T11 RUNOFF FROM T11
  472     BA   1.09
  473     LS     0    68.6       0       0      98       0
  474     UK   800    .010    0.30      61
  475     UK   500    .010    0.10      39
  476     RK  3200   .0080    .020    0.17                      1
  477     RK  5400   .0104    .030             TRAP     100      5      NO

  478     KK     T11 COMBINE T11 AND T10R
  479     HC     2

  480     KK     T11R ROUT  T11 THRU T12 (TRWA0117)
  481     RK  1130   .0088    .015             TRAP     1.5      2

  482     KK       .   (TRWA0000-0034+)
  483     RK  6500    .012    .040             TRAP     100    2.5

  484     KK     T12 RUNOFF FROM T12
  485     BA   0.77
  486     LS     0    74.4       0       0      98       0
  487     UK   500    .008    0.18      65
  488     UK   200    0.01    0.10      35
  489     RK  2200    .008    .023    0.12                      1
  490     RK  3000    .007    .025     .24                 20   2
  491     RK  6600   .0103    .032                         30   5

  492     KK     T12 ADD T12 AND T11R
  493     HC     2

  494     KK     T3OF RECALL DIVERSION FROM T3
  495     DR     T3OF
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

 496      KK     T12 ROUTE T3OF TO T12
 497      RM      20    1.99    0.10

 498      KK     T12 COMBINE T3OF AND T12
 499      HC       2
          *  *** DATA FOR SUBAREAS MNW-B THRU MNW-M TAKEN FROM NIMBUS HEC-1 ANALYSIS
          *       FOR NORTHWEST MCCARRAN AIRPORT DRAINAGE STUDY (WITH SMALL MODIFICATIONS)

 500      KK   MNW-B RUNOFF FROM B
 501      BA    0.68
 502      LS              65      10
 503      UD     2.4

 504      KK    DIVB FLOW SPLIT AT I-15; BCULV IS FLOW CONVEYED BY CULVERT
 505      DT   BCULV
 506      DI       0      22     100     500
 507      DQ       0      22      22      22

 508      KK   RDIVB ROUTE DIVB TO CULVERT AT I15 AND C
 509      KM         CHANGED RK TO RD SO 9/90 HEC-1 VERSION WOULD RUN
 510      RD     600    .004     .05       0       0       5

 511      KK   MNW-C RUNOFF AT C
 512      BA    0.69
 513      LS              65      17
 514      UD     2.0

 515      KK   MNW-C COMBINE DIVB+C
 516      HC       2

 517      KK   MNW-C PONDING STORAGE ROUTING AT I-15
 518      RS       1    STOR       0
 519      SA       0     .28     .92    2.02    3.19    3.44    5.37    9.09
 520      SQ       0       8      25      35      40      78     360    1342
 521      SE      54      55      56      57   57.43      58      59      60

 522      KK    DIVC FLOW SPLIT AT C THRU AND AROUND CULVERT
 523      DT   CCULV
 524      DI       0       8      25      35      40      78     360    1342
 525      DQ       0       8      25      35      40      45      55      65
          *  KK RDIVC ROUTE DIVC NORTH TO D
          *  COMMENTED OUT ROUTING SO 9/90 HEC-1 VERSION WOULD RUN
          *  RK   650    .004     .05       0       0       0      20

 526      KK   MNW-D RUNOFF FROM D
 527      BA     .05
 528      LS              66      10
 529      UD     .40
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  530     KK   MNW-D COMBINE DIVC AND D
  531     HC      2

  532     KK    DIVD DIVERT FLOW TO NORTH; DCULV CROSSES I-15
  533     DT   DCULV
  534     DI       0      28     100     500
  535     DQ       0      28      28      28

  536     KK   RDIVD ROUTE DIVERTED FLOW NORTH TO E
  537     KM        CHANGED RK TO RD SO 9/90 HEC-1 VERSION WOULD RUN
  538     RD    800    .004     .05       0       0       0      20

  539     KK   MNW-E RUNOFF FROM E
  540     BA    0.05
  541     LS              65      18
  542     UD    0.38

  543     KK   MNW-E COMBINE DIVD + E
  544     HC      2

  545     KK   ECULV DIVIDE FLOW AT I-15 CULVERT; ECULV CROSSES I-15 INTO MNW-I
  546     DT   ECULV
  547     DI       0      28     100     500
  548     DQ       0      28      28      28

  549     KK   RDIVE ROUTE FLOW FROM DIVE NORTH ALONG I-15
  550     KM        CHANGED RK TO RD SO 9/90 HEC-1 VERSION WOULD RUN
  551     RD    1200    .007     .05       0       0       0       4

  552     KK  MNW-FG RUNOFF FROM FG
  553     BA    0.36
  554     LS              66      17
  555     UD    1.24

  556     KK  MNW-FG COMBINE EDIV + FG
  557     HC      2

  558     KK    DIVG DIVERT FLOW NORTH; GCULV CROSSES I-15 INTO SUBAREA I
  559     DT   GCULV
  560     DI       0      50      60     100     150     250
  561     DQ       0      50      60      60      60      60

  562     KK   RDIVG ROUTE DIVG NORTH TO AIRPORT CHANNEL
  563     KM        CHANGED RK TO RD SO 9/90 HEC-1 VERSION WOULD RUN
  564     RD    2200    .009    .040       0       0       0      10

  565     KK  MNW-J1 RUNOFF FROM J1
  566     BA    2.37
  567     LS              70
  568     UD    2.67
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  569     KK  MNW-J2 ROUTE J1 TO J2
  570     RK   10000    .012     .04                      10       2

  571     KK  MNW-J2 RUNOFF FROM J2
  572     BA    1.21
  573     LS              70      10
  574     UD    1.22

  575     KK  MNW-J2 COMBINE J1+J2
  576     HC       2

  577     KK     CP1 COMBINE J2 + RDIVG
  578     HC       2

  579     KK    RCP1 ROUTE CP1 TO LAS VEGAS BLVD (CP3)
  580     RK    2600    .008     .04       0       0      20       1

  581     KK    RTNE RETURN FLOW FROM CULVERT E
  582     DR   ECULV

  583     KK    RTNE DUMMY SUBAREA TO GET 1988 HEC1 TO RUN (NEEDS NON-ZERO AREA)
  584     BA    0.01
  585     LS       0      50
  586     UD     0.1

  587     KK    RTNE COMBINE DIVERSION RECALL WITH DUMMY SUBAREA
  588     HC       2

  589     KK   RRTNE ROUTE ECULV TO OUTLET OF I
  590     RK    3900    .013     .05       0       0       0      50

  591     KK    RTNG RETURN FLOW FROM CULVERT G
  592     DR   GCULV

  593     KK    RTNG DUMMY SUBAREA TO GET 1988 HEC1 TO RUN (NEEDS NON-ZERO AREA)
  594     BA    0.01
  595     LS       0      50
  596     UD     0.1

  597     KK    RTNG COMBINE DIVERSION RECALL WITH DUMMY SUBAREA
  598     HC       2

  599     KK   RRTNG ROUTE GCULV TO OUTLET OF I
  600     RK    2500    .013    0.05       0       0       0      50

  601     KK  MNW-I1 RUNOFF FROM I1
  602     BA    0.25
  603     LS              78      15
  604     UD    0.58
```

```
LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  605     KK     CP2 COMBINE HYDROGRAPHS AT LAS VEGAS BLVD AND UPRR
  606     HC       3

  607     KK    RCP2 ROUTE CP2 TO AIRPORT CHANNEL AND LAS VEGAS BLVD (CP3)
  608     RK    2500    .009     .05       0       0       0       4

  609     KK  MNW-I2 RUNOFF FROM I2
  610     BA    0.14
  611     LS              77       1
  612     UD    0.38

  613     KK     CP3 COMBINE FLOW FROM B-I2 AT LAS VEGAS BLVD AND AIRPORT CHANNEL
  614     HC       3

  615     KK    RCP3 ROUTE CPE TO OUTLET OF K
  616     RK    7300     .01     .04       0       0       5       2

  617     KK   MNW-K RUNOFF FROM K
  618     BA    1.43
  619     LS              66      25
  620     UD    1.55

  621     KK     CP4 COMBINE HYDROGRAPHS FOR AIRPORT CHANNEL AND TAXIWAY S
  622     HC       2

  623     KK    RCP4 ROUTE FLOW TO TROPICANA BLVD
  624     RK    3300     .01     .03       0       0      20       4

  625     KK   MNW-L RUNOFF FROM L
  626     BA    0.27
  627     LS              77      60
  628     UD    0.42

  629     KK   MNW-M RUNOFF FROM M
  630     BA    0.49
  631     LS              84      56
  632     UD    0.83

  633     KK     CP5 COMBINE ALL HYDROGRAPHS AT OUTLET AT BOX CULVERT AT TROPICANA
  634     HC       3
          *  *** END OF DATA FROM NIMBUS NORTHWEST MCCARRAN HEC-1 DATA ***
          *

  635     KK     T12 ROUTE MNW-L TO T12 (TRMC0009)
  636     RK    2640   .0045    .040            TRAP      18     1.5

  637     KK       .   (TRWA0000-0034)
  638     RK    5000    .012    .040            TRAP     100     2.5
```

```
LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  639     KK     T12 COMBINE MNW-L AND T12
  640     KM         AIRPORT CHANNEL + TROPICANA WASH
  641     HC       2

  642     KK     F17 COMBINE F17 AND T12
  643     KM         FLAMINGO WASH + TROPICANA WASH
  644     KM        FLAM/TROP CONF.
  645     HC       2

  646     KK     F18 ROUTE F17 AND T12 THRU F18
  647     KM           (FLWA0593)
  648     RK    1430   .0182    .040            TRAP      50       1

  649     KK       .   (FLWA0564+FLWA0620) COMBINED DUE TO RK PROBLEMS WITH NEW HEC1
  650     RK    1695   .0045    .015            TRAP      50       1

  651     KK      R4 RUNOFF FROM R4
  652     BA    2.28
  653     LS       0    86.5
  654     UD    0.34

  655     KK   F15OF RECALL F15 OVERFLOW
  656     DR   F15OF

  657     KK  F15OFR ROUT F15OF THRU R4
  658     RM       3    0.24       0

  659     KK      R4 COMBINE R4 AND F15 OVERFLOW
  660     HC       2

  661     KK   F16OF RECALL F16 OVERFLOW
  662     DR   F16OF

  663     KK  F16OFR ROUT F16OF THRU R4
  664     RM       3    0.24       0

  665     KK      R4 COMBINE R4 AND F16 OVERFLOW
  666     HC       2

  667     KK     F18 ROUT R4 THRU F18
  668     RM      11    0.88    0.10

  669     KK     F18 RUNOFF FROM F18
  670     BA    0.87
  671     LS       0    72.0       0       0      98       0
  672     UK     500    .010    0.20      52
  673     UK     200    .015    0.10      48
  674     RK    1000    .010    .023    .014                       1
  675     RK    1000   .0010    .023    .050                       1
  676     RK   15900   .0090    .020            TRAP      30       1
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```
LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  677     KK     F18 COMBINE R4 AND F18
  678     HC       2

  679     KK     F24 RUNOFF FROM F24
  680     BA    1.03
  681     LS       0    66.3       0       0      98       0
  682     UK     300    .010    0.20      46
  683     UK     100    .015    0.10      54
  684     RK    1300    .013    .020    .035                       1
  685     RK    3000   .0075    .020    .014                       1
  686     RK    4400    .018    .030            TRAP      50       3      NO

  687     KK     F18 COMBINE F18, F24, AND F17
  688     KM        SPENCER
  689     HC       3

  690     KK    F18R ROUT F18 THRU F20A (FLWA0400-0493)
  691     RK    7970   .0065    .040            TRAP      60       2

  692     KK    F20A RUNOFF FROM F20A
  693     BA    0.81
  694     LS       0    70.7       0       0      98       0
  695     UK    1000    .010    0.25      77
  696     UK     250     .02    0.15      23
  697     RK    1900    .001    .020    0.05                       1
  698     RK    2000    .015    .020    0.14
  699     RK    5600   .0108    .033                       40       4

  700     KK    F20A COMBINE F20A AND F18R
  701     HC       2

  702     KK    F20B ROUTE F20A THRU F20B (FLWA0376)
  703     RK    1210   .0148    .040            TRAP      50       1

  704     KK       .   (FLWA0348)
  705     RK    1430    .007    .015            TRAP      60       1

  706     KK     F19 RUNOFF FROM F19
  707     BA    1.54
  708     LS       0    70.8       0       0      98       0
  709     UK     500    .008    0.25      51
  710     UK     100    .015    0.10      49
  711     RK    1300    .010    .020     .04                       1
  712     RK    2500    .010    .020    .019                       1
  713     RK   11400   .0118    .020            TRAP      40       1      NO

  714     KK    F20B ROUTE F19 THRU F20B
  715     RM       2    0.20    0.20
```

```
LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

716       KK    F20B RUNOFF FROM F20B
717       BA    0.73
718       LS      0      82
719       UD    0.25

720       KK    F20B COMBINE F19 AND F20B
721       HC      2

722       KK      VB VAN BUSKIRK DRAINAGE AREA
723       KM         SINGLE SUBAREA TO SIMULATE RUNOFF FROM ENTIRE VAN BUSKIRK WATERSHED.
724       KM         CN AND LAG SELECTED TO MATCH PEAK Q AND TIME-TO-PEAK
725       KM         FROM VAN BUSKIRK PREDESIGN STUDY BY JMM.
726       BA    4.58
727       LS              78
728       UD    0.50

729       KK    F20B COMBINE VAN BUSKIRK AREA, F20A AND F20B
730       KM       D/S FROM DI
731       HC      3

732       KK     F22 ROUTE F20B THRU F22 (FLWA0258-0274)
733       RK   4700   .0110    .030                      70     2.5

734       KK     F21 RUNOFF FROM F21
735       BA    1.27
736       LS      0    77.1       0       0      98       0
737       UK    300    .010    0.25      49
738       UK     60    .020     .10      51
739       RK   1300    .010    .020    .019                      1
740       RK   1750    .008    .020    0.08                      1
741       RK  16000   .0128    .020            TRAP      40       1      NO

742       KK     F21 DIVERT ACROSS BLDR HWY AT OAKEY
743       DT   OAKEY
744       DI      0   10000
745       DQ      0    5000

746       KK     F22 ROUTE F21 THRU F22
747       RM      1    0.06    0.20

748       KK     F22 RUNOFF FROM F22
749       BA    3.43
750       LS      0    74.9       0       0      98       0
751       UK    700    .008    0.25      51
752       UK     60    .015     .10      49
753       RK   1500    .010    .020    .093                      1
754       RK   3000    .008    .020    0.37                      1
755       RK  29500   .0115    .020            TRAP      40       1      NO
```

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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

 756      KK     F22 COMBINE F208, F21 AND F22
 757      KM        BOULDER HWY
 758      HC      3

 759      KK     F23 ROUTE F22 THRU F23 (FLWA0228)
 760      RK   1430    .014    .040            TRAP      50       1

 761      KK       .   (FLWA0175)
 762      RK   2690    .0007   .040            TRAP     100       1

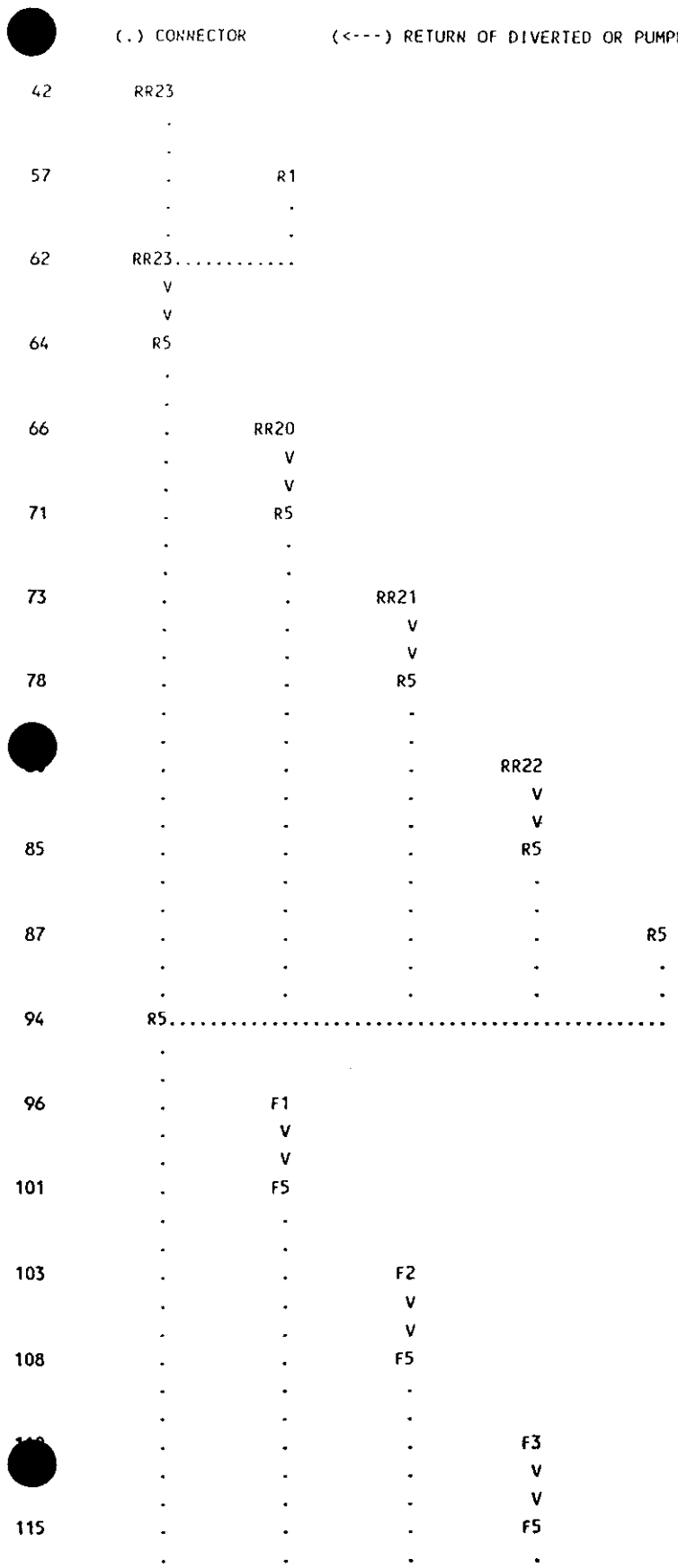
 763      KK       .   (FLWA0079)
 764      RK   5020    .0096   .040            TRAP      50       1

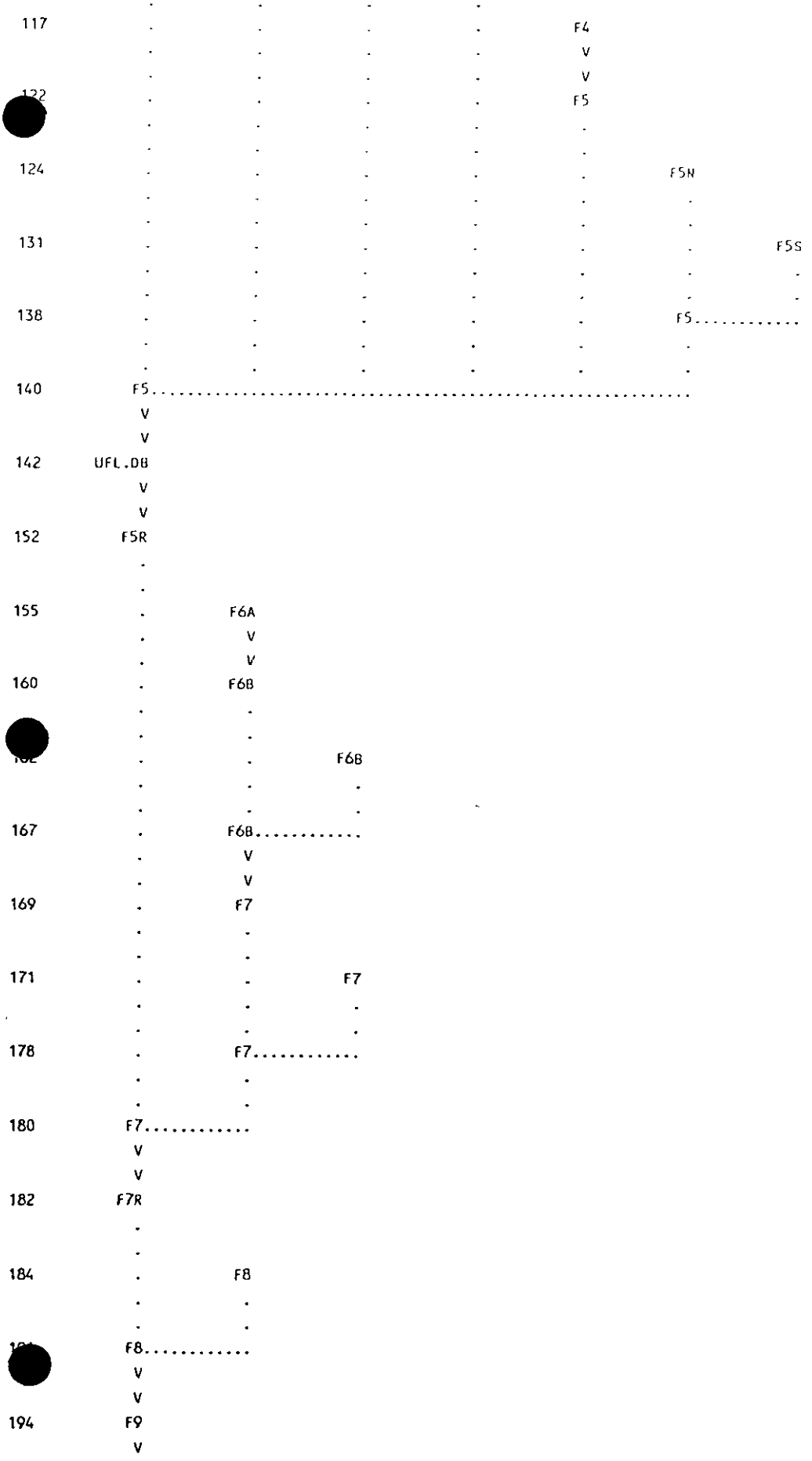
 765      KK       .   (FLWA0000)
 766      RK   4120    .0049   .040            TRAP     107       2

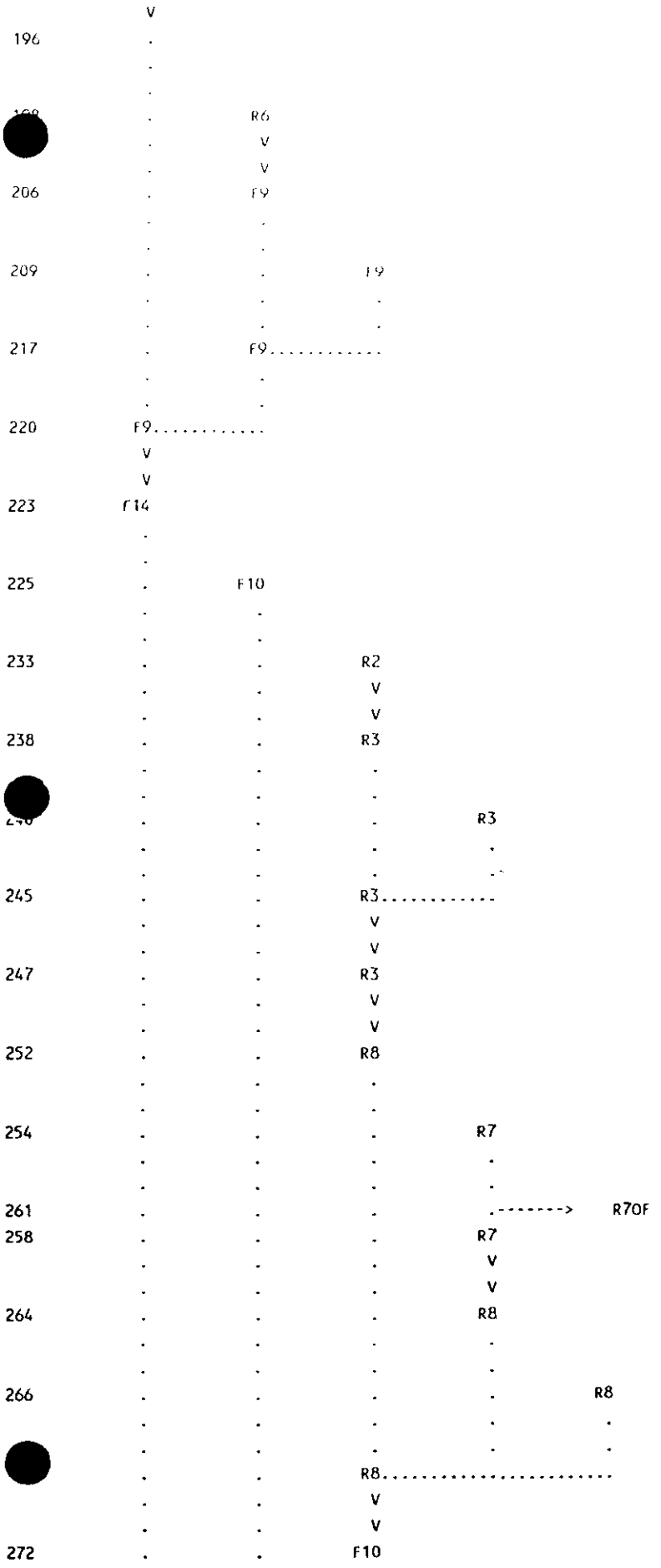
 767      KK     F23 RUNOFF FROM F23
 768      BA   1.92
 769      LS      0    74.4                     98
 770      UK    500     .01   0.25      70
 771      UK    100     .015   .10      30
 772      RK   2600     .005    .02    .037    TRAP      20       1
 773      RK   2200    .0018    .02    0.21    TRAP      40       1
 774      RK  13700    .0075   .032            TRAP      50       2      NO

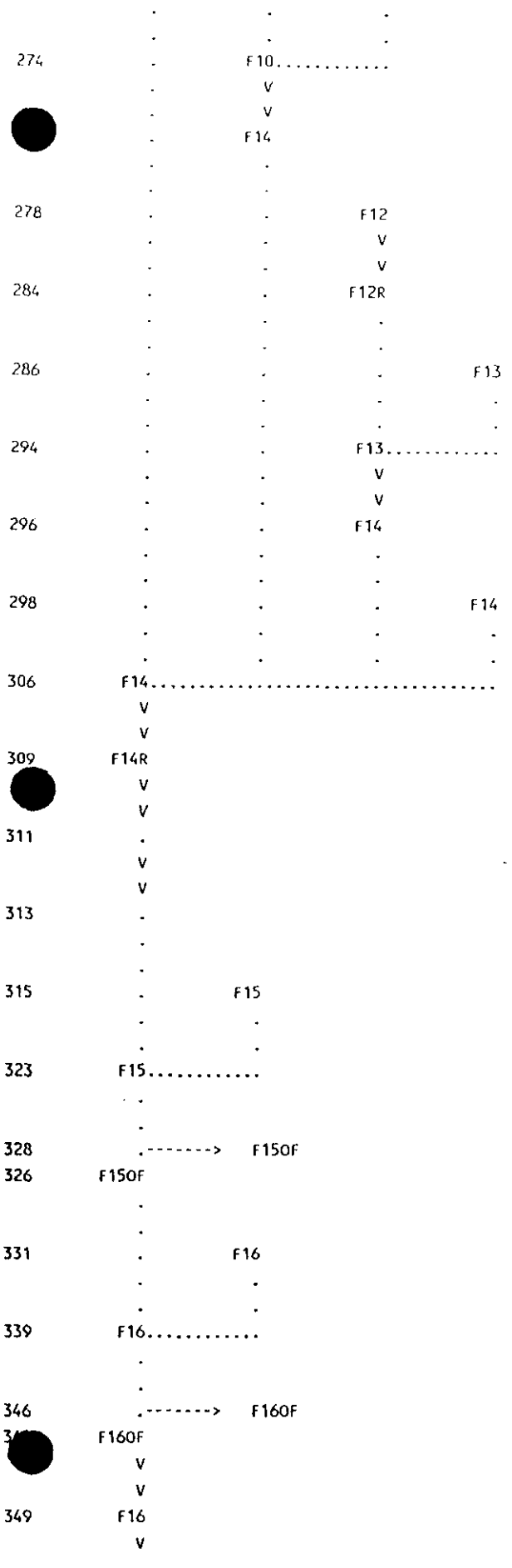
 775      KK     F23 COMBINE F22 AND F23
 776      KM        CONFLUENCE OF FLAMINGO WASH WITH LAS VEGAS WASH
 777      KM       NELLIS,DESERT ROSE
 778      HC      2
 779      ZZ
```

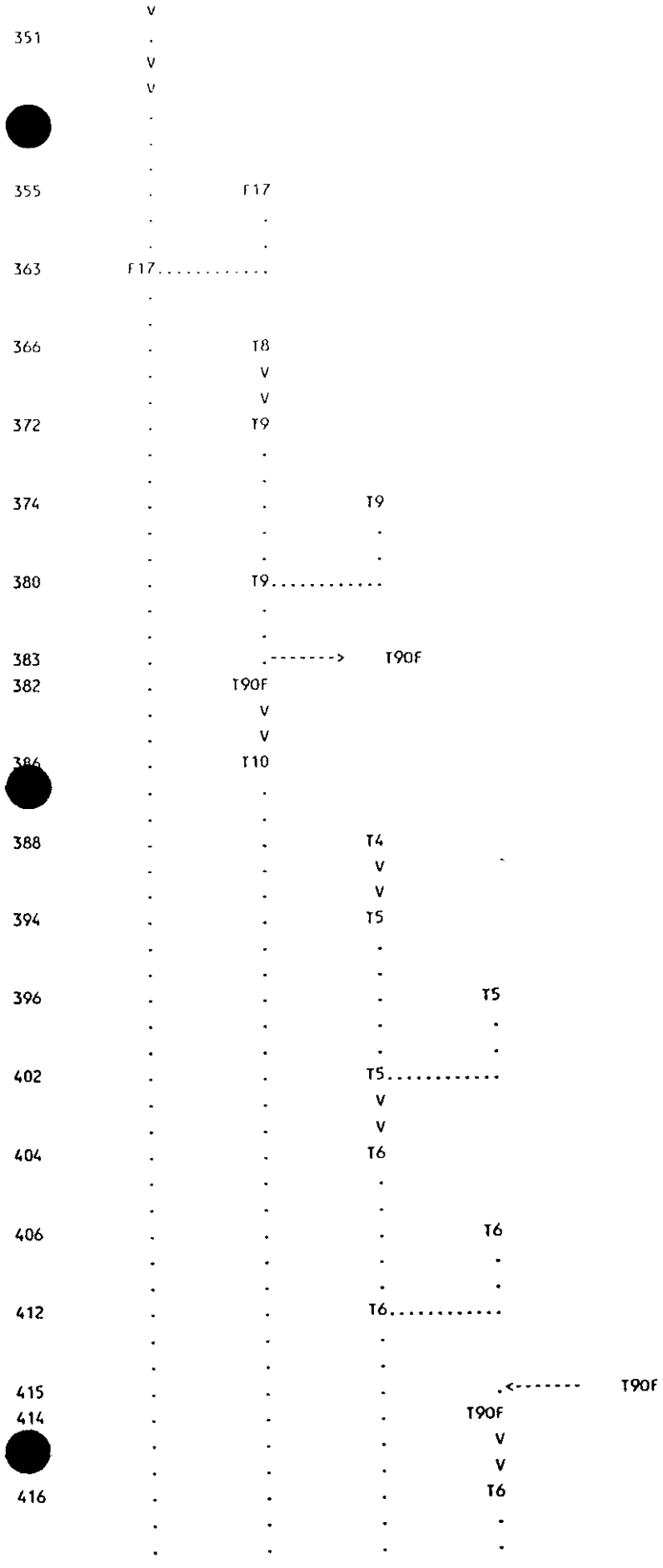
SCHEMATIC DIAGRAM OF STREAM NETWORK

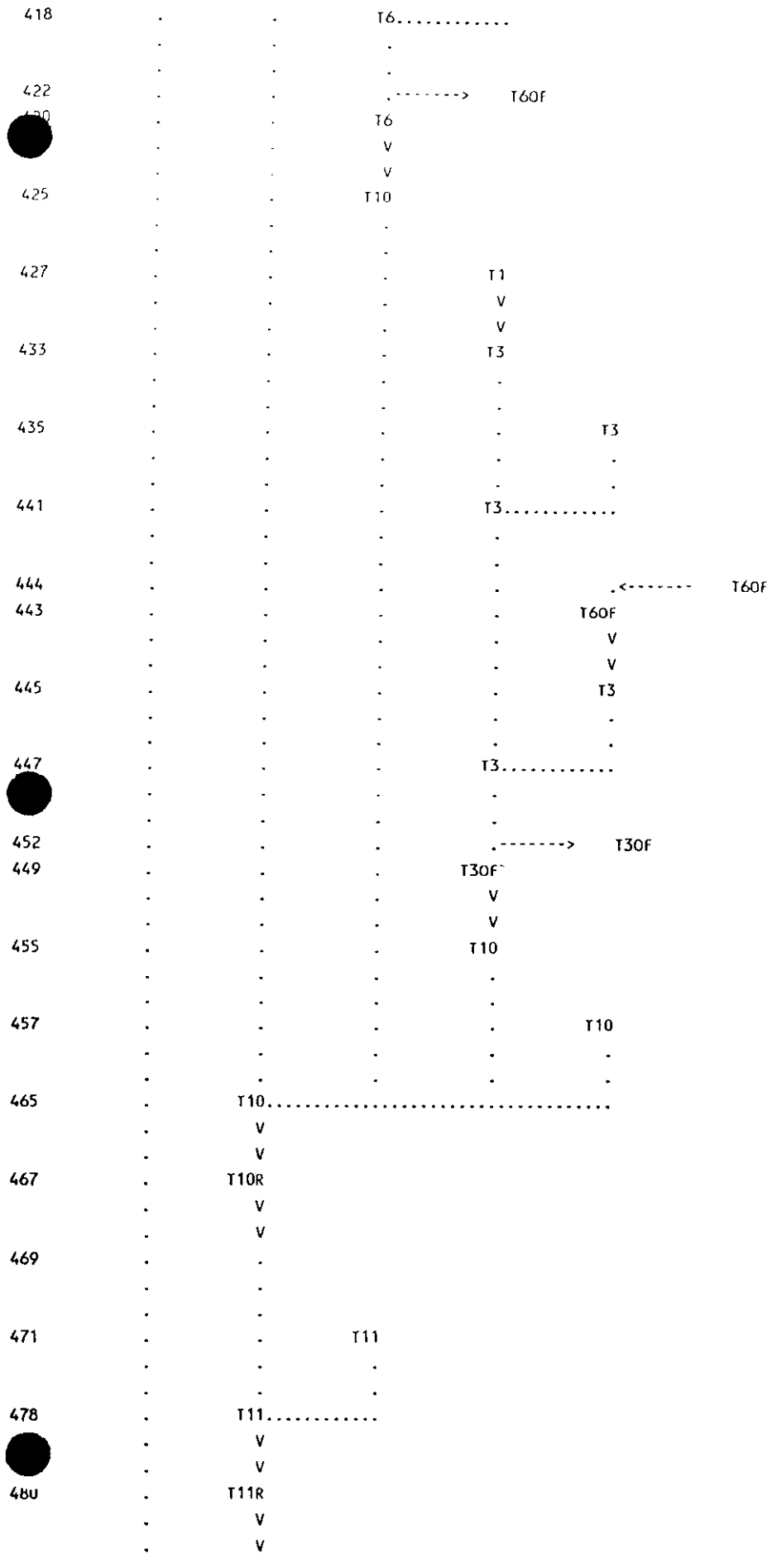


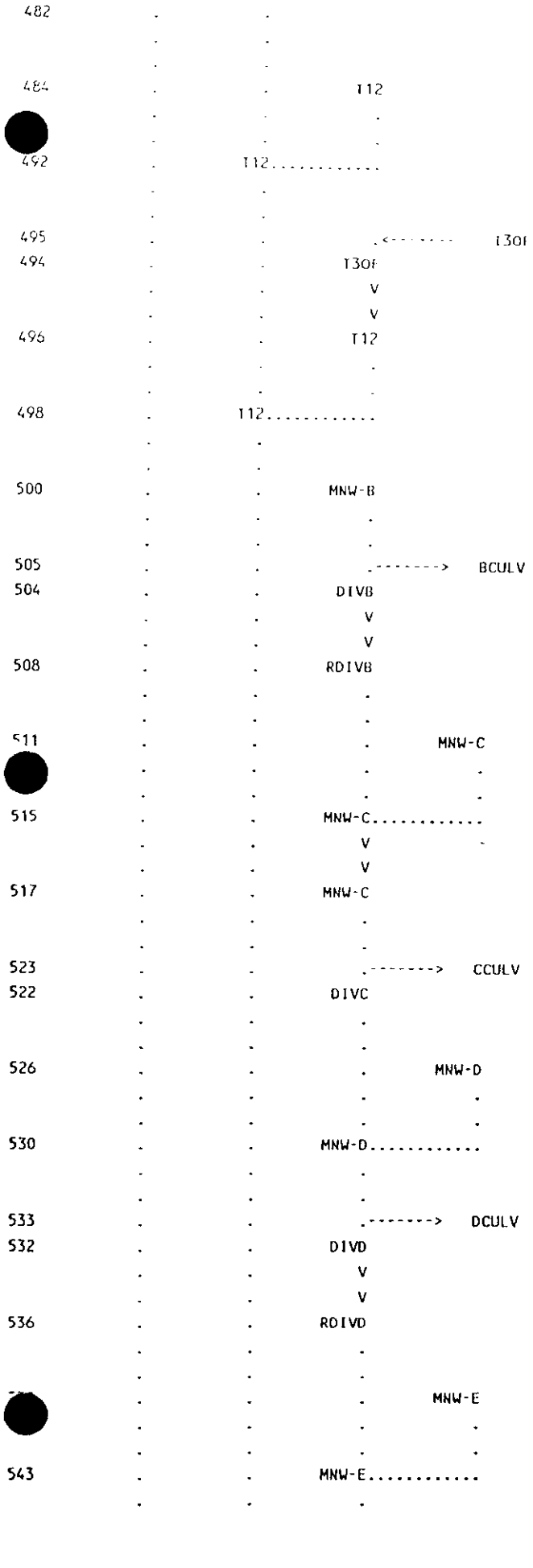

117
F4
V
V
122
F5
124
F5N
131
F5S
138
F5
140
F5
V
V
142
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V
V
152
F5R
155
F6A
V
V
160
F6B
F6B
167
F6B
V
V
169
F7
171
F7
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180
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V
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F7R
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F8
F8
V
V
194
F9
V

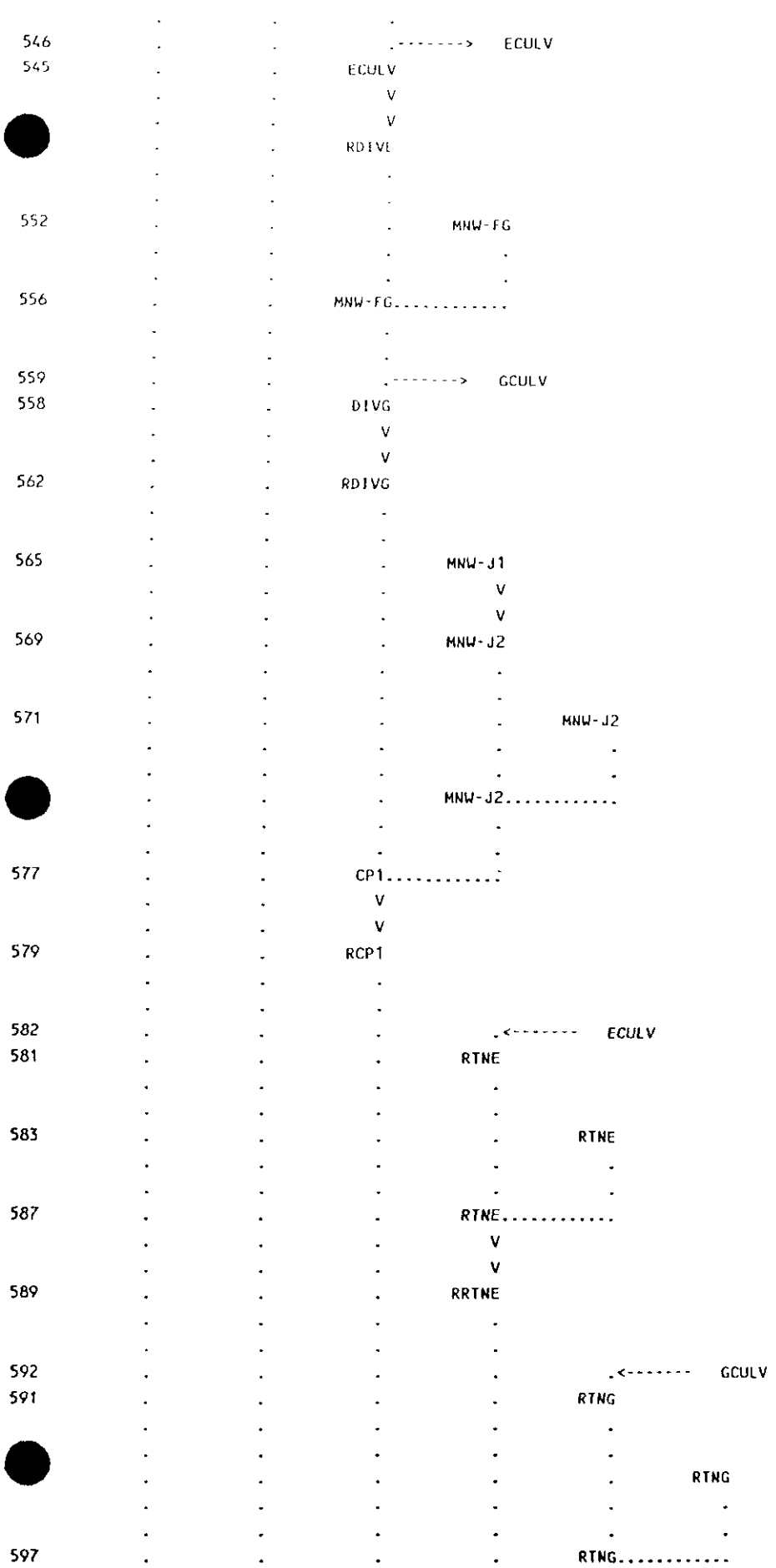

196
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F9
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R6
R2
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R7
R8
R7OF

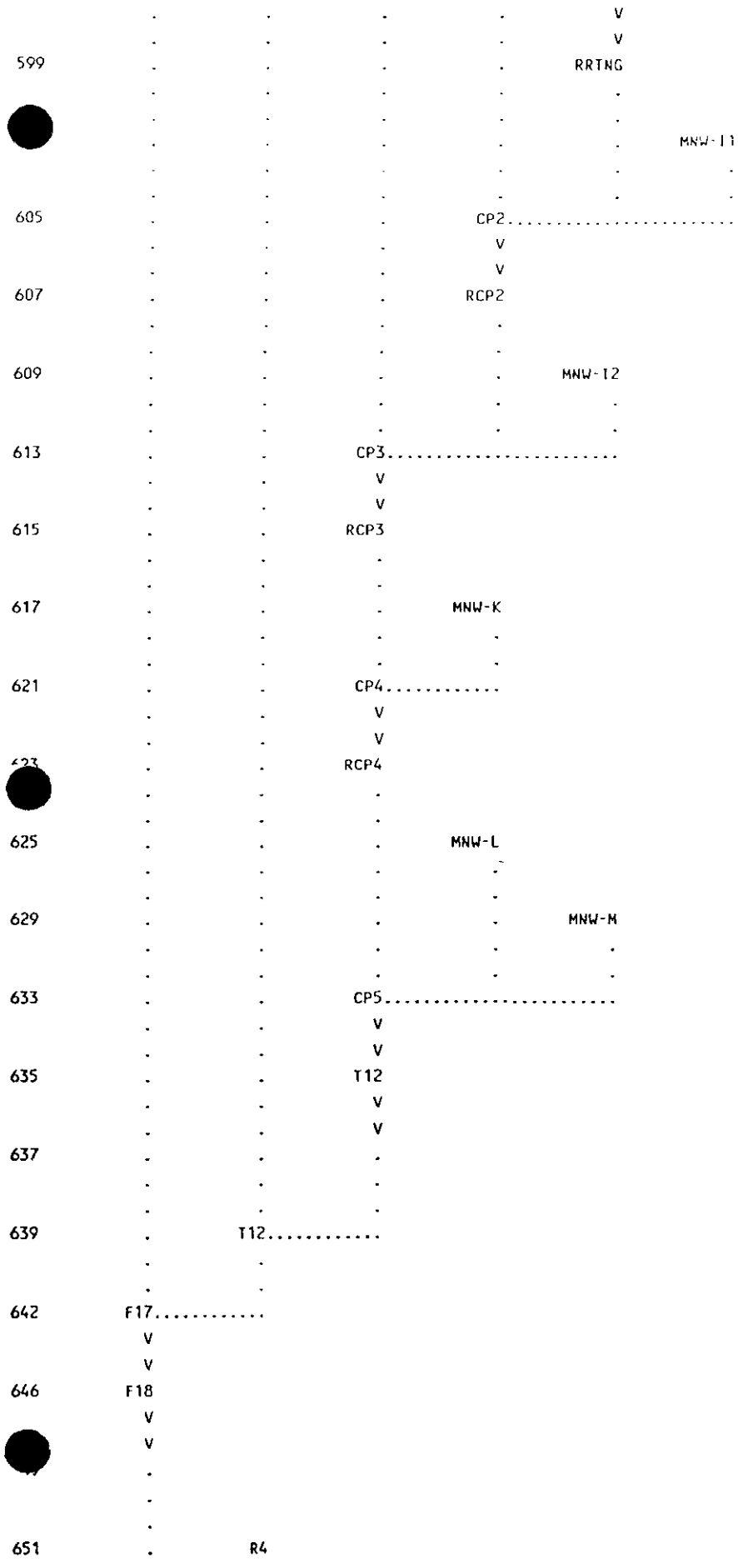

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F10
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F12
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F12R
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F13
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F14R
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F16OF
F16OF
349
F16

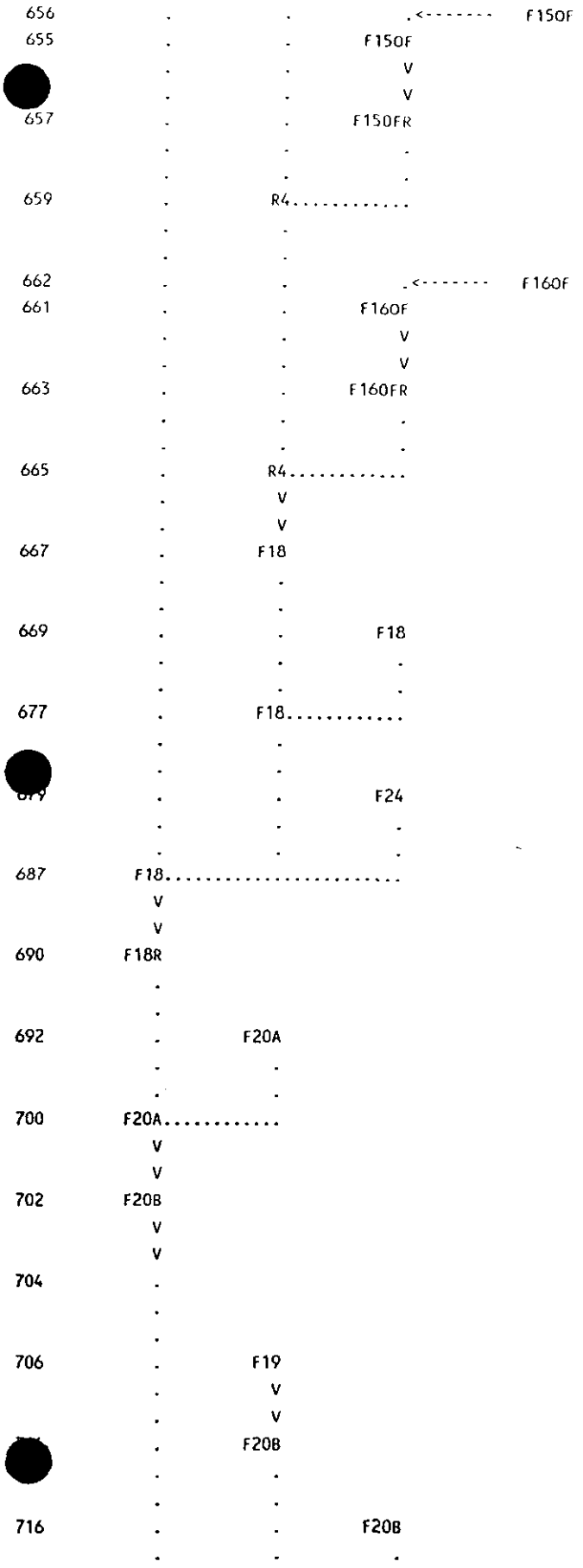

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T10
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T90F
414
T90F
416
T6

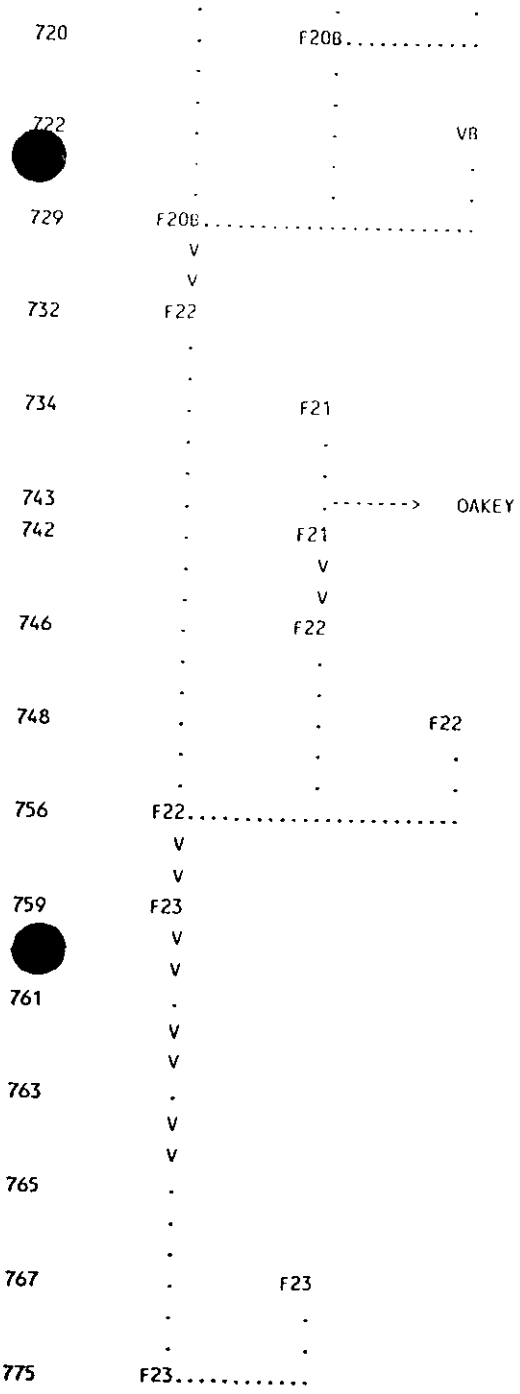

418
T6
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RDIVB
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MNW-C
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MNW-C
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CCULV
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DIVC
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MNW-D
530
MNW-D
533
DCULV
532
DIVD
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RDIVD
MNW-E
543
MNW-E


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ECULV
RDIVE
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MNW-FG.....
GCULV
DIVG
RDIVG
MNW-J1
MNW-J2
MNW-J2
MNW-J2.....
CP1.....
RCP1
ECULV
RTNE
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RTNE.....
RRTNE
GCULV
RTNG
RTNG
RTNG.....


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RRTNG
MNW-I1
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RCP2
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MNW-I2
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CP3
615
RCP3
617
MNW-K
621
CP4
623
RCP4
625
MNW-L
629
MNW-M
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CP5
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T12
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639
T12
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F17
646
F18
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R4


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F150FR
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F160F
F160FR
R4
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F24
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F18R
F20A
F20A
F20B
F19
F20B
F20B



***) RUNOFF ALSO COMPUTED AT THIS LOCATION

```
*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*          SEPTEMBER 1990               *
*           VERSION 4.0                 *
*                                       *
*  RUN DATE  10/06/1997  TIME  12:17:06 *
*                                       *
*****************************************
```


```
*****************************************
*                                       *
*   U.S. ARMY CORPS OF ENGINEERS        *
*   HYDROLOGIC ENGINEERING CENTER       *
*        609 SECOND STREET              *
*      DAVIS, CALIFORNIA 95616          *
*        (916) 756-1104                 *
*                                       *
*****************************************
```


INPUT FILE = F-FL.DAT BY: JEP DATE: 10/06/97
FLAMINGO WASH FIS RESTUDY GCW MODIFICATIONS

REVISED DUPLICATED FIS MODEL F100R.DAT
DELETE RED ROCK WATERSHED TO SIMULATE EXPANSION OF RR DET. BASIN
MODIFY UFWDB PER B & V LOMR REQUEST;BASIN R6 NOT ROUTED THRU UFWDB

CLARK COUNTY FLOOD CONTROL DISTRICT MASTER PLAN UPDATE
RED ROCK/FLAMINGO/TROPICANA WATERSHED
EXISTING DRAINAGE SYSTEM WITH PRESENT DEVELOPMENT
FLAMINGO/TROPICANA STORM (NO UPPER BLUE DIAMOND)- MAIN CHANNEL RUN
100-YEAR 6-HR STORM (SDN #5)
JMM OCTOBER 1990

BASIC DATA FILE BASED ON COE FILE S10P40X.
MODIFICATIONS ADDED FROM B&V RED ROCK BASIN AND UPPER FLAMINGO
BASIN HEC-1 RUNS; NIMBUS NORTHWEST MCCARRAN AIRPORT HEC-1 RUNS;
AND SUBBASIN MODIFICATIONS DUE TO RECENT DEVELOPMENT.

COE MUSKINGUM ROUTING CONVERTED TO KINEMATIC FOR EXISTING
IMPROVED CHANNELS FROM FACILITY INVENTORY.

PB CARDS CONTAIN POINT PRECIPITATION. DARF'S FROM CCRFCD MANUAL
BASED ON STORM AREAS FOR CONCENTRATION POINTS AS FOLLOWS:

SUBBASIN	AREA (SQMI)	DARF
RAINBOW	37.94	0.72
JONES	40.35	0.71
DECATUR,	50.27	0.68
UPPR,I15,CAESARS, WINNICK,HUGHES	51-53	
FL/TROP CONF., SPENCER	73-78	0.64
D/S FROM DI	85.45	0.62
BLDR HWY,NELLIS, DESERT ROSE	90-92	0.61

```
40 IO        OUTPUT CONTROL VARIABLES
                IPRNT        5  PRINT CONTROL
                IPLOT        0  PLOT CONTROL
                QSCAL       0.  HYDROGRAPH PLOT SCALE

  IT         HYDROGRAPH TIME DATA
                NMIN         5  MINUTES IN COMPUTATION INTERVAL
```

```
                IDATE      1    0  STARTING DATE
                ITIME         0000  STARTING TIME
                   NQ          200  NUMBER OF HYDROGRAPH ORDINATES
               NDDATE      1    0  ENDING DATE
               NDTIME         1635  ENDING TIME
               ICENT            19  CENTURY MARK

          COMPUTATION INTERVAL      .08 HOURS
              TOTAL TIME BASE    16.58 HOURS

    ENGLISH UNITS
         DRAINAGE AREA          SQUARE MILES
         PRECIPITATION DEPTH    INCHES
         LENGTH, ELEVATION      FEET
         FLOW                   CUBIC FEET PER SECOND
         STORAGE VOLUME         ACRE-FEET
         SURFACE AREA           ACRES
         TEMPERATURE            DEGREES FAHRENHEIT

JP       MULTI-PLAN OPTION
              NPLAN           1  NUMBER OF PLANS

JR       MULTI-RATIO OPTION
             RATIOS OF PRECIPITATION
             .72       .71       .63       .64       .62       .61


 *** FDKRUT - NEWTON RAPHSON FAILEDFIXED POINT ITERATION USED - ITERATION=  2


 *** FDKRUT WARNING TIME STEP CALCULATION FAILED TO CONVERGE. STABILITY PROBLEMS MAY RESULT


 *** FDKRUT WARNING TIME STEP CALCULATION FAILED TO CONVERGE. STABILITY PROBLEMS MAY RESULT



 *** FDKRUT - NEWTON RAPHSON FAILEDFIXED POINT ITERATION USED - ITERATION=  1



 *** FDKRUT - NEWTON RAPHSON FAILEDFIXED POINT ITERATION USED - ITERATION=  1



 *** FDKRUT - NEWTON RAPHSON FAILEDFIXED POINT ITERATION USED - ITERATION=  1



 *** FDKRUT - NEWTON RAPHSON FAILEDFIXED POINT ITERATION USED - ITERATION=  1
```

*** FDKRUT - NEWTON RAPHSON FAILEDFIXED POINT ITERATION USED - ITERATION= 1

*** FDKRUT - NEWTON RAPHSON FAILEDFIXED POINT ITERATION USED - ITERATION= 1

*** FDKRUT - NEWTON RAPHSON FAILEDFIXED POINT ITERATION USED - ITERATION= 1

*** FDKRUT - NEWTON RAPHSON FAILEDFIXED POINT ITERATION USED - ITERATION= 1

*** FDKRUT - NEWTON RAPHSON FAILEDFIXED POINT ITERATION USED - ITERATION= 1

*** FDKRUT - NEWTON RAPHSON FAILEDFIXED POINT ITERATION USED - ITERATION= 1

*** FDKRUT - NEWTON RAPHSON FAILEDFIXED POINT ITERATION USED - ITERATION= 1

*** FDKRUT - NEWTON RAPHSON FAILEDFIXED POINT ITERATION USED - ITERATION= 2

*** FDKRUT - NEWTON RAPHSON FAILEDFIXED POINT ITERATION USED - ITERATION= 2

*** FDKRUT - NEWTON RAPHSON FAILEDFIXED POINT ITERATION USED - ITERATION= 1

*** FDKRUT WARNING TIME STEP CALCULATION FAILED TO CONVERGE. STABILITY PROBLEMS MAY RESULT

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*** FDKRUT - NEWTON RAPHSON FAILEDFIXED POINT ITERATION USED - ITERATION= 1

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*** FDKRUT - NEWTON RAPHSON FAILEDFIXED POINT ITERATION USED - ITERATION= 2

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PEAK FLOW AND STAGE (END-OF-PERIOD) SUMMARY FOR MULTIPLE PLAN-RATIO ECONOMIC COMPUTATIONS
FLOWS IN CUBIC FEET PER SECOND, AREA IN SQUARE MILES
TIME TO PEAK IN HOURS

OPERATION	STATION	AREA	PLAN		RATIOS APPLIED TO PRECIPITATION RATIO 1 .72	RATIO 2 .71	RATIO 3 .68	RATIO 4 .64	RATIO 5 .62	RATIO 6 .61
HYDROGRAPH AT	RR23	2.03	1	FLOW	274.	268.	242.	214.	199.	191.
				TIME	5.25	5.25	5.25	5.25	5.25	5.25
HYDROGRAPH AT	R1	1.12	1	FLOW	488.	477.	446.	404.	384.	373.
				TIME	3.83	3.83	3.83	3.83	3.83	3.83
2 COMBINED AT	RR23	3.15	1	FLOW	564.	552.	510.	461.	434.	420.
				TIME	5.08	5.08	5.08	5.08	5.08	5.08
ROUTED TO	R5	3.15	1	FLOW	546.	531.	490.	442.	416.	402.
				TIME	4.50	5.50	5.50	5.50	5.50	5.50
HYDROGRAPH AT	RR20	1.37	1	FLOW	511.	500.	468.	425.	403.	393.
				TIME	4.08	4.08	4.08	4.08	4.08	4.08
ROUTED TO	R5	1.37	1	FLOW	477.	467.	437.	397.	377.	367.
				TIME	4.75	4.75	4.75	4.75	4.75	4.75
HYDROGRAPH AT	RR21	6.27	1	FLOW	1833.	1793.	1672.	1512.	1433.	1394.
				TIME	4.42	4.42	4.42	4.42	4.42	4.42
ROUTED TO	R5	6.27	1	FLOW	1774.	1735.	1618.	1465.	1390.	1352.
				TIME	5.08	5.08	5.08	5.17	5.17	5.17
HYDROGRAPH AT	RR22	2.15	1	FLOW	798.	780.	728.	658.	623.	606.
				TIME	4.00	4.00	4.00	4.00	4.00	4.00
ROUTED TO	R5	2.15	1	FLOW	731.	715.	667.	603.	572.	556.
				TIME	4.75	4.75	4.75	4.75	4.75	4.75
HYDROGRAPH AT	R5	5.77	1	FLOW	733.	705.	650.	573.	525.	508.
				TIME	5.17	5.17	5.17	5.17	5.17	5.17
5 COMBINED AT	R5	18.71	1	FLOW	4055.	3949.	3663.	3272.	3064.	2966.
				TIME	5.00	5.00	5.00	5.00	5.00	5.08
HYDROGRAPH AT	F1	4.63	1	FLOW	1623.	1588.	1485.	1348.	1280.	1247.
				TIME	4.17	4.17	4.17	4.17	4.17	4.17
OUTED TO	F5	4.63	1	FLOW	1492.	1461.	1366.	1241.	1180.	1149.
				TIME	5.25	5.25	5.25	5.25	5.25	5.25
YDROGRAPH AT	F2	1.28	1	FLOW	595.	582.	545.	495.	470.	458.
				TIME	3.83	3.83	3.83	3.83	3.83	3.83
TO	F5	1.28	1	FLOW	516.	505.	472.	428.	407.	396.
				TIME	4.58	4.58	4.58	4.58	4.58	4.58
HYDROGRAPH AT	F3	2.60	1	FLOW	1214.	1188.	1107.	1002.	949.	923.

				TIME	3.75	3.75	3.75	3.75	3.75	3.75
ROUTED TO	F5	2.60	1	FLOW	1085.	1061.	990.	895.	848.	825.
				TIME	4.17	4.17	4.17	4.17	4.17	4.17
[redacted]RAPH AT	F4	1.30	1	FLOW	509.	497.	462.	416.	393.	382.
				TIME	3.83	3.83	3.83	3.83	3.83	3.83
ROUTED TO	F5	1.30	1	FLOW	443.	433.	402.	361.	341.	331.
				TIME	4.50	4.50	4.50	4.50	4.50	4.50
HYDROGRAPH AT	F5N	4.04	1	FLOW	1010.	975.	875.	758.	697.	674.
				TIME	4.33	4.33	4.42	4.50	4.58	4.58
HYDROGRAPH AT	F5S	2.00	1	FLOW	502.	486.	436.	370.	339.	323.
				TIME	4.17	4.17	4.17	4.25	4.33	4.33
2 COMBINED AT	F5	6.04	1	FLOW	1492.	1435.	1290.	1102.	1014.	973.
				TIME	4.25	4.25	4.33	4.42	4.50	4.58
6 COMBINED AT	F5	34.56	1	FLOW	7739.	7559.	7051.	6376.	6021.	5850.
				TIME	5.08	5.08	5.08	5.08	5.08	5.17
ROUTED TO	UFL.DB	34.56	1	FLOW	3766.	3488.	2584.	1266.	1238.	1225.
				TIME	6.50	6.50	6.75	7.25	7.25	7.25
			** PEAK STAGES IN FEET **							
			1	STAGE	2471.46	2471.35	2471.00	2470.15	2469.32	2468.91
				TIME	6.50	6.50	6.75	7.25	7.25	7.25
F[redacted]TO	F5R	34.56	1	FLOW	3761.	3486.	2580.	1266.	1238.	1225.
				TIME	6.50	6.58	6.83	7.33	7.33	7.33
HYDROGRAPH AT	F6A	.55	1	FLOW	237.	232.	216.	196.	186.	181.
				TIME	3.75	3.75	3.75	3.75	3.75	3.75
ROUTED TO	F6B	.55	1	FLOW	214.	209.	195.	176.	167.	162.
				TIME	4.08	4.08	4.08	4.08	4.08	4.08
HYDROGRAPH AT	F6B	.85	1	FLOW	375.	367.	342.	308.	292.	284.
				TIME	3.67	3.67	3.67	3.67	3.67	3.67
2 COMBINED AT	F6B	1.40	1	FLOW	490.	479.	445.	402.	380.	370.
				TIME	3.75	3.75	3.75	3.75	3.75	3.75
ROUTED TO	F7	1.40	1	FLOW	463.	453.	422.	381.	360.	350.
				TIME	4.08	4.08	4.08	4.08	4.08	4.08
HYDROGRAPH AT	F7	1.50	1	FLOW	347.	335.	296.	253.	232.	221.
				TIME	4.17	4.17	4.25	4.33	4.33	4.42
2 COMBINED AT	F7	2.90	1	FLOW	806.	783.	713.	623.	577.	554.
				TIME	4.08	4.17	4.17	4.17	4.17	4.17
2 COMBINED AT	F7	37.46	1	FLOW	3881.	3591.	2652.	1536.	1494.	1473.
				TIME	6.50	6.58	6.83	5.33	5.33	5.33
[redacted]										
ROUTED TO	F7R	37.46	1	FLOW	3869.	3582.	2647.	1535.	1493.	1472.
				TIME	6.58	6.58	6.83	5.33	5.42	5.42

HYDROGRAPH AT	F8	.48	1	FLOW	56.	55.	51.	48.	46.	45.	
				TIME	3.67	3.67	3.67	3.67	3.67	3.67	
2 COMBINED AT	F8	37.94	1	FLOW	3874.	3586.	2650.	1550.	1507.	1486.	RAINBOW
				TIME	6.58	6.58	6.83	5.33	5.33	5.33	
ROUTED TO	F9	37.94	1	FLOW	3874.	3581.	2645.	1549.	1506.	1485.	
				TIME	6.58	6.58	6.83	5.33	5.33	5.33	
ROUTED TO	. .	37.94	1	FLOW	3868.	3580.	2644.	1549.	1506.	1485.	
				TIME	6.58	6.67	6.92	5.42	5.42	5.42	
HYDROGRAPH AT	R6	1.51	1	FLOW	134.	129.	115.	94.	84.	78.	
				TIME	5.25	5.25	5.33	5.42	5.50	5.58	
ROUTED TO	F9	1.51	1	FLOW	133.	129.	114.	94.	83.	78.	
				TIME	5.25	5.33	5.33	5.50	5.50	5.58	
HYDROGRAPH AT	F9	.90	1	FLOW	164.	162.	153.	143.	136.	133.	
				TIME	3.75	3.75	3.75	3.75	3.75	3.75	
2 COMBINED AT	F9	2.41	1	FLOW	202.	194.	173.	143.	136.	133.	
				TIME	5.17	5.17	5.25	3.75	3.75	3.75	
2 COMBINED AT	F9	40.35	1	FLOW	3940.	3646.	2694.	1688.	1631.	1603.	JONES
				TIME	6.58	6.67	6.92	5.42	5.42	5.42	
ROUTED TO	F14	40.35	1	FLOW	3907.	3614.	2666.	1681.	1625.	1597.	
				TIME	6.75	6.83	7.08	5.58	5.58	5.58	
H[illegible]RAPH AT	F10	1.17	1	FLOW	347.	338.	319.	294.	284.	277.	
				TIME	3.58	3.58	3.58	3.58	3.58	3.58	
HYDROGRAPH AT	R2	2.01	1	FLOW	689.	668.	607.	528.	489.	470.	
				TIME	3.58	3.58	3.58	3.58	3.58	3.58	
ROUTED TO	R3	2.01	1	FLOW	571.	553.	503.	437.	405.	389.	
				TIME	4.00	4.00	4.00	4.00	4.00	4.00	
HYDROGRAPH AT	R3	2.63	1	FLOW	183.	176.	156.	130.	117.	111.	
				TIME	5.25	5.25	5.25	5.25	5.25	5.25	
2 COMBINED AT	R3	4.64	1	FLOW	686.	661.	588.	497.	453.	432.	
				TIME	4.00	4.00	4.00	4.00	4.00	4.00	
ROUTED TO	R3	4.64	1	FLOW	157.	152.	136.	116.	107.	102.	
				TIME	5.92	5.92	5.92	5.92	5.92	5.92	
			** PEAK STAGES IN FEET **								
			1	STAGE	23.49	23.37	23.02	22.58	22.37	22.27	
				TIME	5.92	5.92	5.92	5.92	5.92	5.92	
ROUTED TO	R8	4.64	1	FLOW	157.	152.	136.	116.	107.	102.	
				TIME	5.92	5.92	5.92	6.00	6.00	6.00	
H[illegible]GRAPH AT	R7	1.39	1	FLOW	266.	257.	232.	200.	185.	177.	
				TIME	3.92	3.92	3.92	4.00	4.00	4.00	
DIVERSION TO	R7OF	1.39	1	FLOW	0.	0.	0.	0.	0.	0.	
				TIME	.08	.08	.08	.08	.08	.08	

YDROGRAPH AT	R7	1.39	1	FLOW	266.	257.	232.	200.	185.	177.	
				TIME	3.92	3.92	3.92	4.00	4.00	4.00	
OUTED TO	R8	1.39	1	FLOW	266.	256.	231.	200.	184.	176.	
				TIME	4.00	4.00	4.00	4.08	4.08	4.08	
YDROGRAPH AT	R8	.51	1	FLOW	64.	61.	54.	47.	44.	42.	
				TIME	3.83	3.83	5.00	5.00	5.00	5.00	
3 COMBINED AT	R8	6.54	1	FLOW	382.	371.	338.	295.	275.	265.	
				TIME	5.17	5.17	5.17	5.17	5.17	5.17	
OUTED TO	F10	6.54	1	FLOW	381.	370.	337.	295.	274.	265.	
				TIME	5.25	5.25	5.25	5.25	5.25	5.25	
2 COMBINED AT	F10	7.71	1	FLOW	487.	478.	437.	389.	365.	352.	
				TIME	3.67	3.67	3.67	3.67	3.67	3.67	
OUTED TO	F14	7.71	1	FLOW	479.	466.	429.	379.	357.	344.	
				TIME	5.08	5.08	5.08	5.08	5.08	5.08	
YDROGRAPH AT	F12	.88	1	FLOW	238.	230.	209.	180.	167.	160.	
				TIME	4.08	4.17	4.17	4.25	4.25	4.33	
OUTED TO	F12R	.88	1	FLOW	231.	224.	203.	176.	163.	157.	
				TIME	4.33	4.33	4.42	4.42	4.50	4.50	
YDROGRAPH AT	F13	.55	1	FLOW	135.	132.	123.	109.	102.	98.	
				TIME	4.92	5.00	5.00	5.00	5.00	5.00	
2 [illegible]BINED AT	F13	1.43	1	FLOW	320.	310.	288.	260.	248.	241.	
				TIME	4.33	4.33	5.00	5.00	5.00	5.00	
OUTED TO	F14	1.43	1	FLOW	317.	307.	286.	258.	246.	239.	
				TIME	4.50	4.50	5.08	5.17	5.17	5.17	
YDROGRAPH AT	F14	.78	1	FLOW	98.	94.	82.	67.	60.	57.	
				TIME	5.25	5.33	5.33	5.42	5.42	4.08	
4 COMBINED AT	F14	50.27	1	FLOW	4223.	3907.	2902.	2307.	2209.	2161.	DECATUR
				TIME	6.75	6.83	7.08	5.33	5.33	5.33	
OUTED TO	F14R	50.27	1	FLOW	4215.	3903.	2897.	2304.	2207.	2160.	
				TIME	6.75	6.83	7.08	5.42	5.42	5.42	
OUTED TO	.	50.27	1	FLOW	4207.	3891.	2890.	2303.	2205.	2158.	
				TIME	6.83	6.92	7.17	5.42	5.42	5.42	
OUTED TO	.	50.27	1	FLOW	4205.	3890.	2887.	2301.	2204.	2156.	
				TIME	6.83	6.92	7.17	5.42	5.50	5.50	
YDROGRAPH AT	F15	1.32	1	FLOW	238.	231.	214.	187.	176.	173.	
				TIME	3.92	3.92	3.92	3.92	3.92	3.92	
2 [illegible]BINED AT	F15	51.59	1	FLOW	4253.	3934.	2921.	2454.	2349.	2297.	UPRR
				TIME	6.83	6.92	7.17	5.42	5.42	5.42	
IVERSION TO	F15OF	51.59	1	FLOW	90.	0.	0.	0.	0.	0.	
				TIME	6.83	.08	.08	.08	.08	.08	

HYDROGRAPH AT	F150F	51.59	1	FLOW	4163.	3934.	2921.	2454.	2349.	2297.	
				TIME	6.83	6.92	7.17	5.42	5.42	5.42	
HYDROGRAPH AT	F16	.52	1	FLOW	172.	169.	158.	146.	137.	136.	
				TIME	3.67	3.67	3.67	3.67	3.75	3.75	
2 COMBINED AT	F16	52.11	1	FLOW	4177.	3946.	2931.	2516.	2406.	2351.	I15
				TIME	6.83	6.92	7.17	5.33	5.33	5.33	
DIVERSION TO	F160F	52.11	1	FLOW	0.	0.	0.	0.	0.	0.	
				TIME	.08	.08	.08	.08	.08	.08	
HYDROGRAPH AT	F160F	52.11	1	FLOW	4177.	3946.	2931.	2516.	2406.	2351.	CAESARS
				TIME	6.83	6.92	7.17	5.33	5.33	5.33	
ROUTED TO	F16	52.11	1	FLOW	4175.	3944.	2926.	2513.	2405.	2350.	
				TIME	6.83	6.92	7.17	5.33	5.42	5.42	
ROUTED TO	.	52.11	1	FLOW	4173.	3939.	2919.	2512.	2404.	2350.	
				TIME	6.83	6.92	7.17	5.42	5.42	5.42	
ROUTED TO	.	52.11	1	FLOW	4168.	3934.	2914.	2511.	2403.	2347.	
				TIME	6.92	7.00	7.33	5.50	5.50	5.50	
HYDROGRAPH AT	F17	.65	1	FLOW	167.	163.	152.	136.	129.	125.	
				TIME	4.17	4.17	4.17	4.17	4.17	4.25	
2 COMBINED AT	F17	52.76	1	FLOW	4198.	3961.	2934.	2599.	2486.	2429.	WINNICK / HUGHES CENTER
				TIME	6.92	7.00	7.33	5.50	5.50	5.50	
HYDROGRAPH AT	T8	1.22	1	FLOW	32.	30.	23.	16.	12.	11.	
				TIME	6.67	6.75	7.00	7.42	7.75	7.92	
ROUTED TO	T9	1.22	1	FLOW	30.	28.	22.	15.	12.	10.	
				TIME	7.17	7.25	7.50	8.00	8.25	8.42	
HYDROGRAPH AT	T9	.87	1	FLOW	71.	67.	58.	45.	40.	37.	
				TIME	5.42	5.50	5.58	5.75	5.83	5.92	
2 COMBINED AT	T9	2.09	1	FLOW	75.	71.	60.	47.	41.	38.	
				TIME	5.50	5.50	5.58	5.75	5.83	5.92	
DIVERSION TO	T90F	2.09	1	FLOW	0.	0.	0.	0.	0.	0.	
				TIME	.08	.08	.08	.08	.08	.08	
HYDROGRAPH AT	T90F	2.09	1	FLOW	75.	71.	60.	47.	41.	38.	
				TIME	5.50	5.50	5.58	5.75	5.83	5.92	
ROUTED TO	T10	2.09	1	FLOW	74.	70.	60.	47.	41.	38.	
				TIME	5.75	5.75	5.83	6.00	6.08	6.17	
HYDROGRAPH AT	T4	3.22	1	FLOW	937.	916.	830.	719.	664.	637.	
				TIME	4.08	4.08	4.17	4.17	4.25	4.25	
ROUTED TO	T5	3.22	1	FLOW	933.	911.	830.	714.	662.	634.	
				TIME	4.17	4.17	4.25	4.25	4.33	4.33	
HYDROGRAPH AT	T5	1.00	1	FLOW	262.	254.	228.	196.	181.	173.	
				TIME	4.08	4.08	4.08	4.17	4.25	4.25	

2 COMBINED AT	T5	4.22	1	FLOW	1190.	1160.	1051.	909.	839.	805.
				TIME	4.17	4.17	4.25	4.25	4.33	4.33
[illegible] TO	T6	4.22	1	FLOW	1177.	1149.	1042.	903.	837.	797.
				TIME	4.33	4.33	4.42	4.42	4.50	4.50
YDROGRAPH AT	T6	1.30	1	FLOW	323.	314.	281.	243.	225.	215.
				TIME	4.25	4.25	4.33	4.33	4.42	4.42
2 COMBINED AT	T6	5.52	1	FLOW	1494.	1458.	1320.	1145.	1059.	1012.
				TIME	4.33	4.33	4.33	4.42	4.50	4.50
YDROGRAPH AT	T90F	.00	1	FLOW	0.	0.	0.	0.	0.	0.
				TIME	.08	.08	.08	.08	.08	.08
OUTED TO	T6	.00	1	FLOW	0.	0.	0.	0.	0.	0.
				TIME	.08	.08	.08	.08	.08	.08
2 COMBINED AT	T6	5.52	1	FLOW	1494.	1458.	1320.	1145.	1059.	1012.
				TIME	4.33	4.33	4.33	4.42	4.50	4.50
IVERSION TO	T60F	5.52	1	FLOW	744.	708.	570.	395.	309.	262.
				TIME	4.33	4.33	4.33	4.42	4.50	4.50
YDROGRAPH AT	T6	5.52	1	FLOW	750.	750.	750.	750.	750.	750.
				TIME	4.00	4.00	4.08	4.17	4.25	4.25
OUTED TO	T10	5.52	1	FLOW	750.	750.	750.	750.	750.	750.
				TIME	5.08	5.08	5.17	5.25	5.42	5.33
YDROGRAPH AT	T1	1.56	1	FLOW	477.	466.	428.	376.	348.	334.
				TIME	4.00	4.00	4.08	4.08	4.17	4.17
OUTED TO	T3	1.56	1	FLOW	472.	463.	427.	371.	345.	331.
				TIME	4.25	4.25	4.33	4.42	4.42	4.42
YDROGRAPH AT	T3	.99	1	FLOW	129.	126.	116.	101.	94.	90.
				TIME	5.08	5.08	5.08	5.17	5.25	5.25
2 COMBINED AT	T3	2.55	1	FLOW	571.	556.	501.	429.	393.	376.
				TIME	4.33	4.33	4.33	4.42	4.50	4.50
YDROGRAPH AT	T60F	.00	1	FLOW	744.	708.	570.	395.	309.	262.
				TIME	4.33	4.33	4.33	4.42	4.50	4.50
OUTED TO	T3	.00	1	FLOW	724.	687.	550.	378.	298.	250.
				TIME	4.42	4.42	4.50	4.50	4.58	4.58
2 COMBINED AT	T3	2.55	1	FLOW	1284.	1234.	1050.	803.	681.	619.
				TIME	4.42	4.42	4.42	4.50	4.58	4.58
IVERSION TO	T30F	2.55	1	FLOW	0.	0.	0.	0.	0.	0.
				TIME	.08	.08	.08	.08	.08	.08
[illegible]RAPH AT	T30F	2.55	1	FLOW	1284.	1234.	1050.	803.	681.	619.
				TIME	4.42	4.42	4.42	4.50	4.58	4.58
OUTED TO	T10	2.55	1	FLOW	1277.	1222.	1044.	797.	678.	614.
				TIME	4.42	4.42	4.50	4.58	4.58	4.67

HYDROGRAPH AT	T10	.82	1	FLOW	157.	151.	142.	126.	117.	116.
				TIME	3.75	3.75	3.75	3.75	3.75	3.75
4 COMBINED AT	T10	10.98	1	FLOW	2129.	2068.	1878.	1617.	1491.	1428.
				TIME	4.42	4.42	4.50	4.58	4.67	4.67
ROUTED TO	T10R	10.98	1	FLOW	2124.	2066.	1875.	1614.	1491.	1426.
				TIME	4.42	4.50	4.50	4.58	4.67	4.67
ROUTED TO	.	10.98	1	FLOW	2122.	2062.	1871.	1612.	1486.	1425.
				TIME	4.50	4.50	4.58	4.67	4.75	4.75
HYDROGRAPH AT	T11	1.09	1	FLOW	255.	251.	236.	216.	210.	205.
				TIME	3.83	3.83	3.83	3.83	3.83	3.83
2 COMBINED AT	T11	12.07	1	FLOW	2233.	2171.	1968.	1699.	1570.	1508.
				TIME	4.50	4.50	4.58	4.67	4.75	4.75
ROUTED TO	T11R	12.07	1	FLOW	2229.	2165.	1965.	1697.	1570.	1506.
				TIME	4.50	4.50	4.58	4.67	4.75	4.75
ROUTED TO	.	12.07	1	FLOW	2213.	2153.	1954.	1685.	1567.	1500.
				TIME	4.67	4.67	4.67	4.83	4.83	4.92
HYDROGRAPH AT	T12	.77	1	FLOW	191.	188.	176.	163.	155.	153.
				TIME	3.83	3.83	3.83	3.83	3.83	3.83
2 COMBINED AT	T12	12.84	1	FLOW	2287.	2226.	2020.	1748.	1625.	1562.
				TIME	4.58	4.67	4.67	4.83	4.83	4.92
HYDROGRAPH AT	T3OF	.00	1	FLOW	0.	0.	0.	0.	0.	0.
				TIME	.08	.08	.08	.08	.08	.08
ROUTED TO	T12	.00	1	FLOW	0.	0.	0.	0.	0.	0.
				TIME	.08	.08	.08	.08	.08	.08
2 COMBINED AT	T12	12.84	1	FLOW	2287.	2226.	2020.	1748.	1625.	1562.
				TIME	4.58	4.67	4.67	4.83	4.83	4.92
HYDROGRAPH AT	MNW-B	.68	1	FLOW	31.	30.	27.	23.	22.	21.
				TIME	6.50	6.50	6.42	6.42	6.42	6.42
DIVERSION TO	BCULV	.68	1	FLOW	22.	22.	22.	22.	22.	21.
				TIME	5.25	5.33	5.50	6.00	6.42	6.42
HYDROGRAPH AT	DIVB	.68	1	FLOW	9.	8.	5.	1.	0.	0.
				TIME	6.50	6.50	6.42	6.42	.08	.08
ROUTED TO	RDIVB	.68	1	FLOW	9.	8.	5.	1.	0.	0.
				TIME	6.50	6.50	6.50	6.58	.08	.08
HYDROGRAPH AT	MNW-C	.69	1	FLOW	47.	45.	42.	37.	35.	34.
				TIME	6.00	6.00	6.00	5.92	5.92	5.92
2 COMBINED AT	MNW-C	1.37	1	FLOW	54.	52.	45.	37.	35.	34.
				TIME	6.17	6.17	6.17	5.92	5.92	5.92
ROUTED TO	MNW-C	1.37	1	FLOW	40.	39.	36.	32.	30.	29.
				TIME	7.08	7.08	7.00	6.75	6.67	6.67

** PEAK STAGES IN FEET **

			1	STAGE	57.43	57.33	57.08	56.66	56.49	56.43
				TIME	7.08	7.08	7.00	6.75	6.67	6.67
[illegible]ION TO	CCULV	1.37	1	FLOW	40.	39.	36.	32.	30.	29.
				TIME	7.08	7.08	7.00	6.75	6.67	6.67
YDROGRAPH AT	DIVC	1.37	1	FLOW	0.	0.	0.	0.	0.	0.
				TIME	.08	.08	.08	.08	.08	.08
YDROGRAPH AT	MNW-D	.05	1	FLOW	5.	5.	4.	3.	3.	3.
				TIME	3.83	3.83	5.08	5.08	5.08	5.08
2 COMBINED AT	MNW-D	1.42	1	FLOW	5.	5.	4.	3.	3.	3.
				TIME	3.83	3.83	5.08	5.08	5.08	5.08
IVERSION TO	DCULV	1.42	1	FLOW	5.	5.	4.	3.	3.	3.
				TIME	3.83	3.83	5.08	5.08	5.08	5.08
IYDROGRAPH AT	DIVD	1.42	1	FLOW	0.	0.	0.	0.	0.	0.
				TIME	.08	.08	.08	.08	.08	.08
OUTED TO	RDIVD	1.42	1	FLOW	0.	0.	0.	0.	0.	0.
				TIME	.08	.08	.08	.08	.08	.08
IYDROGRAPH AT	MNW-E	.05	1	FLOW	7.	7.	6.	5.	5.	5.
				TIME	3.75	3.75	3.75	3.75	3.75	3.75
2 COMBINED AT	MNW-E	1.47	1	FLOW	7.	7.	6.	5.	5.	5.
				TIME	3.75	3.75	3.75	3.75	3.75	3.75
IVERSION TO	ECULV	1.47	1	FLOW	7.	7.	6.	5.	5.	5.
				TIME	3.75	3.75	3.75	3.75	3.75	3.75
IYDROGRAPH AT	ECULV	1.47	1	FLOW	0.	0.	0.	0.	0.	0.
				TIME	.08	.08	.08	.08	.08	.08
OUTED TO	RDIVE	1.47	1	FLOW	0.	0.	0.	0.	0.	0.
				TIME	.08	.08	.08	.08	.08	.08
IYDROGRAPH AT	MNW-FG	.36	1	FLOW	29.	29.	26.	23.	22.	21.
				TIME	5.33	5.33	5.33	5.25	5.25	5.17
2 COMBINED AT	MNW-FG	1.83	1	FLOW	29.	29.	26.	23.	22.	21.
				TIME	5.33	5.33	5.33	5.25	5.25	5.17
IVERSION TO	GCULV	1.83	1	FLOW	29.	29.	26.	23.	22.	21.
				TIME	5.33	5.33	5.33	5.25	5.25	5.17
IYDROGRAPH AT	DIVG	1.83	1	FLOW	0.	0.	0.	0.	0.	0.
				TIME	.08	.08	.08	.08	.08	.08
OUTED TO	RDIVG	1.83	1	FLOW	0.	0.	0.	0.	0.	0.
				TIME	.08	.08	.08	.08	.08	.08
[illegible]GRAPH AT	MNW-J1	2.37	1	FLOW	90.	87.	75.	62.	55.	52.
				TIME	6.92	6.92	7.00	7.00	7.08	7.08
ROUTED TO	MNW-J2	2.37	1	FLOW	90.	87.	75.	62.	55.	52.

				TIME	7.33	7.33	7.33	7.42	7.50	7.50
HYDROGRAPH AT	MNW-J2	1.21	1	FLOW	100.	97.	88.	76.	70.	68.
				TIME	5.50	5.50	5.50	5.50	5.50	5.50
[illegible]BINED AT	MNW-J2	3.58	1	FLOW	142.	136.	119.	98.	89.	84.
				TIME	6.00	6.00	6.08	6.08	6.08	6.00
2 COMBINED AT	CP1	5.41	1	FLOW	142.	136.	119.	98.	89.	84.
				TIME	6.00	6.00	6.08	6.08	6.08	6.00
ROUTED TO	RCP1	5.41	1	FLOW	142.	136.	119.	98.	89.	84.
				TIME	6.08	6.08	6.17	6.17	6.17	6.17
HYDROGRAPH AT	RTNE	.00	1	FLOW	7.	7.	6.	5.	5.	5.
				TIME	3.75	3.75	3.75	3.75	3.75	3.75
HYDROGRAPH AT	RTNE	.01	1	FLOW	0.	0.	0.	0.	0.	0.
				TIME	.08	.08	.08	.08	.08	.08
2 COMBINED AT	RTNE	.01	1	FLOW	7.	7.	6.	5.	5.	5.
				TIME	3.75	3.75	3.75	3.75	3.75	3.75
ROUTED TO	RRTNE	.01	1	FLOW	7.	7.	6.	5.	5.	5.
				TIME	4.42	4.50	4.50	4.50	4.50	4.50
HYDROGRAPH AT	RTNG	.00	1	FLOW	29.	29.	26.	23.	22.	21.
				TIME	5.33	5.33	5.33	5.25	5.25	5.17
HYDROGRAPH AT	RTNG	.01	1	FLOW	0.	0.	0.	0.	0.	0.
				TIME	.08	.08	.08	.08	.08	.08
2 COMBINED AT	RTNG	.01	1	FLOW	29.	29.	26.	23.	22.	21.
				TIME	5.33	5.33	5.33	5.25	5.25	5.17
ROUTED TO	RRTNG	.01	1	FLOW	29.	29.	26.	23.	22.	21.
				TIME	5.58	5.58	5.58	5.50	5.50	5.42
HYDROGRAPH AT	MNW-I1	.25	1	FLOW	53.	52.	47.	42.	39.	38.
				TIME	4.00	4.00	4.00	4.00	4.00	4.00
3 COMBINED AT	CP2	.27	1	FLOW	71.	69.	64.	58.	54.	53.
				TIME	5.17	5.17	5.17	5.17	5.17	5.17
ROUTED TO	RCP2	.27	1	FLOW	71.	69.	64.	57.	54.	53.
				TIME	5.25	5.25	5.25	5.25	5.25	5.25
HYDROGRAPH AT	MNW-I2	.14	1	FLOW	26.	25.	22.	19.	17.	16.
				TIME	3.83	3.83	3.83	3.83	3.83	3.83
3 COMBINED AT	CP3	5.82	1	FLOW	200.	192.	171.	145.	134.	129.
				TIME	5.50	5.50	5.50	5.33	5.25	5.25
ROUTED TO	RCP3	5.82	1	FLOW	199.	192.	171.	145.	134.	129.
				TIME	5.67	5.67	5.67	5.50	5.50	5.42
H[illegible]GRAPH AT	MNW-K	1.43	1	FLOW	142.	139.	129.	117.	111.	108.
				TIME	5.50	5.50	5.42	5.42	5.42	5.42
2 COMBINED AT	CP4	7.25	1	FLOW	341.	331.	299.	262.	245.	237.

				TIME	5.58	5.58	5.58	5.50	5.42	5.42
OUTED TO	RCP4	7.25	1	FLOW	341.	330.	299.	261.	245.	237.
				TIME	5.67	5.67	5.67	5.58	5.50	5.50
[illegible]RAPH AT	MNW-I	.27	1	FLOW	118.	115.	109.	101.	97.	95.
				TIME	3.75	3.75	3.75	3.75	3.75	3.75
YDROGRAPH AT	MNW-M	.49	1	FLOW	165.	162.	154.	142.	137.	134.
				TIME	4.25	4.25	4.25	4.25	4.25	4.25
3 COMBINED AT	CP5	8.01	1	FLOW	488.	476.	441.	398.	376.	366.
				TIME	5.17	5.17	5.17	5.17	5.17	5.17
OUTED TO	T12	8.01	1	FLOW	488.	476.	441.	398.	376.	366.
				TIME	5.25	5.25	5.25	5.25	5.25	5.25
OUTED TO	.	8.01	1	FLOW	487.	475.	440.	397.	375.	365.
				TIME	5.42	5.42	5.42	5.42	5.33	5.42
2 COMBINED AT	T12	20.85	1	FLOW	2733.	2662.	2428.	2117.	1975.	1905.
				TIME	4.58	4.67	4.67	4.83	4.83	4.92
2 COMBINED AT	F17	73.61	1	FLOW	5548.	5401.	4985.	4556.	4346.	4235.
				TIME	4.67	4.67	5.33	5.33	5.33	5.42
OUTED TO	F18	73.61	1	FLOW	5544.	5395.	4984.	4555.	4343.	4234.
				TIME	4.67	4.67	5.33	5.33	5.33	5.42
[illegible]TED TO	.	73.61	1	FLOW	5538.	5387.	4983.	4553.	4342.	4234.
				TIME	4.67	4.67	5.33	5.33	5.42	5.42
YDROGRAPH AT	R4	2.28	1	FLOW	865.	844.	783.	703.	664.	644.
				TIME	3.75	3.75	3.75	3.75	3.75	3.75
YDROGRAPH AT	F150F	.00	1	FLOW	90.	0.	0.	0.	0.	0.
				TIME	6.83	.08	.08	.08	.08	.08
OUTED TO	F150FR	.00	1	FLOW	56.	0.	0.	0.	0.	0.
				TIME	7.08	.08	.08	.08	.08	.08
2 COMBINED AT	R4	2.28	1	FLOW	865.	844.	783.	703.	664.	644.
				TIME	3.75	3.75	3.75	3.75	3.75	3.75
HYDROGRAPH AT	F160F	.00	1	FLOW	0.	0.	0.	0.	0.	0.
				TIME	.08	.08	.08	.08	.08	.08
ROUTED TO	F160FR	.00	1	FLOW	0.	0.	0.	0.	0.	0.
				TIME	.08	.08	.08	.08	.08	.08
2 COMBINED AT	R4	2.28	1	FLOW	865.	844.	783.	703.	664.	644.
				TIME	3.75	3.75	3.75	3.75	3.75	3.75
ROUTED TO	F18	2.28	1	FLOW	692.	676.	627.	563.	531.	515.
				TIME	4.67	4.67	4.67	4.67	4.67	4.67
h [illegible]GRAPH AT	F18	.87	1	FLOW	269.	267.	251.	229.	219.	215.
				TIME	3.75	3.75	3.75	3.83	3.83	3.83
2 COMBINED AT	F18	3.15	1	FLOW	789.	771.	717.	646.	611.	594.

FLAMINGO / TROPICANA CONFLUENCE

				TIME	4.67	4.67	4.67	4.67	4.67	4.67	
HYDROGRAPH AT	F24	1.03	1	FLOW	468.	463.	440.	411.	396.	385.	
				TIME	3.67	3.67	3.67	3.67	3.67	3.67	
[redacted]BINED AT	F18	77.79	1	FLOW	6430.	6263.	5767.	5151.	4863.	4721.	SPENCER
				TIME	4.67	4.75	4.83	5.00	5.00	5.08	
ROUTED TO	F18R	77.79	1	FLOW	6425.	6261.	5764.	5150.	4860.	4719.	
				TIME	4.75	4.83	4.92	5.08	5.17	5.17	
HYDROGRAPH AT	F20A	.81	1	FLOW	121.	120.	113.	104.	100.	97.	
				TIME	3.83	3.83	3.83	3.83	3.83	3.83	
2 COMBINED AT	F20A	78.60	1	FLOW	6468.	6305.	5808.	5197.	4906.	4764.	
				TIME	4.75	4.83	4.92	5.08	5.17	5.17	
ROUTED TO	F20B	78.60	1	FLOW	6465.	6303.	5806.	5196.	4906.	4763.	
				TIME	4.83	4.83	4.92	5.08	5.17	5.25	
ROUTED TO	.	78.60	1	FLOW	6465.	6301.	5804.	5195.	4905.	4763.	
				TIME	4.83	4.83	4.92	5.08	5.17	5.25	
HYDROGRAPH AT	F19	1.54	1	FLOW	614.	603.	571.	534.	509.	504.	
				TIME	3.67	3.67	3.67	3.67	3.67	3.67	
ROUTED TO	F20B	1.54	1	FLOW	545.	536.	508.	472.	452.	445.	
				TIME	3.83	3.83	3.83	3.83	3.83	3.83	
HY[redacted]GRAPH AT	F20B	.73	1	FLOW	238.	231.	212.	186.	173.	167.	
				TIME	3.67	3.67	3.67	3.67	3.67	3.67	
2 COMBINED AT	F20B	2.27	1	FLOW	724.	710.	668.	613.	584.	573.	
				TIME	3.83	3.83	3.83	3.83	3.83	3.83	
HYDROGRAPH AT	VB	4.58	1	FLOW	781.	754.	676.	576.	528.	504.	
				TIME	3.92	3.92	4.00	4.00	4.00	4.00	
3 COMBINED AT	F20B	85.45	1	FLOW	7341.	7175.	6661.	5993.	5650.	5483.	DIS DESERT INN
				TIME	5.00	5.00	5.08	5.08	5.17	5.17	
ROUTED TO	F22	85.45	1	FLOW	7332.	7165.	6659.	5984.	5649.	5477.	
				TIME	5.00	5.08	5.08	5.17	5.17	5.17	
HYDROGRAPH AT	F21	1.27	1	FLOW	505.	497.	466.	439.	408.	401.	
				TIME	3.67	3.67	3.67	3.67	3.67	3.67	
DIVERSION TO	OAKEY	1.27	1	FLOW	253.	248.	233.	219.	204.	200.	
				TIME	3.67	3.67	3.67	3.67	3.67	3.67	
HYDROGRAPH AT	F21	1.27	1	FLOW	253.	248.	233.	219.	204.	200.	
				TIME	3.67	3.67	3.67	3.67	3.67	3.67	
ROUTED TO	F22	1.27	1	FLOW	243.	239.	225.	212.	198.	195.	
				TIME	3.75	3.75	3.75	3.75	3.75	3.75	
H[redacted]GRAPH AT	F22	3.43	1	FLOW	1111.	1075.	1015.	938.	896.	875.	
				TIME	3.67	3.67	3.67	3.67	3.75	3.75	
3 COMBINED AT	F22	90.15	1	FLOW	8002.	7826.	7270.	6530.	6161.	5974.	BOULDER HWY

				TIME	5.08	5.08	5.08	5.08	5.17	5.17
UTED TO	F23	90.15	1	FLOW	8001.	7825.	7266.	6521.	6159.	5970.
				TIME	5.08	5.08	5.08	5.17	5.17	5.17
UTED TO	.	90.15	1	FLOW	7995.	7813.	7255.	6520.	6148.	5961.
				TIME	5.08	5.08	5.17	5.17	5.25	5.25
UTED TO	.	90.15	1	FLOW	7987.	7808.	7246.	6512.	6142.	5949.
				TIME	5.17	5.17	5.17	5.25	5.25	5.25
UTED TO	.	90.15	1	FLOW	7976.	7791.	7239.	6497.	6135.	5947.
				TIME	5.17	5.17	5.25	5.33	5.33	5.33
DROGRAPH AT	F23	1.92	1	FLOW	315.	309.	288.	263.	250.	243.
				TIME	4.08	4.08	4.08	4.17	4.17	4.17
COMBINED AT	F23	92.07	1	FLOW	8188.	8002.	7430.	6664.	6292.	6098.
				TIME	5.17	5.25	5.25	5.33	5.33	5.33

NELLIS / LAS VEGAS WASH

SUMMARY OF KINEMATIC WAVE - MUSKINGUM-CUNGE ROUTING
(FLOW IS DIRECT RUNOFF WITHOUT BASE FLOW)

ISTAO	ELEMENT	DT	PEAK	TIME TO PEAK	VOLUME	INTERPOLATED TO COMPUTATION INTERVAL DT	PEAK	TIME TO PEAK	VOLUME
		(MIN)	(CFS)	(MIN)	(IN)	(MIN)	(CFS)	(MIN)	(IN)
FOR PLAN = 1 RATIO= .72									
	RR23 MANE	5.00	766.30	243.37	1.08	5.00	757.34	245.00	1.08

NTINUITY SUMMARY (AC-FT) - INFLOW= .0000E+00 EXCESS= .1178E+03 OUTFLOW= .1165E+03 BASIN STORAGE= .2933E+00 PERCENT ERROR= .8

FOR PLAN = 1 RATIO= .72									
	RR23 MANE	5.00	274.70	311.38	.53	5.00	274.30	315.00	.53

NTINUITY SUMMARY (AC-FT) - INFLOW= .0000E+00 EXCESS= .5797E+02 OUTFLOW= .5689E+02 BASIN STORAGE= .3317E+00 PERCENT ERROR= 1.3

FOR PLAN = 1 RATIO= .71									
	RR23 MANE	5.00	268.63	313.61	.51	5.00	268.02	315.00	.51

NTINUITY SUMMARY (AC-FT) - INFLOW= .0000E+00 EXCESS= .5608E+02 OUTFLOW= .5499E+02 BASIN STORAGE= .3307E+00 PERCENT ERROR= 1.3

FOR PLAN = 1 RATIO= .68									
	RR23 MANE	4.87	242.01	313.10	.46	5.00	241.73	315.00	.46

ONTINUITY SUMMARY (AC-FT) - INFLOW= .0000E+00 EXCESS= .5054E+02 OUTFLOW= .4947E+02 BASIN STORAGE= .3330E+00 PERCENT ERROR= 1.5

FOR PLAN = 1 RATIO= .64									
	RR23 MANE	5.00	213.92	314.04	.39	5.00	213.76	315.00	.39

ONTINUITY SUMMARY (AC-FT) - INFLOW= .0000E+00 EXCESS= .4346E+02 OUTFLOW= .4256E+02 BASIN STORAGE= .2923E+00 PERCENT ERROR= 1.4

FOR PLAN = 1 RATIO= .62									
	RR23 MANE	5.00	199.11	314.34	.36	5.00	199.04	315.00	.36

ONTINUITY SUMMARY (AC-FT) - INFLOW= .0000E+00 EXCESS= .4006E+02 OUTFLOW= .3920E+02 BASIN STORAGE= .3073E+00 PERCENT ERROR= 1.4

FOR PLAN = 1 RATIO= .61									
	RR23 MANE	5.00	191.60	316.93	.35	5.00	191.25	315.00	.35

CONTINUITY SUMMARY (AC-FT) - INFLOW= .0000E+00 EXCESS= .3839E+02 OUTFLOW= .3753E+02 BASIN STORAGE= .3150E+00 PERCENT ERROR= 1.4

FOR PLAN = 1 RATIO= .72

```
        FOR PLAN = 1  RATIO=  .68
             F23  MANE          5.00     288.39     243.46        .70       5.00     288.29     245.00          .70

ONTINUITY SUMMARY (AC-FT) - INFLOW= .0000E+00 EXCESS= .7306E+02 OUTFLOW  .7138E+02 BASIN STORAGE  .8135E+00 PERCENT ERROR=    1.2

        FOR PLAN = 1  RATIO=  .64
             F23  MANE          5.00     264.35     249.04        .63       5.00     262.53     250.00          .63

ONTINUITY SUMMARY (AC-FT) - INFLOW= .0000E+00 EXCESS= .6623E+02 OUTFLOW= .6453E+02 BASIN STORAGE= .8448E+00 PERCENT ERROR=    1.3

        FOR PLAN = 1  RATIO=  .62
             F23  MANE          5.00     251.75     246.36        .60       5.00     249.98     250.00          .60

ONTINUITY SUMMARY (AC-FT) - INFLOW= .0000E+00 EXCESS= .6290E+02 OUTFLOW= .6123E+02 BASIN STORAGE= .8371E+00 PERCENT ERROR=    1.3

        FOR PLAN = 1  RATIO=  .61
             F23  MANE          5.00     243.09     251.12        .58       5.00     242.99     250.00          .58

CONTINUITY SUMMARY (AC-FT) - INFLOW= .0000E+00 EXCESS= .6126E+02 OUTFLOW= .5959E+02 BASIN STORAGE= .8347E+00 PERCENT ERROR=    1.4


*** NORMAL END OF HEC-1 ***
```

CENTRAL STORM HEC-1 MODEL
FILE NAME: F-FLC.DAT

CENTRAL STORM HEC-1 MODEL
SEPTEMBER 1990 VERSION
FILE NAME: F-FLC.DAT

This model was developed by deleting the Upper Flamingo Wash Detention Basin drainage area from the Overall Storm HEC-1 model (F-FL.DAT). The reason for this modification was to check the effects of a different storm centering. The HEC-1 model results indicated a significant increase in 100-year peak discharges downstream of the Flamingo/Tropicana Wash confluence.

```
*****************************************
*                                       *
*  FLOOD HYDROGRAPH PACKAGE (HEC-1)     *
*        SEPTEMBER 1990                 *
*         VERSION 4.0                   *
*                                       *
*  RUN DATE  10/06/1997  TIME  13:05:44 *
*                                       *
*****************************************
```

```
*****************************************
*                                       *
*    U.S. ARMY CORPS OF ENGINEERS       *
*    HYDROLOGIC ENGINEERING CENTER      *
*         609 SECOND STREET             *
*       DAVIS, CALIFORNIA 95616         *
*         (916) 756-1104                *
*                                       *
*****************************************
```

```
X     X  XXXXXXX   XXXXX           X
X     X  X        X     X         XX
X     X  X        X                 X
XXXXXXX  XXXX     X        XXXXX    X
X     X  X        X                 X
X     X  X        X     X           X
X     X  XXXXXXX   XXXXX           XXX
```

THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.
THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION
NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL LOSS RATE:GREEN AND AMPT INFILTRATION
KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM

```
LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

          *DIAGRAM
    1     ID        INPUT FILE = F-FLC.DAT       BY: JEP        DATE:  10/06/97
    2     ID        FLAMINGO WASH FIS RESTUDY GCW MODIFICATIONS
    3     ID
    4     ID        REVISED DUPLICATED FIS MODEL F100R.DAT
    5     ID        DELETE RED ROCK WATERSHED TO SIMULATE EXPANSION OF RR DET. BASIN
    6     ID        DELETE UPPER FLAMINGO DET. BASIN WATERSHED TO SIMULATE
    7     ID        STORM CENTERING BELOW BASIN
    8     ID
    9     ID    CLARK COUNTY FLOOD CONTROL DISTRICT MASTER PLAN UPDATE
   10     ID    RED ROCK/FLAMINGO/TROPICANA WATERSHED
   11     ID    EXISTING DRAINAGE SYSTEM WITH PRESENT DEVELOPMENT
   12     ID    FLAMINGO/TROPICANA STORM (NO UPPER BLUE DIAMOND)- MAIN CHANNEL RUN
   13     ID        100-YEAR 6-HR STORM (SDN #5)
   14     ID        JMM    OCTOBER 1990
   15     ID
   16     ID        BASIC DATA FILE BASED ON COE FILE S10P40X.
   17     ID        MODIFICATIONS ADDED FROM B&V RED ROCK BASIN AND UPPER FLAMINGO
   18     ID        BASIN HEC-1 RUNS; NIMBUS NORTHWEST MCCARRAN AIRPORT HEC-1 RUNS;
   19     ID        AND SUBBASIN MODIFICATIONS DUE TO RECENT DEVELOPMENT.
   20     ID
   21     ID        COE MUSKINGUM ROUTING CONVERTED TO KINEMATIC FOR EXISTING
   22     ID        IMPROVED CHANNELS FROM FACILITY INVENTORY.
   23     ID
   24     ID    PB CARDS CONTAIN POINT PRECIPITATION.  DARF'S FROM CCRFCD MANUAL
   25     ID    BASED ON STORM AREAS FOR CONCENTRATION POINTS AS FOLLOWS:
   26     ID
   27     ID        SUBBASIN          AREA (SQMI)              DARF
   28     ID        --------          -----------              ----
   29     ID        RAINBOW            3.38                    0.92
   30     ID          JONES            5.79                    0.90
   31     ID        DECATUR,          15.71                    0.82
   32     ID       UPPR,I15,CAESARS   17-19                    0.80
   33     ID       WINNICK,HUGHES
   34     ID       FL/TROP CONF.,     38-43                    0.71
   35     ID        SPENCER
   36     ID       D/S FROM DI        50.89                    0.68
   37     ID       BLDR HWY,NELLIS,   55-57                    0.67
   38     ID       DESERT ROSE
   39     ID
   40     IT      5       0       0     200
   41     IO      5
   42     JR   PREC     .92     .90     .82     .80     .71     .68     .67

   43     KK    F6A RUNOFF FROM F6A
   44     BA    .55
   45     PC   .000    .020    .059    .080    .110    .144    .150    .160    .168    .171
   46     PC   .180    .182    .187    .190    .197    .202    .210    .220    .230    .241
   47     PC   .250    .259    .265    .280    .290    .300    .305    .309    .310    .317
   48     PC   .321    .327    .333    .346    .361    .381    .408    .430    .477    .514
   49     PC   .561    .630    .710    .720    .731    .752    .779    .790    .795    .804
   50     PC   .810    .820    .826    .840    .859    .889    .910    .938    .966    .970
   51     PC   .974    .979    .981    .983    .985    .989    .990    .992    .993    .996
   52     PC   .997    .999   1.00
   53     PB  2.86
```

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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  54      LS       0      88
  55      UD    0.35

  56      KK     F6B ROUTE F6A THRU F6B
  57      RM       4    0.35    0.15

  58      KK     F6B RUNOFF FROM F6B
  59      BA    0.85
  60      PB    2.77
  61      LS       0      88
  62      UD    0.30

  63      KK     F6B COMBINE F6A AND F6B
  64      HC       2

  65      KK      F7 ROUTE F6 THRU F7
  66      RM       3    0.28    0.15

  67      KK      F7 RUNOFF FROM F7
  68      BA    1.50
  69      PB    2.77
  70      LS       0    85.5
  71      UK     700    .015     .15     100
  72      RK    4000   .0114    .030     .65                          1
  73      RK    7500   .0116    .030            TRAP      50       5      NO

  74      KK      F7 COMBINE F7 WITH ROUTED F6
  75      HC       2

  76      KK     F7R ROUTE F7 THRU F8 (FLWA1267-1335)
  77      RK    5230    .011    .030            TRAP      40       1

  78      KK      F8 RUNOFF FROM F8
  79      BA     .48
  80      LS       0    66.1       0       0      98       0
  81      UK    1500    .014     .28      83
  82      UK      50    .020     .10      17
  83      RK    1800     .01    .020    .048
  84      RK    7200    .010    .030                    30       2      NO

  85      KK      F8 COMBINE F8 AND F7R
  86      KM         RAINBOW
  87      HC       2

  88      KK      F9 ROUTE F8 THRU F9 (FLWA1203)
  89      RK    1740   .0138    .015            TRAP      40       2

  90      KK       . (FLWA1152)
  91      RK    2640   .0044    .040            TRAP      50       3
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  92      KK      R6 RUNOFF FROM R6
  93      KM        MOVED HYDROGRAPH
  94      BA    1.51
  95      PB    2.77
  96      LS       0    73.2
  97      UK     500    .015     .15     100
  98      RK    5200    .016    .030     .13                          1
  99      RK    8000   .0044    .030          TRAP      40          1      NO

 100      KK      F9ROUTE R6 THRU F9
 101      KM        ADDED ROUTING
 102      RK    1740   .0138    .015          TRAP      40          2

 103      KK      F9 RUNOFF FROM F9
 104      BA     .90
 105      LS       0    63.0       0       0     98       0
 106      UK     500    .010     .25      73
 107      UK      40    .015     .10      27
 108      RK    2400    .007    .020     .35                          1
 109      RK    2300    .008    .020    .015                          1
 110      RK   10800    .013    .023          TRAP      50          3      NO

 111      KK      F9 COMBINE R6 WITH F9
 112      KM        ADDED COMBINATION
 113      HC       2

 114      KK      F9 COMBINE F8 WITH F9
 115      KM           JONES
 116      HC       2

 117      KK     F14 ROUTE F9 THRU F14
 118      RM       2    0.16    0.20

 119      KK     F10 RUNOFF FROM F10
 120      BA    1.17
 121      LS       0    62.6       0       0     98       0
 122      UK     600    .010     .25      67
 123      UK      40    .015     .10      33
 124      RK    1300    .010    .020    .019                          1
 125      RK    1300    .006     .02    .080    TRAP                  1
 126      RK    8200   .0117     .02          TRAP      40          1
          * *** SUBAREAS R2 - R8 NOW ASSUMED TO BE DIVERTED INTO FLAMINGO WASH BY
          *     RAINBOW AND FLAMINGO RD ****

 127      KK      R2 RUNOFF FROM R2
 128      BA    2.01
 129      PB    3.00
 130      LS       0    79.4
 131      UD    0.21
```

```
LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  132     KK      R3 ROUTE R2 THRU R3
  133     RM       5    0.38    0.15

  134     KK      R3 RUNOFF FROM R3
  135     BA    2.63
  136     PB    2.77
  137     LS       0    68.2
  138     UD    0.61

  139     KK      R3 COMBINE R2+R3
  140     HC       2

  141     KK      R3 ROUTE THRU EXISTING GRAVEL PIT
  142     RS       1    STOR     480
  143     SV       0     480    1290    3150    3420
  144     SE       0      20      60     110     120
  145     SQ       0       0    1800    1800   37500

  146     KK      R8 ROUTE R3 THRU R8
  147     RK    2750    .019    .020            TRAP      40       1

  148     KK      R7 RUNOFF FROM R7
  149     BA    1.39
  150     LS       0    79.5
  151     UD    0.51

  152     KK      R7 DIVERT Q IN EXCESS OF PIPE CAPACITY
  153     KM         LIMITING CAPACITY OF RAINBOW STORM DRAIN = 324 CFS (FLLA0307)
  154     KM         OVERFLOW RUNS DOWN DESERT INN AND EDNA INTO CENTRAL BASIN
  155     DT    R7OF
  156     DI       0     324    1000    5000
  157     DQ       0       0     676    4676

  158     KK      R8 ROUTE R7 THRU R8 (90"-96" RCP IN RAINBOW)
  159     RK    5280    .004    .015            CIRC     8.0

  160     KK      R8 RUNOFF FROM R8
  161     BA     .51
  162     LS       0    73.3
  163     UD    0.37

  164     KK      R8 COMBINE R3+R7+R8
  165     HC       3

  166     KK     F10 ROUTE R8 THRU F10 (114" RCP IN FLAMINGO RD)
  167     RK    5280    .010    .015            CIRC     9.5

  168     KK     F10 COMBINE R8+F10
  169     HC       2
```

```
LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  170     KK    F14 ROUTE F10 THRU F14 (FLLA0000)
  171     RK  4010   .0075   .015          TRAP    20      1

  172     KK    F12 RUNOFF FROM F12
  173     BA   .88
  174     LS     0   87.9
  175     UK   700   .012    .15    100
  176     RK  3500  .0120   .030   .21                    1
  177     RK  8200  .0130   .030          TRAP    10      5     NO

  178     KK  F12R   ROUT    F12   THRU   F13
  179     RM     2   0.20   0.15

  180     KK    F13 RUNOFF FROM F13
  181     BA   .55
  182     LS     0   87.5      0      0    98      0
  183     UK   750   .010    .25     83
  184     UK    50   .015    .10     17
  185     RK  1100    .01   .023    .04                    1
  186     RK  2300    .01   .023    .10                    1
  187     RK  5900   .012   .026          TRAP    40      2     NO

  188     KK    F13 COMBINE     F13    AND    F1R
  189     HC     2

  190     KK    F14 ROUTE F13 THRU F14 (UNIMPROVED)
  191     RM     2    0.15   0.15

  192     KK    F14 RUNOFF FROM F14
  193     BA   .78
  194     LS     0   76.5      0      0    98      0
  195     UK   500   .010    .25     86
  196     UK   400   .015    .10     12
  197     RK  1200  .0090   .023   .024                    1
  198     RK  2400  .0075   .025   .12    TRAP    20      1
  199     RK  5200  .0090   .033          TRAP    75      4     NO

  200     KK    F14 COMBINE F9, F10, F13, AND F14
  201     KM        DECATUR
  202     HC     4

  203     KK   F14R ROUTE F14 THRU F15 (FLWA0990-1049)
  204     RK  3110    .020   .040          TRAP    50      3

  205     KK      .  (FLWA0924)
  206     RK  3490    .010   .040          TRAP    60      1

  207     KK      .  (FLWA0891-0923)
  208     RK  1580   .0076   .030          TRAP    90      1
```

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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  209     KK     F15 RUNOFF FROM F15
  210     BA    1.32
  211     LS       0    78.0       0       0      98       0
  212     UK     640    .013     .15      77
  213     UK     400    .014     .10      25
  214     RK    2500    .013    .020    0.08                        1
  215     RK    4500    .006    .020    0.25                        1
  216     RK    8500   0.012    .030            TRAP      40       3      NO

  217     KK     F15 COMBINE     F15     AND     F14R
  218     KM           UPPR
  219     HC        2

  220     KK   F15OF DIVERT OVERFLOWS
  221     KM         DIVERSION RATING CURVE FROM COE FEASIBILITY STUDY
  222     DT   F15OF
  223     DI        0    4100    7000   10500   35000
  224     DQ        0       0    1700    4640   15500

  225     KK     F16 RUNOFF FROM F16
  226     BA     .52
  227     LS       0    75.5       0       0      98       0
  228     UK     600    .010    0.15      56
  229     UK     400    .015     .10      44
  230     RK    1000    .010    .025    .030                        1
  231     RK    2400    .015    .025     .10                        1
  232     RK    6000    .004    .020                                1

  233     KK     F16 COMBINE F15 WITH F16
  234     KM           115
  235     HC        2

  236     KK   F16OF DIVERT OVERFLOWS
  237     KM         LIMIT FLOW TO 6000 CFS AT CAESARS PALACE/LVB/IMPERIAL PALACE CULVERT
  238     KM         BASED ON COE ASSUMED CAPACITY
  239     KM         CAESARS
  240     DT   F16OF
  241     DI        0    6000   12000   20000
  242     DQ        0       0    6000   14000

  243     KK     F16 ROUT F16 THRU F17 (FLWA0798-0823)
  244     RK    3550    .009    .015            TRAP      48       0

  245     KK       .  (FLWA0773)
  246     RK    1320   .0091    .020            TRAP      80      10

  247     KK       .  (FLWA0648-0798)
  248     RK    7760   .0064    .040            TRAP      30       2
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  249     KK     F17 RUNOFF FROM F17
  250     BA     .65
  251     LS       0    75.5       0       0      98       0
  252     UK     900    .057     .15      51
  253     UK     600    .010     .10      49
  254     RK    1000    .010    .025    .040                    1
  255     RK    1500    .010    .027     .09                    1
  256     RK   11400   .0110    .030            TRAP     100    5      NO

  257     KK     F17 COMBINE     F17     AND  F16
  258     KM       WINNICK,HUGHES
  259     HC       2
          *  *** NO CONTRIBUTION FROM UPPER BLUE DIAMOND FOR FLAMINGO/RED ROCK STORM ***

  260     KK      T8 RUNOFF FROM T8
  261     BA    1.22
  262     LS       0    65.6
  263     UK     600    .015    0.15     100
  264     RK    2000    .018    .030     .14                    1
  265     RK   18000   .0161    .030            TRAP      75    5      NO

  266     KK      T9 ROUTE T8 TO T9
  267     RM       2     .52    0.15

  268     KK      T9 RUNOFF FROM T9
  269     BA    0.87
  270     LS       0    73.1
  271     UK     600    .010    0.15     100
  272     RK    4000    .010    .030 -  0.12                    1
  273     RK   10200   .0134    .030            TRAP      30    5

  274     KK      T9 COMBINE T8 AND T9
  275     HC       2

  276     KK    T9OF DIVERT OVERFLOW
  277     DT    T9OF
  278     DI       0    5480   11000   15000
  279     DQ       0       0    2700    2700

  280     KK     T10 ROUTE T9 THRU T10
  281     RM       3    0.21    0.10

  282     KK      T4 RUNOFF FROM T4
  283     BA    3.22
  284     LS       0    87.6
  285     UK     500    .015    0.15     100
  286     RK    2700    .0190   .030     0.25                   1
  287     RK   20000   .0185    .030            TRAP      75    5      NO
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  288     KK      T5 ROUTE T4 TO T5
  289     RK    6500    .013    .030           TRAP      30       2

  290     KK      T5 RUNOFF FROM T5
  291     BA    1.00
  292     LS       0    87.0
  293     UK     600    .010    0.15     100
  294     RK    2500    .012    .030    0.21                      1
  295     RK    6500    .013    .030           TRAP      30       2

  296     KK      T5 COMBINE T4 AND T5
  297     HC       2

  298     KK      T6 ROUTE T5 TO T6
  299     RK   10800    .012    .030           TRAP      30       5

  300     KK      T6 RUNOFF FROM T6
  301     BA    1.30
  302     LS       0    86.9
  303     UK     600    .010    0.15     100
  304     RK    6000    .012    .030    .400                      1
  305     RK   10800    .012    .030           TRAP      30       5

  306     KK      T6 COMBINE T5 AND T6
  307     HC       2

  308     KK    T9OF RECALL T9OF
  309     DR    T9OF

  310     KK      T6 ROUTE T9OF THRU T6
  311     RM       3    0.23    0.15

  312     KK      T6 COMBINE T6 AND T9OF
  313     HC       2

  314     KK      T6 DIVERT OVERFLOW ALONG UPRR
  315     KM         UPRR 114" CMP CULVERT - 750 CFS CAPACITY
  316     DT    T6OF
  317     DI       0     750    1500   10000
  318     DQ       0       0     750    9250

  319     KK    T10 ROUTE T6 THRU T10
  320     RM       2    0.18    0.15

  321     KK      T1 RUNOFF FROM T1
  322     BA    1.56
  323     LS       0      88
  324     UK     600    .020    0.15     100
  325     RK    4000   .0200    .030    0.28                      1
  326     RK   13200    .017    .030           TRAP      50       5      NO
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  327     KK      T3 ROUTE T1 TO T3
  328     RK   10000   .0106    .032            TRAP      30       5

  329     KK      T3 RUNOFF FROM T3
  330     BA    0.99
  331     LS       0    78.9
  332     UK     500    .010    0.15     100
  333     RK    3000    .010    .030    0.16                       1
  334     RK   10000   .0106    .032            TRAP      30       5

  335     KK      T3 COMBINE T1 AND T3
  336     HC       2

  337     KK    T6OF RECALL DIVERTED OVERFLOW FROM T6
  338     DR    T6OF

  339     KK      T3 ROUTE T6OF THRU T3
  340     RM       1    0.08    0.15

  341     KK      T3 COMBINE T6OF AND T3
  342     HC       2

  343     KK    T3OF DIVERT FLOW IN EXCESS OF CULVERT CAPACITY
  344     KM         BASED ON COE RATING CURVE FROM FEASIBILITY STUDY
  345     KM         DQ FLOWS NORTHEASTERLY, REJOINING FW NEAR PARADISE RD
  346     DT    T3OF
  347     DI       0    1400    1900    3200    5500   19000
  348     DQ       0       0     420    1650    3650   14700

  349     KK     T10 ROUTE T3 THRU T10 (TRWA0272)
  350     RK    3800   .0132    .040            TRAP    17.5       2

  351     KK     T10 RUNOFF FROM T10
  352     BA    0.82
  353     LS       0    78.0       0       0      98       0
  354     UK     700    .013    0.15      78
  355     UK     400    .011     .10      22
  356     RK    1100    .012    .020    .120                       1
  357     RK    3000    .008    .020     .50                       1
  358     RK    3500   0.010    .030            TRAP      30       2

  359     KK     T10 COMBINE T3, T6, T9 AND T10
  360     HC       4

  361     KK    T10R ROUT T10 THRU T11 (TRWA0235)
  362     RK    1160    .010    .015            TRAP      32       0

  363     KK       .   (TRWA0145-0218)
  364     RK    4700   .0095    .030            TRAP      90     1.5
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  365     KK     T11 RUNOFF FROM T11
  366     BA    1.09
  367     LS       0    68.6       0       0      98       0
  368     UK     800    .010    0.30      61
  369     UK     500    .010    0.10      39
  370     RK    3200   .0080    .020    0.17                      1
  371     RK    5400   .0104    .030            TRAP     100       5      NO

  372     KK     T11 COMBINE T11 AND T10R
  373     HC       2

  374     KK    T11R ROUT  T11 THRU T12 (TRWA0117)
  375     RK    1130   .0088    .015            TRAP     1.5       2

  376     KK       .   (TRWA0000-0034+)
  377     RK    6500    .012    .040            TRAP     100     2.5

  378     KK     T12 RUNOFF FROM T12
  379     BA    0.77
  380     LS       0    74.4       0       0      98       0
  381     UK     500    .008    0.18      65
  382     UK     200    0.01    0.10      35
  383     RK    2200    .008    .023    0.12                      1
  384     RK    3000    .007    .025     .24                20       2
  385     RK    6600   .0103    .032                       30       5

  386     KK     T12 ADD T12 AND T11R
  387     HC       2

  388     KK    T3OF RECALL DIVERSION FROM T3
  389     DR    T3OF

  390     KK     T12 ROUTE T3OF TO T12
  391     RM      20    1.99    0.10

  392     KK     T12 COMBINE T3OF AND T12
  393     HC       2
          *  *** DATA FOR SUBAREAS MNW-B THRU MNW-M TAKEN FROM NIMBUS HEC-1 ANALYSIS
          *      FOR NORTHWEST MCCARRAN AIRPORT DRAINAGE STUDY (WITH SMALL MODIFICATIONS)

  394     KK   MNW-B RUNOFF FROM B
  395     BA    0.68
  396     LS              65      10
  397     UD     2.4

  398     KK    DIVB FLOW SPLIT AT I-15; BCULV IS FLOW CONVEYED BY CULVERT
  399     DT   BCULV
  400     DI       0      22     100     500
  401     DQ       0      22      22      22
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  402     KK   RDIVB ROUTE DIVB TO CULVERT AT I15 AND C
  403     KM        CHANGED RK TO RD SO 9/90 HEC-1 VERSION WOULD RUN
  404     RD    600    .004     .05       0       0       5

  405     KK   MNW-C RUNOFF AT C
  406     BA    0.69
  407     LS              65      17
  408     UD     2.0

  409     KK   MNW-C COMBINE DIVB+C
  410     HC       2

  411     KK   MNW-C PONDING STORAGE ROUTING AT I-15
  412     RS       1    STOR       0
  413     SA       0     .28     .92    2.02    3.19    3.44    5.37    9.09
  414     SQ       0       8      25      35      40      78     360    1342
  415     SE      54      55      56      57   57.43      58      59      60

  416     KK    DIVC FLOW SPLIT AT C THRU AND AROUND CULVERT
  417     DT   CCULV
  418     DI       0       8      25      35      40      78     360    1342
  419     DQ       0       8      25      35      40      45      55      65
          *  KK RDIVC ROUTE DIVC NORTH TO D
          *  COMMENTED OUT ROUTING SO 9/90 HEC-1 VERSION WOULD RUN
          *  RK   650    .004     .05       0       0       0      20

  420     KK   MNW-D RUNOFF FROM D
  421     BA     .05
  422     LS              66      10
  423     UD     .40

  424     KK   MNW-D COMBINE DIVC AND D
  425     HC       2

  426     KK    DIVD DIVERT FLOW TO NORTH; DCULV CROSSES I-15
  427     DT   DCULV
  428     DI       0      28     100     500
  429     DQ       0      28      28      28

  430     KK   RDIVD ROUTE DIVERTED FLOW NORTH TO E
  431     KM        CHANGED RK TO RD SO 9/90 HEC-1 VERSION WOULD RUN
  432     RD    800    .004     .05       0       0       0      20

  433     KK   MNW-E RUNOFF FROM E
  434     BA    0.05
  435     LS              65      18
  436     UD    0.38

  437     KK   MNW-E COMBINE DIVD + E
  438     HC       2
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

 439      KK   ECULV DIVIDE FLOW AT I-15 CULVERT; ECULV CROSSES I-15 INTO MNW-1
 440      DT   ECULV
 441      DI       0      28     100     500
 442      DQ       0      28      28      28

 443      KK   RDIVE ROUTE FLOW FROM DIVE NORTH ALONG I-15
 444      KM        CHANGED RK TO RD SO 9/90 HEC-1 VERSION WOULD RUN
 445      RD    1200    .007     .05       0       0       0       4

 446      KK  MNW-FG RUNOFF FROM FG
 447      BA    0.36
 448      LS              66      17
 449      UD    1.24

 450      KK  MNW-FG COMBINE EDIV + FG
 451      HC       2

 452      KK    DIVG DIVERT FLOW NORTH; GCULV CROSSES I-15 INTO SUBAREA I
 453      DT   GCULV
 454      DI       0      50      60     100     150     250
 455      DQ       0      50      60      60      60      60

 456      KK   RDIVG ROUTE DIVG NORTH TO AIRPORT CHANNEL
 457      KM        CHANGED RK TO RD SO 9/90 HEC-1 VERSION WOULD RUN
 458      RD    2200    .009    .040       0       0       0      10

 459      KK  MNW-J1 RUNOFF FROM J1
 460      BA    2.37
 461      LS              70
 462      UD    2.67

 463      KK  MNW-J2 ROUTE J1 TO J2
 464      RK   10000    .012     .04                      10       2

 465      KK  MNW-J2 RUNOFF FROM J2
 466      BA    1.21
 467      LS              70      10
 468      UD    1.22

 469      KK  MNW-J2 COMBINE J1+J2
 470      HC       2

 471      KK     CP1 COMBINE J2 + RDIVG
 472      HC       2

 473      KK    RCP1 ROUTE CP1 TO LAS VEGAS BLVD (CP3)
 474      RK    2600    .008     .04       0       0      20       1

 475      KK    RTNE RETURN FLOW FROM CULVERT E
 476      DR   ECULV
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  477     KK    RTNE DUMMY SUBAREA TO GET 1988 HEC1 TO RUN (NEEDS NON-ZERO AREA)
  478     BA    0.01
  479     LS       0      50
  480     UD     0.1

  481     KK    RTNE COMBINE DIVERSION RECALL WITH DUMMY SUBAREA
  482     HC       2

  483     KK   RRTNE ROUTE ECULV TO OUTLET OF I
  484     RK    3900    .013     .05       0       0       0      50

  485     KK    RTNG RETURN FLOW FROM CULVERT G
  486     DR   GCULV

  487     KK    RTNG DUMMY SUBAREA TO GET 1988 HEC1 TO RUN (NEEDS NON-ZERO AREA)
  488     BA    0.01
  489     LS       0      50
  490     UD     0.1

  491     KK    RTNG COMBINE DIVERSION RECALL WITH DUMMY SUBAREA
  492     HC       2

  493     KK   RRTNG ROUTE GCULV TO OUTLET OF I
  494     RK    2500    .013    0.05       0       0       0      50

  495     KK  MNW-I1 RUNOFF FROM I1
  496     BA    0.25
  497     LS              78      15
  498     UD    0.58

  499     KK     CP2 COMBINE HYDROGRAPHS AT LAS VEGAS BLVD AND UPRR
  500     HC       3

  501     KK    RCP2 ROUTE CP2 TO AIRPORT CHANNEL AND LAS VEGAS BLVD (CP3)
  502     RK    2500    .009     .05       0       0       0       4

  503     KK  MNW-I2 RUNOFF FROM I2
  504     BA    0.14
  505     LS              77       1
  506     UD    0.38

  507     KK     CP3 COMBINE FLOW FROM B-12 AT LAS VEGAS BLVD AND AIRPORT CHANNEL
  508     HC       3

  509     KK    RCP3 ROUTE CPE TO OUTLET OF K
  510     RK    7300     .01     .04       0       0       5       2

  511     KK   MNW-K RUNOFF FROM K
  512     BA    1.43
  513     LS              66      25
  514     UD    1.55
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  515     KK     CP4 COMBINE HYDROGRAPHS FOR AIRPORT CHANNEL AND TAXIWAY S
  516     HC       2

  517     KK    RCP4 ROUTE FLOW TO TROPICANA BLVD
  518     RK    3300     .01     .03       0       0      20       4

  519     KK   MNW-L RUNOFF FROM L
  520     BA    0.27
  521     LS              77      60
  522     UD    0.42

  523     KK   MNW-M RUNOFF FROM M
  524     BA    0.49
  525     LS              84      56
  526     UD    0.83

  527     KK     CP5 COMBINE ALL HYDROGRAPHS AT OUTLET AT BOX CULVERT AT TROPICANA
  528     HC       3
          *  *** END OF DATA FROM NIMBUS NORTHWEST MCCARRAN HEC-1 DATA ***
          *

  529     KK     T12 ROUTE MNW-L TO T12 (TRMC0009)
  530     RK    2640   .0045    .040            TRAP      18     1.5

  531     KK       .   (TRWA0000-0034)
  532     RK    5000    .012    .040            TRAP     100     2.5

  533     KK     T12 COMBINE MNW-L AND T12
  534     KM         AIRPORT CHANNEL + TROPICANA WASH
  535     HC       2

  536     KK     F17 COMBINE F17 AND T12
  537     KM         FLAMINGO WASH + TROPICANA WASH
  538     KM        FLAM/TROP CONF.
  539     HC       2

  540     KK     F18 ROUTE F17 AND T12 THRU F18
  541     KM           (FLWA0593)
  542     RK    1430   .0182    .040            TRAP      50       1

  543     KK       .   (FLWA0564+FLWA0620) COMBINED DUE TO RK PROBLEMS WITH NEW HEC1
  544     RK    1695   .0045    .015            TRAP      50       1

  545     KK      R4 RUNOFF FROM R4
  546     BA    2.28
  547     LS       0    86.5
  548     UD    0.34

  549     KK   F15OF RECALL F15 OVERFLOW
  550     DR   F15OF
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  551     KK  F150FR ROUT F150F THRU R4
  552     RM       3    0.24       0

  553     KK       R4 COMBINE R4 AND F15 OVERFLOW
  554     HC       2

  555     KK   F160F RECALL F16 OVERFLOW
  556     DR   F160F

  557     KK  F160FR ROUT F160F THRU R4
  558     RM       3    0.24       0

  559     KK       R4 COMBINE R4 AND F16 OVERFLOW
  560     HC       2

  561     KK     F18 ROUT R4 THRU F18
  562     RM      11    0.88    0.10

  563     KK     F18 RUNOFF FROM F18
  564     BA    0.87
  565     LS       0    72.0       0       0      98       0
  566     UK     500    .010    0.20      52
  567     UK     200    .015    0.10      48
  568     RK    1000    .010    .023    .014                      1
  569     RK    1000   .0010    .023    .050                      1
  570     RK   15900   .0090    .020            TRAP      30      1

  571     KK     F18 COMBINE R4 AND F18
  572     HC       2

  573     KK     F24 RUNOFF FROM F24
  574     BA    1.03
  575     LS       0    66.3       0       0      98       0
  576     UK     300    .010    0.20      46
  577     UK     100    .015    0.10      54
  578     RK    1300    .013    .020    .035                      1
  579     RK    3000   .0075    .020    .014                      1
  580     RK    4400    .018    .030            TRAP      50      3      NO

  581     KK     F18 COMBINE F18, F24, AND F17
  582     KM         SPENCER
  583     HC       3

  584     KK    F18R ROUT F18 THRU F20A (FLWA0400-0493)
  585     RK    7970   .0065    .040            TRAP      60      2

  586     KK    F20A RUNOFF FROM F20A
  587     BA    0.81
  588     LS       0    70.7       0       0      98       0
  589     UK    1000    .010    0.25      77
  590     UK     250     .02    0.15      23
  591     RK    1900    .001    .020    0.05                      1
  592     RK    2000    .015    .020    0.14
  593     RK    5600   .0108    .033                      40      4
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  594     KK    F20A COMBINE F20A AND F18R
  595     HC      2

  596     KK    F20B ROUTE F20A THRU F20B (FLWA0376)
  597     RK    1210   .0148    .040            TRAP     50       1

  598     KK      .   (FLWA0348)
  599     RK    1430    .007    .015            TRAP     60       1

  600     KK     F19 RUNOFF FROM F19
  601     BA    1.54
  602     LS       0    70.8       0       0     98       0
  603     UK     500    .008    0.25      51
  604     UK     100    .015    0.10      49
  605     RK    1300    .010    .020     .04                    1
  606     RK    2500    .010    .020    .019                    1
  607     RK   11400   .0118    .020            TRAP     40       1      NO

  608     KK    F20B ROUTE F19 THRU F20B
  609     RM      2    0.20    0.20

  610     KK    F20B RUNOFF FROM F20B
  611     BA    0.73
  612     LS       0      82
  613     UD    0.25

  614     KK    F20B COMBINE F19 AND F20B
  615     HC      2

  616     KK      VB VAN BUSKIRK DRAINAGE AREA
  617     KM         SINGLE SUBAREA TO SIMULATE RUNOFF FROM ENTIRE VAN BUSKIRK WATERSHED.
  618     KM         CN AND LAG SELECTED TO MATCH PEAK Q AND TIME-TO-PEAK
  619     KM         FROM VAN BUSKIRK PREDESIGN STUDY BY JMM.
  620     BA    4.58
  621     LS              78
  622     UD    0.50

  623     KK    F20B COMBINE VAN BUSKIRK AREA, F20A AND F20B
  624     KM       D/S FROM D1
  625     HC      3

  626     KK     F22 ROUTE F20B THRU F22 (FLWA0258-0274)
  627     RK    4700   .0110    .030                    70     2.5

  628     KK     F21 RUNOFF FROM F21
  629     BA    1.27
  630     LS       0    77.1       0       0     98       0
  631     UK     300    .010    0.25      49
  632     UK      60    .020     .10      51
  633     RK    1300    .010    .020    .019                    1
  634     RK    1750    .008    .020    0.08                    1
  635     RK   16000   .0128    .020            TRAP     40       1      NO
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  636     KK     F21 DIVERT ACROSS BLDR HWY AT OAKEY
  637     DT   OAKEY
  638     D1       0   10000
  639     DQ       0    5000

  640     KK     F22 ROUTE F21 THRU F22
  641     RM       1    0.06    0.20

  642     KK     F22 RUNOFF FROM F22
  643     BA    3.43
  644     LS       0    74.9       0       0      98       0
  645     UK     700    .008    0.25      51
  646     UK      60    .015     .10      49
  647     RK    1500    .010    .020    .093                      1
  648     RK    3000    .008    .020    0.37                      1
  649     RK   29500   .0115    .020            TRAP      40      1      NO

  650     KK     F22 COMBINE F208, F21 AND F22
  651     KM       BOULDER HWY
  652     HC       3

  653     KK     F23 ROUTE F22 THRU F23 (FLWA0228)
  654     RK    1430    .014    .040            TRAP      50      1

  655     KK       .   (FLWA0175)
  656     RK    2690   .0007    .040            TRAP     100      1

  657     KK       .   (FLWA0079)
  658     RK    5020   .0096    .040            TRAP      50      1

  659     KK       .   (FLWA0000)
  660     RK    4120   .0049    .040            TRAP     107      2

  661     KK     F23 RUNOFF FROM F23
  662     BA    1.92
  663     LS       0    74.4                      98
  664     UK     500     .01    0.25      70
  665     UK     100    .015     .10      30
  666     RK    2600    .005     .02    .037    TRAP      20      1
  667     RK    2200   .0018     .02    0.21    TRAP      40      1
  668     RK   13700   .0075    .032            TRAP      50      2      NO

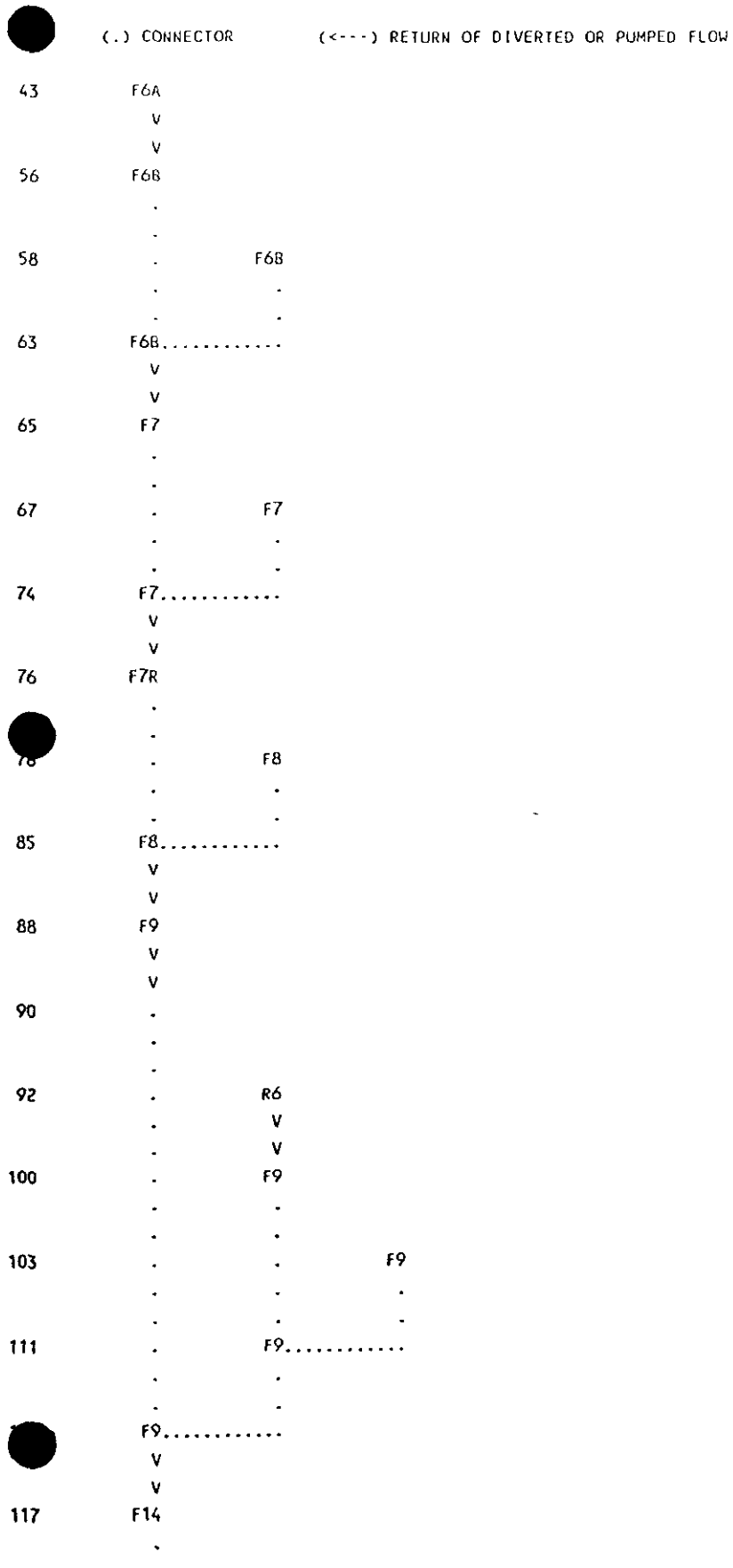
  669     KK     F23 COMBINE F22 AND F23
  670     KM        CONFLUENCE OF FLAMINGO WASH WITH LAS VEGAS WASH
  671     KM       NELLIS,DESERT ROSE
  672     HC       2
  673     ZZ
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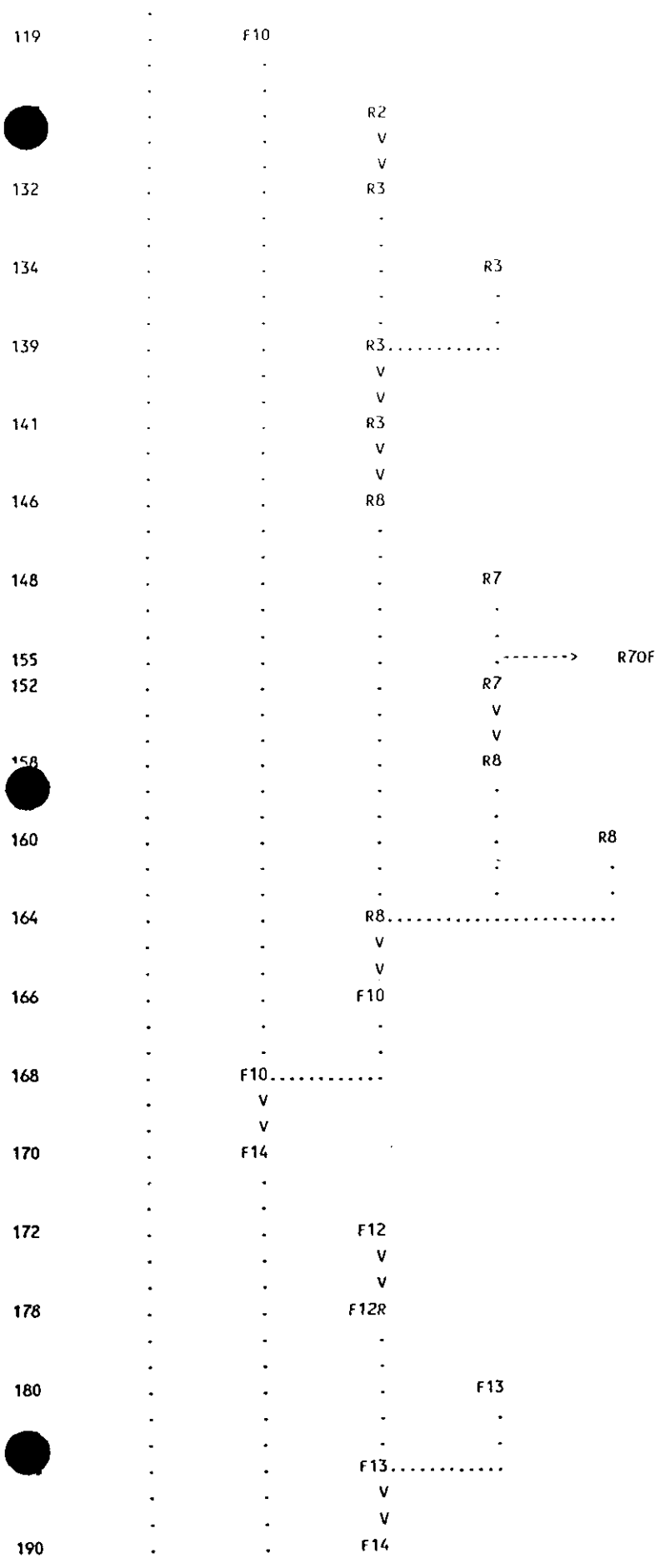
SCHEMATIC DIAGRAM OF STREAM NETWORK

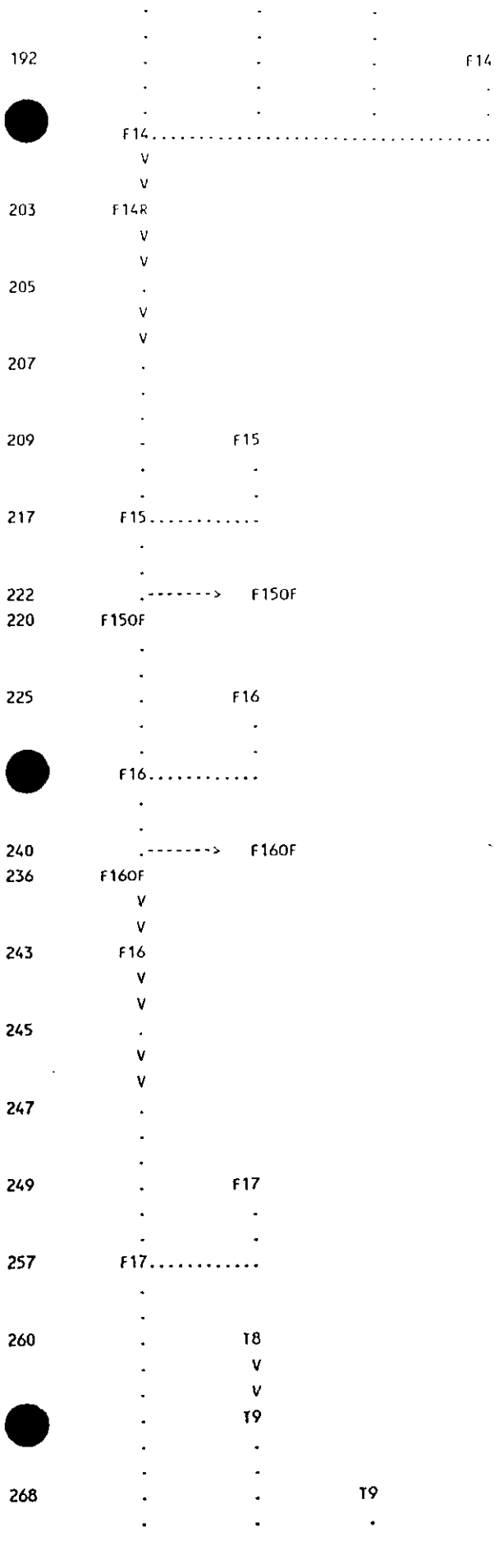
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LINE

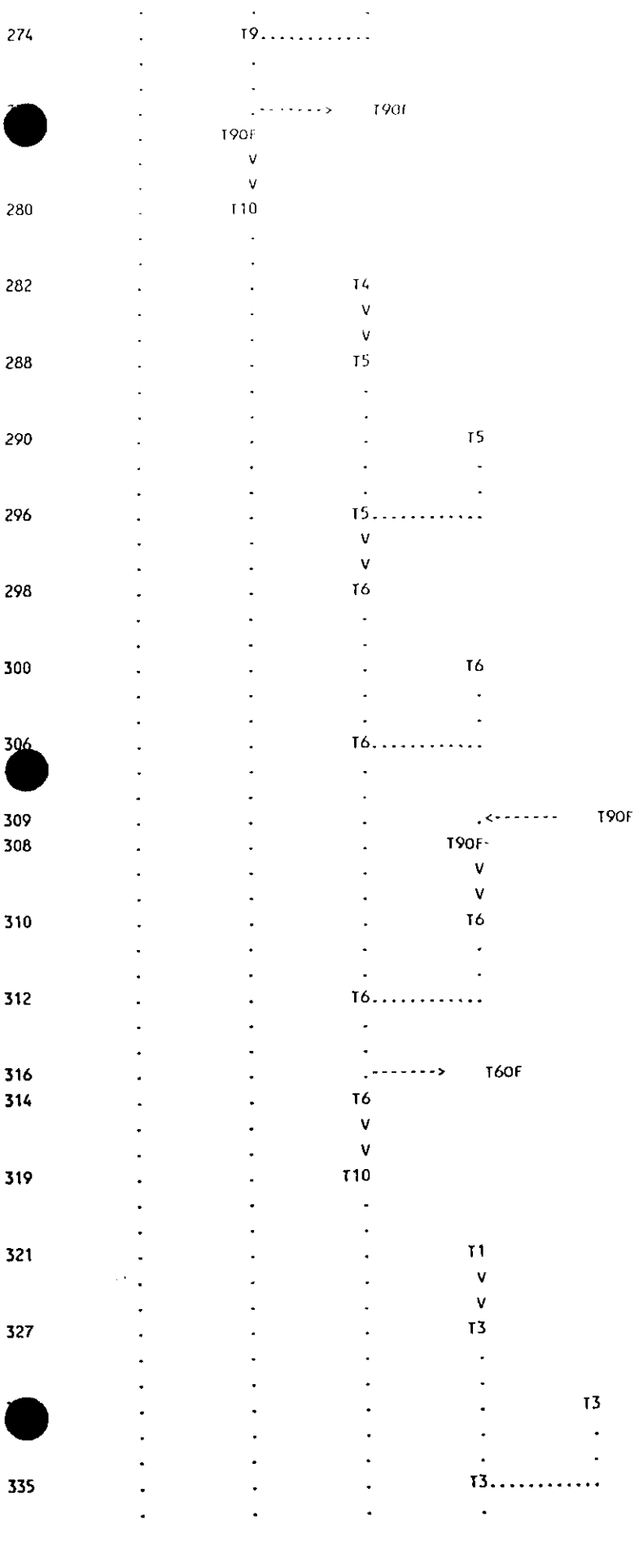
(V) ROUTING (---->) DIVERSION OR PUMP FLOW

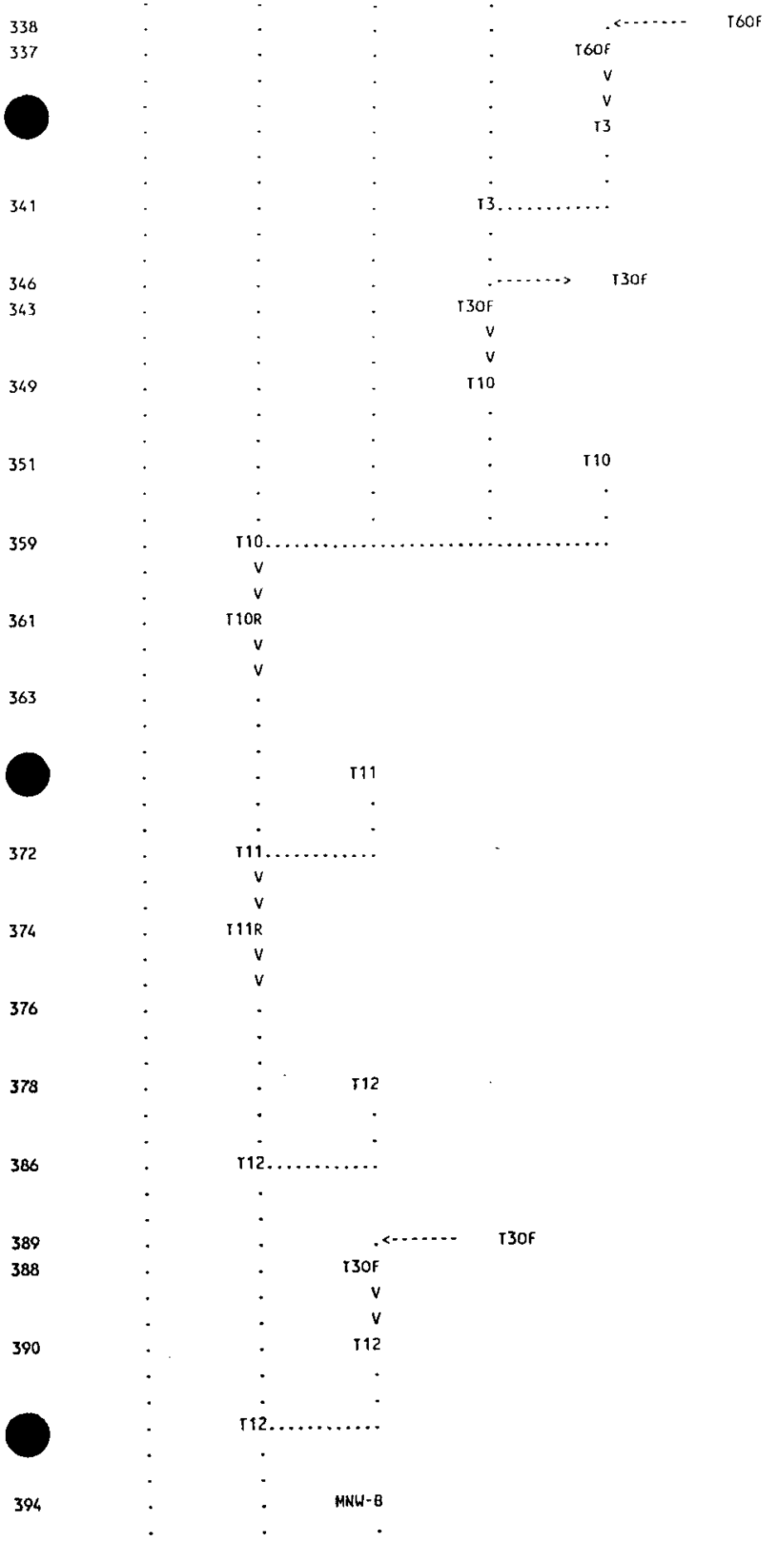
(.) CONNECTOR (<----) RETURN OF DIVERTED OR PUMPED FLOW



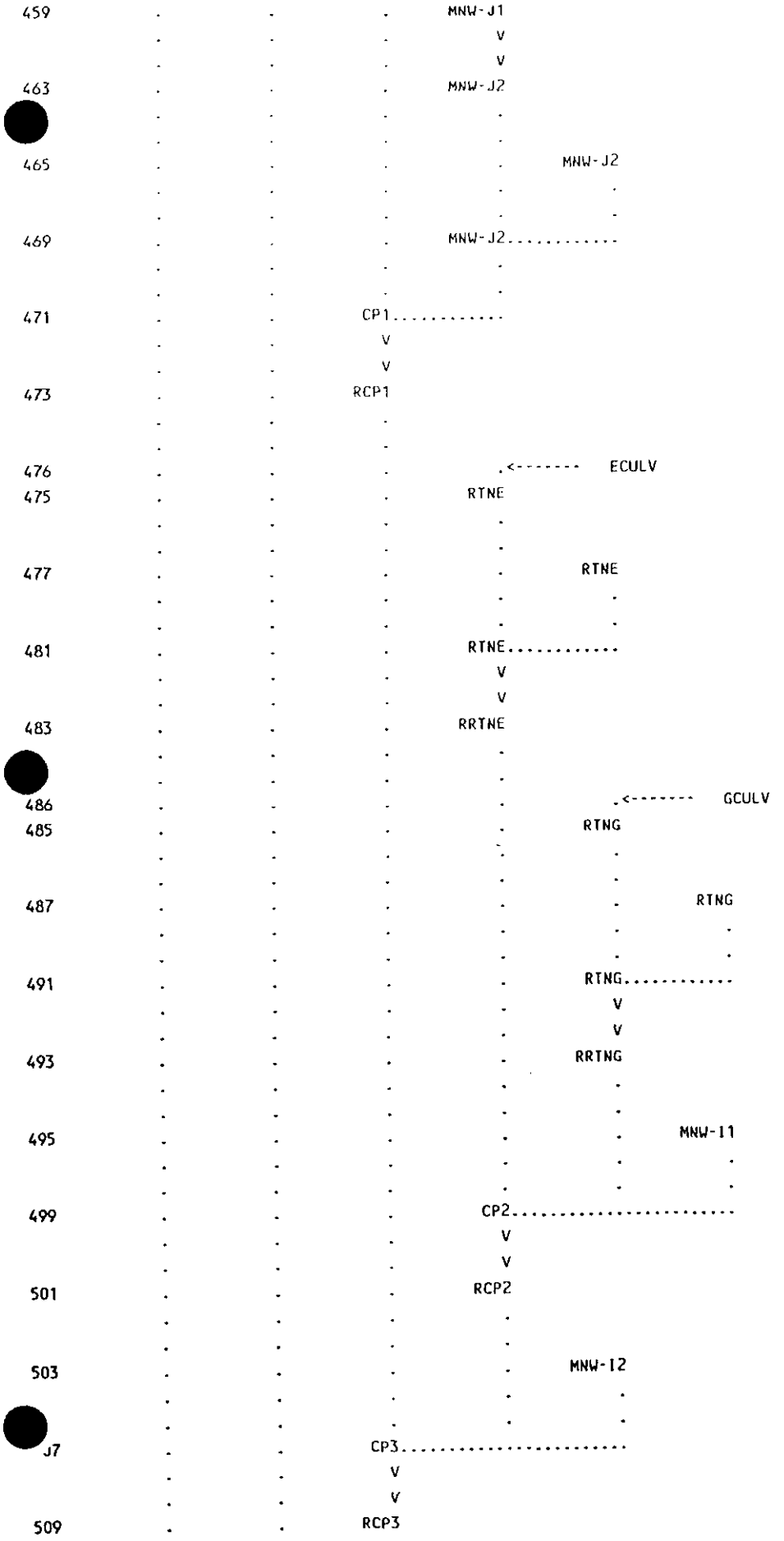

119
F10
R2
132
R3
134
R3
139
R3
141
R3
146
R8
148
R7
155
R70F
152
R7
158
R8
160
R8
164
R8
166
F10
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F10
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F14
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F12
178
F12R
180
F13
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F14

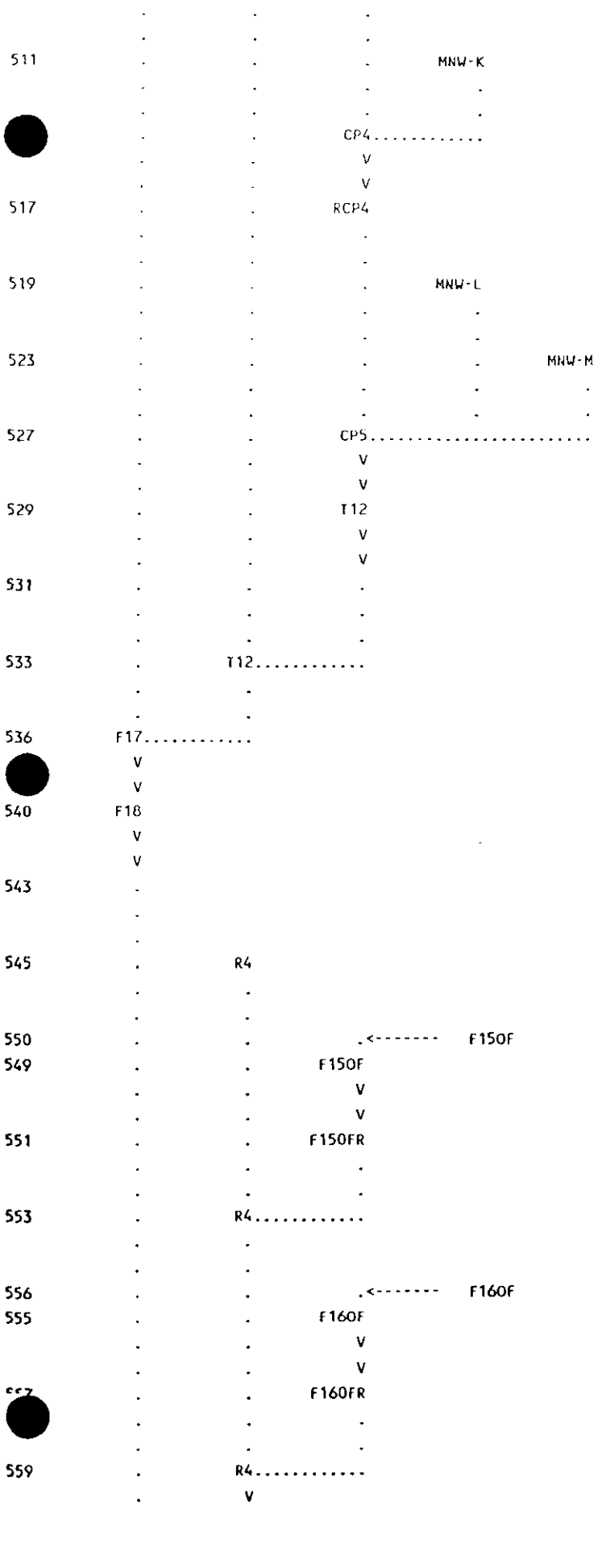

192
F14
F14
203
F14R
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F15
217
F15
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F15OF
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F15OF
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F16
F16
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F16OF
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F17
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T8
T9
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T9

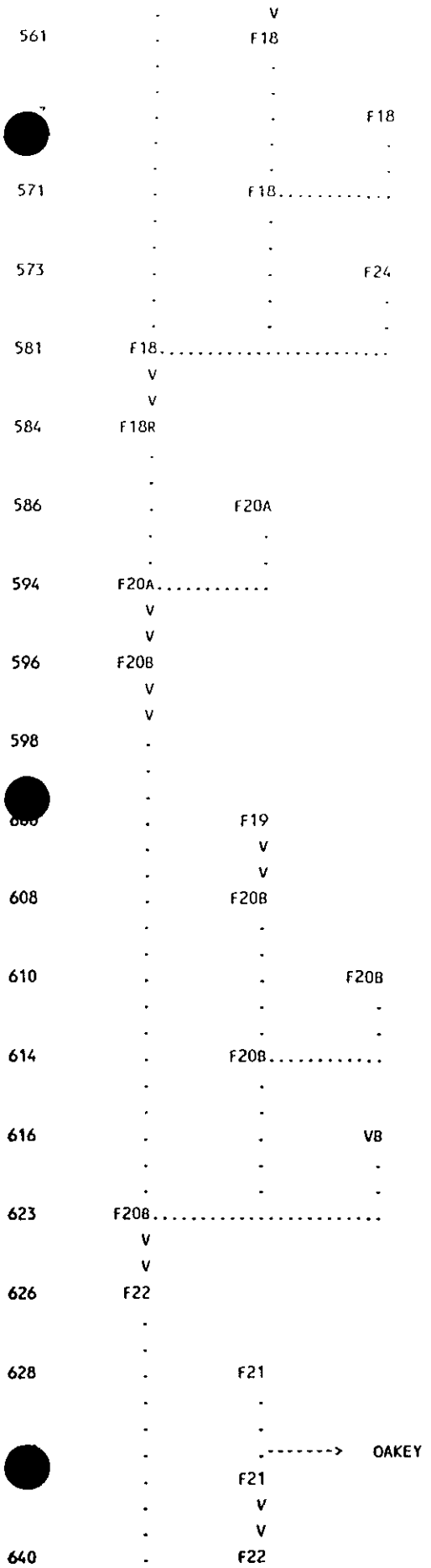

274
T9
T90F
T90F
280
T10
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T4
288
T5
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T5
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T5
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T6
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T6
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T6
309
T90F
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T90F
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T60F
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T1
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T3
T3
335
T3

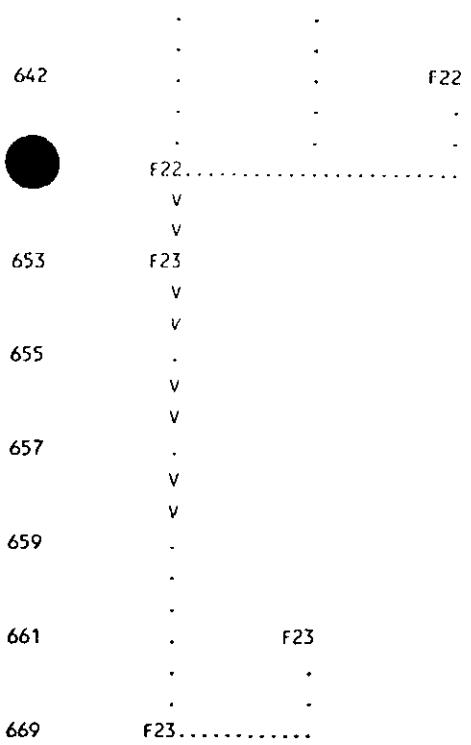

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T60F
T60F
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T3
T30F
T30F
T10
T10
T10
T10R
T11
T11
T11R
T12
T12
T12
T30F
T30F
T12
MNW-B

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                .
399             .-------->  BCULV
398          DIVB
                V
                V
             RDIVB
                .
                .
405             .       MNW-C
                .          .
                .          .
409          MNW-C.............
                V
                V
411          MNW-C
                .
                .
417             .-------->  CCULV
416          DIVC
                .
                .
420             .       MNW-D
                .          .
                .          .
424          MNW-D.............
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                .
427             .-------->  DCULV
426          DIVD
                V
                V
430          RDIVD
                .
                .
433             .       MNW-E
                .          .
                .          .
437          MNW-E.............
                .
                .
440             .-------->  ECULV
439          ECULV
                V
                V
443          RDIVE
                .
                .
446             .       MNW-FG
                .          .
                .          .
450          MNW-FG............
                .
                .
453             .-------->  GCULV
452          DIVG
                V
                V
456          RDIVG
                .
                .
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459
MNW-J1
463
MNW-J2
465
MNW-J2
469
MNW-J2
471
CP1
473
RCP1
476
ECULV
475
RTNE
477
RTNE
481
RTNE
483
RRTNE
486
GCULV
485
RTNG
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RTNG
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RTNG
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RRTNG
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MNW-I1
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CP2
501
RCP2
503
MNW-I2
J7
CP3
509
RCP3


511
MNW-K
CP4
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RCP4
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MNW-L
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MNW-M
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CP5
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T12
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T12
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F17
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F18
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545
R4
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F150F
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F150F
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F150FR
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R4
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F160F
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F160F
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R4


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F18
F18
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F18
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F24
581
F18
584
F18R
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F20A
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F20A
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F20B
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F19
608
F20B
610
F20B
614
F20B
616
VB
623
F20B
626
F22
628
F21
OAKEY
F21
640
F22



(***) RUNOFF ALSO COMPUTED AT THIS LOCATION

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**************************************
*                                    *
*  FLOOD HYDROGRAPH PACKAGE (HEC-1)  *
*        SEPTEMBER 1990              *
*         VERSION 4.0                *
*                                    *
*  RUN DATE  10/06/1997  TIME  13:05:44 *
*                                    *
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*                                    *
*  U.S. ARMY CORPS OF ENGINEERS      *
*  HYDROLOGIC ENGINEERING CENTER     *
*       609 SECOND STREET            *
*     DAVIS, CALIFORNIA 95616        *
*       (916) 756-1104               *
*                                    *
**************************************
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INPUT FILE = F-FLC.DAT BY: JEP DATE: 10/06/97

FLAMINGO WASH FIS RESTUDY GCW MODIFICATIONS

REVISED DUPLICATED FIS MODEL F100R.DAT
DELETE RED ROCK WATERSHED TO SIMULATE EXPANSION OF RR DET. BASIN
DELETE UPPER FLAMINGO DET. BASIN WATERSHED TO SIMULATE
STORM CENTERING BELOW BASIN

CLARK COUNTY FLOOD CONTROL DISTRICT MASTER PLAN UPDATE
RED ROCK/FLAMINGO/TROPICANA WATERSHED
EXISTING DRAINAGE SYSTEM WITH PRESENT DEVELOPMENT
FLAMINGO/TROPICANA STORM (NO UPPER BLUE DIAMOND)- MAIN CHANNEL RUN
100-YEAR 6-HR STORM (SDN #5)
JMM OCTOBER 1990

BASIC DATA FILE BASED ON COE FILE S10P40X.
MODIFICATIONS ADDED FROM B&V RED ROCK BASIN AND UPPER FLAMINGO
BASIN HEC-1 RUNS; NIMBUS NORTHWEST MCCARRAN AIRPORT HEC-1 RUNS;
AND SUBBASIN MODIFICATIONS DUE TO RECENT DEVELOPMENT.

COE MUSKINGUM ROUTING CONVERTED TO KINEMATIC FOR EXISTING
IMPROVED CHANNELS FROM FACILITY INVENTORY.

PB CARDS CONTAIN POINT PRECIPITATION. DARF'S FROM CCRFCD MANUAL
BASED ON STORM AREAS FOR CONCENTRATION POINTS AS FOLLOWS:

SUBBASIN	AREA (SQMI)	DARF
RAINBOW	3.38	0.92
JONES	5.79	0.90
DECATUR,	15.71	0.82
UPPR,I15,CAESARS	17-19	0.80
WINNICK,HUGHES		
FL/TROP CONF.,	38-43	0.71
SPENCER		
D/S FROM DI	50.89	0.68
BLDR HWY,NELLIS,	55-57	0.67
DESERT ROSE		

```
41 IO        OUTPUT CONTROL VARIABLES
                 IPRNT        5  PRINT CONTROL
                 IPLOT        0  PLOT CONTROL
                 QSCAL       0.  HYDROGRAPH PLOT SCALE

   IT        HYDROGRAPH TIME DATA
```

NMIN		5	MINUTES IN COMPUTATION INTERVAL
IDATE	1	0	STARTING DATE
ITIME		0000	STARTING TIME
NQ		200	NUMBER OF HYDROGRAPH ORDINATES
NDDATE	1	0	ENDING DATE
NDTIME		1635	ENDING TIME
ICENT		19	CENTURY MARK

COMPUTATION INTERVAL .08 HOURS
TOTAL TIME BASE 16.58 HOURS

ENGLISH UNITS

DRAINAGE AREA	SQUARE MILES
PRECIPITATION DEPTH	INCHES
LENGTH, ELEVATION	FEET
FLOW	CUBIC FEET PER SECOND
STORAGE VOLUME	ACRE-FEET
SURFACE AREA	ACRES
TEMPERATURE	DEGREES FAHRENHEIT

JP MULTI-PLAN OPTION

NPLAN	1	NUMBER OF PLANS

JR MULTI-RATIO OPTION

RATIOS OF PRECIPITATION

.92	.90	.82	.80	.71	.68	.67

*** FDKRUT - NEWTON RAPHSON FAILEDFIXED POINT ITERATION USED - ITERATION= 1

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PEAK FLOW AND STAGE (END-OF-PERIOD) SUMMARY FOR MULTIPLE PLAN-RATIO ECONOMIC COMPUTATIONS
FLOWS IN CUBIC FEET PER SECOND, AREA IN SQUARE MILES
TIME TO PEAK IN HOURS

OPERATION	STATION	AREA	PLAN		RATIOS APPLIED TO PRECIPITATION RATIO 1 .92	RATIO 2 .90	RATIO 3 .82	RATIO 4 .80	RATIO 5 .71	RATIO 6 .68	RATIO 7 .67
YDROGRAPH AT	F6A	.55	1	FLOW	344.	333.	290.	280.	232.	216.	211.
				TIME	3.75	3.75	3.75	3.75	3.75	3.75	3.75
OUTED TO	F6B	.55	1	FLOW	311.	301.	262.	252.	209.	195.	190.
				TIME	4.08	4.08	4.08	4.08	4.08	4.08	4.08
YDROGRAPH AT	F6B	.85	1	FLOW	547.	529.	460.	443.	367.	342.	333.
				TIME	3.67	3.67	3.67	3.67	3.67	3.67	3.67
2 COMBINED AT	F6B	1.40	1	FLOW	717.	694.	602.	580.	479.	445.	435.
				TIME	3.75	3.75	3.75	3.75	3.75	3.75	3.75
OUTED TO	F7	1.40	1	FLOW	676.	655.	569.	548.	453.	422.	411.
				TIME	4.08	4.08	4.08	4.08	4.08	4.08	4.08
YDROGRAPH AT	F7	1.50	1	FLOW	608.	579.	473.	450.	335.	296.	288.
				TIME	4.00	4.00	4.08	4.08	4.17	4.25	4.25
2 COMBINED AT	F7	2.90	1	FLOW	1276.	1225.	1042.	997.	783.	713.	692.
				TIME	4.00	4.00	4.08	4.08	4.17	4.17	4.17
OUTED TO	F7R	2.90	1	FLOW	1273.	1223.	1037.	994.	781.	710.	690.
				TIME	4.08	4.08	4.17	4.17	4.17	4.25	4.25
YDROGRAPH AT	F8	.48	1	FLOW	75.	73.	65.	63.	55.	51.	51.
				TIME	3.58	3.58	3.67	3.67	3.67	3.67	3.67
2 COMBINED AT	F8	3.38	1	FLOW	1310.	1260.	1066.	1022.	806.	731.	711.
				TIME	4.08	4.08	4.17	4.17	4.17	4.25	4.25
OUTED TO	F9	3.38	1	FLOW	1307.	1256.	1065.	1021.	802.	731.	710.
				TIME	4.08	4.08	4.17	4.17	4.17	4.25	4.25
OUTED TO	.	3.38	1	FLOW	1301.	1252.	1059.	1015.	802.	728.	707.
				TIME	4.17	4.17	4.25	4.25	4.25	4.33	4.33
YDROGRAPH AT	R6	1.51	1	FLOW	236.	224.	185.	175.	129.	115.	109.
				TIME	5.17	5.17	5.17	5.17	5.25	5.33	5.33
UTED TO	F9	1.51	1	FLOW	236.	224.	184.	175.	129.	114.	109.
				TIME	5.17	5.17	5.17	5.17	5.33	5.33	5.42
DROGRAPH AT	F9	.90	1	FLOW	224.	221.	197.	189.	162.	153.	150.
				TIME	3.67	3.67	3.67	3.67	3.75	3.75	3.75
2 INED AT	F9	2.41	1	FLOW	347.	330.	272.	258.	194.	173.	166.
				TIME	5.08	5.08	5.17	5.17	5.17	5.25	5.25
2 COMBINED AT	F9	5.79	1	FLOW	1596.	1517.	1239.	1172.	898.	809.	783.

RAINBOW

JONES

				TIME	4.17	4.17	4.25	4.25	4.25	4.25	4.33
OUTED TO	F14	5.79	1	FLOW	1568.	1492.	1222.	1157.	885.	798.	774.
				TIME	4.33	4.33	4.42	4.42	4.42	4.50	4.50
[redacted]APH AT	F10	1.17	1	FLOW	458.	454.	402.	395.	339.	319.	319.
				TIME	3.58	3.58	3.58	3.58	3.58	3.58	3.58
YDROGRAPH AT	R2	2.01	1	FLOW	1127.	1082.	903.	859.	668.	607.	587.
				TIME	3.58	3.58	3.58	3.58	3.58	3.58	3.58
OUTED TO	R3	2.01	1	FLOW	933.	895.	747.	711.	553.	503.	486.
				TIME	4.00	4.00	4.00	4.00	4.00	4.00	4.00
YDROGRAPH AT	R3	2.63	1	FLOW	336.	319.	256.	241.	176.	156.	149.
				TIME	5.17	5.17	5.25	5.25	5.25	5.25	5.25
2 COMBINED AT	R3	4.64	1	FLOW	1245.	1185.	952.	897.	661.	588.	565.
				TIME	4.00	4.00	4.00	4.00	4.00	4.00	4.00
OUTED TO	R3	4.64	1	FLOW	275.	263.	213.	202.	152.	136.	131.
				TIME	5.83	5.83	5.92	5.92	5.92	5.92	5.92
			** PEAK STAGES IN FEET **								
			1	STAGE	26.12	25.84	24.74	24.48	23.37	23.02	22.91
				TIME	5.83	5.83	5.92	5.92	5.92	5.92	5.92
OUTED TO	R8	4.64	1	FLOW	275.	263.	213.	202.	152.	136.	131.
				TIME	5.92	5.92	5.92	5.92	5.92	5.92	6.00
[redacted]APH AT	R7	1.39	1	FLOW	449.	430.	355.	337.	257.	232.	224.
				TIME	3.92	3.92	3.92	3.92	3.92	3.92	4.00
IVERSION TO	R7OF	1.39	1	FLOW	125.	106.	31.	13.	0.	0.	0.
				TIME	3.92	3.92	3.92	3.92	.08	.08	.08
YDROGRAPH AT	R7	1.39	1	FLOW	324.	324.	324.	324.	257.	232.	224.
				TIME	3.67	3.67	3.83	3.83	3.92	3.92	4.00
OUTED TO	R8	1.39	1	FLOW	324.	324.	324.	324.	256.	231.	223.
				TIME	3.83	3.83	4.00	4.00	4.00	4.00	4.00
YDROGRAPH AT	R8	.51	1	FLOW	126.	119.	93.	87.	61.	54.	52.
				TIME	3.75	3.75	3.83	3.83	3.83	5.00	5.00
3 COMBINED AT	R8	6.54	1	FLOW	626.	601.	501.	476.	371.	338.	327.
				TIME	5.17	5.17	5.17	5.17	5.17	5.17	5.17
OUTED TO	F10	6.54	1	FLOW	622.	597.	499.	474.	370.	337.	326.
				TIME	5.25	5.25	5.25	5.25	5.25	5.25	5.25
2 COMBINED AT	F10	7.71	1	FLOW	764.	733.	621.	592.	475.	435.	423.
				TIME	5.00	5.00	3.67	3.67	3.67	3.67	3.67
OUTED TO	F14	7.71	1	FLOW	762.	731.	614.	586.	466.	429.	416.
				TIME	5.08	5.08	5.08	5.08	5.08	5.08	3.67
YDROGRAPH AT	F12	.88	1	FLOW	395.	380.	315.	299.	230.	209.	201.
				TIME	4.00	4.00	4.00	4.08	4.17	4.17	4.17

ROUTED TO	F12R	.88	1	FLOW	382.	366.	305.	291.	224.	203.	196.	
				TIME	4.17	4.17	4.25	4.25	4.33	4.42	4.42	
HYDROGRAPH AT	F13	.55	1	FLOW	188.	182.	163.	158.	132.	123.	119.	
				TIME	4.92	4.92	4.92	4.92	5.00	5.00	5.00	
2 COMBINED AT	F13	1.43	1	FLOW	547.	524.	429.	408.	310.	288.	281.	
				TIME	4.17	4.17	4.25	4.25	4.33	5.00	5.00	
ROUTED TO	F14	1.43	1	FLOW	539.	516.	424.	404.	307.	286.	279.	
				TIME	4.33	4.33	4.42	4.42	4.50	5.08	5.08	
HYDROGRAPH AT	F14	.78	1	FLOW	169.	163.	136.	129.	94.	82.	78.	
				TIME	5.08	5.08	5.17	5.17	5.33	5.33	5.33	
4 COMBINED AT	F14	15.71	1	FLOW	2859.	2737.	2268.	2151.	1631.	1472.	1422.	DECATUR
				TIME	4.33	4.33	4.33	4.33	4.33	4.42	4.42	
ROUTED TO	F14R	15.71	1	FLOW	2849.	2726.	2257.	2142.	1631.	1470.	1419.	
				TIME	4.33	4.33	4.33	4.33	4.42	4.42	4.42	
ROUTED TO	.	15.71	1	FLOW	2844.	2723.	2256.	2141.	1626.	1468.	1417.	
				TIME	4.42	4.42	4.42	4.42	4.50	4.50	4.50	
ROUTED TO	.	15.71	1	FLOW	2839.	2717.	2249.	2135.	1625.	1465.	1414.	
				TIME	4.42	4.42	4.42	4.42	4.50	4.50	4.50	
HYDROGRAPH AT	F15	1.32	1	FLOW	410.	388.	313.	299.	231.	214.	207.	
				TIME	3.92	3.92	3.92	3.92	3.92	3.92	3.92	
7 COMBINED AT	F15	17.03	1	FLOW	3147.	3013.	2494.	2366.	1789.	1633.	1588.	UPRR
				TIME	4.42	4.42	4.42	4.42	4.50	5.25	5.25	
DIVERSION TO	F15OF	17.03	1	FLOW	0.	0.	0.	0.	0.	0.	0.	
				TIME	.08	.08	.08	.08	.08	.08	.08	
HYDROGRAPH AT	F15OF	17.03	1	FLOW	3147.	3013.	2494.	2366.	1789.	1633.	1588.	
				TIME	4.42	4.42	4.42	4.42	4.50	5.25	5.25	
HYDROGRAPH AT	F16	.52	1	FLOW	252.	240.	206.	202.	169.	158.	153.	
				TIME	3.67	3.67	3.67	3.67	3.67	3.67	3.75	
2 COMBINED AT	F16	17.55	1	FLOW	3253.	3114.	2578.	2445.	1863.	1714.	1666.	I15
				TIME	4.42	4.42	4.42	4.42	5.17	5.17	5.17	
DIVERSION TO	F16OF	17.55	1	FLOW	0.	0.	0.	0.	0.	0.	0.	
				TIME	.08	.08	.08	.08	.08	.08	.08	
HYDROGRAPH AT	F16OF	17.55	1	FLOW	3253.	3114.	2578.	2445.	1863.	1714.	1666.	CAESARS
				TIME	4.42	4.42	4.42	4.42	5.17	5.17	5.17	
ROUTED TO	F16	17.55	1	FLOW	3251.	3111.	2572.	2440.	1860.	1712.	1665.	
				TIME	4.42	4.42	4.42	4.42	5.17	5.25	5.25	
ROUTED TO	.	17.55	1	FLOW	3248.	3107.	2565.	2434.	1858.	1712.	1665.	
				TIME	4.42	4.42	4.50	4.50	5.25	5.25	5.25	
ROUTED TO	.	17.55	1	FLOW	3238.	3100.	2564.	2432.	1857.	1708.	1661.	
				TIME	4.50	4.50	4.58	4.58	5.33	5.33	5.33	

YDROGRAPH AT	F17	.65	1	FLOW	261.	254.	211.	203.	163.	152.	148.	
				TIME	4.08	4.08	4.08	4.08	4.17	4.17	4.17	
2 COMBINED AT	F17	18.20	1	FLOW	3425.	3283.	2718.	2581.	1965.	1809.	1760.	WINNICK / HUGHES CENTER
				TIME	4.50	4.50	4.58	4.58	5.33	5.33	5.33	
YDROGRAPH AT	T8	1.22	1	FLOW	99.	91.	62.	55.	30.	23.	21.	
				TIME	5.67	5.75	6.08	6.17	6.75	7.00	7.08	
OUTED TO	T9	1.22	1	FLOW	91.	84.	57.	51.	28.	22.	20.	
				TIME	6.25	6.25	6.58	6.67	7.25	7.50	7.67	
YDROGRAPH AT	T9	.87	1	FLOW	136.	130.	105.	98.	67.	58.	55.	
				TIME	5.08	5.17	5.25	5.25	5.50	5.58	5.58	
2 COMBINED AT	T9	2.09	1	FLOW	175.	161.	117.	108.	71.	60.	57.	
				TIME	5.75	5.75	5.33	5.42	5.50	5.58	5.67	
IVERSION TO	T90F	2.09	1	FLOW	0.	0.	0.	0.	0.	0.	0.	
				TIME	.08	.08	.08	.08	.08	.08	.08	
YDROGRAPH AT	T90F	2.09	1	FLOW	175.	161.	117.	108.	71.	60.	57.	
				TIME	5.75	5.75	5.33	5.42	5.50	5.58	5.67	
OUTED TO	T10	2.09	1	FLOW	174.	161.	116.	107.	70.	60.	56.	
				TIME	5.92	5.92	5.58	5.58	5.75	5.83	5.92	
YDROGRAPH AT	T4	3.22	1	FLOW	1539.	1462.	1235.	1165.	916.	830.	799.	
				TIME	3.92	4.00	4.00	4.00	4.08	4.17	4.17	
O[redacted]TO	T5	3.22	1	FLOW	1532.	1454.	1231.	1159.	911.	830.	796.	
				TIME	4.00	4.00	4.08	4.08	4.17	4.25	4.25	
YDROGRAPH AT	T5	1.00	1	FLOW	444.	425.	351.	334.	254.	228.	220.	
				TIME	3.92	3.92	4.00	4.00	4.08	4.08	4.17	
2 COMBINED AT	T5	4.22	1	FLOW	1968.	1876.	1572.	1485.	1160.	1051.	1010.	
				TIME	4.00	4.00	4.08	4.08	4.17	4.25	4.25	
OUTED TO	T6	4.22	1	FLOW	1950.	1858.	1557.	1471.	1149.	1042.	1006.	
				TIME	4.17	4.17	4.25	4.25	4.33	4.42	4.42	
YDROGRAPH AT	T6	1.30	1	FLOW	550.	529.	432.	411.	314.	281.	271.	
				TIME	4.08	4.08	4.08	4.17	4.25	4.33	4.33	
2 COMBINED AT	T6	5.52	1	FLOW	2481.	2373.	1981.	1870.	1458.	1320.	1272.	
				TIME	4.17	4.17	4.17	4.25	4.33	4.33	4.42	
YDROGRAPH AT	T90F	.00	1	FLOW	0.	0.	0.	0.	0.	0.	0.	
				TIME	.08	.08	.08	.08	.08	.08	.08	
OUTED TO	T6	.00	1	FLOW	0.	0.	0.	0.	0.	0.	0.	
				TIME	.08	.08	.08	.08	.08	.08	.08	
2 COMBINED AT	T6	5.52	1	FLOW	2481.	2373.	1981.	1870.	1458.	1320.	1272.	
				TIME	4.17	4.17	4.17	4.25	4.33	4.33	4.42	
[redacted]IVERSION TO	T60F	5.52	1	FLOW	1731.	1623.	1231.	1120.	708.	570.	522.	
				TIME	4.17	4.17	4.17	4.25	4.33	4.33	4.42	

HYDROGRAPH AT	T6	5.52	1	FLOW	750.	750.	750.	750.	750.	750.	750.
				TIME	3.67	3.75	3.83	3.83	4.00	4.08	4.08
ROUTED TO	T10	5.52	1	FLOW	750.	750.	750.	750.	750.	750.	750.
				TIME	4.75	4.75	4.92	4.92	5.08	5.17	5.17
HYDROGRAPH AT	T1	1.56	1	FLOW	786.	759.	628.	598.	466.	428.	413.
				TIME	3.92	3.92	3.92	4.00	4.00	4.08	4.08
ROUTED TO	T3	1.56	1	FLOW	778.	752.	627.	593.	463.	427.	408.
				TIME	4.08	4.08	4.17	4.17	4.25	4.33	4.33
HYDROGRAPH AT	T3	.99	1	FLOW	247.	235.	177.	164.	126.	116.	112.
				TIME	4.25	4.25	4.33	4.42	5.08	5.08	5.17
2 COMBINED AT	T3	2.55	1	FLOW	1013.	973.	786.	737.	556.	501.	479.
				TIME	4.08	4.17	4.17	4.25	4.33	4.33	4.42
HYDROGRAPH AT	T60F	.00	1	FLOW	1731.	1623.	1231.	1120.	708.	570.	522.
				TIME	4.17	4.17	4.17	4.25	4.33	4.33	4.42
ROUTED TO	T3	.00	1	FLOW	1691.	1587.	1197.	1094.	687.	550.	506.
				TIME	4.25	4.25	4.25	4.33	4.42	4.50	4.50
2 COMBINED AT	T3	2.55	1	FLOW	2686.	2538.	1974.	1816.	1234.	1050.	974.
				TIME	4.17	4.17	4.25	4.25	4.42	4.42	4.42
DIVERSION TO	T30F	2.55	1	FLOW	1164.	1024.	490.	349.	0.	0.	0.
				TIME	4.17	4.17	4.25	4.25	.08	.08	.08
HYDROGRAPH AT	T30F	2.55	1	FLOW	1522.	1514.	1484.	1466.	1234.	1050.	974.
				TIME	4.17	4.17	4.25	4.25	4.42	4.42	4.42
ROUTED TO	T10	2.55	1	FLOW	1521.	1514.	1483.	1466.	1222.	1044.	974.
				TIME	4.25	4.25	4.33	4.33	4.42	4.50	4.50
HYDROGRAPH AT	T10	.82	1	FLOW	267.	249.	207.	196.	152.	143.	136.
				TIME	3.67	3.67	3.67	3.75	3.75	3.75	3.75
4 COMBINED AT	T10	10.98	1	FLOW	2510.	2487.	2397.	2366.	2069.	1879.	1803.
				TIME	4.25	4.25	4.33	4.33	4.42	4.50	4.50
ROUTED TO	T10R	10.98	1	FLOW	2510.	2487.	2397.	2365.	2066.	1876.	1798.
				TIME	4.25	4.25	4.33	4.33	4.50	4.50	4.50
ROUTED TO	.	10.98	1	FLOW	2509.	2486.	2396.	2364.	2063.	1871.	1797.
				TIME	4.33	4.33	4.42	4.42	4.50	4.58	4.58
HYDROGRAPH AT	T11	1.09	1	FLOW	359.	355.	304.	294.	252.	237.	231.
				TIME	3.75	3.75	3.75	3.83	3.83	3.83	3.83
2 COMBINED AT	T11	12.07	1	FLOW	2716.	2683.	2547.	2506.	2173.	1969.	1893.
				TIME	4.17	4.17	4.33	4.33	4.50	4.58	4.58
ROUTED TO	T11R	12.07	1	FLOW	2715.	2680.	2546.	2504.	2167.	1966.	1889.
				TIME	4.17	4.17	4.33	4.33	4.50	4.58	4.58
ROUTED TO	.	12.07	1	FLOW	2708.	2673.	2543.	2500.	2155.	1956.	1879.
				TIME	4.25	4.33	4.42	4.50	4.67	4.67	4.75

HYDROGRAPH AT	T12	.77	1	FLOW	278.	271.	232.	223.	188.	177.	175.
				TIME	3.75	3.75	3.83	3.83	3.83	3.83	3.83
2 COMBINED AT	T12	12.84	1	FLOW	2874.	2829.	2655.	2602.	2227.	2023.	1944.
				TIME	4.25	4.25	4.42	4.42	4.67	4.67	4.75
HYDROGRAPH AT	T30F	.00	1	FLOW	1164.	1024.	490.	349.	0.	0.	0.
				TIME	4.17	4.17	4.25	4.25	.08	.08	.08
ROUTED TO	T12	.00	1	FLOW	540.	462.	175.	114.	0.	0.	0.
				TIME	6.17	6.17	6.25	6.25	.08	.08	.08
2 COMBINED AT	T12	12.84	1	FLOW	2874.	2829.	2655.	2602.	2227.	2023.	1944.
				TIME	4.25	4.25	4.42	4.42	4.67	4.67	4.75
HYDROGRAPH AT	MNW-B	.68	1	FLOW	55.	52.	42.	40.	30.	27.	26.
				TIME	6.50	6.50	6.50	6.50	6.50	6.42	6.42
DIVERSION TO	BCULV	.68	1	FLOW	22.	22.	22.	22.	22.	22.	22.
				TIME	4.58	4.58	4.83	4.92	5.33	5.50	5.67
HYDROGRAPH AT	DIVB	.68	1	FLOW	33.	30.	20.	18.	8.	5.	4.
				TIME	6.50	6.50	6.50	6.50	6.50	6.42	6.42
ROUTED TO	RDIVB	.68	1	FLOW	33.	30.	20.	18.	8.	5.	4.
				TIME	6.50	6.50	6.50	6.50	6.50	6.50	6.50
HYDROGRAPH AT	MNW-C	.69	1	FLOW	76.	73.	60.	57.	45.	42.	40.
				TIME	6.00	6.00	6.00	6.00	6.00	6.00	6.00
2 COMBINED AT	MNW-C	1.37	1	FLOW	107.	101.	79.	74.	52.	45.	43.
				TIME	6.17	6.17	6.17	6.17	6.17	6.17	6.17
ROUTED TO	MNW-C	1.37	1	FLOW	103.	97.	69.	63.	39.	36.	35.
				TIME	6.50	6.50	6.83	6.83	7.08	7.00	6.92
			** PEAK STAGES IN FEET **								
			1	STAGE	58.09	58.07	57.86	57.78	57.33	57.08	57.00
				TIME	6.50	6.50	6.83	6.83	7.08	7.00	6.92
DIVERSION TO	CCULV	1.37	1	FLOW	46.	46.	44.	43.	39.	36.	35.
				TIME	6.50	6.50	6.83	6.83	7.08	7.00	6.92
HYDROGRAPH AT	DIVC	1.37	1	FLOW	57.	51.	25.	20.	0.	0.	0.
				TIME	6.50	6.50	6.83	6.83	.08	.08	.08
HYDROGRAPH AT	MNW-D	.05	1	FLOW	9.	9.	7.	6.	5.	4.	4.
				TIME	3.83	3.83	3.83	3.83	3.83	5.08	5.08
2 COMBINED AT	MNW-D	1.42	1	FLOW	58.	51.	25.	20.	5.	4.	4.
				TIME	6.50	6.50	6.83	6.83	3.83	5.08	5.08
DIVERSION TO	DCULV	1.42	1	FLOW	28.	28.	25.	20.	5.	4.	4.
				TIME	5.83	6.00	6.83	6.83	3.83	5.08	5.08
HYDROGRAPH AT	DIVD	1.42	1	FLOW	30.	23.	0.	0.	0.	0.	0.
				TIME	6.50	6.50	.08	.08	.08	.08	.08
ROUTED TO	RDIVD	1.42	1	FLOW	30.	23.	0.	0.	0.	0.	0.
				TIME	6.58	6.67	.08	.08	.08	.08	.08

HYDROGRAPH AT	MNW-E	.05	1	FLOW	12.	11.	9.	9.	7.	6.	6.
				TIME	3.75	3.75	3.75	3.75	3.75	3.75	3.75
2 COMBINED AT	MNW-E	1.47	1	FLOW	30.	23.	9.	9.	7.	6.	6.
				TIME	6.58	6.67	3.75	3.75	3.75	3.75	3.75
DIVERSION TO	ECULV	1.47	1	FLOW	28.	23.	9.	9.	7.	6.	6.
				TIME	6.50	6.67	3.75	3.75	3.75	3.75	3.75
HYDROGRAPH AT	ECULV	1.47	1	FLOW	2.	0.	0.	0.	0.	0.	0.
				TIME	6.58	.08	.08	.08	.08	.08	.08
ROUTED TO	RDIVE	1.47	1	FLOW	2.	0.	0.	0.	0.	0.	0.
				TIME	6.83	.08	.08	.08	.08	.08	.08
HYDROGRAPH AT	MNW-FG	.36	1	FLOW	49.	46.	38.	37.	29.	26.	25.
				TIME	5.25	5.25	5.25	5.33	5.33	5.33	5.33
2 COMBINED AT	MNW-FG	1.83	1	FLOW	49.	46.	38.	37.	29.	26.	25.
				TIME	5.25	5.25	5.25	5.33	5.33	5.33	5.33
DIVERSION TO	GCULV	1.83	1	FLOW	49.	46.	38.	37.	29.	26.	25.
				TIME	5.25	5.25	5.25	5.33	5.33	5.33	5.33
HYDROGRAPH AT	DIVG	1.83	1	FLOW	0.	0.	0.	0.	0.	0.	0.
				TIME	.08	.08	.08	.08	.08	.08	.08
ROUTED TO	RDIVG	1.83	1	FLOW	0.	0.	0.	0.	0.	0.	0.
				TIME	.08	.08	.08	.08	.08	.08	.08
HYDROGRAPH AT	MNW-J1	2.37	1	FLOW	179.	170.	132.	123.	87.	75.	72.
				TIME	6.83	6.83	6.92	6.92	6.92	7.00	7.00
ROUTED TO	MNW-J2	2.37	1	FLOW	179.	169.	132.	123.	87.	75.	72.
				TIME	7.08	7.08	7.17	7.25	7.33	7.33	7.42
HYDROGRAPH AT	MNW-J2	1.21	1	FLOW	170.	163.	133.	126.	97.	88.	85.
				TIME	5.25	5.33	5.33	5.42	5.50	5.50	5.50
2 COMBINED AT	MNW-J2	3.58	1	FLOW	276.	261.	204.	191.	136.	119.	114.
				TIME	6.00	6.00	6.08	6.08	6.00	6.08	6.08
2 COMBINED AT	CP1	5.41	1	FLOW	276.	261.	204.	191.	136.	119.	114.
				TIME	6.00	6.00	6.08	6.08	6.00	6.08	6.08
ROUTED TO	RCP1	5.41	1	FLOW	276.	261.	204.	191.	136.	119.	114.
				TIME	6.08	6.08	6.08	6.08	6.08	6.17	6.17
HYDROGRAPH AT	RTNE	.00	1	FLOW	28.	23.	9.	9.	7.	6.	6.
				TIME	6.50	6.67	3.75	3.75	3.75	3.75	3.75
HYDROGRAPH AT	RTNE	.01	1	FLOW	0.	0.	0.	0.	0.	0.	0.
				TIME	4.83	4.83	4.92	4.92	.08	.08	.08
2 COMBINED AT	RTNE	.01	1	FLOW	28.	23.	9.	9.	7.	6.	6.
				TIME	6.50	6.67	3.75	3.75	3.75	3.75	3.75
ROUTED TO	RRTNE	.01	1	FLOW	28.	23.	9.	8.	7.	6.	6.
				TIME	7.00	7.17	4.42	4.42	4.50	4.50	4.50

HYDROGRAPH AT	RTNG	.00	1	FLOW	49.	46.	38.	37.	29.	26.	25.
				TIME	5.25	5.25	5.25	5.33	5.33	5.33	5.33
HYDROGRAPH AT	RTNG	.01	1	FLOW	0.	0.	0.	0.	0.	0.	0.
				TIME	4.83	4.83	4.92	4.92	.08	.08	.08
2 COMBINED AT	RTNG	.01	1	FLOW	49.	47.	38.	37.	29.	26.	25.
				TIME	5.17	5.25	5.25	5.33	5.33	5.33	5.33
ROUTED TO	RRTNG	.01	1	FLOW	49.	46.	38.	37.	29.	26.	25.
				TIME	5.42	5.42	5.50	5.50	5.58	5.58	5.58
HYDROGRAPH AT	MNW-11	.25	1	FLOW	84.	81.	68.	65.	52.	47.	46.
				TIME	4.00	4.00	4.00	4.00	4.00	4.00	4.00
3 COMBINED AT	CP2	.27	1	FLOW	111.	107.	90.	86.	69.	64.	63.
				TIME	4.25	5.17	5.17	5.17	5.17	5.17	5.17
ROUTED TO	RCP2	.27	1	FLOW	111.	106.	90.	86.	69.	64.	62.
				TIME	5.25	5.25	5.25	5.25	5.25	5.25	5.25
HYDROGRAPH AT	MNW-12	.14	1	FLOW	45.	43.	35.	33.	25.	22.	21.
				TIME	3.75	3.75	3.75	3.75	3.83	3.83	3.83
3 COMBINED AT	CP3	5.82	1	FLOW	368.	349.	278.	261.	192.	171.	164.
				TIME	5.58	5.58	5.58	5.58	5.50	5.50	5.50
ROUTED TO	RCP3	5.82	1	FLOW	368.	349.	277.	261.	192.	171.	164.
				TIME	5.75	5.75	5.75	5.75	5.67	5.67	5.67
H[illegible]RAPH AT	MNW-K	1.43	1	FLOW	218.	210.	179.	171.	139.	129.	126.
				TIME	5.50	5.50	5.50	5.50	5.50	5.42	5.42
2 COMBINED AT	CP4	7.25	1	FLOW	584.	557.	454.	431.	331.	299.	289.
				TIME	5.58	5.58	5.58	5.58	5.58	5.58	5.58
ROUTED TO	RCP4	7.25	1	FLOW	584.	557.	454.	430.	330.	299.	289.
				TIME	5.67	5.67	5.67	5.67	5.67	5.67	5.58
HYDROGRAPH AT	MNW-L	.27	1	FLOW	160.	155.	138.	134.	115.	109.	107.
				TIME	3.75	3.75	3.75	3.75	3.75	3.75	3.75
HYDROGRAPH AT	MNW-M	.49	1	FLOW	223.	217.	194.	188.	162.	154.	151.
				TIME	4.17	4.17	4.17	4.17	4.25	4.25	4.25
3 COMBINED AT	CP5	8.01	1	FLOW	774.	744.	621.	593.	476.	441.	430.
				TIME	5.25	5.25	5.25	5.25	5.17	5.17	5.17
ROUTED TO	T12	8.01	1	FLOW	773.	743.	621.	593.	476.	441.	430.
				TIME	5.33	5.33	5.33	5.33	5.25	5.25	5.25
ROUTED TO	.	8.01	1	FLOW	773.	742.	620.	592.	475.	440.	429.
				TIME	5.42	5.42	5.42	5.42	5.42	5.42	5.42
2 COMBINED AT	T12	20.85	1	FLOW	3508.	3431.	3194.	3126.	2664.	2430.	2342.
				TIME	5.50	4.33	4.42	4.50	4.67	4.67	4.75
2 COMBINED AT	F17	39.05	1	FLOW	6888.	6688.	5904.	5706.	4627.	4207.	4049.
				TIME	4.50	4.50	4.50	4.50	4.67	4.67	4.75

FLAMINGO/ TROPICANA CONFLUENCE

OUTED TO	F18	39.05	1	FLOW	6888.	6686.	5899.	5698.	4627.	4197.	4049.
				TIME	4.50	4.50	4.50	4.50	4.67	4.67	4.75
OUTED TO	.	39.05	1	FLOW	6886.	6683.	5892.	5694.	4624.	4188.	4048.
				TIME	4.50	4.50	4.50	4.58	4.67	4.75	4.75
YDROGRAPH AT	R4	2.28	1	FLOW	1285.	1242.	1073.	1031.	844.	783.	763.
				TIME	3.75	3.75	3.75	3.75	3.75	3.75	3.75
YDROGRAPH AT	F150F	.00	1	FLOW	0.	0.	0.	0.	0.	0.	0.
				TIME	.08	.08	.08	.08	.08	.08	.08
OUTED TO	F150FR	.00	1	FLOW	0.	0.	0.	0.	0.	0.	0.
				TIME	.08	.08	.08	.08	.08	.08	.08
2 COMBINED AT	R4	2.28	1	FLOW	1285.	1242.	1073.	1031.	844.	783.	763.
				TIME	3.75	3.75	3.75	3.75	3.75	3.75	3.75
YDROGRAPH AT	F160F	.00	1	FLOW	0.	0.	0.	0.	0.	0.	0.
				TIME	.08	.08	.08	.08	.08	.08	.08
OUTED TO	F160FR	.00	1	FLOW	0.	0.	0.	0.	0.	0.	0.
				TIME	.08	.08	.08	.08	.08	.08	.08
2 COMBINED AT	R4	2.28	1	FLOW	1285.	1242.	1073.	1031.	844.	783.	763.
				TIME	3.75	3.75	3.75	3.75	3.75	3.75	3.75
OUTED TO	F18	2.28	1	FLOW	1030.	995.	859.	825.	676.	627.	611.
				TIME	4.67	4.67	4.67	4.67	4.67	4.67	4.67
YDROGRAPH AT	F18	.87	1	FLOW	386.	368.	322.	313.	267.	251.	244.
				TIME	3.75	3.75	3.75	3.75	3.75	3.75	3.75
2 COMBINED AT	F18	3.15	1	FLOW	1178.	1137.	979.	940.	771.	717.	698.
				TIME	4.67	4.67	4.67	4.67	4.67	4.67	4.67
YDROGRAPH AT	F24	1.03	1	FLOW	629.	607.	546.	527.	459.	440.	431.
				TIME	3.58	3.58	3.58	3.58	3.67	3.67	3.67
3 COMBINED AT	F18	43.23	1	FLOW	8168.	7924.	6978.	6736.	5496.	5006.	4846.
				TIME	4.58	4.58	4.58	4.58	4.67	4.75	4.75
OUTED TO	F18R	43.23	1	FLOW	8162.	7919.	6973.	6731.	5487.	5000.	4838.
				TIME	4.67	4.67	4.67	4.67	4.75	4.83	4.83
YDROGRAPH AT	F20A	.81	1	FLOW	170.	164.	145.	141.	120.	113.	110.
				TIME	3.75	3.75	3.83	3.83	3.83	3.83	3.83
2 COMBINED AT	F20A	44.04	1	FLOW	8229.	7983.	7026.	6783.	5529.	5041.	4878.
				TIME	4.67	4.67	4.67	4.67	4.75	4.83	4.83
OUTED TO	F20B	44.04	1	FLOW	8228.	7982.	7023.	6779.	5520.	5037.	4871.
				TIME	4.67	4.67	4.67	4.67	4.75	4.83	4.83
[redacted] TO	.	44.04	1	FLOW	8226.	7980.	7019.	6774.	5511.	5033.	4868.
				TIME	4.67	4.67	4.67	4.67	4.83	4.83	4.92
YDROGRAPH AT	F19	1.54	1	FLOW	814.	798.	718.	691.	599.	571.	561.
				TIME	3.67	3.67	3.67	3.67	3.67	3.67	3.67

SPENCER

OUTED TO	F208	1.54	1	FLOW	729.	712.	638.	618.	533.	508.	499.	
				TIME	3.83	3.83	3.83	3.83	3.83	3.83	3.83	
YDROGRAPH AT	F208	.73	1	FLOW	378.	364.	307.	293.	231.	212.	205.	
				TIME	3.67	3.67	3.67	3.67	3.67	3.67	3.67	
2 COMBINED AT	F208	2.27	1	FLOW	1036.	1003.	875.	844.	707.	668.	654.	
				TIME	3.75	3.75	3.75	3.75	3.83	3.83	3.83	
YDROGRAPH AT	VB	4.58	1	FLOW	1363.	1302.	1063.	1005.	754.	676.	650.	
				TIME	3.92	3.92	3.92	3.92	3.92	4.00	4.00	
3 COMBINED AT	F208	50.89	1	FLOW	9490.	9208.	8028.	7742.	6322.	5832.	5669.	D/S DESERT INN
				TIME	5.00	5.00	4.92	4.92	4.92	5.00	5.00	
OUTED TO	F22	50.89	1	FLOW	9475.	9194.	8027.	7733.	6318.	5825.	5657.	
				TIME	5.00	5.00	5.00	5.00	5.00	5.00	5.00	
YDROGRAPH AT	F21	1.27	1	FLOW	708.	697.	599.	577.	497.	466.	463.	
				TIME	3.67	3.67	3.67	3.67	3.67	3.67	3.67	
IVERSION TO	OAKEY	1.27	1	FLOW	354.	348.	300.	289.	248.	233.	231.	
				TIME	3.67	3.67	3.67	3.67	3.67	3.67	3.67	
YDROGRAPH AT	F21	1.27	1	FLOW	354.	348.	300.	289.	248.	233.	231.	
				TIME	3.67	3.67	3.67	3.67	3.67	3.67	3.67	
OUTED TO	F22	1.27	1	FLOW	348.	342.	291.	281.	239.	225.	222.	
				TIME	3.67	3.67	3.67	3.67	3.75	3.75	3.75	
YDROGRAPH AT	F22	3.43	1	FLOW	1549.	1499.	1317.	1288.	1075.	1015.	1001.	
				TIME	3.67	3.67	3.67	3.67	3.67	3.67	3.67	
3 COMBINED AT	F22	55.59	1	FLOW	10511.	10187.	8868.	8536.	6971.	6434.	6257.	BOULDER HWY
				TIME	5.00	5.00	5.00	5.00	5.00	5.00	5.08	
OUTED TO	F23	55.59	1	FLOW	10500.	10176.	8860.	8530.	6965.	6427.	6256.	
				TIME	5.00	5.00	5.00	5.00	5.00	5.08	5.08	
OUTED TO	.	55.59	1	FLOW	10497.	10175.	8847.	8518.	6962.	6425.	6242.	
				TIME	5.08	5.08	5.08	5.08	5.08	5.08	5.08	
OUTED TO	.	55.59	1	FLOW	10469.	10145.	8831.	8505.	6945.	6417.	6241.	
				TIME	5.08	5.08	5.08	5.08	5.08	5.17	5.17	
OUTED TO	.	55.59	1	FLOW	10466.	10144.	8822.	8495.	6944.	6401.	6227.	
				TIME	5.17	5.17	5.17	5.17	5.17	5.17	5.25	
YDROGRAPH AT	F23	1.92	1	FLOW	469.	451.	387.	368.	308.	288.	284.	
				TIME	4.00	4.00	4.00	4.08	4.08	4.08	4.08	
2 COMBINED AT	F23	57.51	1	FLOW	10871.	10528.	9123.	8777.	7149.	6590.	6411.	NELLIS / LAS VEGAS WASH
				TIME	5.17	5.17	5.17	5.17	5.17	5.25	5.25	

SUMMARY OF KINEMATIC WAVE - MUSKINGUM-CUNGE ROUTING
(FLOW IS DIRECT RUNOFF WITHOUT BASE FLOW)

ISTAQ	ELEMENT	DT	PEAK	TIME TO PEAK	VOLUME	INTERPOLATED TO COMPUTATION INTERVAL DT	PEAK	TIME TO PEAK	VOLUME
		(MIN)	(CFS)	(MIN)	(IN)	(MIN)	(CFS)	(MIN)	(IN)
FOR PLAN = 1 RATIO= .92									
F7	MANE	3.81	720.90	235.71	1.42	5.00	720.05	235.00	1.42

ONTINUITY SUMMARY (AC-FT) - INFLOW= .0000E+00 EXCESS= .1145E+03 OUTFLOW= .1136E+03 BASIN STORAGE= .3308E+00 PERCENT ERROR= .6

FOR PLAN = 1 RATIO= .92									
F7	MANE	4.09	611.10	237.05	1.24	5.00	608.49	240.00	1.24

ONTINUITY SUMMARY (AC-FT) - INFLOW= .0000E+00 EXCESS= .9998E+02 OUTFLOW= .9900E+02 BASIN STORAGE= .3312E+00 PERCENT ERROR= .6

FOR PLAN = 1 RATIO= .90									
F7	MANE	4.07	580.37	239.30	1.19	5.00	578.94	240.00	1.19

ONTINUITY SUMMARY (AC-FT) - INFLOW= .0000E+00 EXCESS= .9639E+02 OUTFLOW= .9548E+02 BASIN STORAGE= .2886E+00 PERCENT ERROR= .6

FOR PLAN = 1 RATIO= .82									
F7	MANE	4.38	474.45	241.34	1.02	5.00	472.59	245.00	1.02

ONTINUITY SUMMARY (AC-FT) - INFLOW= .0000E+00 EXCESS= .8232E+02 OUTFLOW= .8149E+02 BASIN STORAGE= .2837E+00 PERCENT ERROR= .7

FOR PLAN = 1 RATIO= .80									
F7	MANE	4.51	451.32	244.18	.98	5.00	449.83	245.00	.97

ONTINUITY SUMMARY (AC-FT) - INFLOW= .0000E+00 EXCESS= .7887E+02 OUTFLOW= .7800E+02 BASIN STORAGE= .2840E+00 PERCENT ERROR= .7

FOR PLAN = 1 RATIO= .71									
F7	MANE	4.93	335.29	248.69	.79	5.00	334.78	250.00	.79

ONTINUITY SUMMARY (AC-FT) - INFLOW= .0000E+00 EXCESS= .6376E+02 OUTFLOW= .6290E+02 BASIN STORAGE= .3138E+00 PERCENT ERROR= .9

FOR PLAN = 1 RATIO= .68									
F7	MANE	5.00	297.48	253.18	.73	5.00	296.01	255.00	.73

ONTINUITY SUMMARY (AC-FT) - INFLOW= .0000E+00 EXCESS= .5888E+02 OUTFLOW= .5806E+02 BASIN STORAGE= .2785E+00 PERCENT ERROR= .9

FOR PLAN = 1 RATIO= .67

CONTINUITY SUMMARY (AC-FT) - INFLOW= .0000E+00 EXCESS= .7133E+02 OUTFLOW= .6962E+02 BASIN STORAGE= .8414E+00 PERCENT ERROR= 1.2

*** NORMAL END OF HEC-1 ***

Study Contractor: G. C. Wallace, Inc.

HYDRAULIC ANALYSES INDEX

Clark County, Nevada
(COMMUNITY NAME, STATE)

FLOOD INSURANCE STUDY

HYDRAULIC ANALYSES INDEX

FLOODING SOURCE/ STREAM NAME	HYDROLOGIC METHOD/ MODEL USED	METHOD/MODEL ANALYSIS DATE	EXHIBIT NO. PAPER COPY	EXHIBIT NO. FLOPPY DISKETTES
FLAMINGO WASH	HEC-2/BASE0.01	OCTOBER 6, 1997	ENCLOSED	ENCLOSED
FLAMINGO WASH	HEC-2/BASE1.01	"	"	"
FLAMINGO WASH	HEC-2/BASE1.02	OCTOBER 12, 1997	"	"
FLAMINGO WASH	HEC-2/BASE2.01	OCTOBER 6, 1997	"	"
FLAMINGO WASH	HEC-2/BASE3-4.01	"	"	"
FLAMINGO WASH	HEC-2/BASE3-4.02	"	"	"

2.2.1 RAINBOW BLVD. TO JONES BLVD. REACH

APPROXIMATE METHOD
HEC-2 MODEL ANALYSIS
RAINBOW BLVD. TO JONES BLVD. REACH

This reach from Rainbow Boulevard to Jones Boulevard was not flown as part of this project. Therefore, no topography was generated. So, in order to model this area, a survey crew was sent out to pick up cross sections. Based on these surveyed cross sections and the detailed surveyed bridges in this reach, the HEC-2 model was constructed. The starting water surface elevation was taken from the Jones Boulevard to Industrial Road Reach HEC-2 model. The subcritial run was used to determine the floodplain delineation for this reach.

BASE0.D1

```
**********************************************
*  HEC-2 WATER SURFACE PROFILES              *
*                                            *
*  Version  4.6.2;  May 1991                 *
*                                            *
*  RUN DATE    06OCT97    TIME    10:38:01   *
**********************************************
```


```
**************************************
*  U.S. ARMY CORPS OF ENGINEERS      *
*  HYDROLOGIC ENGINEERING CENTER     *
*  609 SECOND STREET, SUITE D        *
*  DAVIS, CALIFORNIA 95616-4687      *
*          (916) 756-1104            *
**************************************
```


```
X     X  XXXXXXX   XXXXX              XXXXX
X     X  X        X     X           X     X
X     X  X        X                       X
XXXXXXX  XXXX     X          XXXXX    XXXXX
X     X  X        X                  X
X     X  X        X     X            X
X     X  XXXXXXX  XXXXX              XXXXXXX
```

THIS RUN EXECUTED 06OCT97 10:38:03

****
HEC-2 WATER SURFACE PROFILES

Version 4.6.2; May 1991
****

```
T1      550.032
T2      FLAMINGO WASH FIS RESTUDY
T3      FLOODPLAIN DETERMINATION
T3      RAINBOW BLVD. TO JONES BLVD.
T4      FILE: BASE0.D1
T4      STARTING WSE = 2278.74  FROM BASE1.D1
T4      SUBCRITICAL RUN

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

                2                                                         3900    2278.74

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLOC     IBW       CHNIM     ITRACE

     1                  -1                                      -2        -6

J   RIABLE CODES FOR SUMMARY PRINTOUT

    150                100

NC    0.025     0.025     0.03      0.1       0.3
C1      470        21   1033.6   1139.45    496.29     497.3    497.44
SR   2287.1      1000   2286.43   1011.63   2286.11   1013.88      2286   1018.25   2285.78   1026.47
SR     2284   1029.84      2282    1033.6      2280   1037.35      2278   1041.08      2276   1044.81
SR   2274.8   1047.02   2274.47   1125.14      2276   1128.04      2278   1131.84      2280   1135.65
SR     2282   1139.45      2284   1143.25   2285.45   1146.01      2286   1157.83   2286.04    1158.7
SR   2286.2   1160.71

NC    0.025     0.025      .015
C1      480        27   1037.36   1120.53    314.57    317.78    315.97
SR   2294.3      1000      2294   1007.37   2293.91   1009.73   2293.01   1023.57   2292.78   1027.28
SR     2292   1028.94      2290   1033.16      2288   1037.36   2286.16   1041.18      2286   1041.54
SR     2284   1045.96      2282   1050.19      2280   1055.11   2279.98   1055.27   2280.03   1060.89
SR     2280   1096.41   2280.31   1101.25      2282   1105.98      2284   1110.71      2286   1115.55
SR     2288   1120.53      2290    1125.3      2292   1129.86   2292.43   1130.82   2292.52   1169.51
SR     2292   1170.97   2291.65    1171.6

NC     0.02      0.02     0.015
C1      490        13      1054   1095.75    144.45    149.77    143.95
SS       10                 1054      2294   1095.75      2294
SR   2294.4      1000   2294.73   1002.88   2294.72   1015.52    2294.6   1027.21      2294   1031.11
     2294.1      1054    2284.1      1054    2284.1   1095.75    2294.1   1095.75      2294   1107.09
     2294.5   1111.08   2294.61   1127.32   2294.51   1131.81
```

[redacted]	0.025	0.025	0.015							
S	.9	1.56	2.6	100	41.75	1.75	320	0	2284.6	2284.1
X1	500	10	1050	1091.75	102	102	102			
X2			1	2292.6	2295.3			1.33		
X3	10			1050	2294	1091.75	2294			
GR	2294.5	1000	2294.88	1008.14	2294.73	1038.02	2294.6	1050	2284.6	1050
GR	2284.6	1091.75	2294.6	1091.75	2294.56	1100.74	2294.86	1121.69	2294.5	1125.84
NC	0.02	0.02	0.02							
X1	510	25	1004.78	1116.38	25	25	25			
GR	2298.8	1000	2298	1000.62	2296.14	1001.97	2296	1004.78	2295.65	1011.7
GR	2294	1018.55	2292	1024.72	2291.3	1026.83	2290	1029.58	2288	1033.81
GR	2286	1038.05	2285.06	1039.94	2285.06	1087.65	2286	1089.57	2288	1093.44
GR	2288.7	1095.14	2290	1097.3	2292	1101.56	2294	1107.37	2295.46	1111.71
GR	2295.5	1116.38	2296	1123.41	2296.51	1129.95	2297.66	1133.29	2297.62	1149.23
NC	0.02	0.02	0.02							
X1	520	6	1000	1086.89	270.2	253.62	261.38			
GR	2304.6	1000	2292.1	1027.64	2287.2	1043.88	2287.1	1068.47	2296.4	1086.89
GR	2299.8	1115.75								
NC	0.02	0.02	0.02							
X1	530	12	1012.73	1091.01	290.28	300.88	292.28			
GR	2306.5	1000	2305.16	1002.59	2304.10	1012.73	2299.36	1021.04	2299.44	1024.50
GR	2289.5	1043.63	2289.31	1058.09	2289.85	1075.82	2296.48	1091.01	2297.34	1100.5
G	2301.5	1118.84	2302.73	1126.28						
NC	0.02	0.02	0.02							
X1	540	10	1011.97	1089	478.99	474.14	474.25			
GR	2308.1	1000	2307.49	1011.97	2293.72	1038.41	2292.99	1056.88	2294.28	1074.36
GR	2301.1	1089	2301.85	1102.44	2305.68	1118.12	2306.02	1122.17	2306.89	1124.57
NC	0.02	0.02	0.02							
X1	550	11	1015.21	1090.47	518.84	523.12	520.66			
GR	2314.3	1000	2312.70	1004.83	2312.22	1015.21	2297.95	1046.16	2297.68	1059.03
GR	2298.0	1071.99	2304.93	1090.47	2307.63	1114.24	2308.23	1126.06	2309.40	1128.02
GR	2309.2	1129.01								
NC	0.02	0.02	0.02							
X1	560	12	1018.03	1090.97	479.65	475.74	479.99			
GR	2319.6	1000	2318.50	1002.59	2317.24	1018.03	2302.47	1045	2302.36	1066.33
GR	2302.6	1077	2304.01	1078.97	2304.21	1081.04	2309.45	1090.97	2313.96	1118.24
GR	2314.8	1127.28	2315.85	1129.28						
NC	0.02	0.02	0.02							
X1	570	6	1000	1075.08	390.27	400.54	397.21			
GR	2316.4	1000	2310.41	1012.38	2306.89	1030.12	2307.49	1041.92	2310.55	1063.27
GR	2316.5	1075.08								

	0.02	0.02	0.015							
X1	580	5	1000	1041.75	120.01	116.82	123.21			
X3	10			1000	2317.8	1041.75	2317.8	2317.8	2317.8	
GR	2317.3	1000	2310.02	1000	2310.02	1041.75	2317.64	1041.75	2317.64	1078.71
SB	.9	1.56	2.6	132	41.75	1.75	320		2312.18	2310.02
NC	0.02	0.02	0.015							
X1	590	4	1000	1041.75	134.38	132.50	125.31			
X2			1	2320.18	2322.01			1.33		
X3	10			1000	2324.1	1041.75	2324.1			
GR	2324.0	1000	2312.18	1000	2312.18	1041.75	2324.0	1041.75		
NC	0.02	0.02	0.02							
X1	600	7	1000	1089.82	133.41	120.42	123.12			
GR	2325.3	1000	2321.55	1005.46	2314.06	1017.49	2314.10	1040.45	2315.06	1068.41
GR	2325.3	1089.82	2325.30	1091.72						
NC	0.02	0.02	0.02							
X1	610	12	1019.65	1108.86	473.98	414.07	443.09			
GR	2328.9	1000	2329.43	1013.76	2327.86	1019.65	2319.17	1036.52	2318.69	1059.47
GR	2318.2	1061.23	2318.72	1063.31	2318.73	1081.16	2319.15	1086.20	2331.00	1108.86
GR	2331.0	1110.79	2330.49	1119.31						
NC	0.02	0.02	0.02							
X1	620	13	1017.50	1108.12	491.57	536.11	512.99			
G	2333.8	1000	2332.15	1013.04	2330.86	1017.5	2324.57	1028.71	2323.47	1030.25
G	2323.1	1039.35	2322.65	1041.70	2322.41	1047.74	2323.18	1067.52	2323.13	1084.98
GR	2336.4	1108.12	2336.46	1110.13	2336.14	1116.80				
NC	0.02	0.02	0.02							
X1	630	8	1000	1094.39	383.67	381.50	381.82			
GR	2336.0	1000	2326.15	1025.52	2325.00	1044.64	2324.81	1066.49	2326.92	1071.49
GR	2339.9	1094.39	2339.91	1096.31	2339.69	1112.07				
NC	.015	.02	.015							
X1	640	6	1000	1066	194.78	125.27	87.80			
X3	10			1000	2337.25	1066	2337.25			
GR	2337.2	1000	2333.25	1000	2327.25	1009	2327.25	1057	2333.25	1066
GR	2337.2	1066								
SB	.90	1.56	2.6	184	48	6	426	1.5	2328.41	2327.25
NC	.02	.02	.015							
X1	650	6	1000	1066	188.47	187.44	198.08			
X2			1	2336.41	2339.86			1.33		
X3	10			1000	2336.41	1066	2336.41			
GR	2336.4	1000	2334.41	1000	2328.41	1009	2328.41	1057	2334.41	1066
GR	2336.4	1066								

	.03	.03	.025							
X	660	11	1000	1079.80	99.31	163.20	127.89			
GR	2339.7	1000	2339.59	1000.88	2340.05	1003.49	2334.75	1004.66	2333.26	1007.57
GR	2329.8	1013.92	2329.24	1037.32	2329.67	1058.47	2331.76	1067.91	2338.02	1072.09
GR	2341.3	1079.80								
NC	.03	.03	.025							
X1	670	11	1000	1085.33	503.66	552.77	530.81			
GR	2341.0	1000	2341.07	1003.53	2341.07	1010.83	2341.07	1013.66	2338.05	1015.93
GR	2333.2	1021.71	2332.37	1043.45	2332.59	1053.02	2333.69	1058.39	2342.45	1071.27
GR	2349.4	1085.33								
NC	.03	.03	.025							
X1	680	11	1000	1085.52	483.05	501.60	508.76			
GR	2351	1000	2346.16	1006.72	2345.75	1012.63	2345.23	1015.64	2342.32	1017.51
GR	2335.4	1023.77	2334.72	1035.57	2334.89	1055.45	2336.08	1058.93	2343.65	1071.58
GR	2351.8	1085.52								
NC	.03	.03	.02							
X1	690	4	1000	1082	433	442.93	437.49			
X3	10			1000	2352.4	1082	2352.4			
GR	2352.4	1000	2338.40	1021	2338.40	1061	2352.40	1082		
SB	.90	1.56	2.6	130	40	4	798	1.5	2338.49	2338.40
NC	.03	.03	.02							
X	700	4	1000	1082	126.98	127.16	119.30			
X			1	2352.49	2354.36			1.33		
X3	10			1000	2352.49	1082	2352.49			
GR	2352.4	1000	2338.49	1021	2338.49	1061	2352.49	1082		
NC	.03	.03	.025	.1	.3					
X1	710	5	1000	1094.10	41.86	31.18	33.13			
GR	2353.1	1000	2341.58	1036.19	2341.63	1047.76	2341.74	1066.24	2354.06	1094.10

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*PROF 1

CRITICAL DEPTH TO BE CALCULATED AT ALL CROSS SECTIONS
ALLOWABLE ERROR FOR CRITICAL DEPTH DETERMINATION (ALLDC) = 2.000 PERCENT OF THE DEPTH

CCHV= .100 CEHV= .300
*SECNO 470.000
3720 CRITICAL DEPTH ASSUMED

470.000	4.27	2278.74	2278.74	2278.74	2280.64	1.90	.00	.00	2282.00
3900.0	.0	3900.0	.0	.0	352.7	.0	.0	.0	2282.00
.00	.00	11.06	.00	.000	.030	.000	.000	2274.47	1039.69
.008742	496.	497.	497.	0	4	0	.00	93.56	1133.26

*SECNO 480.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

480.000	5.51	2285.49	2285.49	.00	2287.77	2.28	1.19	.11	2288.00
900.0	.0	3900.0	.0	.0	322.0	.0	2.4	.6	2288.00
.01	.00	12.11	.00	.000	.015	.000	.000	2279.98	1042.67
.002096	315.	316.	318.	0	11	0	.00	71.65	1114.32

*SECNO 490.000

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 1054.0 1095.8 TYPE= 1 TARGET= 41.750
ELENCL= 2294.00 ELENCR= 2294.00

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2294.10 ELREA= 2294.10

490.000	6.47	2290.57	2290.57	.00	2293.81	3.23	.33	.29	2294.10
3900.0	.0	3900.0	.0	.0	270.2	.0	3.4	.8	2294.10
.01	.00	14.43	.00	.000	.015	.000	.000	2284.10	1054.00
.002522	144.	144.	150.	0	8	0	.00	41.75	1095.75

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

SPECIAL BRIDGE

5227 DOWNSTREAM ELEV IS 2289.61 , NOT 2290.57 HYDRAULIC JUMP OCCURS DOWNSTREAM (IF LOW FLOW CONTROLS)

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	.90	1.56	2.60	100.00	41.75	1.75	320.00	.00	2284.60	2284.10

*SECNO 500.000

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.41

CLASS B LOW FLOW

3420 BRIDGE W.S.= 2291.01 BRIDGE VELOCITY= 14.65 CALCULATED CHANNEL AREA= 256.

EGPRS	EGLWC	H3	QWEIR	QLOW	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
4.17	2294.79	.00	0.	3900.	320.	320.	2292.60	2295.30	0.

3470 ENCROACHMENT STATIONS= 1050.0 1091.8 TYPE= 1 TARGET= 41.750
ELENCL= 2294.00 ELENCR= 2294.00

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2294.60 ELREA= 2294.60

500.000	8.16	2292.76	.00	.00	2294.79	2.04	.99	.00	2294.60
3900.0	.0	3900.0	.0	.0	340.6	.0	4.1	.9	2294.60
.01	.00	11.45	.00	.000	.015	.000	.000	2284.60	1050.00
.001263	102.	102.	102.	0	0	0	.00	41.75	1091.75

*SECNO 510.000

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.49

510.000	9.30	2294.36	2290.49	.00	2294.96	.60	.02	.14	2296.00
3900.0	.0	3900.0	.0	.0	627.0	.0	4.4	.9	2295.50
.01	.00	6.22	.00	.000	.020	.000	.000	2285.06	1017.09
0568	25.	25.	25.	3	14	0	.00	91.33	1108.42

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
[redacted]	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 520.000

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

520.000	7.11	2294.21	2294.21	.00	2296.79	2.58	.31	.59	2304.60
3900.0	.0	3900.0	.0	.0	302.6	.0	7.2	1.4	2296.40
.02	.00	12.89	.00	.000	.020	.000	.000	2287.10	1022.98
.003669	270.	261.	254.	0	15	0	.00	59.57	1082.55

*SECNO 530.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

530.000	6.87	2296.18	2296.18	.00	2298.74	2.55	1.06	.00	2304.10
3900.0	.0	3900.0	.0	.0	304.1	.0	9.2	1.8	2296.48
.03	.00	12.83	.00	.000	.020	.000	.000	2289.31	1030.77
.003617	290.	292.	301.	0	8	0	.00	59.57	1090.33

*[redacted]540.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

540.000	6.97	2299.96	2299.96	.00	2302.51	2.54	1.72	.00	2307.49
3900.0	.0	3900.0	.0	.0	304.7	.0	12.6	2.4	2301.10
.04	.00	12.80	.00	.000	.020	.000	.000	2292.99	1026.42
.003625	479.	474.	474.	0	5	0	.00	60.14	1086.56

SECNO 550.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

550.000	7.27	2304.95	2304.95	.00	2307.55	2.59	1.90	.01	2312.22
3900.0	.0	3900.0	.0	.0	301.8	.0	16.2	3.1	2304.93
.05	.00	12.92	.05	.000	.020	.020	.000	2297.68	1030.97
.003691	519.	521.	523.	0	8	0	.00	59.72	1090.69

SECNO 560.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

560.000	6.77	2309.13	2309.13	.00	2311.76	2.63	1.77	.01	2317.24
3900.0	.0	3900.0	.0	.0	299.5	.0	19.5	3.8	2309.45
.06	.00	13.02	.00	.000	.020	.000	.000	2302.36	1032.84
.003674	480.	480.	476.	0	11	0	.00	57.52	1090.36

[redacted]

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IOC	ICONT	CORAR	TOPWID	ENDST

*SECNO 570.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

570.000	7.19	2314.08	2314.08	.00	2316.51	2.43	1.46	.02	2316.40
3900.0	.0	3900.0	.0	.0	311.9	.0	22.3	4.3	2316.50
.07	.00	12.50	.00	.000	.020	.000	.000	2306.89	1004.80
.003696	390.	397.	401.	0	8	0	.00	65.48	1070.28

*SECNO 580.000

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 1000.0 1041.8 TYPE= 1 TARGET= 41.750
ELENCL= 2317.80 ELENCR= 2317.80

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2317.80 ELREA= 2317.80

000	6.47	2316.49	2316.49	.00	2319.73	3.24	.37	.24	2367.30
3900.0	.0	3900.0	.0	.0	270.2	.0	23.1	4.5	2317.80
.07	.00	14.44	.00	.000	.015	.000	.000	2310.02	1000.00
.002524	120.	123.	117.	0	12	0	.00	41.75	1041.75

SPECIAL BRIDGE

5227 DOWNSTREAM ELEV IS 2315.53 , NOT 2316.49 HYDRAULIC JUMP OCCURS DOWNSTREAM (IF LOW FLOW CONTROLS)

SB XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
.90	1.56	2.60	132.00	41.75	1.75	320.00	.00	2312.18	2310.02

*SECNO 590.000
5790 POSSIBLE INVALID SOLUTION 20 TRIALS OF EG NOT ENOUGH
FINAL QWEIR + QPR = 4407. DOES NOT EQUAL ACTUAL Q = 3900.

6840, FLOW IS BY WEIR AND LOW FLOW

3301 HV CHANGED MORE THAN HVINS

6420 BRIDGE W.S.= 2319.00 BRIDGE VELOCITY= 13.95 CALCULATED CHANNEL AREA= 273.

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

EGPRS	EGLWC	H3	QWEIR	QLOW	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
2320.09	2322.02	2.51	0.	4407.	320.	320.	2320.18	2322.01	132.

3470 ENCROACHMENT STATIONS= 1000.0 1041.8 TYPE= 1 TARGET= 41.750
ELENCL= 2324.10 ELENCR= 2324.10

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2374.00 ELREA= 2324.10

590.000	7.31	2319.49	.00	.00	2322.02	2.53	2.29	.00	2374.00
3900.0	.0	3900.0	.0	.0	305.5	.0	23.9	4.6	2324.10
.07	.00	12.76	.00	.000	.015	.000	.000	2312.18	1000.00
.001744	134.	125.	133.	4	0	20	.00	41.75	1041.75

*SECNO 600.000

3301 HV CHANGED MORE THAN HVINS

600.000	6.89	2320.95	2319.68	.00	2322.35	1.40	.22	.11	2325.30
3900.0	.0	3900.0	.0	.0	411.0	.0	24.9	4.8	2325.30
.07	.00	9.49	.00	.000	.020	.000	.000	2314.06	1006.41
.001768	133.	123.	120.	5	15	0	.00	74.34	1080.75

*SECNO 610.000

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

610.000	6.04	2324.24	2324.24	.00	2326.56	2.32	1.10	.28	2327.86
3900.0	.0	3900.0	.0	.0	318.9	.0	28.7	5.5	2331.00
.08	.00	12.23	.00	.000	.020	.000	.000	2318.20	1026.68
.003715	474.	443.	414.	0	11	0	.00	69.25	1095.93

*SECNO 620.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAE	TOPWID	ENDST
620.000	5.71	2328.12	2328.12	.00	2330.41	2.29	1.92	.00	2330.86
3900.0	.0	3900.0	.0	.0	321.4	.0	32.4	6.3	2336.40
.10	.00	12.13	.00	.000	.020	.000	.000	2322.41	1022.38
.003761	492.	513.	536.	0	11	0	.00	71.30	1093.68

*SECNO 630.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

630.000	6.28	2331.09	2331.09	.00	2333.49	2.40	1.42	.03	2336.00
3900.0	.0	3900.0	.0	.0	313.7	.0	35.2	6.9	2339.90
.11	.00	12.43	.00	.000	.020	.000	.000	2324.81	1012.72
.003688	384.	382.	382.	0	8	0	.00	66.13	1078.85

*SECNO 640.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 1000.0 1066.0 TYPE= 1 TARGET= 66.000
ICL= 2337.25 ELENCR= 2337.25

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2387.20 ELREA= 2337.25

640.000	5.53	2332.78	2332.78	.00	2335.22	2.43	.24	.01	2387.20
3900.0	.0	3900.0	.0	.0	311.5	.0	35.8	7.1	2337.25
.11	.00	12.52	.00	.000	.015	.000	.000	2327.25	1000.70
.002097	195.	88.	125.	0	11	0	.00	64.60	1065.30

SPECIAL BRIDGE

5227 DOWNSTREAM ELEV IS 2331.67 , NOT 2332.78 HYDRAULIC JUMP OCCURS DOWNSTREAM (IF LOW FLOW CONTROLS)

SB XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
.90	1.56	2.60	184.00	48.00	6.00	426.00	1.50	2328.41	2327.25

'SECNO 650.000

301 HV CHANGED MORE THAN HVINS

302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.74

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WIN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

CLASS B LOW FLOW

3420 BRIDGE W.S.= 2333.81 BRIDGE VELOCITY= 12.79 CALCULATED CHANNEL AREA= 271.

EGPRS	EGLWC	H3	QWEIR	QLOW	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
2334.81	2337.18	.00	0.	3900.	426.	432.	2336.41	2339.86	0.

3470 ENCROACHMENT STATIONS= 1000.0 1066.0 TYPE= 1 TARGET= 66.000
ELENCL= 2336.41 ELENCR= 2336.41

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2386.40 ELREA= 2336.41

650.000	7.59	2336.00	.00	.00	2337.18	1.18	1.97	.00	2386.40
3900.0	.0	3900.0	.0	.0	447.1	.0	37.6	7.4	2336.41
.11	.00	8.72	.00	.000	.015	.000	.000	2328.41	1000.00
.000690	188.	198.	187.	0	0	0	.00	66.00	1066.00

*SECNO 660.000

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .43

660.000	6.51	2335.75	2334.97	.00	2337.54	1.78	.17	.18	2339.70
3900.0	.0	3900.0	.0	.0	364.0	.0	38.8	7.6	2341.30
.12	.00	10.72	.00	.000	.025	.000	.000	2329.24	1004.44
.003646	99.	128.	163.	3	15	0	.00	66.14	1070.58

*SECNO 670.000

3301 HV CHANGED MORE THAN HVINS

3185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

670.000	7.01	2339.38	2339.38	.00	2342.21	2.83	2.41	.31	2341.00
3900.0	.0	3900.0	.0	.0	289.1	.0	42.7	8.3	2349.40
.13	.00	13.49	.00	.000	.025	.000	.000	2332.37	1014.93
.005792	504.	531.	553.	0	8	0	.00	51.83	1066.76

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

SECNO 680.000

;301 HV CHANGED MORE THAN HVINS

680.000	7.74	2342.46	2341.83	.00	2344.76	2.30	2.50	.05	2351.00
3900.0	.0	3900.0	.0	.0	320.5	.0	46.3	8.9	2351.80
.14	.00	12.17	.00	.000	.025	.000	.000	2334.72	1017.42
.004223	483.	509.	502.	2	5	0	.00	52.18	1069.60

SECNO 690.000
;185 MINIMUM SPECIFIC ENERGY
;720 CRITICAL DEPTH ASSUMED

;470 ENCROACHMENT STATIONS= 1000.0 1082.0 TYPE= 1 TARGET= 82.000
ELENCL= 2352.40 ELENCR= 2352.40

;495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2402.40 ELREA= 2352.40

490.000	6.12	2344.52	2344.52	.00	2347.13	2.61	1.73	.09	2402.40
3900.0	.0	3900.0	.0	.0	300.9	.0	49.4	9.4	2352.40
.15	.00	12.96	.00	.000	.020	.000	.000	2338.40	1011.82
.003708	433.	437.	443.	0	15	0	.00	58.35	1070.18

;PECIAL BRIDGE

;227 DOWNSTREAM ELEV IS 2343.46 , NOT 2344.52 HYDRAULIC JUMP OCCURS DOWNSTREAM (IF LOW FLOW CONTROLS)

;B XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
.90	1.56	2.60	130.00	40.00	4.00	798.00	1.50	2338.49	2338.40

'SECNO 700.000

;301 HV CHANGED MORE THAN HVINS

;302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.60

;LASS B LOW FLOW

;420 BRIDGE W.S.= 2344.94 BRIDGE VELOCITY= 13.13 CALCULATED CHANNEL AREA= 295.

TECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

EGPRS	EGLWC	H3	QWEIR	QLOW	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
.00	2347.85	.00	0.	3900.	798.	798.	2352.49	2354.36	0.

3470 ENCROACHMENT STATIONS= 1000.0 1082.0 TYPE= 1 TARGET= 82.000
ELENCL= 2352.49 ELENCR= 2352.49

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2402.40 ELREA= 2352.49

700.000	8.00	2346.49	.00	.00	2347.85	1.36	.73	.00	2402.40
3900.0	.0	3900.0	.0	.0	416.5	.0	50.4	9.6	2352.49
.15	.00	9.36	.00	.000	.020	.000	.000	2338.49	1008.92
.001442	127.	119.	127.	0	0	0	.00	64.09	1073.00

CCHV= .100 CEHV= .300
*SECNO 710.000

3[redacted]V CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

710.000	6.61	2348.19	2348.19	.00	2350.62	2.42	.08	.32	2353.10
3900.0	.0	3900.0	.0	.0	312.2	.0	50.7	9.7	2354.06
.15	.00	12.49	.00	.000	.025	.000	.000	2341.58	1015.42
.005765	42.	33.	31.	0	15	0	.00	65.41	1080.83

THIS RUN EXECUTED 06OCT97 10:39:40

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HEC-2 WATER SURFACE PROFILES

Version 4.6.2; May 1991
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NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

RAINBOW BLVD. TO JONES B

SUMMARY PRINTOUT TABLE 100

	SECNO	EGLWC	ELLC	EGPRS	ELTRD	QPR	QWEIR	CLASS	H3	DEPTH	CWSEL	VCH	EG
*	500.000	2294.79	2292.60	2294.17	2295.30	3900.00	.00	2.00	.00	8.16	2292.76	11.45	2294.79
*	590.000	2322.02	2320.18	2320.09	2322.01	4406.91	.34	15.00	2.51	7.31	2319.49	12.76	2322.02
*	650.000	2337.18	2336.41	2334.81	2339.86	3900.00	.00	2.00	.00	7.59	2336.00	8.72	2337.18
	700.000	2347.85	2352.49	.00	2354.36	3900.00	.00	2.00	.00	8.00	2346.49	9.36	2347.85

[redacted]OW BLVD. TO JONES B

SUMMARY PRINTOUT TABLE 150

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	LG	10*KS	VCH	AREA	.01K
*	470.000	.00	.00	.00	2274.47	3900.00	2278.74	2278.74	2280.64	87.42	11.06	352.70	417.11
*	480.000	315.97	.00	.00	2279.98	3900.00	2285.49	2285.49	2287.77	20.96	12.11	322.04	851.87
*	490.000	143.95	.00	.00	2284.10	3900.00	2290.57	2290.57	2293.81	25.22	14.43	270.24	776.67
*	500.000	102.00	2295.30	2292.60	2284.60	3900.00	2292.76	.00	2294.79	12.63	11.45	340.59	1097.48
*	510.000	25.00	.00	.00	2285.06	3900.00	2294.36	2290.49	2294.96	5.68	6.22	627.03	1636.48
*	520.000	261.38	.00	.00	2287.10	3900.00	2294.21	2294.21	2296.79	36.69	12.89	302.60	643.85
*	530.000	292.28	.00	.00	2289.31	3900.00	2296.18	2296.18	2298.74	36.17	12.83	304.07	648.48
*	540.000	474.25	.00	.00	2292.99	3900.00	2299.96	2299.96	2302.51	36.25	12.80	304.74	647.74
*	550.000	520.66	.00	.00	2297.68	3900.00	2304.95	2304.95	2307.55	36.91	12.92	301.79	641.97
*	560.000	479.99	.00	.00	2302.36	3900.00	2309.13	2309.13	2311.76	36.74	13.02	299.48	643.40
*	[redacted]70.000	397.21	.00	.00	2306.89	3900.00	2314.08	2314.08	2316.51	36.96	12.50	311.92	641.50
*	580.000	123.21	.00	.00	2310.02	3900.00	2316.49	2316.49	2319.73	25.24	14.44	270.16	776.32
*	590.000	125.31	2322.01	2320.18	2312.18	3900.00	2319.49	.00	2322.02	17.44	12.76	305.54	933.85
	600.000	123.12	.00	.00	2314.06	3900.00	2320.95	2319.68	2322.35	17.68	9.49	411.00	927.39
*	610.000	443.09	.00	.00	2318.20	3900.00	2324.24	2324.24	2326.56	37.15	12.23	318.95	639.89
*	620.000	512.99	.00	.00	2322.41	3900.00	2328.12	2328.12	2330.41	37.61	12.13	321.44	635.96
*	630.000	381.82	.00	.00	2324.81	3900.00	2331.09	2331.09	2333.49	36.88	12.43	313.74	642.22
*	640.000	87.80	.00	.00	2327.25	3900.00	2332.78	2332.78	2335.22	20.97	12.52	311.48	851.58
*	650.000	198.08	2339.86	2336.41	2328.41	3900.00	2336.00	.00	2337.18	6.90	8.72	447.09	1485.20
*	660.000	127.89	.00	.00	2329.24	3900.00	2335.75	2334.97	2337.54	36.46	10.72	363.96	645.89
*	670.000	530.81	.00	.00	2332.37	3900.00	2339.38	2339.38	2342.21	57.92	13.49	289.08	512.43
	680.000	508.76	.00	.00	2334.72	3900.00	2342.46	2341.83	2344.76	42.23	12.17	320.47	600.15
*	690.000	437.49	.00	.00	2338.40	3900.00	2344.52	2344.52	2347.13	37.08	12.96	300.89	640.44
*	700.000	119.30	2354.36	2352.49	2338.49	3900.00	2346.49	.00	2347.85	14.42	9.36	416.54	1026.94

SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH	AREA	.01K
* 710.000	33.13	.00	.00	2341.58	3900.00	2348.19	2348.19	2350.62	57.65	12.49	312.19	513.63

> OW BLVD. TO JONES B

SUMMARY PRINTOUT TABLE 150

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
*	470.000	3900.00	2278.74	.00	.00	.00	93.56	.00
*	480.000	3900.00	2285.49	.00	6.75	.00	71.65	315.97
*	490.000	3900.00	2290.57	.00	5.08	.00	41.75	143.95
*	500.000	3900.00	2292.76	.00	2.19	.00	41.75	102.00
*	510.000	3900.00	2294.36	.00	1.60	.00	91.33	25.00
*	520.000	3900.00	2294.21	.00	-.15	.00	59.57	261.38
*	530.000	3900.00	2296.18	.00	1.97	.00	59.57	292.28
*	540.000	3900.00	2299.96	.00	3.78	.00	60.14	474.25
*	550.000	3900.00	2304.95	.00	4.99	.00	59.72	520.66
*	560.000	3900.00	2309.13	.00	4.18	.00	57.52	479.99
*	570.000	3900.00	2314.08	.00	4.95	.00	65.48	397.21
*	580.000	3900.00	2316.49	.00	2.41	.00	41.75	123.21
*	590.000	3900.00	2319.49	.00	3.00	.00	41.75	125.31
	600.000	3900.00	2320.95	.00	1.46	.00	74.34	123.12
*	610.000	3900.00	2324.24	.00	3.29	.00	69.25	443.09
*	620.000	3900.00	2328.12	.00	3.88	.00	71.30	512.99
*	630.000	3900.00	2331.09	.00	2.97	.00	66.13	381.82
*	640.000	3900.00	2332.78	.00	1.69	.00	64.60	87.80
*	650.000	3900.00	2336.00	.00	3.22	.00	66.00	198.08
*	660.000	3900.00	2335.75	.00	-.25	.00	66.14	127.89
*	670.000	3900.00	2339.38	.00	3.63	.00	51.83	530.81
	680.000	3900.00	2342.46	.00	3.08	.00	52.18	508.76
*	690.000	3900.00	2344.52	.00	2.06	.00	58.35	437.49
*	700.000	3900.00	2346.49	.00	1.98	.00	64.09	119.30

SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
710.000	3900.00	2348.19	.00	1.70	.00	65.41	33.13

SUMMARY OF ERRORS AND SPECIAL NOTES

CAUTION SECNO= 470.000 PROFILE= 1 CRITICAL DEPTH ASSUMED

CAUTION SECNO= 480.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 480.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 490.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 490.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 500.000 PROFILE= 1 HYDRAULIC JUMP D.S.
WARNING SECNO= 500.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 510.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO= 520.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 520.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 530.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 530.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

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CAUTION SECNO= 570.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 580.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 580.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 590.000 PROFILE= 1 HYDRAULIC JUMP D.S.
CAUTION SECNO= 590.000 PROFILE= 1 20 TRIALS OF EG NOT ENOUGH

CAUTION SECNO= 610.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 610.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 620.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 620.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 630.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 630.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 640.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 640.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 650.000 PROFILE= 1 HYDRAULIC JUMP D.S.
WARNING SECNO= 650.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

G SECNO= 660.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

AUTION SECNO= 670.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
AUTION SECNO= 670.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

AUTION SECNO= 690.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
AUTION SECNO= 690.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

:AUTION SECNO= 700.000 PROFILE= 1 HYDRAULIC JUMP D.S.
JARNING SECNO= 700.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

:AUTION SECNO= 710.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
:AUTION SECNO= 710.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

2.2.2 JONES BLVD. TO INDUSTRIAL RD. REACH

APPROXIMATE METHOD
HEC-2 MODEL ANALYSIS
JONES BLVD. TO INDUSTRIAL RD. REACH

This reach from Jones Boulevard to Industrial Road was flown as part of this project. Therefore, topography was generated. However, the extent of the topography east of Industrial Road does not include the terminus of the culvert. So, a survey crew was sent out to pick up shots. Based on these survey shots, the HEC-2 model was constructed for the Industrial Road Culvert. The starting water surface elevation was computed using normal depth. The subcritial run was used to determine the floodplain delineation for this reach. Based on the above information, the floodplain is confined to a culvert from Industrial Road to the Imperial Palace Hotel and Casino Parking Garage.

A supplemental HEC-2 model analysis was performed to estimate the limits of flooding due to a spillover at the Cameron Street Culvert/Orleans Culvert. Cross sections were developed from Arville Street to Cameron Street along Harmon Avenue and Cameron Street. The Cameron Street cross sections show a limited conveyance capacity due the ground falling away to the east at the top of curb. Therefore, the majority of the storm water would spillover the Cameron Street curb to the east across the Orleans Hotel and Casino property. The remainder of the Cameron Street storm water would travel north to Harmon Avenue where it would then travel east to Arville Street. At Arville Street, the storm water would return to the Flamingo Wash.

In order to establish the worst case floodplain delineation west of Cameron Street, the full spillover flow was calculated as being effective flow area in the roadway only to Harmon Avenue. In order to establish the floodplain delineation due to the Flamingo Wash north of Harmon Avenue, the approximate Cameron Street conveyance capacity was used in the HEC-2 model along Harmon Avenue cross sections. The starting water surface elevation was computed using critical depth. The subcritial run was used to determine the floodplain delineation.

BASE1.DT

```
*****************************************
*  HEC-2 WATER SURFACE PROFILES         *
*                                       *
*  Version  4.6.2;  May 1991            *
*                                       *
*  DATE     06OCT97     TIME   10:40:55  *
*****************************************
```


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*****************************************
*  U.S. ARMY CORPS OF ENGINEERS         *
*  HYDROLOGIC ENGINEERING CENTER        *
*  609 SECOND STREET, SUITE D           *
*  DAVIS, CALIFORNIA 95616-4687         *
*           (916) 756-1104              *
*****************************************
```


```
X     X  XXXXXXX   XXXXX              XXXXX
X     X  X        X     X           X     X
X     X  X        X                       X
XXXXXXX  XXXX     X          XXXXX    XXXXX
X     X  X        X                  X
X     X  X        X     X            X
X     X  XXXXXXX   XXXXX             XXXXXXX
```

THIS RUN EXECUTED 060CT97 10:40:57

****
HEC-2 WATER SURFACE PROFILES

Version 4.6.2; May 1991
****

```
T1      550.032
T2      FLAMINGO WASH FIS RESTUDY
T3      FLOODPLAIN DETERMINATION
T4      FILES: BASE1.DWG, BASE1.D1
T4      STARTING WSE = NORMAL DEPTH
T4      SUBCRITICAL RUN

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

                2                             0.005                         3900      2110

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

     -1                  -1                                      -2        -6

J   VARIABLE CODES FOR SUMMARY PRINTOUT

    150                 100

NC    0.02      0.02      0.025     0.1       0.3
X1      10         9      1016      1080
GR    2116      1000      2116      1016      2106.8    1016      2106.8    1080      2116      1080
GR    2116   1137.78      2116   1138.63      2116   1190.21      2116   1211.89

NC    0.02      0.02      0.015
X1      20        10      1086.5    1150.5      50        50        50
X3      10                          1086.5    2118.3    1150.5    2118.3
GR  2118.3      1000    2118.3    1010.55   2118.3    1021.18   2118.3    1023.97   2118.3    1031.95
GR  2118.3    1086.5    2108.8    1086.5    2108.8    1150.5    2118.2    1150.5    2118.2    1220.07

NC    0.02      0.02      0.015
SB     0.9      1.56       2.6       150        64         4       480         0   2121.26    2108.8
X1      30         7      1076      1140      1071      1071      1071
X2                            1   2129.26   2133.8                          1.33
X3      10                          1076      2132      1140      2132
GR  2132.6      1000      2132    1056.5      2132      1076   2121.26      1076   2121.26      1140
GR    2132      1140   2132.17   1150.66

NC    0.02      0.02      0.025
X1      40        21   1052.22   1141.81     32.57     38.38     32.95
GR  2133.2      1000   2132.19   1052.02      2132   1052.22      2130   1055.81      2128   1059.25
    2126   1062.68      2124    1066.1      2122   1069.51   2121.46   1070.43      2122   1091.59
GR  2122.1   1094.59      2122   1098.78    2121.3   1127.39      2122   1128.18      2124   1130.46
GR    2126   1132.79      2128   1135.17    2129.3   1136.76      2130   1141.81   2131.92   1177.78
GR    2132   1180.46
```

C	0.02	0.02	0.025							
1	50	18	1027.63	1147.95	126.7	156.74	141.28			
R	2132.9	1000	2133.85	1027.63	2132	1033.15	2130	1039.07	2128	1044.87
R	2126	1050.43	2124	1055.87	2123.68	1056.72	2122.57	1090.43	2123.44	1124.77
R	2124	1126.19	2126	1131.26	2128	1136.26	2130	1141.18	2132	1146.07
R	2132.5	1147.95	2133.09	1166.81	2132	1176.95				
C	0.02	0.02	0.015							
1	60	23	1033.24	1170.76	113.71	161.62	141.88			
R	2136.4	1000	2136	1010.12	2135.69	1014.32	2135.24	1025.25	2134	1033.24
R	2133.5	1037.42	2132	1041.89	2130	1047.66	2128	1053.19	2125.93	1058.66
R	2125.5	1088.8	2126	1150.33	2126.23	1152.33	2126.23	1152.45	2128	1156.38
R	2130	1161.1	2132	1165.84	2134.05	1170.76	2134	1171.21	2134.73	1200.08
R	2134	1226.15	2133.94	1228.76	2134	1229.76				
C	0.02	0.02	0.015							
1	70	20	1014.79	1150.21	16.29	15.67	15.47			
R	2138	1000	2136	1012.21	2135.48	1014.79	2134	1018.04	2132	1022.21
R	2130	1026.4	2128.03	1031.18	2128	1034.97	2126	1040.8	2126	1052.79
R	2125.3	1092.6	2126	1117.02	2128	1134.14	2128.47	1135.71	2130	1139.13
R	2132	1144.01	2134	1148.95	2134.64	1150.21	2134.98	1178.85	2134	1204.81
C	0.02	0.02	0.015							
1	80	15	1011.19	1144.98	1	1	1			
R	2138	1000	2136	1011.19	2136.04	1011.25	2134	1015.55	2132	1019.82
R	2130	1024.39	2129.56	1025.14	2130	1128.98	2130.72	1135.47	2132	1139.51
R	2134	1143.5	2134.77	1144.98	2135.02	1173.67	2134	1202.29	2134	1202.8
C	0.02	0.02	0.015							
1	90	11	1028.36	1125.36	11.72	30.41	24.79			
3	10			1028.36	2142	1125.36	2142			
R	2139.6	1000	2139.44	1013.51	2140	1028.36	2130.5	1028.36	2130.5	1125.36
R	2140	1125.36	2140	1138.33	2142	1142.36	2142.29	1142.96	2142	1149.65
R	2142	1150.07								
C	0.02	0.02	0.015							
B	1.25	1.56	2.6	100	97	6	546	0	2131	2130.5
1	100	7	1002.38	1099.38	45.06	45.75	44.67			
2			1	2137	2142			2		
3	10			1002.38	2142	1099.38	2142			
R	2141.2	1000	2141	1002.38	2131	1002.38	2131	1099.38	2141	1099.38
R	2142	1109.94	2142.16	1110.14						
C	0.02	0.02	0.025							
1	110	23	1040.32	1195.62	423.53	274.8	320.85			
R	2160	1000	2158	1004.62	2156	1009.22	2154	1013.75	2152	1018.62
R	2150	1023.47	2148	1027.89	2146	1033.89	2144	1040.32	2142	1046.87
R	2140	1053.57	2139.06	1056.63	2138	1067.36	2136	1085.25	2135.01	1094.93
R	2134.6	1123.91	2133.89	1145.21	2136	1154.49	2138	1160.35	2140	1166.38
R	2141.7	1172.23	2142	1173.03	2144	1195.62				

[redacted]	0.02	0.02	0.025							
C1	120	28	1038.13	1156.1	152.47	136.53	140.52			
GR	2160	1000	2160.02	1000.79	2158	1006.99	2156	1011.78	2154	1016.17
GR	2152	1020.69	2150	1025.11	2148	1029.32	2146	1033.22	2144	1038.13
GR	2142	1043.2	2140	1048.11	2138	1052.93	2136.67	1056.07	2136.29	1063.51
GR	2136	1083.19	2135.07	1129.31	2136	1132.1	2138	1137.23	2140	1142.97
GR	2142	1148.93	2144	1155.67	2144.09	1156.1	2144	1168.63	2143.69	1177.28
GR	2144	1179.56	2145.21	1188.63	2144.27	1199.36				
NC	0.02	0.02	0.015							
C1	130	23	1043	1093.53	147.26	217.54	200.57			
C3	10			1043	2147	1093.5	2147			
GR	2147	1000	2147	1043	2136.35	1043	2136.35	1093.5	2145	1093.5
GR	2148	1093.53	2150	1093.67	2152	1093.8	2154	1093.92	2156	1094.04
GR	2158	1094.16	2160	1094.28	2162	1094.4	2164	1094.52	2166	1094.64
GR	2168	1094.76	2170	1094.88	2172	1095	2174	1095.12	2176	1095.25
GR	2176.2	1095.25	2176.14	1097.06	2177.18	1126.26				
NC	0.02	0.02	0.015							
SB	0.9	1.56	2.6	50	50.5	2.5	480	0	2138.63	2136.35
C1	140	18	1051.5	1102	221.59	232.92	227.79			
C2			1	2148.63	2150			1.33		
C3	10			1051.5	2149	1102	2149			
GR	2164	1000	2165.34	1027.56	2165.6	1038.1	2164	1043.89	2163.14	1046.04
GR	2162	1046.09	2160	1046.17	2158	1046.26	2156	1046.37	2154	1046.49
G[redacted]	2152	1046.65	2150	1046.99	2148	1047.66	2148.63	1051.5	2138.63	1051.5
GR	138.6	1102	2148.63	1102	2150	1165.37				
NC	0.02	0.02	0.02							
C1	150	19	1143.85	1228.03	459.97	478.08	470.1			
GR	2151.8	1000	2150.92	1143.85	2150	1145.3	2148	1148.47	2146	1151.66
GR	2144	1154.86	2142	1158.07	2140.29	1160.81	2140	1165.05	2139.72	1169.9
GR	2140	1179.41	2140.27	1187.17	2142	1190.4	2144	1194.14	2146	1197.88
GR	2147.5	1200.77	2147.59	1208.51	2148	1228.03	2153	1228.03		
NC	0.03	0.03	0.02							
C1	160	19	1031.53	1116.81	269.26	239.99	254.22			
GR	2150.7	1000	2151.66	1031.53	2151.82	1032.4	2150	1035.78	2148	1039.52
GR	2146	1043.28	2144	1047.06	2142	1050.83	2141.2	1051.85	2141.2	1058.21
GR	2141.2	1078.5	2142	1096.8	2142.04	1098.03	2144	1101.8	2146	1105.66
GR	2148	1109.54	2150	1113.43	2151.73	1116.81	2150.73	1228.05		
NC	0.03	0.03	0.015							
C1	170	8	1027	1090.33	226.48	200.55	215.74			
C3	10			1027	2152	1090.33	2152			
GR	2151.2	1000	2152	1027	2141.3	1027	2141.3	1090.33	2152	1090.33
GR	2152.1	1106.59	2152	1107.25	2152	1128.85				

	0.03	0.03	0.015							
SE	1.25	1.56	2.6	100	63.33	3.33	375	0	2142	2141.3
X1	180	6	1028	1091.33	103.52	100.65	102.34			
X2			1	2148.25	2152			2		
X3	10			1028	2153	1091.33	2153			
GR	2152	1000	2152	1028	2142	1028	2142	1091.33	2152	1091.33
GR	2152.7	1101.65								
NC	0.03	0.03	0.025							
X1	190	26	1057.63	1159.62	500.04	500.52	500.57			
GR	2161.8	1000	2161.15	1037.1	2160	1057.63	2158	1066.33	2156	1070.52
GR	2154	1074.32	2152	1078.82	2150	1087.6	2149.23	1092.96	2148	1097.4
GR	2146	1105.61	2145.96	1105.64	2146	1106.89	2146.62	1129.48	2148	1132.61
GR	2150	1137.11	2152	1141.61	2154	1146.11	2156	1150.62	2158	1155.12
GR	2160	1159.62	2162	1164.12	2164	1168.62	2165.24	1171.43	2165.44	1173.81
GR	2164.9	1304.26								
NC	0.03	0.03	0.025							
X1	200	29	1081.32	1206.85	418.92	454.91	440.55			
GR	2166	1000	2163.87	1007.72	2164	1009.02	2164	1018.08	2164	1057.09
GR	2163.8	1081.32	2163.68	1085.02	2163.1	1100.9	2162	1105.12	2160	1112.09
GR	2158.5	1116.91	2158	1125.2	2157.92	1126.57	2157.3	1157.54	2156.61	1186.3
GR	2158	1189.66	2160	1194.48	2162	1199.28	2164	1204.07	2165.16	1206.85
GR	2166	1214.07	2166.27	1216.22	2166	1221.85	2166.58	1255.95	2167.34	1280.88
GR	2168	1294.63	2168.26	1300	2170	1311.97	2171.9	1324.88		
NC	0.03	0.03	0.025							
X1	210	28	1100.8	1215.9	500.22	499.61	499.61			
GR	2172.4	1000	2173.9	1065.74	2173.31	1085.11	2172	1100.8	2171.94	1101.34
GR	2170	1105.9	2168	1110.73	2166	1115.57	2164.77	1118.64	2164	1126.5
GR	2163.5	1131.43	2162	1138.59	2161.45	1140.84	2162	1156.97	2162.31	1169.45
GR	2164	1190.56	2164.01	1190.96	2166	1196.6	2168	1202.2	2169.6	1206.63
GR	2169.6	1215.9	2169.17	1223.35	2169.89	1261.96	2170	1264.25	2170.46	1282.17
GR	2170.9	1301	2172	1309.55	2173.98	1327.16				
NC	0.03	0.03	0.025							
X1	220	20	1141.31	1259.83	493.09	465.08	485.49			
GR	2176.5	1000	2176.38	1031.14	2177.52	1116.69	2176.83	1123.53	2176.6	1141.31
GR	2176	1143.04	2174	1148.79	2172	1154.59	2170	1160.45	2169.1	1163.13
GR	2169.4	1192.93	2169.83	1203.88	2169.62	1216.41	2169.67	1234.76	2170	1236.45
GR	2172	1245.12	2174	1252.8	2174.01	1252.83	2175.96	1259.83	2174.94	1388.6
NC	0.03	0.03	0.025							
X1	230	17	1075.04	1182.23	500.61	500.8	501.36			
GR	2182	1000	2181.88	1014.68	2181.94	1042.68	2181.66	1049.4	2181.39	1075.04
GR	2180	1078.73	2178	1084.05	2176	1089.39	2174.04	1094.65	2175.34	1119.23
GR	2175.6	1163.67	2176	1164.88	2178	1172.81	2180	1180.59	2180.35	1181.79
GR	2180.9	1182.23	2180	1249.38						

[redacted]	0.03	0.03	0.025							
X[redacted]	240	23	1147.52	1248.81	500.99	499.84	499.89			
GR	2186.5	1000	2186.56	1129.61	2188	1133.51	2188.96	1135.99	2188.71	1147.52
GR	2188	1149.52	2186	1155.1	2184	1160.7	2182	1166.3	2181.36	1168.1
GR	2180.9	1188.89	2182	1207.98	2183.07	1232.59	2184	1235.33	2186	1240.96
GR	2188	1246.09	2189.09	1248.81	2188.75	1269.8	2188	1286.33	2187.56	1294.31
GR	2188	1298.97	2188.86	1306.71	2190	1428.37				
NC	0.03	0.03	0.025							
X1	250	18	1025.38	1133.09	282	280.83	282.34			
GR	2194	1000	2193.61	1014.56	2193.05	1025.38	2192	1027.7	2190	1031.99
GR	2188	1036.21	2186	1040.39	2184.99	1042.43	2184.97	1079.5	2185.25	1112.07
GR	2186	1114.07	2188	1119.44	2190	1124.87	2192	1130.41	2192.94	1133.09
GR	2194	1147.97	2194	1152.06	2194	1182.85				
NC	0.03	0.03	0.015							
X1	260	8	1005	1093	270.66	272.26	271.17			
X3	10			1005	2197	1093	2197			
GR	2195.4	1000	2196	1005	2189.1	1005	2189.1	1093	2196	1093
GR	2195.6	1109.61	2195	1129.86	2195	1159.81				
NC	0.03	0.03	0.015							
SB	0.9	1.56	2.6	100	88	4	420	0	2190.4	2189.1
X1	270	8	1035.5	1123.5	197.48	195.43	195.33			
X2			1	2195.4	2197			1.33		
X	10			1035.5	2198	1123.5	2198			
GR	97.3	1013.74	2196.91	1026.08	2197	1035.5	2190.4	1035.5	2190.4	1123.5
GR	2197	1123.5	2197.23	1126.89	2196.99	1135.18				
NC	0.03	0.03	0.025							
X1	280	22	1022.84	1209.93	327.18	307.59	311.22			
GR	2212	1000	2210	1004.36	2208	1008.65	2206	1012.92	2204	1017.17
GR	2202	1021.41	2201.33	1022.84	2200.09	1051.83	2200	1052.46	2198	1066.54
GR	2196	1079.93	2195.64	1082.2	2195.49	1123.58	2194.51	1159.45	2195.13	1190.53
GR	2196	1192.92	2197.41	1196.24	2198	1198.98	2200	1208.4	2200.32	1209.93
GR	2200.2	1230.54	2200	1392.7						
NC	0.03	0.03	0.025							
X1	290	23	1028.04	1218.24	326.63	318.08	320.59			
GR	2209.5	1000	2209.88	1021.04	2210	1021.87	2210.71	1028.04	2210	1031.4
GR	2208	1039.44	2206	1048.06	2204	1056.67	2202	1070.78	2200.78	1093.78
GR	2200	1118.06	2199.43	1178.79	2200	1180.89	2201.44	1186.08	2202	1189.02
GR	2204	1195.63	2206	1202.35	2208	1209.9	2210	1216.48	2210.45	1218.24
GR	2210.1	1247.59	2210.63	1261.39	2211.47	1295.01				
NC	0.03	0.03	0.015							
X1	300	19	1124.77	1156.11	45.92	47.38	43.68			
X3	10			1124.77	2212	1156.11	2212			
GR	2210	1000	2210.54	1007.79	2210.76	1030.34	2207.9	1124.77	2199.9	1124.77
GR	2199.9	1134.77	2207.9	1134.77	2207.9	1135.44	2199.9	1135.44	2199.9	1145.44
GR	2207.9	1145.44	2207.9	1146.11	2199.9	1146.11	2199.9	1156.11	2207.9	1156.11
[redacted]	0.8	1191.34	2212	1212.68	2212.08	1212.9	2212.31	1248.99		

[redacted]	0.03	0.03	0.015							
X	310	14	1073.5	1104.83	1075	1075	1075			
X3	10			1073.5	2224	1104.83	2224			
GR	2224.5	1000	2222.1	1073.5	2214.1	1073.5	2214.1	1083.5	2222.1	1083.5
GR	2222.1	1084.17	2214.1	1084.17	2214.1	1094.17	2222.1	1094.17	2222.1	1094.83
GR	2214.1	1094.83	2214.1	1104.83	2222.1	1104.83	2224.2	1149.59		
NC	0.03	0.03	0.015							
X1	320	7	1036	1109.5	175	175	175			
X3	10			1036	2226.5	1109.5	2226.5			
GR	2224	1000	2226	1015.17	2226.2	1036	2216.4	1036	2216.4	1109.5
GR	2226.1	1109.5	2226.13	1177.15						
NC	0.03	0.03	0.015							
SB	1.25	1.56	2.6	155	73.5	3.5	350	0	2216.9	2216.4
X1	330	10	1039.5	1113	80	80	80			
X2			1	2221.9	2223.5			2		
X3	10			1000	2227	1155.22	2227			
GR	2224	1000	2224.17	1008.15	2224	1017.14	2224	1022.44	2224	1029.33
GR	2223.6	1039.5	2216.9	1039.5	2216.9	1113	2223.6	1113	2223.9	1155.22
NC	0.03	0.03	0.025							
X1	340	28	1113.73	1213.19	419.71	407.27	419.1			
GR	2232.6	1013.83	2233.16	1037.81	2232	1047.28	2230.89	1056.62	2230.93	1113.73
GR	2230	1117.51	2228	1126.01	2227.07	1130.01	2228.06	1137.71	2226	1143.9
	2224	1150.1	2223.46	1151.78	2223.73	1172.32	2223.77	1186.22	2224	1187.11
GR	225.6	1193.01	2226	1196.12	2227.15	1202.25	2228	1204.18	2230	1208.68
GR	2232	1213.19	2234	1217.7	2236	1222.21	2238	1226.72	2240	1231.3
GR	2240	1231.35	2240.25	1235.29	2240.99	1283.05				
NC	0.03	0.03	0.03							
X1	350	28	1008.56	1115.53	517.98	492.5	503.6			
GR	2240	1000	2238	1008.56	2236	1015.17	2234.78	1018.96	2234.8	1028.78
GR	2234	1033.67	2234.05	1033.82	2232	1039.06	2230	1044.76	2228	1050.92
GR	2226	1054.07	2226.68	1070.18	2226.01	1092.35	2228	1095.8	2230	1099.29
GR	2232	1102.78	2234	1106.34	2236	1109.93	2238	1113.56	2239.09	1115.53
GR	2240	1172.34	2240	1184.24	2239.85	1197.26	2239.33	1209.01	2239.55	1235.1
GR	2240	1236.65	2242	1244.14	2243.19	1249.26				
NC	0.03	0.03	0.015							
X1	360	14	1033	1070.33	209.2	235.77	221.39			
X3	10			1033	2243	1070.33	2243			
GR	2243.6	1000	2243.29	1021.16	2242	1026.31	2241.85	1027.26	2240	1028.17
GR	2240.1	1033	2230.1	1033	2230.1	1070.33	2240.1	1070.33	2240	1070.43
GR	2241.9	1070.76	2242	1072.09	2242.95	1077.63	2243.29	1096.74		
NC	0.03	0.03	0.015							
SB	0.9	1.56	2.6	80	37.33	1.33	360	0	2230.8	2230.1
X1	370	9	1032	1069.33	100	100	100			
X2			1	2240.8	2243.5			1.33		
X3	10			1032	2244	1069.33	2244			
	243.8	1000	2243.58	1017.41	2240.8	1032	2230.8	1032	2230.8	1069.33
GR	240.8	1069.33	2242.76	1069.89	2243.39	1075.02	2243.58	1093.4		

[redacted]	0.035	0.035	0.035							
X	380	35	1013.23	1363.45	427.09	513.18	471.93			
GR	2250	1000	2250.67	1000.49	2248	1003.91	2246	1006.44	2244	1008.93
GR	2242	1013.12	2242	1013.23	2240	1018.26	2238	1023.36	2237.17	1025.48
GR	2238	1054.84	2237.74	1073.55	2236.8	1085.66	2237.13	1097.22	2238	1100.28
GR	2240	1107.3	2241.8	1113.54	2240	1124.51	2239.45	1127.66	2238.39	1149.36
GR	2238.3	1188.93	2238	1191.99	2236.07	1219.66	2236.06	1233.58	2238	1239.38
GR	2239.5	1244.57	2238.39	1271.19	2238.04	1289.7	2238	1293.55	2237.28	1317.23
GR	2238	1328.23	2240	1349.71	2241.69	1357.02	2242	1363.45	2242.74	1368.17
NC	0.035	0.035	0.035							
X1	390	59	1050.07	1378.76	386.3	404.15	382.37			
X3	10			1044.58	2252.14	1418.51	2247.61			
GR	2250	1000	2248	1011.21	2246.98	1016.42	2248	1024.34	2250	1035.43
GR	2251.2	1044.9	2250	1046.64	2248	1050.07	2246	1052.93	2245.7	1053.17
GR	2244	1070.43	2243.01	1079.72	2243.1	1095.84	2242	1123.66	2241.76	1128.59
GR	2240	1153.99	2241.27	1165.1	2241.41	1178.87	2241.62	1197.62	2242	1204.93
GR	2242.4	1219.22	2243.95	1242.77	2242	1256.79	2240.72	1265.9	2242	1287.79
GR	2242	1288.72	2242	1289	2240.02	1308.54	2241.7	1318.38	2241.22	1326.28
GR	2242	1336.21	2242.6	1343.76	2242.5	1355	2244	1361.04	2246	1370.53
GR	2247.2	1378.76	2246.2	1391.53	2246	1418.98	2244.89	1427.27	2244	1431.85
GR	2242.3	1441.24	2244	1451.27	2245.16	1462.62	2244.39	1497.54	2244	1500.79
GR	2243.4	1506.28	2244	1509.13	2245.08	1514.35	2244.72	1531.13	2246	1563.65
GR	2246.3	1577.24	2246.7	1599.57	2248	1603.19	2250	1608.63	2252	1613.39
GR	2254	1617.98	2256	1621.98	2258	1625.38	2259.93	1633.51		
N	[redacted].035	0.035	0.035							
X1	400	46	1023.16	1356.91	357.39	423.51	403.29			
X3	10			1013.57	2259.43	1382.04	2250.46			
GR	2260	1000	2258	1008.69	2256	1015.97	2254	1023.16	2253.09	1026.48
GR	2252	1039.65	2252	1040.17	2250	1047.03	2248	1053.81	2247.01	1057.15
GR	2246.4	1071.09	2246.56	1090.04	2246	1106.57	2245.87	1107.4	2246	1107.62
GR	2246.8	1126.94	2246	1139.05	2245.11	1163.93	2246	1168.44	2247.12	1174.45
GR	2246.7	1188.29	2246.89	1217.85	2246.3	1248.39	2246	1255.13	2245.64	1262.42
GR	2244.3	1273.11	2244.8	1288.21	2246	1293.21	2248	1301.76	2248.44	1303.77
GR	2249.5	1356.91	2249.63	1381.12	2248.69	1404.01	2248	1412.38	2247.76	1415.35
GR	2248	1416.79	2250	1423.57	2252	1429.32	2253.45	1432.88	2252	1442.3
GR	2250.7	1450.29	2252	1456.01	2254	1462.94	2256	1469.23	2258	1475.53
GR	2260	1479.71								
C	0.035	0.035	0.035							
X1	410	53	1079.98	1436.42	511.96	536.05	493.17			
GR	2261.2	1000	2260.85	1010.56	2262	1018.5	2263.66	1030.28	2262	1036.14
GR	2260	1043.4	2258.93	1047.29	2258.35	1079.98	2258	1082.4	2256	1094.87
GR	2254.7	1103.75	2254	1107.46	2252	1116.99	2251.16	1120.97	2250.58	1139.86
GR	2251.4	1150.58	2250.98	1162.54	2252	1177.62	2252.47	1184.63	2253.54	1190.7
GR	2253.4	1207.87	2252	1221.88	2251.33	1228.11	2250.56	1240.96	2250	1264.15
GR	2249.6	1283.08	2249.96	1310.37	2249.64	1321.48	2250	1326.94	2250.15	1329.41
GR	2251.9	1343.09	2250.52	1382.69	2250.15	1403.48	2251.1	1416.28	2252	1421.53
GR	2254	1433.67	2254.37	1436.42	2254.63	1474.39	2254	1517.79	2253.8	1520.28
GR	2254	1542.07	2254.2	1557.59	2254	1560.09	2253.13	1574.67	2254	1592.54
[redacted]	2254	1593.69	2256	1597.8	2258	1601.83	2260	1605.86	2261.86	1609.04
[redacted]	2262	1611.84	2262	1616.31	2260.25	1659.18				

	0.035	0.035	0.035							
[redacted]	420	51	1008.24	1232.99	501.17	502.99	503.19			
X3	10			1004.92	2265	1248.31	2265			
GR	2264.6	1000	2264	1008.24	2263.73	1013.07	2262	1017.85	2260	1023.35
GR	2258	1028.83	2256	1034.32	2254.72	1037.84	2255.35	1052.61	2255.35	1092.02
GR	2254.8	1147.28	2254	1151.52	2253.89	1151.8	2253.86	1158.35	2254	1158.49
GR	2255.6	1162.54	2256	1173.57	2255.98	1174.16	2256.41	1185.53	2257.46	1210.3
GR	2258	1212.88	2260	1221.9	2262	1229.76	2262.89	1232.99	2262	1257.02
GR	2261.8	1260.52	2260	1270.99	2257.9	1283.64	2258	1284.2	2258.07	1295.17
GR	2257.2	1313.8	2258	1320.92	2259.27	1332.65	2258	1340.9	2257.52	1344
GR	2258	1345.08	2260	1349.56	2261.44	1353.07	2262	1361.49	2262.67	1375.99
GR	2264	1377.64	2266	1380.12	2268	1382.63	2270	1385.18	2272	1387.88
GR	2274	1390.69	2276	1393.65	2278	1396.69	2280	1399.79	2282	1402.92
GR	2284	1406.26								
NC	0.025	0.025	0.03							
X1	430	20	1020.56	1141.52	451.72	360.45	397.81			
GR	2268	1000	2267.22	1009.19	2267.01	1020.56	2266	1022.85	2264	1027.33
GR	2262	1031.68	2260	1036.05	2258	1040.53	2257.13	1042.53	2257.63	1100.12
GR	2258	1108.31	2258.44	1119.41	2260	1123.24	2262	1128.03	2264	1132.61
GR	2266	1137.09	2268	1141.52	2270	1145.95	2271.86	1150.4	2272	1153.95
NC	0.025	0.025	0.03							
X1	440	22	1024.31	1127.91	501.16	499.74	501.58			
GR	2273.7	1000	2272.37	1003.19	2272	1010.02	2271.59	1017.57	2270	1020.56
G	2268	1024.31	2266	1028.06	2264	1031.79	2262	1035.49	2261.24	1036.88
G[redacted]	261.2	1114.98	2262	1116.44	2264	1120.26	2266	1124.08	2268	1127.91
GR	2270	1131.74	2272	1135.58	2274	1139.43	2274.82	1141.03	2275.65	1157.04
GR	2276	1160.11	2276.04	1160.56						
NC	0.025	0.025	0.03							
X1	450	23	1037.19	1147.24	500.22	501.51	500.9			
GR	2276.5	1000	2276.13	1004.33	2276.63	1008.45	2276.36	1017.9	2276.34	1019.61
GR	2276	1026.95	2275.66	1034.06	2274	1037.19	2272	1040.95	2270	1044.71
GR	2268	1048.47	2266	1052.23	2265.72	1052.75	2265.65	1128.63	2266	1129.1
GR	2268	1133.93	2270	1138.39	2272	1142.83	2274	1147.24	2276	1151.65
GR	2276.4	1152.65	2277.4	1173.14	2277.8	1176.29				
NC	0.025	0.025	0.03							
X1	460	23	1055.27	1163.26	500.54	498.01	499.73			
GR	2282	1000	2281.54	1003.62	2281.29	1022.08	2280.89	1034.68	2281.11	1036.99
GR	2280.2	1051.03	2280	1051.55	2278	1055.27	2276	1058.93	2274	1062.57
GR	2272	1066.16	2270.09	1069.53	2270	1081.64	2270	1127.37	2270.2	1148.18
GR	2272	1151.65	2274	1155.5	2276	1159.37	2278	1163.26	2280	1167.16
GR	2281	1169.18	2281	1183.48	2281.14	1188.29				
C	0.025	0.025	0.03							
1	470	21	1033.6	1139.45	496.29	497.3	497.44			
R	2287.1	1000	2286.43	1011.63	2286.11	1013.88	2286	1018.25	2285.78	1026.47
R	2284	1029.84	2282	1033.6	2280	1037.35	2278	1041.08	2276	1044.81
R	2274.8	1047.02	2274.47	1125.14	2276	1128.04	2278	1131.84	2280	1135.65
[redacted]	2282	1139.45	2284	1143.25	2285.45	1146.01	2286	1157.83	2286.04	1158.7
R[redacted]	86.2	1160.71								

[redacted]	0.025	0.025	0.015							
[redacted]	480	27	1037.36	1120.53	314.57	317.78	315.97			
GR	2294.3	1000	2294	1007.37	2293.91	1009.73	2293.01	1023.57	2292.78	1027.28
GR	2292	1028.94	2290	1033.16	2288	1037.36	2286.16	1041.18	2286	1041.54
GR	2284	1045.96	2282	1050.19	2280	1055.11	2279.98	1055.27	2280.03	1060.89
GR	2280	1096.41	2280.31	1101.25	2282	1105.98	2284	1110.71	2286	1115.55
GR	2288	1120.53	2290	1125.3	2292	1129.86	2292.43	1130.82	2292.52	1169.51
GR	2292	1170.97	2291.65	1171.6						
NC	0.02	0.02	0.015							
C1	490	13	1054	1095.75	144.45	149.77	143.95			
C3	10			1054	2294	1095.75	2294			
GR	2294.4	1000	2294.73	1002.88	2294.72	1015.52	2294.6	1027.21	2294	1031.11
GR	2294.1	1054	2284.1	1054	2284.1	1095.75	2294.1	1095.75	2294	1107.09
GR	2294.5	1111.08	2294.61	1127.32	2294.51	1131.81				
NC	0.02	0.02	0.015							
GB	0.9	1.56	2.6	100	41.75	1.75	320	0	2284.6	2284.1
C1	500	10	1050	1091.75	102	102	102			
C2			1	2292.6	2295.3			1.33		
C3	10			1050	2294	1091.75	2294			
GR	2294.5	1000	2294.88	1008.14	2294.73	1038.02	2294.6	1050	2284.6	1050
GR	2284.6	1091.75	2294.6	1091.75	2294.56	1100.74	2294.86	1121.69	2294.5	1125.84
NC	0.02	0.02	0.02							
C	510	25	1004.78	1116.38	25	25	25			
GR	2298.8	1000	2298	1000.62	2296.14	1001.97	2296	1004.78	2295.65	1011.7
GR	2294	1018.55	2292	1024.72	2291.3	1026.83	2290	1029.58	2288	1033.81
GR	2286	1038.05	2285.06	1039.94	2285.06	1087.65	2286	1089.57	2288	1093.44
GR	2288.7	1095.14	2290	1097.3	2292	1101.56	2294	1107.37	2295.46	1111.71
GR	2295.5	1116.38	2296	1123.41	2296.51	1129.95	2297.66	1133.29	2297.62	1149.23
NC	0.02	0.02	0.02	0.1	0.3					
C1	520	6	1000	1086.89	270.2	253.62	261.38			
GR	2304.6	1000	2292.1	1027.64	2287.2	1043.88	2287.1	1068.47	2296.4	1086.89
GR	2299.8	1115.75								

TECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

PROF 1

CRITICAL DEPTH TO BE CALCULATED AT ALL CROSS SECTIONS
ALLOWABLE ERROR FOR CRITICAL DEPTH DETERMINATION (ALLDC) = 2.000 PERCENT OF THE DEPTH

CHV= .100 CEHV= .300
SECNO 10.000

10.000	5.30	2112.10	2111.65	2110.00	2114.15	2.05	.00	.00	2116.00
3900.0	.0	3900.0	.0	.0	339.2	.0	.0	.0	2116.00
.00	.00	11.50	.00	.000	.025	.000	.000	2106.80	1016.00
.004966	0.	0.	0.	0	14	3	.00	64.00	1080.00

SECNO 20.000
185 MINIMUM SPECIFIC ENERGY
720 CRITICAL DEPTH ASSUMED

470 ENCROACHMENT STATIONS= 1086.5 1150.5 TYPE= 1 TARGET= 64.000
ELENCL= 2118.30 ELENCR= 2118.30

RIVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2118.30 ELREA= 2118.30

20.000	4.85	2113.65	2113.65	.00	2116.10	2.45	.17	.12	2118.30
3900.0	.0	3900.0	.0	.0	310.5	.0	.4	.1	2118.30
.00	.00	12.56	.00	.000	.015	.000	.000	2108.80	1086.50
.002363	50.	50.	50.	0	11	0	.00	64.00	1150.50

SPECIAL BRIDGE

227 DOWNSTREAM ELEV IS 2112.80 , NOT 2113.65 HYDRAULIC JUMP OCCURS DOWNSTREAM (IF LOW FLOW CONTROLS)

B XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
.90	1.56	2.60	150.00	64.00	4.00	480.00	.00	2121.26	2108.80

SECNO 30.000

301 HV CHANGED MORE THAN HVINS

302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.57

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

CLASS B LOW FLOW

3420 BRIDGE W.S.= 2120.11 BRIDGE VELOCITY= 12.79 CALCULATED CHANNEL AREA= -69.

EGPRS	EGLWC	H3	QWEIR	QLOW	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
.00	2129.11	.00	0.	3900.	480.	480.	2129.26	2133.80	0.

3470 ENCROACHMENT STATIONS= 1076.0 1140.0 TYPE= 1 TARGET= 64.000
ELENCL= 2132.00 ELENCR= 2132.00

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2132.00 ELREA= 2132.00

30.000	6.47	2127.73	.00	.00	2129.11	1.38	13.01	.00	2132.00
3900.0	.0	3900.0	.0	.0	414.2	.0	9.3	1.6	2132.00
.03	.00	9.42	.00	.000	.015	.000	.000	2121.26	1076.00
.000957	1071.	1071.	1071.	0	0	0	.00	64.00	1140.00

*SECNO 40.000

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .55

40.000	6.40	2127.70	2126.69	.00	2129.20	1.50	.05	.04	2132.00
3900.0	.0	3900.0	.0	.0	396.6	.0	9.6	1.7	2130.00
.03	.00	9.83	.00	.000	.025	.000	.000	2121.30	1059.77
.003191	33.	33.	38.	2	15	0	.00	75.04	1134.81

*SECNO 50.000

50.000	5.76	2128.33	2127.54	.00	2129.68	1.35	.47	.01	2133.85
3900.0	.0	3900.0	.0	.0	417.9	.0	10.9	2.0	2132.50
.04	.00	9.33	.00	.000	.025	.000	.000	2122.57	1043.92
.003417	127.	141.	157.	3	15	0	.00	93.15	1137.07

*SECNO 60.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

60.000	3.92	2129.42	2129.42	.00	2131.13	1.70	.39	.10	2134.00
3900.0	.0	3900.0	.0	.0	372.5	.0	12.2	2.3	2134.05
.04	.00	10.47	.00	.000	.015	.000	.000	2125.50	1049.26
.002245	114.	142.	162.	0	14	0	.00	110.48	1159.74

*SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 70.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

70.000	4.33	2129.63	2129.63	.00	2131.33	1.70	.03	.00	2135.48
3900.0	.0	3900.0	.0	.0	372.9	.0	12.3	2.3	2134.64
.04	.00	10.46	.00	.000	.015	.000	.000	2125.30	1027.29
.002244	16.	15.	16.	0	8	0	.00	111.03	1138.31

*SECNO 80.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

80.000	3.56	2133.12	2133.12	.00	2134.70	1.58	.00	.01	2136.00
3900.0	.0	3900.0	.0	.0	387.0	.0	12.3	2.3	2134.77
.04	.00	10.08	.00	.000	.015	.000	.000	2129.56	1017.42
.002309	1.	1.	1.	0	15	0	.00	124.33	1141.75

*SECNO 90.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 1028.4 1125.4 TYPE= 1 TARGET= 97.000
ELENCL= 2142.00 ELENCR= 2142.00

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2140.00 ELREA= 2142.00

90.000	3.67	2134.17	2134.17	.00	2136.03	1.86	.06	.09	2140.00
3900.0	.0	3900.0	.0	.0	356.3	.0	12.5	2.4	2142.00
.04	.00	10.95	.00	.000	.015	.000	.000	2130.50	1028.36
.002375	12.	25.	30.	0	8	0	.00	97.00	1125.36

SPECIAL BRIDGE

5227 DOWNSTREAM ELEV IS 2133.54 , NOT 2134.17 HYDRAULIC JUMP OCCURS DOWNSTREAM (IF LOW FLOW CONTROLS)

SB XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
1.25	1.56	2.60	100.00	97.00	6.00	546.00	.00	2131.00	2130.50

*SECNO 100.000

3301 HV CHANGED MORE THAN HVINS

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.54

CLASS B LOW FLOW

3420 BRIDGE W.S.= 2134.60 BRIDGE VELOCITY= 11.13 CALCULATED CHANNEL AREA= 328.

EGPRS	EGLWC	H3	QWEIR	QLOW	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
.00	2136.89	.00	0.	3900.	546.	546.	2137.00	2142.00	0.

3470 ENCROACHMENT STATIONS= 1002.4 1099.4 TYPE= 1 TARGET= 97.000
ELENCL= 2142.00 ELENCR= 2142.00

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2141.00 ELREA= 2142.00

100.000	4.81	2135.81	.00	.00	2136.89	1.09	.86	.00	2141.00
3900.0	.0	3900.0	.0	.0	466.2	.0	13.0	2.5	2142.00
.04	.00	8.36	.00	.000	.015	.000	.000	2131.00	1002.38
.000997	45.	45.	46.	0	0	0	.00	97.00	1099.38

*SECNO 110.000

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

110.000	5.30	2139.19	2139.19	.00	2140.93	1.74	.65	.20	2144.00
3900.0	.0	3900.0	.0	.0	368.5	.0	16.0	3.3	2144.00
.05	.00	10.58	.00	.000	.025	.000	.000	2133.89	1056.21
.006225	424.	321.	275.	0	8	0	.00	107.72	1163.93

*SECNO 120.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

120.000	4.91	2139.98	2139.98	.00	2141.88	1.89	.87	.05	2144.00
3900.0	.0	3900.0	.0	.0	353.1	.0	17.2	3.6	2144.09
.06	.00	11.04	.00	.000	.025	.000	.000	2135.07	1048.15
.006107	152.	141.	137.	0	11	0	.00	94.77	1142.92

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 130.000

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 1043.0 1093.5 TYPE= 1 TARGET= 50.500
ELENCL= 2147.00 ELENCR= 2147.00

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2147.00 ELREA= 2148.00

130.000	5.70	2142.05	2142.05	.00	2144.90	2.85	.73	.29	2147.00
3900.0	.0	3900.0	.0	.0	287.6	.0	18.7	3.9	2148.00
.06	.00	13.56	.00	.000	.015	.000	.000	2136.35	1043.00
.002415	147.	201.	218.	0	8	0	.00	50.50	1093.50

SPECIAL BRIDGE

5230WNSTREAM ELEV IS 2141.14 , NOT 2142.05 HYDRAULIC JUMP OCCURS DOWNSTREAM (IF LOW FLOW CONTROLS)

SB XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
.90	1.56	2.60	50.00	50.50	2.50	480.00	.00	2138.63	2136.35

*SECNO 140.000

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.48

CLASS B LOW FLOW

3420 BRIDGE W.S.= 2143.39 BRIDGE VELOCITY= 13.78 CALCULATED CHANNEL AREA= 228.

EGPRS	EGLWC	H3	QWEIR	QLOW	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
.00	2147.68	.00	0.	3900.	480.	480.	2148.63	2150.00	0.

470 ENCROACHMENT STATIONS= 1051.5 1102.0 TYPE= 1 TARGET= 50.500
ELENCL= 2149.00 ELENCR= 2149.00

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	BL	OLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2148.63 ELREA= 2149.00

140.000	7.36	2145.96	.00	.00	2147.68	1.71	2.78	.00	2148.63
3900.0	.0	3900.0	.0	.0	371.1	.0	20.4	4.2	2149.00
.07	.00	10.51	.00	.000	.015	.000	.000	2138.60	1051.50
.001107	222.	228.	233.	0	0	0	.00	50.50	1102.00

*SECNO 150.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

150.000	8.40	2148.12	2148.12	.00	2150.27	2.14	.89	.13	2150.92
3900.0	.0	3900.0	.0	.0	331.8	.0	24.2	4.9	2153.00
.08	.00	11.75	.00	.000	.020	.000	.000	2139.72	1148.28
.004003	460.	470.	478.	0	14	0	.00	79.75	1228.03

*SECNO 160.000

[redacted] CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 2.18

160.000	8.74	2149.94	2147.02	.00	2150.80	.86	.40	.13	2151.66
3900.0	.0	3900.0	.0	.0	523.1	.0	26.7	5.3	2151.73
.09	.00	7.46	.00	.000	.020	.000	.000	2141.20	1035.90
.000846	269.	254.	240.	3	19	0	.00	77.40	1113.30

*SECNO 170.000

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.51

3470 ENCROACHMENT STATIONS= 1027.0 1090.3 TYPE= 1 TARGET= 63.330
ELENCL= 2152.00 ELENCR= 2152.00

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2152.00 ELREA= 2152.00

170.000	8.88	2150.18	2146.19	.00	2150.93	.75	.12	.01	2152.00
3900.0	.0	3900.0	.0	.0	562.4	.0	29.4	5.7	2152.00
.10	.00	6.93	.00	.000	.015	.000	.000	2141.30	1027.00
.000370	226.	216.	201.	2	11	0	.00	63.33	1090.33

[redacted]

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IOC	ICONT	CORAR	TOPWID	ENDST

ECIAL BRIDGE

XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
1.25	1.56	2.60	100.00	63.33	3.33	375.00	.00	2142.00	2141.30

ECNO 180.000
ESSURE AND WEIR FLOW, Weir Submergence Based on TRAPEZOIDAL Shape

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
2152.80	2151.18	.15	128.	3765.	375.	375.	2148.25	2152.00	100.

70 ENCROACHMENT STATIONS= 1028.0 1091.3 TYPE= 1 TARGET= 63.330
ELENCL= 2153.00 ELENCR= 2153.00

OF OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2152.00 ELREA= 2153.00

180.000	10.04	2152.04	.00	.00	2152.62	.58	1.70	.00	2152.00
3900.0	.0	3900.0	.0	.0	635.9	.0	30.8	5.8	2153.00
.10	.00	6.13	.00	.000	.015	.000	.000	2142.00	1028.00
.000255	104.	102.	101.	2	0	2	.00	63.33	1091.33

SECNO 190.000

301 HV CHANGED MORE THAN HVINS

185 MINIMUM SPECIFIC ENERGY
720 CRITICAL DEPTH ASSUMED

190.000	7.09	2153.05	2153.05	.00	2155.43	2.38	.35	.54	2160.00
3900.0	.0	3900.0	.0	.0	315.2	.0	36.3	6.6	2160.00
.11	.00	12.37	.00	.000	.025	.000	.000	2145.96	1076.45
.005811	500.	501.	501.	0	19	0	.00	67.53	1143.98

SECNO 200.000
185 MINIMUM SPECIFIC ENERGY
720 CRITICAL DEPTH ASSUMED

200.000	5.15	2161.76	2161.76	.00	2163.68	1.92	2.62	.05	2163.80
3900.0	.0	3900.0	.0	.0	350.4	.0	39.6	7.4	2165.16
.12	.00	11.13	.00	.000	.025	.000	.000	2156.61	1105.96
.006090	419.	441.	455.	0	19	0	.00	92.74	1198.70

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WIN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 210.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

210.000	5.77	2167.22	2167.22	.00	2169.21	1.99	3.00	.02	2172.00
3900.0	.0	3900.0	.0	.0	344.7	.0	43.6	8.4	2169.60
.13	.00	11.31	.00	.000	.025	.000	.000	2161.45	1112.62
.005939	500.	500.	500.	0	8	0	.00	87.40	1200.02

*SECNO 220.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

220.000	4.53	2173.63	2173.63	.00	2175.44	1.81	2.94	.02	2176.60
3900.0	.0	3900.0	.0	.0	361.3	.0	47.5	9.5	2175.96
.15	.00	10.79	.00	.000	.025	.000	.000	2169.10	1149.86
.006167	493.	485.	465.	0	15	0	.00	101.53	1251.39

*SECNO 230.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

230.000	5.37	2179.41	2179.41	.00	2181.26	1.86	3.09	.01	2181.39
3900.0	.0	3900.0	.0	.0	356.8	.0	51.7	10.6	2180.90
.16	.00	10.93	.00	.000	.025	.000	.000	2174.04	1080.31
.006159	501.	501.	501.	0	11	0	.00	97.98	1178.28

*SECNO 240.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

240.000	5.29	2186.19	2186.19	.00	2188.33	2.13	3.19	.08	2188.71
3900.0	.0	3900.0	.0	.0	332.7	.0	55.6	11.7	2189.09
.17	.00	11.72	.00	.000	.025	.000	.000	2180.90	1154.56
.006633	501.	500.	500.	0	8	0	.00	86.90	1241.46

*SECNO 250.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

250.000	4.44	2189.41	2189.41	.00	2191.36	1.95	1.78	.02	2193.05
3900.0	.0	3900.0	.0	.0	347.9	.0	57.8	12.3	2192.94
.18	.00	11.21	.00	.000	.025	.000	.000	2184.97	1033.23
.006021	282.	282.	281.	0	15	0	.00	90.05	1123.28

	SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
		QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
	TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
	SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 260.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 1005.0 1093.0 TYPE= 1 TARGET= 88.000
ELENCL= 2197.00 ELENCR= 2197.00

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2196.00 ELREA= 2197.00

260.000	3.92	2193.02	2193.02	.00	2195.00	1.98	.97	.01	2196.00
3900.0	.0	3900.0	.0	.0	345.3	.0	60.0	12.8	2197.00
.19	.00	11.29	.00	.000	.015	.000	.000	2189.10	1005.00
.002353	271.	271.	272.	0	11	0	.00	88.00	1093.00

SPECIAL BRIDGE

5227 DOWNSTREAM ELEV IS 2192.43 , NOT 2193.02 HYDRAULIC JUMP OCCURS DOWNSTREAM (IF LOW FLOW CONTROLS)

	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
.90	1.56	2.60	100.00	88.00	4.00	420.00	.00	2190.40	2189.10

*SECNO 270.000

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.48

CLASS B LOW FLOW

3420 BRIDGE W.S.= 2193.81 BRIDGE VELOCITY= 11.44 CALCULATED CHANNEL AREA= 286.

EGPRS	EGLWC	H3	QWEIR	QLOW	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
2195.11	2196.63	.00	0.	3900.	420.	420.	2195.40	2197.00	0.

3470 ENCROACHMENT STATIONS= 1035.5 1123.5 TYPE= 1 TARGET= 88.000
ELENCL= 2198.00 ELENCR= 2198.00

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2197.00 ELREA= 2198.00

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST
270.000	5.01	2195.41	.00	.00	2196.63	1.21	1.62	.00	2197.00
3900.0	.0	3900.0	.0	.0	441.0	.0	61.8	13.2	2198.00
.19	.00	8.84	.00	.000	.015	.000	.000	2190.40	1035.50
.001073	197.	195.	195.	0	0	0	.00	88.00	1123.50

*SECNO 280.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

280.000	3.96	2198.47	2198.47	.00	2199.95	1.48	.68	.08	2201.33
3900.0	.0	3900.0	.0	.0	400.0	.0	64.8	14.0	2200.32
.20	.00	9.75	.00	.000	.025	.000	.000	2194.51	1063.23
.006554	327.	311.	308.	0	15	0	.00	137.96	1201.19

*SECNO 290.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

290.000	4.09	2203.52	2203.52	.00	2205.03	1.50	2.09	.01	2210.71
3900.0	.0	3900.0	.0	.0	396.2	.0	67.7	15.0	2210.45
.21	.00	9.84	.00	.000	.025	.000	.000	2199.43	1060.04
6509	327.	321.	318.	0	8	0	.00	134.01	1194.05

*SECNO 300.000

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 1124.8 1156.1 TYPE= 1 TARGET= 31.340
ELENCL= 2212.00 ELENCR= 2212.00

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2207.90 ELREA= 2212.00

300.000	8.15	2208.05	2208.05	.00	2211.99	3.94	.27	.73	2207.90
3900.0	.0	3900.0	.0	.0	244.7	.0	68.0	15.1	2212.00
.21	.00	15.94	.00	.000	.015	.000	.000	2199.90	1124.77
.005791	46.	44.	47.	0	17	0	.00	31.34	1156.11

*SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 310.000
*185 MINIMUM SPECIFIC ENERGY
*720 CRITICAL DEPTH ASSUMED

*470 ENCROACHMENT STATIONS= 1073.5 1104.8 TYPE= 1 TARGET= 31.330
ELENCL= 2224.00 ELENCR= 2224.00

*495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2222.10 ELREA= 2224.00

310.000	8.15	2222.25	2222.25	.00	2226.19	3.94	6.21	.00	2222.10
3900.0	.0	3900.0	.0	.0	244.8	.0	74.1	15.9	2224.00
.23	.00	15.93	.00	.000	.015	.000	.000	2214.10	1073.50
.005768	1075.	1075.	1075.	0	5	0	.00	31.33	1104.83

*SECNO 320.000
*280 CROSS SECTION 320.00 EXTENDED .05 FEET

*301 HV CHANGED MORE THAN HVINS

*302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 5.42

*470 ENCROACHMENT STATIONS= 1036.0 1109.5 TYPE= 1 TARGET= 73.500
ELENCL= 2226.50 ELENCR= 2226.50

*495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2226.20 ELREA= 2226.50

320.000	9.78	2226.18	2220.82	.00	2226.64	.46	.10	.35	2226.20
3900.0	.0	3900.0	.0	.0	718.9	.0	76.0	16.1	2226.50
.24	.00	5.43	.00	.000	.015	.000	.000	2216.40	1036.00
.000196	175.	175.	175.	3	11	0	.00	73.50	1109.50

*SPECIAL BRIDGE

SB XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
1.25	1.56	2.60	155.00	73.50	3.50	350.00	.00	2216.90	2216.40

*SECNO 330.000
*280 CROSS SECTION 330.00 EXTENDED 2.40 FEET

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

PRESSURE AND WEIR FLOW, Weir Submergence Based on TRAPEZOIDAL Shape

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
2229.19	2226.70	.06	2282.	1627.	350.	350.	2221.90	2223.50	155.

3470 ENCROACHMENT STATIONS= 1000.0 1155.2 TYPE= 1 TARGET= 155.220
ELENCL= 2227.00 ELENCR= 2227.00

330.000	9.39	2226.29	.00	.00	2226.71	.41	.07	.00	2223.60
3900.0	103.4	3667.7	128.8	91.3	690.7	107.5	77.5	16.3	2223.60
.24	1.13	5.31	1.20	.030	.015	.030	.000	2216.90	1000.00
.000181	80.	80.	80.	2	0	4	.00	155.22	1155.22

*SECNO 340.000

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

340.000	5.97	2229.43	2229.43	.00	2231.43	2.00	.22	.48	2230.93
3900.0	.0	3900.0	.0	.0	343.6	.0	83.4	17.5	2232.00
.25	.00	11.35	.00	.000	.025	.000	.000	2223.46	1119.95
.006055	420.	419.	407.	0	14	0	.00	87.44	1207.39

*SECNO 350.000

350.000	6.63	2232.63	2232.38	.00	2234.82	2.19	3.33	.06	2238.00
3900.0	.0	3900.0	.0	.0	328.4	.0	87.3	18.4	2239.09
.26	.00	11.88	.00	.000	.030	.000	.000	2226.00	1037.46
.007258	518.	504.	493.	2	8	0	.00	66.43	1103.89

*SECNO 360.000

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

CNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

470 ENCROACHMENT STATIONS= 1033.0 1070.3 TYPE= 1 TARGET= 37.330
ELENCL= 2243.00 ELENCR= 2243.00

495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2240.10 ELREA= 2243.00

360.000	6.95	2237.05	2237.05	.00	2240.56	3.51	.91	.40	2240.10
3900.0	.0	3900.0	.0	.0	259.3	.0	88.8	18.6	2243.00
.27	.00	15.04	.00	.000	.015	.000	.000	2230.10	1033.00
.002652	209.	221.	236.	0	8	0	.00	37.33	1070.33

SPECIAL BRIDGE

227 DOWNSTREAM ELEV IS 2236.11 , NOT 2237.05 HYDRAULIC JUMP OCCURS DOWNSTREAM (IF LOW FLOW CONTROLS)

XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
.90	1.56	2.60	80.00	37.33	1.33	360.00	.00	2230.80	2230.10

370.000

301 HV CHANGED MORE THAN HVINS

CLASS B LOW FLOW

420 BRIDGE W.S.= 2237.59 BRIDGE VELOCITY= 15.17 CALCULATED CHANNEL AREA= 245.

EGPRS	EGLWC	H3	QWEIR	QLOW	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
2239.89	2241.71	.00	0.	3900.	360.	360.	2240.80	2243.50	0.

470 ENCROACHMENT STATIONS= 1032.0 1069.3 TYPE= 1 TARGET= 37.330
ELENCL= 2244.00 ELENCR= 2244.00

495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2240.80 ELREA= 2244.00

370.000	8.63	2239.43	.00	.00	2241.71	2.28	1.15	.00	2240.80
3900.0	.0	3900.0	.0	.0	322.2	.0	89.4	18.7	2244.00
.27	.00	12.10	.00	.000	.015	.000	.000	2230.80	1032.00
.001400	100.	100.	100.	0	0	0	.00	37.33	1069.33

*SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 380.000

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.40

380.000	6.20	2242.26	2239.63	.00	2242.38	.12	.46	.22	2242.00
3900.0	.0	3899.9	.1	.1	1383.3	.2	98.7	20.8	2242.00
.32	.01	2.82	.29	.035	.035	.035	.000	2236.06	1012.58
.000714	427.	472.	513.	3	18	0	.00	352.50	1365.09

*SECNO 390.000

3265 DIVIDED FLOW

3301 HV CHANGED MORE THAN HVINS

[redacted]INIMUM SPECIFIC ENERGY
372[redacted]RITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 1044.6 1418.5 TYPE= 1 TARGET= 373.930
ELENCL= 2252.14 ELENCR= 2247.61

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2248.00 ELREA= 2247.20

390.000	3.67	2243.67	2243.67	.00	2244.60	.93	.74	.24	2248.00
3900.0	.0	3900.0	.0	.0	503.0	.0	106.9	23.6	2247.20
.33	.00	7.75	.00	.000	.035	.000	.000	2240.00	1073.52
.015336	386.	382.	404.	0	14	0	.00	279.95	1359.71

*SECNO 400.000

3470 ENCROACHMENT STATIONS= 1013.6 1382.0 TYPE= 1 TARGET= 368.470
ELENCL= 2259.43 ELENCR= 2250.46

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2254.00 ELREA= 2249.50

400.000	4.24	2248.54	2248.18	.00	2249.26	.72	4.63	.02	2254.00
3900.0	.0	3900.0	.0	.0	571.5	.0	111.9	26.1	2249.50
.35	.00	6.82	.00	.000	.035	.000	.000	2244.30	1052.00
.008926	357.	403.	424.	4	8	0	.00	256.44	1308.45

'ECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 410.000

3265 DIVIDED FLOW

410.000	3.34	2252.94	2252.57	.00	2253.58	.64	4.31	.01	2258.35
3900.0	.0	3900.0	.0	.0	607.0	.0	118.6	29.2	2254.37
.37	.00	6.42	.00	.000	.035	.000	.000	2249.60	1112.54
.008559	512.	493.	536.	4	19	0	.00	289.39	1427.20

*SECNO 420.000

3301 HV CHANGED MORE THAN HVINS

3470 ENCROACHMENT STATIONS= 1004.9 1248.3 TYPE= 1 TARGET= 243.390
ELENCL= 2265.00 ELENCR= 2265.00

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2264.00 ELREA= 2262.89

.000	4.06	2257.92	2257.91	.00	2259.14	1.23	5.39	.18	2264.00
0.0	.0	3900.0	.0	.0	439.0	.0	124.6	31.9	2262.89
.38	.00	8.88	.00	.000	.035	.000	.000	2253.86	1029.06
.013787	501.	503.	503.	2	11	0	.00	183.41	1212.47

SECNO 430.000

301 HV CHANGED MORE THAN HVINS

430.000	4.59	2261.72	2261.69	.00	2263.56	1.84	4.23	.19	2267.01
3900.0	.0	3900.0	.0	.0	357.8	.0	128.3	33.2	2268.00
.39	.00	10.90	.00	.000	.030	.000	.000	2257.13	1032.29
.008462	452.	398.	360.	2	8	0	.00	95.08	1127.36

SECNO 440.000

440.000	4.52	2265.72	2265.32	.00	2267.28	1.56	3.69	.03	2268.00
3900.0	.0	3900.0	.0	.0	388.9	.0	132.6	34.3	2268.00
.41	.00	10.03	.00	.000	.030	.000	.000	2261.20	1028.59
.006451	501.	502.	500.	3	11	0	.00	94.95	1123.54

ECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 450.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

450.000	4.20	2269.85	2269.85	.00	2271.76	1.91	3.74	.10	2274.00
3900.0	.0	3900.0	.0	.0	351.7	.0	136.8	35.4	2274.00
.42	.00	11.09	.00	.000	.030	.000	.000	2265.65	1044.99
.008750	500.	501.	502.	0	11	0	.00	93.07	1138.06

*SECNO 460.000

460.000	4.19	2274.19	2274.12	.00	2276.03	1.84	4.27	.01	2278.00
3900.0	.0	3900.0	.0	.0	358.0	.0	140.9	36.4	2278.00
.43	.00	10.89	.00	.000	.030	.000	.000	2270.00	1062.21
.008333	501.	500.	498.	1	5	0	.00	93.68	1155.88

*SECNO 470.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

470.000	4.27	2278.74	2278.74	.00	2280.64	1.91	4.26	.02	2282.00
3900.0	.0	3900.0	.0	.0	352.1	.0	145.0	37.5	2282.00
.45	.00	11.08	.00	.000	.030	.000	.000	2274.47	1039.71
.008792	496.	497.	497.	0	8	0	.00	93.54	1133.24

*SECNO 480.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

480.000	5.51	2285.49	2285.49	.00	2287.77	2.28	1.20	.11	2288.00
3900.0	.0	3900.0	.0	.0	322.0	.0	147.4	38.1	2288.00
.45	.00	12.11	.00	.000	.015	.000	.000	2279.98	1042.67
.002096	315.	316.	318.	0	11	0	.00	71.65	1114.32

*SECNO 490.000

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 1054.0 1095.8 TYPE= 1 TARGET= 41.750
ELENCL= 2294.00 ELENCR= 2294.00

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

5495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2294.10 ELREA= 2294.10

490.000	6.47	2290.57	2290.57	.00	2293.81	3.23	.33	.29	2294.10
3900.0	.0	3900.0	.0	.0	270.2	.0	148.4	38.3	2294.10
.46	.00	14.43	.00	.000	.015	.000	.000	2284.10	1054.00
.002522	144.	144.	150.	0	8	0	.00	41.75	1095.75

SPECIAL BRIDGE

5227 DOWNSTREAM ELEV IS 2289.61 , NOT 2290.57 HYDRAULIC JUMP OCCURS DOWNSTREAM (IF LOW FLOW CONTROLS)

SB XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
.90	1.56	2.60	100.00	41.75	1.75	320.00	.00	2284.60	2284.10

*SECNO 500.000

5701 HV CHANGED MORE THAN HVINS

CL[redacted] LOW FLOW

5420 BRIDGE W.S.= 2291.01 BRIDGE VELOCITY= 14.65 CALCULATED CHANNEL AREA= 256.

EGPRS	EGLWC	H3	QWEIR	QLOW	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
2294.17	2294.73	.00	0.	3900.	320.	320.	2292.60	2295.30	0.

5470 ENCROACHMENT STATIONS= 1050.0 1091.8 TYPE= 1 TARGET= 41.750
ELENCL= 2294.00 ELENCR= 2294.00

5495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2294.60 ELREA= 2294.60

500.000	8.03	2292.63	.00	.00	2294.73	2.10	.93	.00	2294.60
3900.0	.0	3900.0	.0	.0	335.3	.0	149.1	38.4	2294.60
.46	.00	11.63	.00	.000	.015	.000	.000	2284.60	1050.00
.001322	102.	102.	102.	0	0	0	.00	41.75	1091.75

SECNO 510.000

*CNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
*IME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

;301 HV CHANGED MORE THAN HVINS

;302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.51

510.000	9.23	2294.29	2290.50	.00	2294.90	.61	.02	.15	2296.00
3900.0	.0	3900.0	.0	.0	620.8	.0	149.4	38.4	2295.50
.46	.00	6.28	.00	.000	.020	.000	.000	2285.06	1017.37
.000583	25.	25.	25.	3	14	0	.00	90.84	1108.21

:CHV= .100 CEHV= .300
*SECNO 520.000

;301 HV CHANGED MORE THAN HVINS

*185 MINIMUM SPECIFIC ENERGY
;720 CRITICAL DEPTH ASSUMED

*20.000	7.11	2294.21	2294.21	.00	2296.79	2.58	.31	.59	2304.60
00.0	.0	3900.0	.0	.0	302.5	.0	152.1	38.9	2296.40
.47	.00	12.89	.00	.000	.020	.000	.000	2287.10	1022.98
.003671	270.	261.	254.	0	15	0	.00	59.57	1082.55

THIS RUN EXECUTED 06OCT97 10:44:25

****
HEC-2 WATER SURFACE PROFILES

Version 4.6.2; May 1991
****

NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

FLOODPLAIN DETERMINATION

SUMMARY PRINTOUT TABLE 100

	SECNO	EGLWC	ELLC	EGPRS	ELTRD	QPR	QWEIR	CLASS	H3	DEPTH	CWSEL	VCH	EG
*	30.000	2129.11	2129.26	.00	2133.80	3900.00	.00	2.00	.00	6.47	2127.73	9.42	2129.11
*	100.000	2136.89	2137.00	.00	2142.00	3900.00	.00	2.00	.00	4.81	2135.81	8.36	2136.89
*	140.000	2147.68	2148.63	.00	2150.00	3900.00	.00	2.00	.00	7.36	2145.96	10.51	2147.68
	180.000	2151.18	2148.25	2152.80	2152.00	3765.47	127.64	30.00	.15	10.04	2152.04	6.13	2152.62
	270.000	2196.63	2195.40	2195.11	2197.00	3900.00	.00	2.00	.00	5.01	2195.41	8.84	2196.63
	330.000	2226.70	2221.90	2229.19	2223.50	1627.36	2281.74	30.00	.06	9.39	2226.29	5.31	2226.71
	370.000	2241.71	2240.80	2239.89	2243.50	3900.00	.00	2.00	.00	8.63	2239.43	12.10	2241.71
	500.000	2294.73	2292.60	2294.17	2295.30	3900.00	.00	2.00	.00	8.03	2292.63	11.63	2294.73

PLAIN DETERMINATION

SUMMARY PRINTOUT TABLE 150

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRTWS	EG	10*KS	VCH	AREA	.01K
	10.000	.00	.00	.00	2106.80	3900.00	2112.10	2111.65	2114.15	49.66	11.50	339.22	553.44
*	20.000	50.00	.00	.00	2108.80	3900.00	2113.65	2113.65	2116.10	23.63	12.56	310.47	802.27
*	30.000	1071.00	2133.80	2129.26	2121.26	3900.00	2127.73	.00	2129.11	9.57	9.42	414.18	1260.36
*	40.000	32.95	.00	.00	2121.30	3900.00	2127.70	2126.69	2129.20	31.91	9.83	396.59	690.43
	50.000	141.28	.00	.00	2122.57	3900.00	2128.33	2127.54	2129.68	34.17	9.33	417.87	667.14
*	60.000	141.88	.00	.00	2125.50	3900.00	2129.42	2129.42	2131.13	22.45	10.47	372.47	823.15
*	70.000	15.47	.00	.00	2125.30	3900.00	2129.63	2129.63	2131.33	22.44	10.46	372.94	823.25
*	80.000	1.00	.00	.00	2129.56	3900.00	2133.12	2133.12	2134.70	23.09	10.08	386.98	811.68
*	90.000	24.79	.00	.00	2130.50	3900.00	2134.17	2134.17	2136.03	23.75	10.95	356.26	800.30
*	100.000	44.67	2142.00	2137.00	2131.00	3900.00	2135.81	.00	2136.89	9.97	8.36	466.24	1235.27
*	110.000	320.85	.00	.00	2133.89	3900.00	2139.19	2139.19	2140.93	62.25	10.58	368.53	494.31
*	120.000	140.52	.00	.00	2135.07	3900.00	2139.98	2139.98	2141.88	61.07	11.04	353.11	499.05
*	130.000	200.57	.00	.00	2136.35	3900.00	2142.05	2142.05	2144.90	24.15	13.56	287.65	793.65
*	140.000	227.79	2150.00	2148.63	2138.60	3900.00	2145.96	.00	2147.68	11.07	10.51	371.14	1172.26
*	150.000	470.10	.00	.00	2139.72	3900.00	2148.12	2148.12	2150.27	40.03	11.75	331.84	616.39
*	160.000	254.22	.00	.00	2141.20	3900.00	2149.94	2147.02	2150.80	8.46	7.46	523.06	1341.21
*	170.000	215.74	.00	.00	2141.30	3900.00	2150.18	2146.19	2150.93	3.70	6.93	562.40	2026.40
	180.000	102.34	2152.00	2148.25	2142.00	3900.00	2152.04	.00	2152.62	2.55	6.13	635.89	2440.32
*	190.000	500.57	.00	.00	2145.96	3900.00	2153.05	2153.05	2155.43	58.11	12.37	315.16	511.63
*	200.000	440.55	.00	.00	2156.61	3900.00	2161.76	2161.76	2163.68	60.90	11.13	350.39	499.76
*	210.000	499.61	.00	.00	2161.45	3900.00	2167.22	2167.22	2169.21	59.39	11.31	344.69	506.08
*	220.000	485.49	.00	.00	2169.10	3900.00	2173.63	2173.63	2175.44	61.67	10.79	361.32	496.60
*	230.000	501.36	.00	.00	2174.04	3900.00	2179.41	2179.41	2181.26	61.59	10.93	356.78	496.94
*	240.000	499.89	.00	.00	2180.90	3900.00	2186.19	2186.19	2188.33	66.33	11.72	332.75	478.86

SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH	AREA	.01K
250.000	282.34	.00	.00	2184.97	3900.00	2189.41	2189.41	2191.36	60.21	11.21	347.87	502.61
260.000	271.17	.00	.00	2189.10	3900.00	2193.02	2193.02	2195.00	23.53	11.29	345.34	804.08
270.000	195.33	2197.00	2195.40	2190.40	3900.00	2195.41	.00	2196.63	10.73	8.84	440.96	1190.53
280.000	311.22	.00	.00	2194.51	3900.00	2198.47	2198.47	2199.95	65.54	9.75	400.05	481.73
290.000	320.59	.00	.00	2199.43	3900.00	2203.52	2203.52	2205.03	65.09	9.84	396.18	483.39
300.000	43.68	.00	.00	2199.90	3900.00	2208.05	2208.05	2211.99	57.91	15.94	244.74	512.49
310.000	1075.00	.00	.00	2214.10	3900.00	2222.25	2222.25	2226.19	57.68	15.93	244.83	513.49
320.000	175.00	.00	.00	2216.40	3900.00	2226.18	2220.82	2226.64	1.96	5.43	718.86	2783.08
330.000	80.00	2223.50	2221.90	2216.90	3900.00	2226.29	.00	2226.71	1.81	5.31	889.47	2897.66
340.000	419.10	.00	.00	2223.46	3900.00	2229.43	2229.43	2231.43	60.55	11.35	343.56	501.18
350.000	503.60	.00	.00	2226.00	3900.00	2232.63	2232.38	2234.82	72.58	11.88	328.41	457.77
360.000	221.39	.00	.00	2230.10	3900.00	2237.05	2237.05	2240.56	26.52	15.04	259.28	757.31
.000	100.00	2243.50	2240.80	2230.80	3900.00	2239.43	.00	2241.71	14.00	12.10	322.19	1042.47
380.000	471.93	.00	.00	2236.06	3900.00	2242.26	2239.63	2242.38	7.14	2.82	1383.62	1459.82
390.000	382.37	.00	.00	2240.00	3900.00	2243.67	2243.67	2244.60	153.36	7.75	503.01	314.93
400.000	403.29	.00	.00	2244.30	3900.00	2248.54	2248.18	2249.26	89.26	6.82	571.46	412.79
410.000	493.17	.00	.00	2249.60	3900.00	2252.94	2252.57	2253.58	85.59	6.42	607.01	421.55
420.000	503.19	.00	.00	2253.86	3900.00	2257.92	2257.91	2259.14	137.87	8.88	438.99	332.15
430.000	397.81	.00	.00	2257.13	3900.00	2261.72	2261.69	2263.56	84.62	10.90	357.83	423.98
440.000	501.58	.00	.00	2261.20	3900.00	2265.72	2265.32	2267.28	64.51	10.03	388.92	485.56
450.000	500.90	.00	.00	2265.65	3900.00	2269.85	2269.85	2271.76	87.50	11.09	351.72	416.92
460.000	499.73	.00	.00	2270.00	3900.00	2274.19	2274.12	2276.03	83.33	10.89	357.98	427.22
470.000	497.44	.00	.00	2274.47	3900.00	2278.74	2278.74	2280.64	87.92	11.08	352.06	415.93
480.000	315.97	.00	.00	2279.98	3900.00	2285.49	2285.49	2287.77	20.96	12.11	322.04	851.87
490.000	143.95	.00	.00	2284.10	3900.00	2290.57	2290.57	2293.81	25.22	14.43	270.24	776.67
.000	102.00	2295.30	2292.60	2284.60	3900.00	2292.63	.00	2294.73	13.22	11.63	335.34	1072.54

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH	AREA	.01K
*	510.000	25.00	.00	.00	2285.06	3900.00	2294.29	2290.50	2294.90	5.83	6.28	620.78	1615.14
*	520.000	261.38	.00	.00	2287.10	3900.00	2294.21	2294.21	2296.79	36.71	12.89	302.54	643.68

PLAIN DETERMINATION

UMMARY PRINTOUT TABLE 150

SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
10.000	3900.00	2112.10	.00	.00	2.10	64.00	.00
20.000	3900.00	2113.65	.00	1.55	.00	64.00	50.00
30.000	3900.00	2127.73	.00	14.08	.00	64.00	1071.00
40.000	3900.00	2127.70	.00	-.03	.00	75.04	32.95
50.000	3900.00	2128.33	.00	.63	.00	93.15	141.28
60.000	3900.00	2129.42	.00	1.10	.00	110.48	141.88
70.000	3900.00	2129.63	.00	.21	.00	111.03	15.47
80.000	3900.00	2133.12	.00	3.49	.00	124.33	1.00
90.000	3900.00	2134.17	.00	1.05	.00	97.00	24.79
100.000	3900.00	2135.81	.00	1.63	.00	97.00	44.67
[illegible].000	3900.00	2139.19	.00	3.38	.00	107.72	320.85
120.000	3900.00	2139.98	.00	.79	.00	94.77	140.52
130.000	3900.00	2142.05	.00	2.06	.00	50.50	200.57
140.000	3900.00	2145.96	.00	3.92	.00	50.50	227.79
150.000	3900.00	2148.12	.00	2.16	.00	79.75	470.10
160.000	3900.00	2149.94	.00	1.81	.00	77.40	254.22
170.000	3900.00	2150.18	.00	.24	.00	63.33	215.74
180.000	3900.00	2152.04	.00	1.86	.00	63.33	102.34
190.000	3900.00	2153.05	.00	1.01	.00	67.53	500.57
200.000	3900.00	2161.76	.00	8.71	.00	92.74	440.55
210.000	3900.00	2167.22	.00	5.46	.00	87.40	499.61
220.000	3900.00	2173.63	.00	6.41	.00	101.53	485.49
230.000	3900.00	2179.41	.00	5.77	.00	97.98	501.36
240.000	3900.00	2186.19	.00	6.79	.00	86.90	499.89

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
*	250.000	3900.00	2189.41	.00	3.22	.00	90.05	282.34
*	260.000	3900.00	2193.02	.00	3.61	.00	88.00	271.17
*	270.000	3900.00	2195.41	.00	2.39	.00	88.00	195.33
*	280.000	3900.00	2198.47	.00	3.06	.00	137.96	311.22
*	290.000	3900.00	2203.52	.00	5.05	.00	134.01	320.59
*	300.000	3900.00	2208.05	.00	4.53	.00	31.34	43.68
*	310.000	3900.00	2222.25	.00	14.20	.00	31.33	1075.00
*	320.000	3900.00	2226.18	.00	3.93	.00	73.50	175.00
	330.000	3900.00	2226.29	.00	.11	.00	155.22	80.00
*	340.000	3900.00	2229.43	.00	3.13	.00	87.44	419.10
	350.000	3900.00	2232.63	.00	3.20	.00	66.43	503.60
*	360.000	3900.00	2237.05	.00	4.42	.00	37.33	221.39
*	370.000	3900.00	2239.43	.00	2.39	.00	37.33	100.00
*	380.000	3900.00	2242.26	.00	2.83	.00	352.50	471.93
*	390.000	3900.00	2243.67	.00	1.41	.00	279.95	382.37
	400.000	3900.00	2248.54	.00	4.86	.00	256.44	403.29
	410.000	3900.00	2252.94	.00	4.40	.00	289.39	493.17
	420.000	3900.00	2257.92	.00	4.98	.00	183.41	503.19
	430.000	3900.00	2261.72	.00	3.80	.00	95.08	397.81
	440.000	3900.00	2265.72	.00	4.00	.00	94.95	501.58
*	450.000	3900.00	2269.85	.00	4.14	.00	93.07	500.90
	460.000	3900.00	2274.19	.00	4.34	.00	93.68	499.73
	470.000	3900.00	2278.74	.00	4.55	.00	93.54	497.44
	480.000	3900.00	2285.49	.00	6.75	.00	71.65	315.97
	490.000	3900.00	2290.57	.00	5.08	.00	41.75	143.95
	500.000	3900.00	2292.63	.00	2.06	.00	41.75	102.00

SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
510.000	3900.00	2294.29	.00	1.66	.00	90.84	25.00
520.000	3900.00	2294.21	.00	-.08	.00	59.57	261.38

SUMMARY OF ERRORS AND SPECIAL NOTES

CAUTION SECNO= 20.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 20.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 30.000 PROFILE= 1 HYDRAULIC JUMP D.S.
WARNING SECNO= 30.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 40.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO= 60.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 60.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 70.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 70.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 80.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 80.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 90.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 90.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 100.000 PROFILE= 1 HYDRAULIC JUMP D.S.
[illegible] SECNO= 100.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO= 110.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 110.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 120.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 120.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 130.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 130.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 140.000 PROFILE= 1 HYDRAULIC JUMP D.S.
WARNING SECNO= 140.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO= 150.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 150.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

WARNING SECNO= 160.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 170.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

AUTION SECNO= 190.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
AUTION SECNO= 190.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

AUTION SECNO= 200.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
[illegible] SECNO= 200.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 210.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 210.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

[redacted] SECNO= 220.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 220.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 230.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 230.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 240.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 240.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 250.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 250.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 260.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 260.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 270.000 PROFILE= 1 HYDRAULIC JUMP D.S.
WARNING SECNO= 270.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO= 280.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 280.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 290.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 290.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 300.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
[redacted] SECNO= 300.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 310.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 310.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

WARNING SECNO= 320.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO= 340.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 340.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 360.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 360.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 370.000 PROFILE= 1 HYDRAULIC JUMP D.S.

WARNING SECNO= 380.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO= 390.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 390.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 450.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 450.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 470.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 470.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

[redacted] SECNO= 480.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 480.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

:A SECNO= 490.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
:AUTION SECNO= 490.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

:AUTION SECNO= 500.000 PROFILE= 1 HYDRAULIC JUMP D.S.

/ARNING SECNO= 510.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

:AUTION SECNO= 520.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
:AUTION SECNO= 520.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

BASE1.D2

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*******************************************
*  HEC-2 WATER SURFACE PROFILES           *
*                                         *
*  Version  4.6.2;  May 1991              *
*                                         *
*    DATE    12OCT97    TIME   15:57:16   *
*******************************************
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*****************************************
*  U.S. ARMY CORPS OF ENGINEERS         *
*  HYDROLOGIC ENGINEERING CENTER        *
*  609 SECOND STREET, SUITE D           *
*  DAVIS, CALIFORNIA 95616-4687         *
*        (916) 756-1104                 *
*****************************************
```


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X     X  XXXXXXX   XXXXX              XXXXX
X     X  X        X     X            X     X
X     X  X        X                        X
XXXXXXX  XXXX     X          XXXXX    XXXXX
X     X  X        X                   X
X     X  X        X     X             X
X     X  XXXXXXX   XXXXX              XXXXXXX
```

THIS RUN EXECUTED 12OCT97 15:57:17

****
HEC-2 WATER SURFACE PROFILES

Version 4.6.2; May 1991
****

```
T1      550.032
T2      FLAMINGO WASH FIS RESTUDY
T3      FLOODPLAIN DETERMINATION
T4      BREAKOUT ANALYSIS AT CAMERON STREET BRIDGE
T4      FILES: BASE1.DWG, BASE1.D2  JOB 2
T4      STARTING WSE = CRITICAL DEPTH
T4      SUBCRITICAL RUN

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

                2                             -1                            100       2192

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

     -1                 -1                                      -2        -6

J3  VARIABLE CODES FOR SUMMARY PRINTOUT

    150                100

NC    0.016     0.016     0.016       0.1       0.3
X1     1001         6      1000   1252.87
GR     2194    736.46   2192.73      1000      2192   1115.64   2191.42   1167.88      2192   1252.87
GR     2194   1379.59

NC      0.1      0.03     0.016
X1     1002        34   1093.19   1173.61    396.14    396.14    398.76
GR     2196      1000   2195.91   1020.82   2195.34   1083.67      2196   1085.98   2197.93   1093.19
GR     2196   1102.07   2194.89   1106.98   2194.57   1111.61   2194.87   1136.25   2194.83   1160.73
GR   2195.7   1172.16      2196   1173.61      2196   1195.83   2195.92    1200.9      2196    1201.1
GR     2198   1206.19      2200   1211.28      2202   1216.32      2204   1221.04      2206    1225.4
GR     2208   1231.88      2208   1238.27      2208   1256.52      2210      1269      2212   1275.37
GR     2214   1281.08      2216   1286.87   2217.78   1293.42      2216   1298.92      2214   1304.49
GR     2212   1310.11      2210    1315.7      2208   1321.05      2206   1325.65

NC      0.1      0.03     0.016
X1     1003        18   1084.49   1163.07    403.99    403.99    402.69
GR   2204.5      1000   2204.21      1068   2204.41   1084.49      2204   1090.88   2203.72   1095.73
GR     2204   1109.76    2204.1   1120.33      2204   1123.03   2203.63   1144.65      2204   1148.46
GR     2205   1163.07   2204.81   1176.08   2206.04   1184.12      2206   1185.17   2207.37   1213.67
GR   2207.3   1334.41      2208   1337.75      2210    1347.9
```

[illegible]	0.1	0.03	0.016							
C1	1004	11	1069.86	1152.2	396.18	397.46	397.45			
SR	2212	1000	2211.45	1069.86	2210.42	1086.92	2210.56	1091.71	2210.68	1114.66
SR	2210.3	1141.05	2211.04	1152.2	2210.52	1171.77	2210.96	1180.82	2212	1251.53
SR	2214	1356.13								
AC	0.1	0.03	0.016							
D1	1	2300								
C1	1005	16	1175.48	1250.08	447.05	247.06	368.62			
C3	10					1250.08	2222			
SR	2222	1000	2220	1122.12	2219.9	1125.13	2218	1157.65	2217.23	1175.48
SR	2216	1180.21	2215.55	1181.89	2215.16	1186.75	2215.36	1212.46	2215.11	1235.65
SR	2215.2	1250.08	2214	1267.24	2213.97	1267.62	2213.54	1279.82	2213.78	1296.9
SR	2212	1455.04								
AC	0.1	0.03	0.016							
C1	1006	34	1246.85	1327.45	399.92	399.92	399.92			
C3	10					1327.45	2224			
SR	2224	1000	2222	1173.08	2221.67	1183.57	2220.65	1240.64	2220.42	1246.85
SR	2220	1246.97	2218.53	1247.7	2217.96	1252.56	2218	1256.83	2218	1258.12
SR	2218.2	1278.51	2218	1293.05	2217.88	1301.36	2218	1305.33	2219.15	1327.45
SR	2218.2	1339.57	2218.6	1351.55	2218	1385.23	2218	1441.87	2218.5	1466.76
SR	2218	1519.03	2218	1555.03	2218.63	1580.22	2220	1581.93	2222	1584.43
SR	2224	1586.92	2226	1589.41	2228	1591.88	2230	1594.35	2232	1596.79
SR	2234	1599.19	2236	1601.55	2238	1603.87	2240	1606.17		
AC	0.1	0.03	0.016							
C1	1007	13	1219.96	1307.75	399.92	397.3	397.3			
C3	10					1307.75	2224			
SR	2224	1000	2222	1167.09	2221.36	1219.96	2220.4	1230.89	2220	1235.15
SR	2219.9	1236.2	2219.95	1263.27	2219.63	1286.33	2219.91	1291.18	2220	1296.23
SR	2220.4	1307.75	2220	1369.33	2218	1549.19				
AC	0.1	0.03	0.016							
C1	1008	21	1095.7	1168.83	381.62	382.92	382.92			
C3	10					1168.83	2225			
SR	2226	1000	2225.34	1042.04	2224	1069.25	2223.92	1070.89	2223.06	1083.88
SR	2222	1095.7	2221.71	1098.65	2221.43	1104.31	2221.67	1129.72	2221.34	1154.01
SR	2221.6	1168.83	2221.49	1223.01	2220	1403.44	2218.56	1538.23	2219.03	1572.3
SR	2219	1647.26	2219.44	1714.27	2220	1730.05	2222	1730.99	2224	1731.92
SR	2225.9	1733.04								
AC	0.1	0.03	0.016							
C1	1009	10	1200.81	1279.23	424.75	422.13	422.13			
C3	10			1200.81	2229	1279.23	2229			
SR	2226	1000	2224	1172.14	2223.65	1200.81	2223.64	1206.6	2223.25	1232.85
SR	2223.3	1258.66	2223.57	1279.23	2224	1318.85	2224.57	1434.22	2224.07	1518.77

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
[redacted]	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

PROF 1

RITICAL DEPTH TO BE CALCULATED AT ALL CROSS SECTIONS
LLOWABLE ERROR FOR CRITICAL DEPTH DETERMINATION (ALLDC) = 2.000 PERCENT OF THE DEPTH

CHV= .100 CEHV= .300
SECNO 1001.000
720 CRITICAL DEPTH ASSUMED

1001.000	.54	2191.96	2191.96	2192.00	2192.09	.14	.00	.00	2192.73
100.0	.0	100.0	.0	.0	33.9	.0	.0	.0	2192.00
.00	.00	2.95	.00	.000	.016	.000	.000	2191.42	1119.66
.005845	0.	0.	0.	0	11	0	.00	126.66	1246.32

SECNO 1002.000
185 MINIMUM SPECIFIC ENERGY
720 CRITICAL DEPTH ASSUMED

1002.000	.67	2195.24	2195.24	.00	2195.47	.22	2.17	.03	2197.93
[redacted]0.0	.0	100.0	.0	.0	26.4	.0	.3	.9	2196.00
[redacted].03	.00	3.79	.00	.000	.016	.000	.000	2194.57	1105.41
.005080	396.	399.	396.	0	11	0	.00	60.77	1166.18

SECNO 1003.000

265 DIVIDED FLOW

185 MINIMUM SPECIFIC ENERGY
720 CRITICAL DEPTH ASSUMED

1003.000	.71	2204.33	2204.33	.00	2204.54	.20	2.02	.00	2204.41
100.0	.4	99.6	.0	2.5	27.7	.0	.5	1.6	2205.00
.06	.16	3.60	.00	.100	.016	.000	.000	2203.63	1038.69
.004959	404.	403.	404.	0	8	0	.00	107.31	1153.35

SECNO 1004.000

265 DIVIDED FLOW

185 MINIMUM SPECIFIC ENERGY
720 CRITICAL DEPTH ASSUMED

1004.000	.64	2210.94	2210.94	.00	2211.12	.18	2.03	.00	2211.45
100.0	.0	93.4	6.6	.0	26.9	5.2	.8	2.6	2211.04
.09	.00	3.48	1.27	.000	.016	.030	.000	2210.30	1078.27
[redacted]259	396.	397.	397.	0	11	0	.00	97.05	1180.46

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 1005.000
3280 CROSS SECTION 1005.00 EXTENDED 6.43 FEET

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= .0 1250.1 TYPE= 1 TARGET= 1250.079

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2217.23 ELREA= 2222.00

1005.000	3.32	2218.43	2218.43	.00	2219.95	1.52	1.00	.40	2217.23
2300.0	10.3	2289.7	.0	16.2	231.1	.0	2.0	3.4	2222.00
.10	.63	9.91	.00	.100	.016	.000	.000	2215.11	1150.23
.002677	447.	369.	247.	0	26	0	.00	99.85	1250.08

*SECNO 1006.000
7 MINIMUM SPECIFIC ENERGY
3. ITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= .0 1327.4 TYPE= 1 TARGET= 1327.449

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2220.42 ELREA= 2224.00

1006.000	3.28	2221.16	2221.16	.00	2222.61	1.45	1.08	.01	2220.42
2300.0	4.5	2295.5	.0	11.3	237.2	.0	4.3	4.4	2224.00
.12	.40	9.68	.00	.100	.016	.000	.000	2217.88	1211.89
.002715	400.	400.	400.	0	5	0	.00	115.56	1327.45

*SECNO 1007.000
3280 CROSS SECTION 1007.00 EXTENDED 4.85 FEET

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= .0 1307.8 TYPE= 1 TARGET= 1307.749

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2221.36 ELREA= 2224.00

*SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST
1007.000	3.22	2222.85	2222.85	.00	2224.10	1.25	1.04	.02	2221.36
2300.0	64.1	2235.9	.0	92.1	245.8	.0	7.0	5.9	2224.00
.13	.70	9.10	.00	.100	.016	.000	.000	2219.63	1096.03
.002526	400.	397.	397.	0	17	0	.00	211.72	1307.75

*SECNO 1008.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= .0 1168.8 TYPE= 1 TARGET= 1168.829

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2222.00 ELREA= 2225.00

1008.000	3.31	2224.65	2224.65	.00	2226.14	1.49	.99	.07	2222.00
2300.0	46.2	2253.8	.0	45.4	227.6	.0	9.6	7.3	2225.00
.14	1.02	9.90	.00	.100	.016	.000	.000	2221.34	1056.15
.002642	382.	383.	383.	0	32	0	.00	112.68	1168.83

* 1009.000
3[illegible]ROSS SECTION 1009.00 EXTENDED 2.31 FEET

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 1200.8 1279.2 TYPE= 1 TARGET= 78.420
ELENCL= 2229.00 ELENCR= 2229.00

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2223.65 ELREA= 2229.00

1009.000	3.13	2226.38	2226.38	.00	2227.89	1.51	1.14	.00	2223.65
2300.0	.0	2300.0	.0	.0	233.5	.0	12.1	8.2	2229.00
.15	.00	9.85	.00	.000	.016	.000	.000	2223.25	1200.81
.002750	425.	422.	422.	0	11	0	.00	78.42	1279.23

THIS RUN EXECUTED 12OCT97 15:57:55

****
HEC-2 WATER SURFACE PROFILES

Version 4.6.2; May 1991
****

NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

FLOODPLAIN DETERMINATION

SUMMARY PRINTOUT TABLE 100

SECNO	EGLWC	ELLC	EGPRS	ELTRD	QPR	QWEIR	CLASS	H3	DEPTH	CWSEL	VCH	EG

PLAIN DETERMINATION

MMARY PRINTOUT TABLE 150

SECNO	XLCH	ELTRO	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH	AREA	.01K
1001.000	.00	.00	.00	2191.42	100.00	2191.96	2191.96	2192.09	58.45	2.95	33.91	13.08
1002.000	398.76	.00	.00	2194.57	100.00	2195.24	2195.24	2195.47	50.80	3.79	26.37	14.03
1003.000	402.69	.00	.00	2203.63	100.00	2204.33	2204.33	2204.54	49.59	3.60	30.14	14.20
1004.000	397.45	.00	.00	2210.30	100.00	2210.94	2210.94	2211.12	52.59	3.48	32.06	13.79
1005.000	368.62	.00	.00	2215.11	2300.00	2218.43	2218.43	2219.95	26.77	9.91	247.31	444.52
1006.000	399.92	.00	.00	2217.88	2300.00	2221.16	2221.16	2222.61	27.15	9.68	248.53	441.43
1007.000	397.30	.00	.00	2219.63	2300.00	2222.85	2222.85	2224.10	25.26	9.10	337.86	457.59
1008.000	382.92	.00	.00	2221.34	2300.00	2224.65	2224.65	2226.14	26.42	9.90	272.98	447.48
1009.000	422.13	.00	.00	2223.25	2300.00	2226.38	2226.38	2227.89	27.50	9.85	233.55	438.59

AIN DETERMINATION

MMARY PRINTOUT TABLE 150

SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLOB
1001.000	100.00	2191.96	.00	.00	-.04	126.66	.00
1002.000	100.00	2195.24	.00	3.29	.00	60.77	398.76
1003.000	100.00	2204.33	.00	9.09	.00	107.31	402.69
1004.000	100.00	2210.94	.00	6.61	.00	97.05	397.45
1005.000	2300.00	2218.43	.00	7.49	.00	99.85	368.62
1006.000	2300.00	2221.16	.00	2.73	.00	115.56	399.92
1007.000	2300.00	2222.85	.00	1.69	.00	211.72	397.30
1008.000	2300.00	2224.65	.00	1.79	.00	112.68	382.92
1009.000	2300.00	2226.38	.00	1.73	.00	78.42	422.13

SUMMARY OF ERRORS AND SPECIAL NOTES

CAUTION SECNO= 1001.000 PROFILE= 1 CRITICAL DEPTH ASSUMED

CAUTION SECNO= 1002.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 1002.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 1003.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 1003.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 1004.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 1004.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 1005.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 1005.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 1006.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 1006.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 1007.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 1007.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 1008.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 1008.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 1009.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 1009.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

2.2.3 IMPERIAL PALACE TO SPENCER ST. REACH

APPROXIMATE METHOD
HEC-2 MODEL ANALYSIS
IMPERIAL PALACE TO SPENCER ST. REACH

This reach from Imperial Palace to Spencer Street was flown as part of this project. Therefore, topography was generated. The starting water surface elevation was computed using normal depth. The subcritial run was used to determine the floodplain delineation for this reach.

As discussed in the report, the Winnick Avenue Culvert will intercept approximately 50 percent of the flow. Therefore, the HEC-2 model was constructed in this area along Winnick Avenue to determine the floodplain caused by the remaining surface flows.

BASE2.01

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*******************************************
*  HEC-2 WATER SURFACE PROFILES           *
*                                         *
*  Version  4.6.2;  May 1991              *
*                                         *
*  RUN DATE    06OCT97    TIME   11:03:27  *
*******************************************
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*****************************************
*  U.S. ARMY CORPS OF ENGINEERS         *
*  HYDROLOGIC ENGINEERING CENTER        *
*  609 SECOND STREET, SUITE D           *
*  DAVIS, CALIFORNIA 95616-4687         *
*         (916) 756-1104                *
*****************************************
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X     X  XXXXXXX   XXXXX             XXXXX
X     X  X        X     X           X     X
X     X  X        X                       X
XXXXXXX  XXXX     X         XXXXX    XXXXX
X     X  X        X                 X
X     X  X        X     X           X
X     X  XXXXXXX   XXXXX            XXXXXXX
```

GR	1936	1214.92	1938	1218.84	1939.89	1222.54	1940	1224.83	1941.2	1249.47

C	1942	1260.06	1942.66	1268.85	1944	1274.05				
NC	0.025	0.025	0.015							
X1	40	12	1133.81	1184.19	10	10	10			
X3	10			1133.81	1942	1184.19	1942			
GR	1941.3	1000	1941.45	1090.13	1941.22	1104.02	1940	1133.81	1933.6	1133.81
GR	1933.6	1184.19	1940	1184.19	1940	1206.88	1941.22	1232.32	1942	1242.6
GR	1942.6	1251.47	1944	1256.84						
NC	0.025	0.025	0.015							
SB	0.9	1.56	2.6	170	50.38	2.38	240	0	1934.6	1933.6
X1	50	12	1184.49	1234.87	112.85	117.18	115.08			
X2			1	1939.599	1943.13			1.33		
X3	10			1184.49	1945	1234.87	1945			
GR	1942.5	1000	1943.06	1093.5	1942.65	1100.84	1942.61	1115.98	1942	1129.89
GR	1942	1184.49	1934.6	1184.49	1934.6	1234.87	1943	1234.87	1943	1239.96
GR	1943.2	1254.01	1943.64	1350.42						
NC	0.025	0.025	0.015							
QT	1	4600								
X1	60	27	1059.71	1149.4	375.8	397.17	387.41			
GR	1949.4	1000	1948	1015.95	1947.88	1017.39	1946.17	1047.07	1946	1049.22
GR	1945.2	1059.71	1944	1062.77	1942	1067.82	1940	1072.95	1939.77	1073.57
GR	1939.5	1090.82	1938	1094.84	1936.76	1097.96	1936.87	1110.33	1938	1113.23
GR	1939.2	1116.15	1939.37	1137.83	1940	1138.84	1942	1142.41	1944	1145.9
GR	1946	1149.4	1947.75	1152.54	1948	1155.14	1949.08	1165.1	1949.24	1192.51
C	1950	1202.7	1950.32	1206.97						
NC	0.025	0.025	0.015							
X1	70	23	1062.67	1154.22	427.31	406.33	417.23			
GR	1952	1000	1951.01	1048.35	1950	1062.67	1949.99	1063.36	1948	1067.18
GR	1946	1070.79	1944	1074.17	1942.83	1076	1943.1	1084.29	1942	1099.07
GR	1941.8	1099.92	1941.57	1112.55	1942	1115.39	1943.17	1121.4	1943.35	1139.21
GR	1944	1140.31	1946	1143.61	1948	1146.85	1950	1149.96	1951.72	1152.28
GR	1952	1154.22	1953.75	1165.11	1953.84	1194.64				
NC	0.025	0.025	0.015							
X1	80	19	1056.35	1140.68	1	1	1			
GR	1952	1000	1952	1002.13	1951.45	1036.88	1950.33	1056.35	1950	1056.92
GR	1948	1060.33	1946	1063.74	1944	1067.15	1942.6	1068.83	1942.6	1132.22
GR	1944	1132.98	1946	1136.05	1948	1138.66	1950	1140.68	1951.88	1142.98
GR	1952	1143.96	1954	1156.72	1954	1157.77	1954.38	1201.02		
NC	0.025	0.025	0.015							
X1	90	23	1052.98	1113.6	53.02	56.59	51.93			
GR	1955.2	1000	1954	1006.02	1953.68	1007.66	1952.47	1022.15	1952	1035.65
GR	1951.6	1045.56	1951.07	1052.98	1950	1054.57	1948	1057.59	1946	1060.63
GR	1944	1063.71	1943.1	1065.06	1943.1	1105.06	1944	1109.3	1946	1110.15
GR	1948	1110.99	1950	1111.87	1952	1112.94	1953.03	1113.6	1954	1119.02
GR	1954.3	1121.63	1954	1145.66	1953.67	1187.07				

N	0.025	0.025	0.015							
X1	100	27	1068.7	1129.14	346.14	339.84	342.73			
GR	1958.9	1000	1959.19	1057.4	1958.29	1068.55	1958	1068.7	1956	1070.39
GR	1954	1071.98	1952	1073.58	1950	1075.17	1948	1076.75	1946	1078.32
GR	1944.7	1079	1944.7	1119	1946	1119.77	1948	1121.07	1950	1122.37
GR	1952	1123.68	1954	1124.99	1956	1126.31	1956.84	1126.86	1958	1129.14
GR	1960	1133.08	1961.7	1136.43	1962	1161.01	1962	1164.12	1962	1169.92
GR	1962.1	1180.79	1963.48	1218.41						
NC	0.025	0.025	0.015							
X1	110	25	1070.23	1130.3	1	1	1			
GR	1958	1000	1959.26	1058.72	1958.52	1069.8	1958	1070.23	1956	1071.86
GR	1954	1073.49	1952	1075.13	1950	1076.77	1948	1078.41	1947.23	1079.37
GR	1947.2	1119.37	1948	1122.31	1950	1123.63	1952	1124.96	1954	1126.29
GR	1956	1127.61	1956.94	1128.23	1958	1130.3	1960	1134.23	1961.78	1137.72
GR	1962	1156.11	1962	1162.57	1962	1167.55	1962.22	1180.81	1963.53	1218.4
NC	0.025	0.025	0.015							
X1	120	27	1082.95	1140.72	25.32	22.42	24.78			
GR	1959.7	1000	1960	1034.06	1960.7	1069.3	1960	1077.37	1959.54	1081.8
GR	1958	1082.95	1956	1084.44	1954	1085.94	1952	1087.44	1950	1088.93
GR	1948	1090.43	1947.5	1090.88	1947.5	1130.88	1948	1133.47	1950	1134.85
GR	1952	1136.24	1954	1137.62	1956	1138.99	1957.22	1139.81	1958	1140.72
GR	1960	1142.7	1962	1144.46	1962.02	1148.81	1962	1152.73	1962	1157.77
GR	1962.4	1185.25	1963.78	1223.58						
NC	0.025	0.025	0.015							
X1	130	24	1091.34	1145.53	125.29	125.61	125.31			
GR	1963	1000	1962	1082.33	1960	1086.89	1958.57	1090.09	1958	1091.34
GR	1956	1092.89	1954	1094.44	1952	1095.99	1950	1097.54	1948	1099.5
GR	1948	1139.5	1950	1141.65	1952	1142.63	1954	1143.6	1956	1144.57
GR	1958	1145.53	1960	1147.33	1961.39	1148.78	1962	1151.72	1962.83	1155.18
GR	1964	1156.8	1964.47	1157.37	1965.16	1174.08	1965.71	1213.65		
NC	0.025	0.025	0.015							
X1	140	25	1123.53	1181.8	57.23	56.76	55.76			
GR	1965.1	1000	1964	1109.48	1964.09	1112.94	1962	1117.49	1960	1121.87
GR	1959.2	1123.53	1958	1124.74	1956	1126.67	1954	1128.54	1952	1130.26
GR	1950	1131.84	1948.5	1132.5	1948.5	1172.5	1950	1175.19	1952	1176.29
GR	1954	1177.52	1956	1178.95	1958	1180.42	1959.86	1181.8	1960	1182.12
GR	1962	1186.57	1964	1191.03	1966	1195.47	1966.85	1197.34	1966.36	1258.33
NC	0.025	0.025	0.015							
X1	150	24	1135	1193.6	1	1	1			
GR	1965.4	1000	1964.25	1124.53	1964	1124.8	1962	1129.47	1960	1133.87
GR	1959.5	1135	1958	1136.46	1956	1138.43	1954	1140.4	1952	1142.4
GR	1950.5	1143.5	1950.5	1183.5	1952	1187.45	1954	1189.03	1956	1190.57
GR	1958	1192.09	1959.99	1193.6	1960	1193.68	1962	1198.04	1964	1202.42
GR	1966	1206.72	1966.89	1208.61	1967.17	1222.54	1966.39	1280.29		

	0.025	0.025	0.015							
X1	160	21	1022.9	1081.97	119.51	110.97	114.85			
GR	1964	1000	1962	1020.85	1961.14	1022.9	1960	1024.28	1958	1026.68
GR	1956	1029.05	1954	1031.39	1952	1033.69	1951.76	1033.96	1951.77	1074.55
GR	1952	1074.73	1954	1076.3	1956	1077.86	1958	1079.44	1960	1081.05
GR	1961.1	1081.97	1962	1085.8	1964	1091.98	1966	1097.23	1966.68	1098.86
GR	1967.1	1124.37								
NC	0.025	0.025	0.015							
X1	170	24	1021.94	1098.85	98.31	96.38	97.13			
GR	1967	1000	1966	1012.58	1965.99	1012.86	1964	1017.32	1962	1021.94
GR	1961.3	1023.53	1960	1025.98	1958	1029.63	1956	1033.27	1954	1036.91
GR	1952.3	1039.96	1952.49	1078.78	1952.8	1090.15	1954	1091.24	1956	1093.09
GR	1958	1094.94	1960	1096.8	1961.88	1098.54	1962	1098.85	1964	1103.45
GR	1966	1107.87	1968	1112.15	1968.22	1112.6	1968.32	1119.73		
NC	0.03	0.03	0.025							
X1	180	37	1105.54	1192.93	358.08	374.39	363.91			
GR	1970	1000	1969.41	1028.94	1968.36	1064.62	1968.63	1086	1970	1087.29
GR	1970.1	1087.42	1970	1100.03	1969.97	1105.54	1968	1109.38	1966	1113.23
GR	1964	1117.01	1962	1120.79	1960	1124.58	1958	1128.36	1956.15	1131.88
GR	1956.8	1143	1956	1147.31	1955.07	1152.03	1956	1170.74	1955.93	1170.74
GR	1958	1176.71	1959.49	1180.23	1960	1180.82	1962	1183.17	1964	1185.58
GR	1966	1188.01	1968	1190.47	1970	1192.93	1972	1195.38	1974	1197.84
GR	1975.3	1199.53	1976	1202.18	1976.53	1204.15	1978	1230.41	1978.06	1230.73
G	79.6	1268.21	1980	1278.63						
NC	0.03	0.03	0.025							
X1	190	42	1045.63	1134.18	349.99	362.07	356.25			
GR	1980	1000	1979.83	1002.64	1978.63	1026.03	1978	1042.24	1977.86	1045.63
GR	1976	1048.01	1974.65	1049.5	1974	1051.69	1972.2	1057.64	1972	1057.83
GR	1970	1059.68	1968	1061.56	1966	1063.46	1964	1065.36	1962	1067.28
GR	1960.4	1068.9	1960.4	1079.82	1960	1081.62	1958	1090.14	1957.64	1091.57
GR	1957.9	1101.67	1958	1101.76	1960	1106.43	1960.85	1108.4	1962	1111.96
GR	1963.3	1116.18	1964	1117.03	1966	1119.5	1968	1121.97	1970	1124.43
GR	1972	1126.89	1974	1129.33	1976	1131.76	1978	1134.18	1980	1136.59
GR	1980.8	1137.6	1981.5	1143.92	1982	1150.97	1982.99	1166.12	1984	1176.63
GR	1984.3	1179.97	1984.45	1222.66						
NC	0.03	0.03	0.025							
X1	200	35	1081.17	1169.9	344.1	367.63	357.38			
GR	1979.8	1000	1979.18	1029.49	1979.12	1052.59	1978.6	1067.43	1978	1077.24
GR	1977.7	1081.17	1976	1083.12	1974	1085.36	1972	1087.6	1970	1089.84
GR	1968	1092.07	1966	1094.26	1964	1096.33	1963.25	1097.1	1962.44	1108.96
GR	1963.4	1118.36	1963.2	1132.05	1964	1134.42	1965.81	1139.65	1966	1140.91
GR	1968	1152.85	1968.07	1153.21	1970	1155.03	1972	1156.9	1974	1158.74
GR	1976	1160.58	1978	1162.42	1980	1164.26	1982	1166.1	1984	1167.93
GR	1986	1169.8	1986.14	1169.9	1985.91	1175.55	1988	1199.66	1988.33	1203.15

[redacted]	0.025	0.025	0.015							
X1	210	28	1020.72	1112.24	218.28	223.05	220.26			
GR	1984	1000	1984.02	1005.21	1982.67	1015.97	1982	1020.72	1980	1024.38
GR	1978	1026.77	1976	1029.13	1974	1031.45	1972	1033.74	1970	1036.02
GR	1968	1038.3	1966	1040.57	1965.48	1041.23	1965.56	1087.58	1966	1088.46
GR	1968	1090.47	1970	1092.59	1972	1094.71	1974	1096.83	1976	1098.95
GR	1978	1101.07	1980	1103.2	1982	1105.33	1984	1107.49	1986	1109.84
GR	1986.9	1112.24	1987.25	1118.07	1988	1138.44				
NC	0.025	0.025	0.015							
X1	220	7	1044.15	1104.44	96.67	97.77	95.38			
X3	10			1044.15	1987	1104.44	1987			
GR	1986.2	1000	1986.57	1044.15	1968.66	1044.15	1968.66	1094.4	1986	1094.4
GR	1986.8	1104.44	1986.9	1141.04						
NC	0.025	0.025	0.015							
SB	0.9	1.56	2.6	115	50.25	2.25	576	0	1969.76	1968.66
X1	230	6	1059.76	1110.01	105.83	104.98	106.05			
X2			1	1981.76	1987.6			1.33		
X3	10			1059.76	1987.2	1110.01	1987.2			
GR	1987.1	1000	1987.1	1059.76	1969.76	1059.76	1969.76	1110.01	1987.1	1110.01
GR	1987.1	1161.77								
NC	0.025	0.025	0.025							
X1	240	24	1023.48	1114.49	100.09	99.49	98.95			
[redacted]	1986	1000	1985.03	1014.57	1984.8	1023.48	1984	1025.31	1982	1030.02
GR	1980	1034.87	1978	1039.77	1976	1044.7	1975.59	1045.71	1975.71	1065.01
GR	1975.9	1076.65	1976	1079.47	1976.57	1085.82	1978	1090.42	1980	1094.27
GR	1982	1098.12	1984	1101.96	1986	1105.8	1988	1109.64	1990	1113.5
GR	1990.5	1114.49	1992.03	1119.47	1992	1119.74	1992.15	1125.82		
NC	0.025	0.025	0.025							
X1	250	29	1057.08	1169.75	483.82	467.47	478.12			
GR	1997.3	1000	1996	1025.03	1994	1057.08	1993.84	1059.01	1992	1061.82
GR	1990	1064.74	1988	1067.62	1986	1070.5	1984.57	1072.52	1984.32	1091.51
GR	1984	1092.06	1982	1095.54	1980	1099.12	1978.65	1101.59	1979.52	1114.22
GR	1980	1115.21	1982	1119.32	1982.68	1120.71	1982.27	1141.82	1984	1145.49
GR	1986	1149.77	1988	1154.11	1990	1158.51	1992	1162.95	1994	1167.41
GR	1995	1169.75	1994.48	1179.68	1996	1217.96	1998	1250.87		
NC	0.025	0.025	0.025							
X1	260	32	1125.84	1217.45	458.42	414.37	437.75			
GR	2002	1000	2000	1099.97	1999.98	1125.84	1998	1129.08	1996	1132.43
GR	1994	1135.78	1992	1139.14	1990.39	1141.83	1990.13	1157.45	1990	1157.66
GR	1988	1160.93	1986	1164.19	1984	1167.44	1982.24	1170.27	1982.12	1181.56
GR	1984	1184.35	1984.49	1185.06	1986	1192.93	1986.42	1195.31	1986.94	1204.85
GR	1988	1205.87	1990	1207.79	1992	1209.67	1994	1211.5	1996	1213.28
GR	1998	1214.99	2000	1216.64	2001.02	1217.45	2002	1230.77	2002.83	1241.5
GR	2002.6	1268.79	2003.91	1441.11						

[redacted]	0.025	0.025	0.02							
X1	270	16	1119.93	1157.26	213.44	213.44	213.69			
X3	10			1119.93	1999	1157.26	1999			
GR	1998.6	1000	1998.21	1067.08	1998	1077.71	1997.87	1089.69	1998	1095.71
GR	1998.1	1098.35	1998	1119.93	1983.4	1119.93	1983.4	1157.26	1998	1157.26
GR	2000	1175.33	2000.38	1176.08	2002	1184.44	2002.72	1188.02	2002.76	1209.37
GR	2004	1230.11								
NC	0.025	0.025	0.02							
SB	0.9	1.56	2.6	94	37.33	1.33	360	0	1984.3	1983.4
X1	280	17	1088.14	1124.47	110.45	115.15	110.04			
X2			1	1994.3	1997.3			1.33		
X3	10			1088.14	1999	1124.47	1999			
GR	2006	1000	2005.55	1016.53	2004	1023.84	2002	1033.33	2000.41	1040.84
GR	2000	1045.99	1999.38	1053.66	1998	1071.53	1997.96	1088.14	1984.3	1088.14
GR	1984.3	1124.47	1997.88	1124.47	1998	1130.07	1998.01	1135.33	1998	1135.45
GR	1997.3	1158.85	1998	1171.46						
NC	0.025	0.025	0.025							
ST	1	3900								
X1	290	27	1087.68	1216.15	402.5	479.38	451.82			
GR	2012.9	1000	2012.48	1087.68	2012	1088.64	2010	1092.64	2008	1096.63
GR	2006	1100.61	2004	1104.6	2002	1108.58	2000.01	1112.53	2000	1112.78
GR	1999.1	1129	1998	1131.23	1996	1134.95	1994	1138.62	1993.63	1139.29
GR	1993.7	1156.13	1994	1156.77	1996	1161.74	1998	1166.26	1998.4	1167.13
[redacted]	2000	1187.26	2001.03	1198.95	2002	1203.24	2004	1211.29	2005.27	1216.15
GR	2006	1237.37	2006	1253.12						
NC	0.025	0.025	0.025							
X1	300	38	1101.61	1253.69	445.34	406.87	430.29			
GR	2022	1000	2023.2	1052.04	2023.19	1099.68	2022	1101.61	2020	1104.85
GR	2018	1108.13	2016	1111.46	2014	1114.82	2012	1118.18	2010.62	1120.51
GR	2010.6	1138.37	2010	1139.8	2008	1144.21	2006	1148.61	2004	1153
GR	2003.1	1154.97	2002	1161.54	2001.94	1161.9	2002	1162.1	2003.16	1166.76
GR	2004	1168.39	2006	1172.05	2008	1175.68	2010	1179.14	2012	1182.49
GR	2012.8	1183.85	2012.62	1222.77	2013.26	1227.82	2014	1230.57	2016	1238.32
GR	2016.5	1240.47	2018	1243.56	2020	1247.79	2022	1252.02	2022.49	1253.69
GR	2022.9	1271	2024	1310.6	2024.22	1318.33				
NC	0.025	0.025	0.015							
X1	310	9	1036.87	1067.87	360.41	351.83	353.38			
X3	10			1036.87	2020	1067.87	2020			
GR	2020.2	1000	2020	1012.51	2019.76	1026.57	2018	1036.87	2008	1036.87
GR	2008	1067.87	2018	1067.87	2018.74	1089.14	2020	1105.23		
NC	0.025	0.025	0.015							
SB	0.9	1.56	2.6	58	31	1	210	0	2008.4	2008
X1	320	6	1074.88	1105.88	89.08	89.25	86.84			
X2			1	2015.4	2020.2			1.33		
X3	10			1074.88	2021	1105.88	2021			
GR	2022	1000	2020	1074.88	2008.4	1074.88	2008.4	1105.88	2020	1105.88
[redacted]	20.4	1120.7								

[redacted]	0.035	0.035	0.03							
X	330	32	1073.22	1159.42	407.14	409.75	409.02			
GR	2028.2	1000	2028	1028.29	2027.94	1033.37	2026.74	1044.04	2028	1061.85
GR	2028.6	1070.03	2028	1073.22	2027.23	1077.02	2026	1081.25	2024	1088.07
GR	2022	1094.83	2020	1101.57	2019.81	1102.13	2018	1104.59	2016	1107.4
GR	2015.2	1108.46	2014.22	1116.23	2015.11	1124.64	2016	1126.01	2018	1129.12
GR	2020	1132.3	2020.97	1133.92	2021.77	1151.67	2022	1152.07	2024	1155.53
GR	2026	1158.82	2026.16	1159.42	2026.49	1168.36	2026.56	1198.52	2028	1224.16
GR	2028	1226.25	2028	1243.69						
NC	0.035	0.035	0.03							
X1	340	23	1056.91	1165.92	416.01	411.16	414.66			
GR	2034	1000	2033.54	1041.15	2032.89	1056.91	2032	1071.73	2031.99	1071.84
GR	2030	1076.76	2028	1081.57	2026	1086.12	2024	1090.12	2023.05	1093.65
GR	2022	1113.5	2021.92	1114.5	2022	1115.38	2022.98	1128.04	2024	1134.12
GR	2025.2	1141.02	2026	1143.48	2028	1149.7	2030	1155.88	2031.85	1161.5
GR	2032	1165.92	2032.4	1227.24	2032.47	1306.6				
NC	0.025	0.025	0.015							
X1	350	8	1014	1077.2	391.21	407.9	400.22			
X3	10			1014	2036	1077.2	2036			
GR	2035.1	1000	2034	1014	2025.9	1014	2025.9	1077.2	2034	1077.2
GR	2036	1086.37	2036.2	1094.88	2036.44	1095.33				
NC	0.025	0.025	0.015							
[redacted]	0.9	1.56	2.6	70	63.2	3.2	480	0	2025.9	2025.9
X[redacted]	360	8	1023.92	1087.12	69.15	67.58	69.23			
X2			1	2033.9	2036.06			1.33		
X3	10			1023.92	2037	1087.12	2037			
GR	2036	1000	2036.27	1011.98	2036	1023.92	2025.9	1023.92	2025.9	1087.12
GR	2036	1087.12	2036.11	1091.98	2036.81	1114.07				
NC	0.025	0.025	0.015							
X1	370	23	1037.84	1109.55	67.22	66.57	66.95			
GR	2039.2	1000	2039.54	1028.04	2038	1035.22	2037.44	1037.84	2036	1044.09
GR	2034	1048.46	2032	1052.89	2030	1057.17	2028	1060.8	2028	1064.5
GR	2028	1081.98	2028	1089.63	2028	1099.06	2028	1106.03	2030	1106.68
GR	2032	1107.62	2034	1108.62	2035.81	1109.55	2036	1112.07	2036.77	1118.39
GR	2037.6	1131.72	2038	1190.66	2038	1190.72				
NC	0.025	0.025	0.015							
X1	380	17	1037.66	1118.27	1	1	1			
GR	2039.3	1000	2039.67	1028.22	2038	1035.96	2037.63	1037.66	2036	1043.96
GR	2034	1049.96	2032	1055.19	2030	1060.04	2030	1066.79	2030	1104.28
GR	2032	1106.78	2034	1108.4	2035.83	1109.57	2036	1111.36	2036.85	1118.27
GR	2037.7	1131.66	2038	1190.48						
NC	0.035	0.035	0.03							
X1	390	28	1040.49	1129.17	384.6	427.73	409.92			
GR	2043.5	1000	2043.12	1008.96	2044	1038.32	2044.06	1040.22	2044	1040.49
GR	2043.9	1040.61	2044	1040.96	2044.44	1044.41	2044	1045.36	2042	1049.72
[redacted]	2040	1054.05	2038	1058.31	2036	1062.53	2034	1066.73	2033.2	1068.42
GR	2033.1	1081	2032.17	1087.19	2033.73	1092.76	2033.91	1107.36	2034	1107.55

C	2036	1112.48	2038	1117.34	2040	1122.11	2042	1126.83	2042.99	1129.17
[redacted]	2042	1141.02	2042.83	1171.51	2042.75	1213.88				
NC	0.025	0.025	0.015							
X1	400	26	1023.26	1125.1	427.56	379.77	400.26			
GR	2043.4	1000	2044	1008.84	2044.48	1016.77	2044.6	1018.87	2044.76	1023.26
GR	2044	1029.09	2043.84	1030.28	2042	1035.42	2040	1041	2038	1046.59
GR	2036	1052.17	2034.55	1056.13	2034	1071.56	2033.36	1076.02	2034	1078.19
GR	2034.8	1081.88	2035.08	1097.23	2036	1100.89	2036.84	1104.16	2038	1107.49
GR	2040	1113.12	2042	1118.75	2043.92	1124.26	2044	1125.1	2046	1147.4
GR	2048	1170.4								
NC	0.025	0.025	0.015							
X1	410	27	1023.15	1123.94	1	1	1			
GR	2043.5	1000	2044	1007.48	2044.57	1016.63	2044.79	1018.64	2044.89	1023.15
GR	2044	1030.2	2044.01	1030.29	2042	1035.51	2040	1040.71	2038	1045.88
GR	2036	1051.03	2035.83	1051.5	2034.27	1053.8	2034	1065.18	2033.41	1076.18
GR	2033.8	1083.76	2034	1088.34	2034.44	1098.59	2035.86	1100.44	2036	1101.24
GR	2038	1106.68	2040	1112.44	2042	1118.2	2043.99	1123.94	2044	1124.08
GR	2046	1146.2	2048	1169.51						
NC	0.025	0.025	0.015							
X1	420	24	1043.78	1135.75	57.42	58.75	57.86			
GR	2044.5	1000	2044.02	1013.17	2045.14	1029.1	2045.24	1031.49	2045.15	1043.78
GR	2044	1044.56	2042	1045.39	2040	1046.21	2038	1047.01	2036	1047.78
GR	2034.3	1048.4	2034	1070.27	2033.65	1090.96	2034	1102.69	2034.75	1134.3
C	2036	1134.46	2038	1134.73	2040	1135	2042	1135.29	2044	1135.59
G[redacted]	2045	1135.75	2046	1151.17	2048	1177.91	2048.44	1184.02		
NC	0.025	0.025	0.015							
X1	430	11	1060.08	1090.66	208.31	211.94	208.45			
X3	10			1060.08	2048	1090.66	2048			
GR	2049	1000	2048	1009.5	2047.54	1017.61	2046.6	1060.08	2034.15	1060.08
GR	2034.1	1090.66	2046.6	1090.66	2046.27	1095.89	2046.88	1121.19	2047.37	1136.94
GR	2047.3	1157.66								
NC	0.025	0.025	0.015							
SB	1.25	1.56	2.6	31.5	30.58	0.58	300	0	2048.53	2034.15
X1	440	15	1046.07	1076.65	1470.06	1457.21	1463.68			
X2			1	2058.53	2060.53			2		
X3	10			1046.07	2060	1076.65	2060			
GR	2058.6	1000	2059.32	1015.39	2058.81	1046.07	2048.53	1046.07	2048.53	1076.65
GR	2058.8	1076.65	2060	1087.37	2062	1090.99	2064	1094.51	2065.63	1098.52
GR	2066	1100.87	2066.3	1103.82	2066	1113.26	2065.91	1115.86	2065.96	1135.4
NC	0.025	0.025	0.015							
X1	450	21	1069.16	1100.27	388.92	404.9	397.95			
GR	2063.1	1000	2062.46	1062.1	2062.1	1069.08	2062	1069.16	2060	1070.84
GR	2058	1072.51	2056	1074.19	2054	1075.87	2052.22	1077.38	2052.71	1098.84
GR	2054	1099.01	2056	1099.27	2058	1099.53	2060	1099.79	2062	1100.06
GR	2062.4	1100.27	2062.24	1102.13	2064	1106.77	2065.41	1110.3	2066	1138.35
GP	2068	1229.16								

[redacted]	0.025	0.025	0.015							
X1	460	23	1069.93	1105.01	393.56	408.01	401.61			
GR	2067.7	1000	2067.03	1064.15	2068	1069.93	2068.18	1070.53	2068	1070.67
GR	2066	1072.3	2064	1073.93	2062	1075.55	2060	1077.18	2058	1078.81
GR	2057.4	1079.29	2057.56	1100.18	2058	1100.27	2060	1100.7	2062	1101.09
GR	2064	1101.46	2066	1101.81	2066.59	1101.91	2068	1105.01	2068.95	1107
GR	2070	1116.39	2070.87	1124.41	2070	1214.9				
NC	0.025	0.025	0.015							
X1	470	21	1076.93	1115.33	402.75	394.14	398.77			
GR	2073.8	1000	2072.77	1065.9	2073.13	1076.93	2072	1077.24	2070	1078.56
GR	2068	1079.79	2066	1080.99	2064	1082.22	2062.67	1083.04	2062.71	1107.09
GR	2064	1107.31	2066	1107.65	2068	1108.01	2070	1108.51	2071.42	1108.98
GR	2072	1110.03	2074	1114.41	2074.36	1115.33	2074	1124.29	2073.8	1135.27
GR	2074	1315.22								
NC	0.025	0.025	0.015							
X1	480	21	1026.66	1163.79	213.66	185.9	192.99			
X3	10			1026.66	2076	1163.79	2076			
GR	2073.6	1000	2073.75	1014.61	2074	1017.95	2074.97	1026.66	2074	1030.55
GR	2072	1042.8	2070	1054.27	2068	1065.84	2066	1074.47	2064.18	1079.6
GR	2064.2	1126.09	2066	1130.87	2068	1136.31	2070	1145.62	2072	1154.99
GR	2073.1	1163.79	2073.64	1179.89	2074	1182.32	2074	1184.45	2073.75	1196.44
GR	2073.7	1218.52								
[redacted]	0.1	0.1	0.016							
IH	5	0.1	1078.9	0.016	1133.91	0.1	1380	0.016	1473.5	0.1
IH	1592.8									
IT	1	1950								
1	490	26	1380	1473.5	137.94	134.7	133.56			
3	10			1380	2077	1473.5	2077			
R	2076.2	1000	2076	1070.44	2075.7	1078.9	2075.65	1093.59	2074.77	1095.59
R	2075.1	1113.21	2074.62	1131.24	2075.52	1133.91	2075.42	1139.4	2074.8	1147.24
R	2074.6	1237.96	2074.44	1262.26	2075.25	1380	2074	1384.16	2072.88	1388.18
R	2073.4	1392.2	2072.56	1396.28	2072.65	1422.63	2072.87	1453.13	2073.88	1455.88
R	2074	1460.2	2074.02	1460.41	2075.24	1473.5	2076	1489.31	2076.27	1548.19
R	2076.6	1592.8								
C	0.1	0.1	0.016							
H	5	0.1	1085.11	0.016	1149.87	0.1	1383.37	0.016	1469.12	0.1
H	1584.8									
1	500	29	1383.37	1469.12	201.63	205.58	201.53			
3	10			1383.37	2079	1469.12	2079			
R	2077.9	1000	2078	1079.54	2078.04	1084.64	2078	1085.11	2077.79	1096.49
R	2077	1098.93	2076.88	1117.48	2076.69	1135.33	2077.46	1137.07	2076.9	1141.08
R	2078	1148.66	2078.19	1149.87	2078	1161.08	2077.06	1239.92	2076.66	1266.66
R	2076	1383.37	2076	1383.6	2075.41	1391.31	2075.55	1394.62	2074.64	1397.49
R	2074.8	1425.39	2074.83	1456.48	2075.69	1459.45	2075.8	1463.28	2076	1464.24
R	2076.8	1469.12	2077.99	1555.71	2078	1559.68	2078	1584.8		

N	0.1	0.1	0.016							
NH	5	0.1	1084.93	0.016	1136.15	0.1	1383.68	0.016	1470.61	0.1
NH	1543.7									
X1	510	28	1383.68	1470.61	200.34	198.87	199.21			
X3	10			1383.68	2081	1470.61	2081			
GR	2080.5	1000	2080	1069.72	2079.8	1084.93	2079.47	1096.82	2078.88	1098.95
GR	2079.3	1116.36	2078.64	1134.53	2079.78	1136.15	2079.18	1140.94	2079.36	1149.29
GR	2080	1183.52	2080	1201.45	2078.71	1236.9	2078.59	1265.15	2079.65	1292.21
GR	2078.4	1383.68	2078	1386.37	2077.43	1390	2077.38	1394.06	2076.69	1397.95
GR	2076.7	1425.28	2076.58	1455.81	2077.08	1458.62	2077.38	1463.12	2078	1465.32
GR	2079.5	1470.61	2080	1485.7	2080.44	1543.7				
NC	0.1	0.1	0.016							
NH	5	0.1	1084.05	0.016	1123.94	0.1	1366.83	0.016	1457.45	0.1
NH	1523									
X1	520	29	1366.83	1457.45	198.12	199.29	199.24			
X3	10			1366.83	2082	1457.45	2082			
GR	2081.5	1000	2081.42	1074.05	2081.73	1084.05	2080.98	1087.47	2081.18	1103.48
GR	2081	1121.11	2081.86	1123.94	2081.43	1128.1	2082.01	1134.95	2081.95	1146.76
GR	2082	1147.04	2082	1203.66	2081.83	1213.57	2081.16	1228.52	2080.95	1263.15
GR	2080.5	1366.83	2080	1370.04	2078.47	1378.27	2079.13	1381.53	2078.01	1385.19
GR	2078	1386.82	2078	1398.81	2078.24	1413.06	2078.26	1444.5	2079.01	1446.85
GR	2079.4	1450.39	2080	1453.11	2080.92	1457.45	2081.93	1523		
NC	0.1	0.1	0.016							
N	5	0.1	1082.96	0.016	1123.08	0.1	1346.74	0.016	1431.3	0.1
NH	1601									
X1	530	22	1346.74	1431.3	210.23	241.33	227.48			
X3	10			1346.74	2084	1431.3	2084			
GR	2083.2	1000	2083.7	1072.53	2083.71	1082.96	2082.35	1086.89	2082.9	1102.27
GR	2082.6	1119.01	2083.62	1123.08	2083.29	1128.26	2083.02	1136.13	2083.01	1241.73
GR	2082.6	1346.74	2082	1350.59	2080.52	1359.41	2081.3	1362.33	2079.98	1367.32
GR	2080.1	1393.44	2080.61	1421.98	2081.51	1425.57	2081.9	1430.88	2082	1431.3
GR	2084	1513.51	2084	1601						
NC	0.1	0.1	0.016							
NH	5	0.1	1034.63	0.016	1082.12	0.1	1155.7	0.016	1242.61	0.1
NH	1662.5									
X1	540	30	1155.7	1235.18	173.09	201.13	189.3			
X3	10			1155.7	2085	1235.18	2085			
GR	2085.3	1000	2084.14	1027.87	2084.28	1034.63	2084	1036.59	2083.69	1038.99
GR	2083.3	1056.98	2083.17	1073.21	2084	1074.74	2084.32	1075.3	2084	1077.59
GR	2083.7	1080.12	2084	1081.27	2084.31	1082.12	2084.15	1103.24	2084	1125.27
GR	2083	1155.7	2082.23	1161.51	2082.99	1165.34	2082.14	1167.92	2082	1174.17
GR	2081.4	1199.23	2082	1213.92	2082.61	1230.67	2083.48	1235.18	2083.43	1242.61
GR	2084	1265.06	2083.87	1279.58	2084	1288.94	2086	1635.3	2086.16	1662.5
C	0.1	0.1	0.016							
1	550	11	1113.83	1286.4	237.87	248.39	244.36			
3	10			1113.83	2087	1286.4	2087			
P	2086	1000	2086	1006.83	2085.22	1113.83	2084.16	1169.33	2084.02	1177.67
	2084	1177.78	2084	1240.62	2084.59	1242.98	2084.41	1250.04	2086	1277.72
R	2086.6	1286.4								

[illegible]0.016	0.016	0.015								
1	3900									
560	19	1011.29	1090.36	63.57	64.65	67.51				
2090.9	1009.62	2084.97	1009.62	2084	1011.29	2082	1014.16	2080	1017.23	
2078	1020.53	2077.65	1021.06	2076	1034.43	2076	1048.77	2076.12	1053.14	
2078	1053.74	2080	1054.61	2082	1055.47	2083.53	1056.15	2083.54	1085.21	
2084	1086.7	2085.15	1090.36	2085.23	1098.87	2088.23	1098.87			

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*PROF 1

CRITICAL DEPTH TO BE CALCULATED AT ALL CROSS SECTIONS
ALLOWABLE ERROR FOR CRITICAL DEPTH DETERMINATION (ALLDC) = 2.000 PERCENT OF THE DEPTH

CHV= .100 CEHV= .300
*SECNO 10.000
5720 CRITICAL DEPTH ASSUMED

10.000	8.50	1930.20	1930.20	1930.00	1931.98	1.78	.00	.00	1928.13
5500.0	291.9	5142.0	66.1	87.1	466.3	19.1	.0	.0	1928.00
.00	3.35	11.03	3.45	.035	.030	.035	.000	1921.70	1139.32
.005307	0.	0.	0.	0	8	5	.00	184.60	1323.92

*SECNO 20.000
*185 MINIMUM SPECIFIC ENERGY
5720 CRITICAL DEPTH ASSUMED

20.000	8.92	1933.32	1933.32	.00	1935.22	1.90	1.56	.04	1931.19
5500.0	290.5	5185.3	24.2	95.9	456.1	10.5	3.9	1.4	1932.00
.01	3.03	11.37	2.31	.035	.030	.035	.000	1924.40	1113.63
5174	314.	298.	276.	0	8	0	.00	208.12	1321.75

SECNO 30.000

301 HV CHANGED MORE THAN HVINS

185 MINIMUM SPECIFIC ENERGY
720 CRITICAL DEPTH ASSUMED

30.000	6.93	1935.76	1935.76	.00	1938.47	2.71	1.29	.24	1940.00
5500.0	.0	5500.0	.0	.0	416.7	.0	8.6	2.7	1938.00
.02	.00	13.20	.00	.000	.015	.000	.000	1928.83	1136.18
.002049	407.	418.	430.	0	15	0	.00	78.28	1214.46

SECNO 40.000

301 HV CHANGED MORE THAN HVINS

185 MINIMUM SPECIFIC ENERGY
720 CRITICAL DEPTH ASSUMED

470 ENCROACHMENT STATIONS= 1133.8 1184.2 TYPE= 1 TARGET= 50.380

ECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

ELENCL= 1942.00 ELENCR= 1942.00

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1940.00 ELREA= 1942.00

40.000	7.15	1940.75	1940.75	.00	1944.37	3.62	.02	.27	1940.00
5500.0	.0	5500.0	.0	.0	360.4	.0	8.7	2.7	1942.00
.02	.00	15.26	.00	.000	.015	.000	.000	1933.60	1133.81
.002365	10.	10.	10.	0	8	0	.00	50.38	1184.19

SPECIAL BRIDGE

5227 DOWNSTREAM ELEV IS 1939.65 , NOT 1940.75 HYDRAULIC JUMP OCCURS DOWNSTREAM (IF LOW FLOW CONTROLS)

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	.90	1.56	2.60	170.00	50.38	2.38	240.00	.00	1934.60	1933.60

*SECNO 50.000

3 V CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.42

PRESSURE AND WEIR FLOW, Weir Submergence Based on TRAPEZOIDAL Shape

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
1953.48	1947.40	.00	2011.	3490.	240.	240.	1939.60	1943.13	170.

3470 ENCROACHMENT STATIONS= 1184.5 1234.9 TYPE= 1 TARGET= 50.380
ELENCL= 1945.00 ELENCR= 1945.00

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1942.00 ELREA= 1945.00

50.000	8.98	1943.58	.00	.00	1945.88	2.29	1.51	.00	1942.00
5500.0	.0	5500.0	.0	.0	452.5	.0	9.8	2.9	1945.00
.02	.00	12.16	.00	.000	.015	.000	.000	1934.60	1184.49
.001174	113.	115.	117.	5	0	4	.00	50.38	1234.87

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 60.000

3301 HV CHANGED MORE THAN HVINS

60.000	8.04	1944.80	1943.89	.00	1946.41	1.60	.46	.07	1945.20
4600.0	.0	4600.0	.0	.0	452.6	.0	13.8	3.5	1946.00
.03	.00	10.16	.00	.000	.015	.000	.000	1936.76	1060.72
.001220	376.	387.	397.	4	15	0	.00	86.58	1147.31

*SECNO 70.000

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

70.000	6.30	1947.87	1947.87	.00	1950.25	2.38	.65	.23	1950.00
4600.0	.0	4600.0	.0	.0	371.2	.0	17.7	4.3	1952.00
.04	.00	12.39	.00	.000	.015	.000	.000	1941.57	1067.42
002092	427.	417.	406.	0	15	0	.00	79.21	1146.63

*SECNO 80.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

80.000	5.28	1947.88	1947.88	.00	1950.28	2.40	.00	.00	1950.33
4600.0	.0	4600.0	.0	.0	370.1	.0	17.7	4.3	1950.00
.04	.00	12.43	.00	.000	.015	.000	.000	1942.60	1060.53
.002096	1.	1.	1.	0	14	0	.00	77.98	1138.51

*SECNO 90.000

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

90.000	6.65	1949.75	1949.75	.00	1952.71	2.97	.11	.17	1951.07
4600.0	.0	4600.0	.0	.0	332.8	.0	18.2	4.4	1953.03
.04	.00	13.82	.00	.000	.015	.000	.000	1943.10	1054.95
.002102	53.	52.	57.	0	11	0	.00	56.81	1111.76

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

SECNO 100.000
'185 MINIMUM SPECIFIC ENERGY
5720 CRITICAL DEPTH ASSUMED

100.000	7.13	1951.82	1951.82	.00	1955.06	3.23	.73	.08	1958.00
4600.0	.0	4600.0	.0	.0	318.8	.0	20.7	4.8	1958.00
.05	.00	14.43	.00	.000	.015	.000	.000	1944.70	1073.72
.002155	346.	343.	340.	0	8	0	.00	49.85	1123.57

'SECNO 110.000
'185 MINIMUM SPECIFIC ENERGY
5720 CRITICAL DEPTH ASSUMED

110.000	6.86	1954.06	1954.06	.00	1957.15	3.09	.00	.01	1958.00
4600.0	.0	4600.0	.0	.0	326.1	.0	20.7	4.8	1958.00
.05	.00	14.11	.00	.000	.015	.000	.000	1947.20	1073.44
.002092	1.	1.	1.	0	8	0	.00	52.89	1126.33

'SECNO 120.000
'185 MINIMUM SPECIFIC ENERGY
5720 CRITICAL DEPTH ASSUMED

120.000	6.87	1954.37	1954.37	.00	1957.50	3.13	.05	.01	1958.00
4600.0	.0	4600.0	.0	.0	324.1	.0	20.9	4.8	1958.00
.05	.00	14.19	.00	.000	.015	.000	.000	1947.50	1085.66
.002118	25.	25.	22.	0	5	0	.00	52.21	1137.87

'SECNO 130.000
'185 MINIMUM SPECIFIC ENERGY
5720 CRITICAL DEPTH ASSUMED

130.000	6.99	1954.99	1954.99	.00	1958.20	3.21	.27	.02	1958.00
4600.0	.0	4600.0	.0	.0	320.0	.0	21.8	5.0	1958.00
.05	.00	14.38	.00	.000	.015	.000	.000	1948.00	1093.67
.002141	125.	125.	126.	0	8	0	.00	50.41	1144.08

'SECNO 140.000
'185 MINIMUM SPECIFIC ENERGY
5720 CRITICAL DEPTH ASSUMED

140.000	7.01	1955.51	1955.51	.00	1958.66	3.16	.12	.01	1959.20
4600.0	.0	4600.0	.0	.0	322.5	.0	22.2	5.0	1959.86
.05	.00	14.26	.00	.000	.015	.000	.000	1948.50	1127.13
.002125	57.	56.	57.	0	5	0	.00	51.46	1178.60

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 150.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

150.000	6.83	1957.33	1957.33	.00	1960.36	3.03	.00	.01	1959.50
4600.0	.0	4600.0	.0	.0	329.0	.0	22.3	5.0	1959.99
.05	.00	13.98	.00	.000	.015	.000	.000	1950.50	1137.12
.002074	1.	1.	1.	0	8	0	.00	54.46	1191.58

*SECNO 160.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

160.000	6.95	1958.71	1958.71	.00	1961.75	3.04	.24	.00	1961.14
4600.0	.0	4600.0	.0	.0	328.9	.0	23.1	5.2	1961.10
.05	.00	13.99	.00	.000	.015	.000	.000	1951.76	1025.83
.002067	120.	115.	111.	0	5	0	.00	54.19	1080.01

*SECNO 170.000

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.75

170.000	8.48	1960.78	1958.47	.00	1962.03	1.25	.11	.18	1962.00
4600.0	.0	4600.0	.0	.0	512.9	.0	24.1	5.3	1962.00
.06	.00	8.97	.00	.000	.015	.000	.000	1952.30	1024.50
.000673	98.	97.	96.	5	11	0	.00	73.03	1097.53

*SECNO 180.000

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

180.000	7.43	1962.50	1962.50	.00	1965.24	2.74	.54	.45	1969.97
4600.0	.0	4600.0	.0	.0	346.6	.0	27.6	5.9	1970.00
.06	.00	13.27	.00	.000	.025	.000	.000	1955.07	1119.84
.005634	358.	364.	374.	0	11	0	.00	63.94	1183.78

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

SECNO 190.000
185 MINIMUM SPECIFIC ENERGY
720 CRITICAL DEPTH ASSUMED

190.000	8.59	1966.23	1966.23	.00	1969.18	2.95	2.01	.07	1977.86
4600.0	.0	4600.0	.0	.0	333.6	.0	30.4	6.4	1978.00
.07	.00	13.79	.00	.000	.025	.000	.000	1957.64	1063.24
.005631	350.	356.	362.	0	8	0	.00	56.54	1119.78

SECNO 200.000
185 MINIMUM SPECIFIC ENERGY
720 CRITICAL DEPTH ASSUMED

200.000	7.48	1969.92	1969.92	.00	1972.64	2.72	2.04	.02	1977.70
4600.0	.0	4600.0	.0	.0	347.4	.0	33.2	6.9	1986.14
.08	.00	13.24	.00	.000	.025	.000	.000	1962.44	1089.93
.005766	344.	357.	368.	0	15	0	.00	65.03	1154.96

SECNO 210.000
185 MINIMUM SPECIFIC ENERGY
720 CRITICAL DEPTH ASSUMED

210.000	6.39	1971.87	1971.87	.00	1974.69	2.82	.71	.03	1982.00
4600.0	.0	4600.0	.0	.0	341.1	.0	35.0	7.2	1986.90
.08	.00	13.49	.00	.000	.015	.000	.000	1965.48	1033.89
.002055	218.	220.	223.	0	11	0	.00	60.69	1094.57

SECNO 220.000
185 MINIMUM SPECIFIC ENERGY
720 CRITICAL DEPTH ASSUMED

470 ENCROACHMENT STATIONS= 1044.2 1104.4 TYPE= 1 TARGET= 60.290
ELENCL= 1987.00 ELENCR= 1987.00

495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1986.57 ELREA= 1987.00

220.000	6.36	1975.02	1975.02	.00	1978.24	3.21	.21	.12	1986.57
4600.0	.0	4600.0	.0	.0	319.7	.0	35.7	7.3	1987.00
.08	.00	14.39	.00	.000	.015	.000	.000	1968.66	1044.15
.002418	97.	95.	98.	0	5	0	.00	50.25	1094.40

*CNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

SPECIAL BRIDGE

5227 DOWNSTREAM ELEV IS 1974.07 , NOT 1975.02 HYDRAULIC JUMP OCCURS DOWNSTREAM (IF LOW FLOW CONTROLS)

SB XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
.90	1.56	2.60	115.00	50.25	2.25	576.00	.00	1969.76	1968.66

*SECNO 230.000

5301 HV CHANGED MORE THAN HVINS

5302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.41

CLASS B LOW FLOW

5420 BRIDGE W.S.= 1975.79 BRIDGE VELOCITY= 14.56 CALCULATED CHANNEL AREA= 290.

E***S	EGLWC	H3	QWEIR	QLOW	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
.00	1979.79	.00	0.	4600.	576.	576.	1981.76	1987.60	0.

5470 ENCROACHMENT STATIONS= 1059.8 1110.0 TYPE= 1 TARGET= 50.250
ELENCL= 1987.20 ELENCR= 1987.20

5495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1987.10 ELREA= 1987.20

230.000	7.98	1977.74	.00	.00	1979.79	2.04	1.55	.00	1987.10
4600.0	.0	4600.0	.0	.0	401.2	.0	36.6	7.4	1987.20
.09	.00	11.47	.00	.000	.015	.000	.000	1969.76	1059.76
.001213	106.	106.	105.	0	0	0	.00	50.25	1110.01

*SECNO 240.000

5301 HV CHANGED MORE THAN HVINS

5185 MINIMUM SPECIFIC ENERGY
5720 CRITICAL DEPTH ASSUMED

240.000	6.70	1982.29	1982.29	.00	1984.89	2.60	.22	.17	1984.80
4600.0	.0	4600.0	.0	.0	355.4	.0	37.4	7.6	1990.50
.09	.00	12.94	.00	.000	.025	.000	.000	1975.59	1029.34
.005636	100.	99.	99.	0	15	0	.00	69.33	1098.67

ECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 250.000
7185 MINIMUM SPECIFIC ENERGY
5720 CRITICAL DEPTH ASSUMED

250.000	8.47	1987.12	1987.12	.00	1989.44	2.32	2.79	.03	1994.00
4600.0	.0	4600.0	.0	.0	376.5	.0	41.4	8.4	1995.00
.10	.00	12.22	.00	.000	.025	.000	.000	1978.65	1068.88
.006635	484.	478.	467.	0	11	0	.00	83.32	1152.21

*SECNO 260.000
7185 MINIMUM SPECIFIC ENERGY
5720 CRITICAL DEPTH ASSUMED

260.000	9.63	1991.75	1991.75	.00	1994.32	2.57	2.61	.07	1999.98
4600.0	.0	4600.0	.0	.0	357.7	.0	45.1	9.2	2001.02
.11	.00	12.86	.00	.000	.025	.000	.000	1982.12	1139.55
.005882	458.	438.	414.	0	8	0	.00	69.88	1209.44

*SECNO 270.000

3 CROACHMENT STATIONS= 1119.9 1157.3 TYPE= 1 TARGET= 37.330
ELENCL= 1999.00 ELENCR= 1999.00

5495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= -1998.00 ELREA= 1999.00

270.000	9.00	1992.40	1991.16	.00	1995.31	2.91	.88	.10	1998.00
4600.0	.0	4600.0	.0	.0	335.9	.0	46.8	9.4	1999.00
.11	.00	13.70	.00	.000	.020	.000	.000	1983.40	1119.93
.003068	213.	214.	213.	2	15	0	.00	37.33	1157.26

SPECIAL BRIDGE

5227 DOWNSTREAM ELEV IS 1990.11 , NOT 1992.40 HYDRAULIC JUMP OCCURS DOWNSTREAM (IF LOW FLOW CONTROLS)

SB XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
.90	1.56	2.60	94.00	37.33	1.33	360.00	.00	1984.30	1983.40

*SECNO 280.000
CLASS B LOW FLOW

5420 BRIDGE W.S.= 1991.83 BRIDGE VELOCITY= 16.02 CALCULATED CHANNEL AREA= 271.

CNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

EGPRS	EGLWC	H3	QWEIR	QLOW	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
1996.35	1996.56	.00	0.	4600.	360.	360.	1994.30	1997.30	0.

5470 ENCROACHMENT STATIONS= 1088.1 1124.5 TYPE= 1 TARGET= 36.330
ELENCL= 1999.00 ELENCR= 1999.00

5495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1997.96 ELREA= 1999.00

280.000	9.50	1993.80	.00	.00	1996.56	2.76	1.25	.00	1997.96
4600.0	.0	4600.0	.0	.0	345.0	.0	47.7	9.5	1999.00
.12	.00	13.33	.00	.000	.020	.000	.000	1984.30	1088.14
.002805	110.	110.	115.	0	0	0	.00	36.33	1124.47

*SECNO 290.000

5[redacted] CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
5720 CRITICAL DEPTH ASSUMED

290.000	7.98	2001.61	2001.61	.00	2003.57	1.96	1.77	.08	2012.48
3900.0	.0	3900.0	.0	.0	346.9	.0	51.3	10.2	2005.27
.13	.00	11.24	.00	.000	.025	.000	.000	1993.63	1109.36
.006364	403.	452.	479.	0	15	0	.00	92.14	1201.50

*SECNO 300.000
7185 MINIMUM SPECIFIC ENERGY
5720 CRITICAL DEPTH ASSUMED

300.000	10.57	2012.51	2012.51	.00	2014.71	2.20	2.47	.07	2022.00
3900.0	.0	3900.0	.0	.0	327.6	.0	54.6	11.0	2022.49
.14	.00	11.90	.00	.000	.025	.000	.000	2001.94	1117.32
.005208	445.	430.	407.	0	10	0	.00	66.04	1183.36

*SECNO 310.000

5301 HV CHANGED MORE THAN HVINS

[illegible]CNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	OLOB	OCH	OROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

'185 MINIMUM SPECIFIC ENERGY
;720 CRITICAL DEPTH ASSUMED

;470 ENCROACHMENT STATIONS= 1036.9 1067.9 TYPE= 1 TARGET= 31.000
ELENCL= 2020.00 ELENCR= 2020.00

;495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2018.00 ELREA= 2020.00

310.000	7.87	2015.87	2015.87	.00	2019.84	3.97	1.34	.53	2018.00
3900.0	.0	3900.0	.0	.0	243.9	.0	56.9	11.4	2020.00
.14	.00	15.99	.00	.000	.015	.000	.000	2008.00	1036.87
.002878	360.	353.	352.	0	15	0	.00	31.00	1067.87

;PECIAL BRIDGE

;227 DOWNSTREAM ELEV IS 2014.87 , NOT 2015.87 HYDRAULIC JUMP OCCURS DOWNSTREAM (IF LOW FLOW CONTROLS)

;F [illegible]K	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
[illegible]90	1.56	2.60	58.00	31.00	1.00	210.00	.00	2008.40	2008.00

'SECNO 320.000
;280 CROSS SECTION 320.00 EXTENDED .30 FEET

;301 HV CHANGED MORE THAN HVINS

;302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.89

'RESSURE AND WEIR FLOW, Weir Submergence Based on TRAPEZOIDAL Shape

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
2024.22	2020.63	.00	468.	3429.	210.	210.	2015.40	2020.20	58.

;470 ENCROACHMENT STATIONS= 1074.9 1105.9 TYPE= 1 TARGET= 31.000
ELENCL= 2021.00 ELENCR= 2021.00

;495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2020.00 ELREA= 2021.00

CNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WIN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST
320.000	12.30	2020.70	.00	.00	2022.33	1.62	2.49	.00	2020.00
3900.0	.0	3900.0	.0	.0	381.4	.0	57.6	11.4	2021.00
.15	.00	10.23	.00	.000	.015	.000	.000	2008.40	1074.88
.000804	89.	87.	89.	3	0	2	.00	31.00	1105.88

*SECNO 330.000

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

330.000	9.55	2023.77	2023.77	.00	2026.20	2.43	.78	.24	2028.00
3900.0	.0	3900.0	.0	.0	311.7	.0	60.8	11.9	2026.16
.16	.00	12.51	.00	.000	.030	.000	.000	2014.22	1088.84
.008833	407.	409.	410.	0	19	0	.00	66.29	1155.13

*SECNO 340.000
7[illegible] MINIMUM SPECIFIC ENERGY
3[illegible]RITICAL DEPTH ASSUMED

340.000	6.59	2028.51	2028.51	.00	2030.81	2.30	3.57	.01	2032.89
3900.0	.0	3900.0	.0	.0	320.4	.0	63.8	12.6	2032.00
.16	.00	12.17	.00	.000	.030	.000	.000	2021.92	1080.35
.008372	416.	415.	411.	0	19	0	.00	70.92	1151.27

*SECNO 350.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 1014.0 1077.2 TYPE= 1 TARGET= 63.200
ELENCL= 2036.00 ELENCR= 2036.00

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2034.00 ELREA= 2036.00

350.000	4.89	2030.79	2030.79	.00	2033.26	2.47	1.61	.05	2034.00
3900.0	.0	3900.0	.0	.0	309.3	.0	66.7	13.2	2036.00
.17	.00	12.61	.00	.000	.015	.000	.000	2025.90	1014.00
.002363	391.	400.	408.	0	15	0	.00	63.20	1077.20

[redacted]NO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

ECIAL BRIDGE

27 DOWNSTREAM ELEV IS 2030.01 , NOT 2030.79 HYDRAULIC JUMP OCCURS DOWNSTREAM (IF LOW FLOW CONTROLS)

XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
.90	1.56	2.60	70.00	63.20	3.20	480.00	.00	2025.90	2025.90

ECNO 360.000

01 HV CHANGED MORE THAN HVINS

02 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.46

ASS B LOW FLOW

20 BRIDGE W.S.= 2030.98 BRIDGE VELOCITY= 12.79 CALCULATED CHANNEL AREA= 305.

[redacted]S	EGLWC	H3	QWEIR	QLOW	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
.00	2033.65	.00	0.	3900.	480.	480.	2033.90	2036.06	0.

70 ENCROACHMENT STATIONS= 1023.9 1087.1 TYPE= 1 TARGET= 63.200
ELENCL= 2037.00 ELENCR= 2037.00

95 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2036.00 ELREA= 2037.00

360.000	6.23	2032.13	.00	.00	2033.65	1.52	.39	.00	2036.00
3900.0	.0	3900.0	.0	.0	393.7	.0	67.3	13.3	2037.00
.18	.00	9.91	.00	.000	.015	.000	.000	2025.90	1023.92
.001109	69.	69.	68.	0	0	0	.00	63.20	1087.12

SECNO 370.000

301 HV CHANGED MORE THAN HVINS

185 MINIMUM SPECIFIC ENERGY
720 CRITICAL DEPTH ASSUMED

370.000	5.82	2033.82	2033.82	.00	2036.39	2.57	.10	.31	2037.44
3900.0	.0	3900.0	.0	.0	303.2	.0	67.8	13.4	2035.81
.18	.00	12.86	.00	.000	.015	.000	.000	2028.00	1048.85
[redacted]156	67.	67.	67.	0	11	0	.00	59.68	1108.53

CNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 380.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

380.000	5.71	2035.71	2035.71	.00	2038.15	2.44	.00	.01	2037.63
3900.0	.0	3900.0	.0	.0	311.4	.0	67.8	13.4	2036.85
.18	.00	12.52	.00	.000	.015	.000	.000	2030.00	1044.82
.002114	1.	1.	1.	0	8	0	.00	64.68	1109.50

*SECNO 390.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

390.000	7.17	2039.34	2039.34	.00	2041.78	2.44	1.54	.00	2044.00
3900.0	.0	3900.0	.0	.0	311.3	.0	70.7	14.0	2042.99
.19	.00	12.53	.00	.000	.030	.000	.000	2032.17	1055.45
.008386	385.	410.	428.	0	11	0	.00	65.09	1120.54

*SECNO 400.000

3 V CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 2.91

400.000	8.08	2041.44	2040.16	.00	2042.77	1.33	.88	.11	2044.76
3900.0	.0	3900.0	.0	.0	421.7	.0	74.1	14.6	2044.00
.20	.00	9.25	.00	.000	.015	.000	.000	2033.36	1036.98
.000992	428.	400.	380.	3	11	0	.00	80.20	1117.18

*SECNO 410.000

410.000	8.34	2041.75	2039.71	.00	2042.80	1.05	.00	.03	2044.89
3900.0	.0	3900.0	.0	.0	474.1	.0	74.1	14.6	2043.99
.20	.00	8.23	.00	.000	.015	.000	.000	2033.41	1036.15
.000691	1.	1.	1.	2	15	0	.00	81.34	1117.49

*SECNO 420.000

3301 HV CHANGED MORE THAN HVINS

:CNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.82

420.000	8.79	2042.44	2038.08	.00	2042.88	.44	.02	.06	2045.15
3900.0	.0	3900.0	.0	.0	732.6	.0	74.9	14.8	2045.00
.20	.00	5.32	.00	.000	.015	.000	.000	2033.65	1045.21
.000210	57.	58.	59.	2	11	0	.00	90.15	1135.36

*SECNO 430.000

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 1060.1 1090.7 TYPE= 1 TARGET= 30.580
ELENCL= 2048.00 ELENCR= 2048.00

3 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2046.60 ELREA= 2048.00

[illegible].000	7.96	2042.06	2042.06	.00	2046.07	4.01	.11	1.07	2046.60
3900.0	.0	3900.0	.0	.0	242.6	.0	77.3	15.0	2048.00
.20	.00	16.08	.00	.000	.015	.000	.000	2034.10	1060.08
.002906	208.	208.	212.	0	11	0	.00	30.58	1090.66

SPECIAL BRIDGE

5227 DOWNSTREAM ELEV IS 2041.29 , NOT 2042.06 HYDRAULIC JUMP OCCURS DOWNSTREAM (IF LOW FLOW CONTROLS)

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	1.25	1.56	2.60	31.50	30.58	.58	300.00	.00	2048.53	2034.15

*SECNO 440.000
6790 POSSIBLE INVALID SOLUTION 20 TRIALS OF EG NOT ENOUGH
FINAL QWEIR + QPR = 8287. DOES NOT EQUAL ACTUAL Q = 3900.

3301 HV CHANGED MORE THAN HVINS

CNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

RESSURE AND WEIR FLOW, Weir Submergence Based on TRAPEZOIDAL Shape

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
2046.15	2060.72	.01	0.	8287.	300.	300.	2058.53	2060.53	32.

470 ENCROACHMENT STATIONS= 1046.1 1076.7 TYPE= 1 TARGET= 30.580
ELENCL= 2060.00 ELENCR= 2060.00

495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2058.81 ELREA= 2060.00

440.000	8.59	2057.12	.00	.00	2060.54	3.42	14.47	.00	2058.81
3900.0	.0	3900.0	.0	.0	262.6	.0	85.7	16.1	2060.00
.23	.00	14.85	.00	.000	.015	.000	.000	2048.53	1046.07
.002315	1470.	1464.	1457.	5	0	20	.00	30.58	1076.65

450.000

301 HV CHANGED MORE THAN HVINS

185 MINIMUM SPECIFIC ENERGY
720 CRITICAL DEPTH ASSUMED

450.000	9.49	2061.71	2061.71	.00	2065.76	4.05	.99	.19	2062.00
3900.0	.0	3900.0	.0	.0	241.6	.0	88.0	16.4	2062.40
.24	.00	16.15	.00	.000	.015	.000	.000	2052.22	1069.41
.002654	389.	398.	405.	0	8	0	.00	30.62	1100.02

SECNO 460.000
185 MINIMUM SPECIFIC ENERGY
720 CRITICAL DEPTH ASSUMED

460.000	9.36	2066.76	2066.76	.00	2070.93	4.17	1.09	.04	2068.00
3900.0	.0	3900.0	.0	.0	237.9	.0	90.3	16.6	2068.00
.25	.00	16.39	.00	.000	.015	.000	.000	2057.40	1071.68
.002759	394.	402.	408.	0	8	0	.00	30.60	1102.28

SECNO 470.000
185 MINIMUM SPECIFIC ENERGY

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

720 CRITICAL DEPTH ASSUMED

470.000	8.95	2071.62	2071.62	.00	2075.50	3.88	1.06	.03	2073.13
3900.0	.0	3900.0	.0	.0	246.9	.0	92.5	16.9	2074.36
.25	.00	15.80	.00	.000	.015	.000	.000	2062.67	1077.49
.002545	403.	399.	394.	0	8	0	.00	31.85	1109.34

SECNO 480.000

280 CROSS SECTION 480.00 EXTENDED 2.00 FEET

301 HV CHANGED MORE THAN HVINS

302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 5.24

470 ENCROACHMENT STATIONS= 1026.7 1163.8 TYPE= 1 TARGET= 137.130
ELENCL= 2076.00 ELENCR= 2076.00

495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2074.97 ELREA= 2076.00

480.000	11.53	2075.71	2069.57	.00	2075.91	.21	.05	.37	2074.97
3900.0	.0	3900.0	.0	.0	1066.1	.0	95.4	17.3	2076.00
.27	.00	3.66	.00	.000	.015	.000	.000	2064.18	1026.66
.000093	214.	193.	186.	3	14	0	.00	137.13	1163.79

490 NH CARD USED
SECNO 490.000

301 HV CHANGED MORE THAN HVINS

185 MINIMUM SPECIFIC ENERGY
720 CRITICAL DEPTH ASSUMED

470 ENCROACHMENT STATIONS= 1380.0 1473.5 TYPE= 1 TARGET= 93.500
ELENCL= 2077.00 ELENCR= 2077.00

495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2075.25 ELREA= 2077.00

490.000	3.00	2075.56	2075.56	.00	2076.76	1.20	.02	.30	2075.25
1950.0	.0	1950.0	.0	.0	221.4	.0	97.4	17.7	2077.00
.27	.00	8.81	.00	.000	.016	.000	.000	2072.56	1380.00
.002891	138.	134.	135.	0	14	0	.00	93.50	1473.50

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

1490 NH CARD USED
*SECNO 500.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 1383.4 1469.1 TYPE= 1 TARGET= 85.750
ELENCL= 2079.00 ELENCR= 2079.00

5495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2076.00 ELREA= 2079.00

500.000	2.94	2077.58	2077.58	.00	2078.85	1.27	.57	.02	2076.00
1950.0	.0	1950.0	.0	.0	215.8	.0	98.4	18.1	2079.00
.28	.00	9.03	.00	.000	.016	.000	.000	2074.64	1383.37
.002814	202.	202.	206.	0	8	0	.00	85.75	1469.12

490 NH CARD USED
SECNO 510.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 1383.7 1470.6 TYPE= 1 TARGET= 86.930
ELENCL= 2081.00 ELENCR= 2081.00

5495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2078.40 ELREA= 2081.00

510.000	2.90	2079.48	2079.48	.00	2080.75	1.27	.56	.00	2078.40
1950.0	.0	1950.0	.0	.0	216.0	.0	99.4	18.5	2081.00
.28	.00	9.03	.00	.000	.016	.000	.000	2076.58	1383.68
.002823	200.	199.	199.	0	5	0	.00	86.86	1470.54

490 NH CARD USED
SECNO 520.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 1366.8 1457.4 TYPE= 1 TARGET= 90.620
ELENCL= 2082.00 ELENCR= 2082.00

5495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2080.50 ELREA= 2082.00

520.000	3.00	2081.00	2081.00	.00	2082.23	1.23	.57	.00	2080.50
1950.0	.0	1950.0	.0	.0	219.3	.0	100.3	18.9	2082.00
.29	.00	8.89	.00	.000	.016	.000	.000	2078.00	1366.83
.002856	198.	199.	199.	0	8	0	.00	90.62	1457.45

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

490 NH CARD USED
*SECNO 530.000
7185 MINIMUM SPECIFIC ENERGY
5720 CRITICAL DEPTH ASSUMED

5470 ENCROACHMENT STATIONS= 1346.7 1431.3 TYPE= 1 TARGET= 84.560
ELENCL= 2084.00 ELENCR= 2084.00

5495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2082.60 ELREA= 2084.00

530.000	3.15	2083.13	2083.13	.00	2084.42	1.29	.65	.02	2082.60
1950.0	.0	1950.0	.0	.0	214.0	.0	101.5	19.3	2084.00
.30	.00	9.11	.00	.000	.016	.000	.000	2079.98	1346.74
.002865	210.	227.	241.	0	8	0	.00	84.56	1431.30

1490 NH CARD USED
*SECNO 540.000
7185 MINIMUM SPECIFIC ENERGY
5720 CRITICAL DEPTH ASSUMED

5470 ENCROACHMENT STATIONS= 1155.7 1235.2 TYPE= 1 TARGET= 79.480
ELENCL= 2085.00 ELENCR= 2085.00

5495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2083.00 ELREA= 2085.00

540.000	3.28	2084.68	2084.68	.00	2086.05	1.37	.55	.03	2083.00
1950.0	.0	1950.0	.0	.0	207.3	.0	102.4	19.7	2085.00
.30	.00	9.40	.00	.000	.016	.000	.000	2081.40	1155.70
.002931	173.	189.	201.	0	8	0	.00	79.48	1235.18

*SECNO 550.000

5301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
5720 CRITICAL DEPTH ASSUMED

5470 ENCROACHMENT STATIONS= 1113.8 1286.4 TYPE= 1 TARGET= 172.570
ELENCL= 2087.00 ELENCR= 2087.00

*CNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	OLOB	QCH	OROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2085.22 ELREA= 2087.00

550.000	2.10	2086.10	2086.10	.00	2086.92	.82	.75	.05	2085.22
1950.0	.0	1950.0	.0	.0	267.8	.0	103.7	20.4	2087.00
.31	.00	7.28	.00	.000	.016	.000	.000	2084.00	1113.83
.003237	238.	244.	248.	0	14	0	.00	165.35	1279.18

*SECNO 560.000

*302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 4.04

560.000	9.98	2085.98	2084.29	.00	2087.09	1.11	.08	.09	2084.00
3900.0	5.9	3879.9	14.2	2.5	457.5	6.7	104.3	20.6	2085.15
.31	2.34	8.48	2.11	.016	.015	.016	.000	2076.00	1009.62
.000793	64.	68.	65.	2	23	0	.00	89.25	1098.87

THIS RUN EXECUTED 06OCT97 11:07:19

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HEC-2 WATER SURFACE PROFILES

Version 4.6.2; May 1991
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NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

FLOODPLAIN DETERMINATION

SUMMARY PRINTOUT TABLE 100

SECNO	EGLWC	ELLC	EGPRS	ELTRD	QPR	QWEIR	CLASS	H3	DEPTH	CWSEL	VCH	EG
50.000	1947.40	1939.60	1953.48	1943.13	3489.83	2011.25	30.00	.00	8.98	1943.58	12.16	1945.88
230.000	1979.79	1981.76	.00	1987.60	4600.00	.00	2.00	.00	7.98	1977.74	11.47	1979.79
280.000	1996.56	1994.30	1996.35	1997.30	4600.00	.00	2.00	.00	9.50	1993.80	13.33	1996.56
0.000	2020.63	2015.40	2024.22	2020.20	3429.31	467.90	30.00	.00	12.30	2020.70	10.23	2022.33
360.000	2033.65	2033.90	.00	2036.06	3900.00	.00	2.00	.00	6.23	2032.13	9.91	2033.65
440.000	2060.72	2058.53	2046.15	2060.53	8286.56	.08	30.00	.01	8.59	2057.12	14.85	2060.54

LAIN DETERMINATION

UMMARY PRINTOUT TABLE 150

SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH	AREA	.01K
10.000	.00	.00	.00	1921.70	5500.00	1930.20	1930.20	1931.98	53.07	11.03	572.50	754.96
20.000	297.76	.00	.00	1924.40	5500.00	1933.32	1933.32	1935.22	51.74	11.37	562.50	764.65
30.000	417.80	.00	.00	1928.83	5500.00	1935.76	1935.76	1938.47	20.49	13.20	416.67	1215.16
40.000	10.00	.00	.00	1933.60	5500.00	1940.75	1940.75	1944.37	23.65	15.26	360.42	1131.07
50.000	115.08	1943.13	1939.60	1934.60	5500.00	1943.58	.00	1945.88	11.74	12.16	452.47	1605.42
60.000	387.41	.00	.00	1936.76	4600.00	1944.80	1943.89	1946.41	12.20	10.16	452.64	1316.93
70.000	417.23	.00	.00	1941.57	4600.00	1947.87	1947.87	1950.25	20.92	12.39	371.17	1005.73
80.000	1.00	.00	.00	1942.60	4600.00	1947.88	1947.88	1950.28	20.96	12.43	370.14	1004.80
90.000	51.93	.00	.00	1943.10	4600.00	1949.75	1949.75	1952.71	21.02	13.82	332.80	1003.42
100.000	342.73	.00	.00	1944.70	4600.00	1951.82	1951.82	1955.06	21.55	14.43	318.79	991.02
110.000	1.00	.00	.00	1947.20	4600.00	1954.06	1954.06	1957.15	20.92	14.11	326.12	1005.73
120.000	24.78	.00	.00	1947.50	4600.00	1954.37	1954.37	1957.50	21.18	14.19	324.11	999.59
130.000	125.31	.00	.00	1948.00	4600.00	1954.99	1954.99	1958.20	21.41	14.38	319.95	994.20
140.000	55.76	.00	.00	1948.50	4600.00	1955.51	1955.51	1958.66	21.25	14.26	322.52	997.77
150.000	1.00	.00	.00	1950.50	4600.00	1957.33	1957.33	1960.36	20.74	13.98	329.03	1010.05
160.000	114.85	.00	.00	1951.76	4600.00	1958.71	1958.71	1961.75	20.67	13.99	328.91	1011.69
170.000	97.13	.00	.00	1952.30	4600.00	1960.78	1958.47	1962.03	6.73	8.97	512.88	1772.79
180.000	363.91	.00	.00	1955.07	4600.00	1962.50	1962.50	1965.24	56.34	13.27	346.59	612.87
190.000	356.25	.00	.00	1957.64	4600.00	1966.23	1966.23	1969.18	56.31	13.79	333.58	612.98
200.000	357.38	.00	.00	1962.44	4600.00	1969.92	1969.92	1972.64	57.66	13.24	347.43	605.79
210.000	220.26	.00	.00	1965.48	4600.00	1971.87	1971.87	1974.69	20.55	13.49	341.08	1014.74
220.000	95.38	.00	.00	1968.66	4600.00	1975.02	1975.02	1978.24	24.18	14.39	319.69	935.55
230.000	106.05	1987.60	1981.76	1969.76	4600.00	1977.74	.00	1979.79	12.13	11.47	401.20	1321.03
240.000	98.95	.00	.00	1975.59	4600.00	1982.29	1982.29	1984.89	56.36	12.94	355.39	612.76

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH	AREA	.01K
*	250.000	478.12	.00	.00	1978.65	4600.00	1987.12	1987.12	1989.44	60.35	12.22	376.45	592.13
*	260.000	437.75	.00	.00	1982.12	4600.00	1991.75	1991.75	1994.32	58.82	12.86	357.67	599.80
	270.000	213.69	.00	.00	1983.40	4600.00	1992.40	1991.16	1995.31	30.68	13.70	335.86	830.51
*	280.000	110.04	1997.30	1994.30	1984.30	4600.00	1993.80	.00	1996.56	28.05	13.33	345.01	868.57
*	290.000	451.82	.00	.00	1993.63	3900.00	2001.61	2001.61	2003.57	63.64	11.24	346.92	488.88
*	300.000	430.29	.00	.00	2001.94	3900.00	2012.51	2012.51	2014.71	52.08	11.90	327.62	540.41
*	310.000	353.38	.00	.00	2008.00	3900.00	2015.87	2015.87	2019.84	28.78	15.99	243.89	726.97
*	320.000	86.84	2020.20	2015.40	2008.40	3900.00	2020.70	.00	2022.33	8.04	10.23	381.40	1375.70
*	330.000	409.02	.00	.00	2014.22	3900.00	2023.77	2023.77	2026.20	88.33	12.51	311.66	414.96
*	340.000	414.66	.00	.00	2021.92	3900.00	2028.51	2028.51	2030.81	83.72	12.17	320.43	426.23
*	350.000	400.22	.00	.00	2025.90	3900.00	2030.79	2030.79	2033.26	23.63	12.61	309.28	802.35
*	360.000	69.23	2036.06	2033.90	2025.90	3900.00	2032.13	.00	2033.65	11.09	9.91	393.70	1171.27
*	370.000	66.95	.00	.00	2028.00	3900.00	2033.82	2033.82	2036.39	21.56	12.86	303.25	839.87
*	380.000	1.00	.00	.00	2030.00	3900.00	2035.71	2035.71	2038.15	21.14	12.52	311.43	848.26
*	390.000	409.92	.00	.00	2032.17	3900.00	2039.34	2039.34	2041.78	83.86	12.53	311.30	425.87
*	400.000	400.26	.00	.00	2033.36	3900.00	2041.44	2040.16	2042.77	9.92	9.25	421.69	1238.16
	410.000	1.00	.00	.00	2033.41	3900.00	2041.75	2039.71	2042.80	6.91	8.23	474.09	1483.61
*	420.000	57.86	.00	.00	2033.65	3900.00	2042.44	2038.08	2042.88	2.10	5.32	732.59	2694.15
*	430.000	208.45	.00	.00	2034.10	3900.00	2042.06	2042.06	2046.07	29.06	16.08	242.59	723.52
*	440.000	1463.68	2060.53	2058.53	2048.53	3900.00	2057.12	.00	2060.54	23.15	14.85	262.62	810.62
*	450.000	397.95	.00	.00	2052.22	3900.00	2061.71	2061.71	2065.76	26.54	16.15	241.55	757.01
*	460.000	401.61	.00	.00	2057.40	3900.00	2066.76	2066.76	2070.93	27.59	16.39	237.91	742.42
*	470.000	398.77	.00	.00	2062.67	3900.00	2071.62	2071.62	2075.50	25.45	15.80	246.87	773.14
*	480.000	192.99	.00	.00	2064.18	3900.00	2075.71	2069.57	2075.91	.93	3.66	1066.10	4048.35
*	490.000	133.56	.00	.00	2072.56	1950.00	2075.56	2075.56	2076.76	28.91	8.81	221.40	362.69
*	500.000	201.53	.00	.00	2074.64	1950.00	2077.58	2077.58	2078.85	28.14	9.03	215.83	367.62

SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH	AREA	.01K
510.000	199.21	.00	.00	2076.58	1950.00	2079.48	2079.48	2080.75	28.23	9.03	216.04	366.99
520.000	199.24	.00	.00	2078.00	1950.00	2081.00	2081.00	2082.23	28.56	8.89	219.25	364.87
530.000	227.48	.00	.00	2079.98	1950.00	2083.13	2083.13	2084.42	28.65	9.11	214.05	364.33
540.000	189.30	.00	.00	2081.40	1950.00	2084.68	2084.68	2086.05	29.31	9.40	207.34	360.18
550.000	244.36	.00	.00	2084.00	1950.00	2086.10	2086.10	2086.92	32.37	7.28	267.76	342.74
560.000	67.51	.00	.00	2076.00	3900.00	2085.98	2084.29	2087.09	7.93	8.48	466.68	1384.97

PLAIN DETERMINATION

SUMMARY PRINTOUT TABLE 150

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
*	10.000	5500.00	1930.20	.00	.00	.20	184.60	.00
*	20.000	5500.00	1933.32	.00	3.12	.00	208.12	297.76
*	30.000	5500.00	1935.76	.00	2.44	.00	78.28	417.80
*	40.000	5500.00	1940.75	.00	4.99	.00	50.38	10.00
*	50.000	5500.00	1943.58	.00	2.83	.00	50.38	115.08
	60.000	4600.00	1944.80	.00	1.22	.00	86.58	387.41
*	70.000	4600.00	1947.87	.00	3.06	.00	79.21	417.23
*	80.000	4600.00	1947.88	.00	.02	.00	77.98	1.00
*	90.000	4600.00	1949.75	.00	1.86	.00	56.81	51.93
*	100.000	4600.00	1951.82	.00	2.08	.00	49.85	342.73
*	110.000	4600.00	1954.06	.00	2.23	.00	52.89	1.00
*	120.000	4600.00	1954.37	.00	.31	.00	52.21	24.78
*	130.000	4600.00	1954.99	.00	.62	.00	50.41	125.31
*	140.000	4600.00	1955.51	.00	.52	.00	51.46	55.76
*	150.000	4600.00	1957.33	.00	1.82	.00	54.46	1.00
*	160.000	4600.00	1958.71	.00	1.38	.00	54.19	114.85
*	170.000	4600.00	1960.78	.00	2.07	.00	73.03	97.13
*	180.000	4600.00	1962.50	.00	1.72	.00	63.94	363.91
*	190.000	4600.00	1966.23	.00	3.72	.00	56.54	356.25
*	200.000	4600.00	1969.92	.00	3.70	.00	65.03	357.38
*	210.000	4600.00	1971.87	.00	1.95	.00	60.69	220.26
*	220.000	4600.00	1975.02	.00	3.15	.00	50.25	95.38
*	230.000	4600.00	1977.74	.00	2.72	.00	50.25	106.05
*	240.000	4600.00	1982.29	.00	4.54	.00	69.33	98.95

SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
250.000	4600.00	1987.12	.00	4.83	.00	83.32	478.12
260.000	4600.00	1991.75	.00	4.63	.00	69.88	437.75
270.000	4600.00	1992.40	.00	.64	.00	37.33	213.69
280.000	4600.00	1993.80	.00	1.40	.00	36.33	110.04
290.000	3900.00	2001.61	.00	7.81	.00	92.14	451.82
300.000	3900.00	2012.51	.00	10.91	.00	66.04	430.29
310.000	3900.00	2015.87	.00	3.36	.00	31.00	353.38
320.000	3900.00	2020.70	.00	4.84	.00	31.00	86.84
330.000	3900.00	2023.77	.00	3.07	.00	66.29	409.02
340.000	3900.00	2028.51	.00	4.74	.00	70.92	414.66
350.000	3900.00	2030.79	.00	2.29	.00	63.20	400.22
360.000	3900.00	2032.13	.00	1.34	.00	63.20	69.23
370.000	3900.00	2033.82	.00	1.69	.00	59.68	66.95
380.000	3900.00	2035.71	.00	1.89	.00	64.68	1.00
390.000	3900.00	2039.34	.00	3.63	.00	65.09	409.92
400.000	3900.00	2041.44	.00	2.10	.00	80.20	400.26
410.000	3900.00	2041.75	.00	.31	.00	81.34	1.00
420.000	3900.00	2042.44	.00	.69	.00	90.15	57.86
430.000	3900.00	2042.06	.00	-.38	.00	30.58	208.45
440.000	3900.00	2057.12	.00	15.06	.00	30.58	1463.68
450.000	3900.00	2061.71	.00	4.59	.00	30.62	397.95
460.000	3900.00	2066.76	.00	5.05	.00	30.60	401.61
470.000	3900.00	2071.62	.00	4.86	.00	31.85	398.77
480.000	3900.00	2075.71	.00	4.08	.00	137.13	192.99
490.000	1950.00	2075.56	.00	-.15	.00	93.50	133.56
500.000	1950.00	2077.58	.00	2.02	.00	85.75	201.53

SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
510.000	1950.00	2079.48	.00	1.90	.00	86.86	199.21
520.000	1950.00	2081.00	.00	1.52	.00	90.62	199.24
530.000	1950.00	2083.13	.00	2.13	.00	84.56	227.48
540.000	1950.00	2084.68	.00	1.55	.00	79.48	189.30
550.000	1950.00	2086.10	.00	1.42	.00	165.35	244.36
560.000	3900.00	2085.98	.00	-.12	.00	89.25	67.51

SUMMARY OF ERRORS AND SPECIAL NOTES

AUTION SECNO= 10.000 PROFILE= 1 CRITICAL DEPTH ASSUMED

AUTION SECNO= 20.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
AUTION SECNO= 20.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

AUTION SECNO= 30.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
AUTION SECNO= 30.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

AUTION SECNO= 40.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
AUTION SECNO= 40.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

AUTION SECNO= 50.000 PROFILE= 1 HYDRAULIC JUMP O.S.
ARNING SECNO= 50.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

AUTION SECNO= 70.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
AUTION SECNO= 70.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

AUTION SECNO= 80.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
AUTION SECNO= 80.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

ON SECNO= 90.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
SECNO= 90.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

AUTION SECNO= 100.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
AUTION SECNO= 100.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

AUTION SECNO= 110.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
AUTION SECNO= 110.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

AUTION SECNO= 120.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
AUTION SECNO= 120.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

AUTION SECNO= 130.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
AUTION SECNO= 130.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

AUTION SECNO= 140.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
AUTION SECNO= 140.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

AUTION SECNO= 150.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
AUTION SECNO= 150.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

AUTION SECNO= 160.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
AUTION SECNO= 160.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

ARNING SECNO= 170.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

SECNO= 180.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
SECNO= 180.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

AUTION SECNO= 190.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
AUTION SECNO= 190.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

[redacted] SECNO= 200.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
UTION SECNO= 200.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

UTION SECNO= 210.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
UTION SECNO= 210.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

UTION SECNO= 220.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
UTION SECNO= 220.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

AUTION SECNO= 230.000 PROFILE= 1 HYDRAULIC JUMP D.S.
ARNING SECNO= 230.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

AUTION SECNO= 240.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
AUTION SECNO= 240.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

AUTION SECNO= 250.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
AUTION SECNO= 250.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

AUTION SECNO= 260.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
AUTION SECNO= 260.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

AUTION SECNO= 280.000 PROFILE= 1 HYDRAULIC JUMP D.S.

AUTION SECNO= 290.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
[redacted] SECNO= 290.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

AUTION SECNO= 300.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
AUTION SECNO= 300.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

AUTION SECNO= 310.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
AUTION SECNO= 310.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

AUTION SECNO= 320.000 PROFILE= 1 HYDRAULIC JUMP D.S.
ARNING SECNO= 320.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

AUTION SECNO= 330.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
AUTION SECNO= 330.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

AUTION SECNO= 340.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
AUTION SECNO= 340.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

AUTION SECNO= 350.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
AUTION SECNO= 350.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

AUTION SECNO= 360.000 PROFILE= 1 HYDRAULIC JUMP D.S.
ARNING SECNO= 360.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

AUTION SECNO= 370.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
AUTION SECNO= 370.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

[redacted] SECNO= 380.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
[redacted] SECNO= 380.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

[redacted]ON SECNO= 390.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 390.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

WARNING SECNO= 400.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 420.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO= 430.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 430.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 440.000 PROFILE= 1 HYDRAULIC JUMP D.S.
CAUTION SECNO= 440.000 PROFILE= 1 20 TRIALS OF EG NOT ENOUGH

CAUTION SECNO= 450.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 450.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 460.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 460.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 470.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 470.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

WARNING SECNO= 480.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CA[redacted]TION SECNO= 490.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
[redacted]ON SECNO= 490.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 500.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 500.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 510.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 510.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 520.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 520.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 530.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 530.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 540.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 540.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 550.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 550.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

WARNING SECNO= 560.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

2.2.4 EASTERN AVE. TO LAS VEGAS WASH REACH

Flamingo Wash FIS Volume II of III

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2.3.1 RAINBOW BLVD. TO JONES BLVD. REACH

MANNING'S NUMBER ("n")

PROJECT: FLAMINGO WASH FIS RESTUDY
DRAWING: FLO.DWG

HEC-2 STATION	$n_{channel}$	$n_{left\ overbank}$	$n_{right\ overbank}$	ROLL#/PICTURE#	PAGE# CALC. SHEET
530	0.020	0.020	0.020	1 / 1-5	1 & 2 of 37
540	0.020	0.020	0.020	1 / 6-15	3 & 4 of 37
550	0.020	0.020	0.020	1 / 6-15	3 & 4 of 37
560	0.020	0.020	0.020	1 / 6-15	3 & 4 of 37
570	0.020	0.020	0.020	1 / 6-15	3 & 4 of 37
580	0.015	0.020	0.020	1 / 12	BRIDGE
590	0.015	0.020	0.020	1 / 11	BRIDGE
600	0.020	0.020	0.020	1 / 6-15	3 & 4 of 37
610	0.020	0.020	0.020	1 / 6-15	3 & 4 of 37
620	0.020	0.020	0.020	1 / 6-15	3 & 4 of 37
630	0.020	0.020	0.020	1 / 6-15	3 & 4 of 37
640	0.015	0.015	0.020	1 / 5	BRIDGE
650	0.015	0.020	0.020	1 / 4	BRIDGE
660	0.025	0.030	0.030	1 / 1-5	1 & 2 of 37
670	0.025	0.030	0.030	1 / 1 -5	1 & 2 of 37
680	0.025	0.030	0.030	1 / 1-5	1 & 2 of 37
690	0.020	0.030	0.030	1 / 1	BRIDGE
700	0.020	0.030	0.030	1 / 1	BRIDGE
710	0.025	0.030	0.030	1 / 1-5	1 & 2 of 37

DATE 6/ /

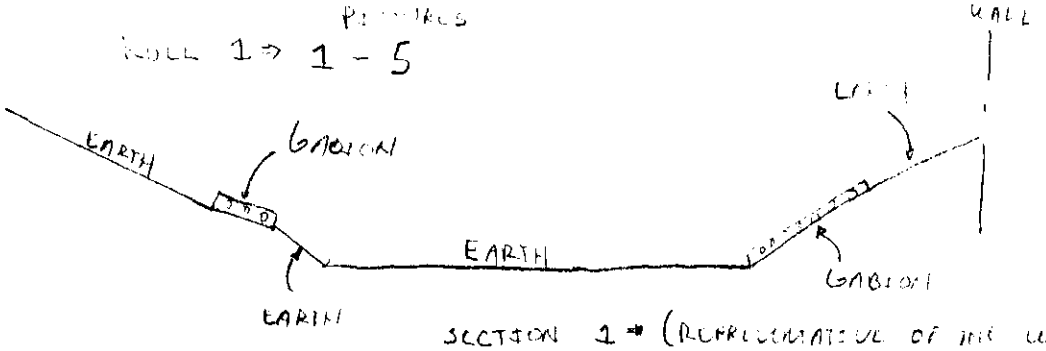
CLIENT [illegible] JOB NO 550.032 C CALC BY

DESCRIPTION CHANNEL MANNING'S "n" CHECKED BY

$n = (n_0 + n_1 + n_2 + n_3 + n_4) m_5$

PICTURES

ROLL 1 ⇒ 1 - 5



SECTION 1 = (REPRESENTATIVE OF THE OVERALL REACH)

MATERIALS

EARTH = 0.020 GABION = 0.030

12% CONSIST OF GABION, 88% CONSIST OF EARTH

$n_0 = 12\%\,(.030) + 88\%\,(0.020) = .021$

IRREGULARITY:

SMOOTH

$n_1 = 0.000$

VARIATIONS:

GRADUAL

$n_2 = 0.000$

OBSTRUCTIONS:

NEGLIBLE

$n_3 = 0.000$

VEGETATION:

LOW

$n_4 = 0.005$

DEGREE OF MEANDERING

MINOR

$m_5 = 1.000$

$n_{CHANNEL} = 0.0262$ ROUND TO

$n_{CHANNEL} = 0.025$

PICTURE

ROLL 1 ⇒ 1 - 5

EN-3-N
3/66

SHEET 1 OF 37

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102

DATE

CLIENT CCRFCD JOB NO 550.022 CALC BY

DESCRIPTION OVERBANK MANNING'S n CHECKED BY

MANNING'S n

LAND [illegible] CHANNEL

30% CONSIST OF CHANNEL 70% CONSIST OF [illegible]

$n_0 = 30\%(.030) + 70\%(0.020) = .023$

IRREGULARITY:

SMOOTH

$n_1 = 0.000$

VARIATIONS:

GRADUAL

$n_2 = 0.000$

OBSTRUCTIONS

NEGLIGIBLE

$n_3 = 0.000$

VEGETATION

LOW

$n_4 = 0.005$

DEGREE OF MEANDERING

MINOR

$n_5 = 1.000$

$n_{\text{LEFT, RIGHT OVERBANK}} = .028$ ROUND TO

$n_{\text{OVERBANK}} = 0.03$

PICTURE

ROLL 1 => 1-5

EN-3-N
3/66

SHEET 2 OF 37

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102

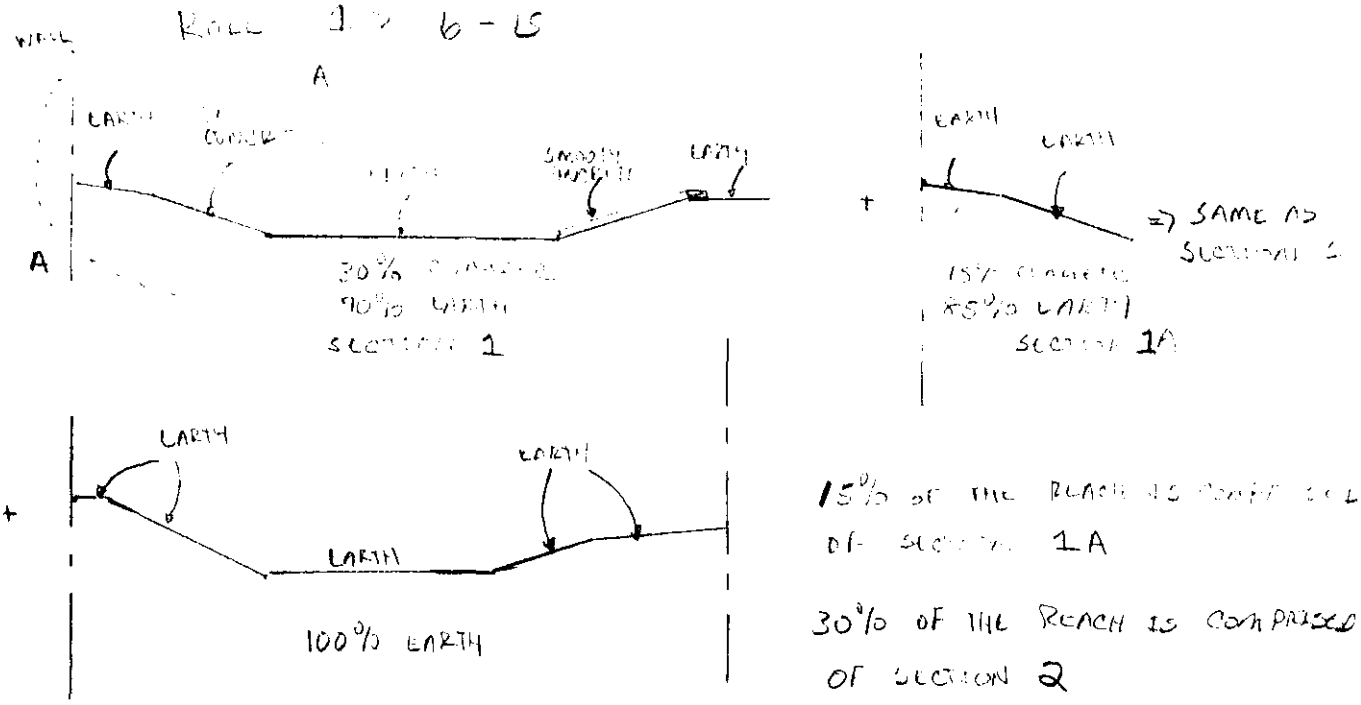
DATE 6/..

CLIENT CCRFCD JOB NO 550.032S CALC BY

DESCRIPTION CHANNEL MANNING'S n CHECKED BY

PROJECT

ROLL 1 → 6 - 15



15% OF THE REACH IS COMPRISED OF SECTION 1A

30% OF THE REACH IS COMPRISED OF SECTION 2

55% OF THE REACH IS COMPRISED OF SECTION 1

MATERIAL:

EARTH = 0.020 CONCRETE = 0.015

$$n_0 = 55\%\left[30\%(.015) + 70\%(.020)\right] + 15\%\left[15\%(.015) + 85\%(.020)\right] + 30\%(.020)\Big] = .019$$

IRREGULARITY:

SMOOTH

$n_1 = 0.000$

VARIATION:

GRADUAL

$n_2 = 0.000$

OBSTRUCTION:

NEGLIBLE

$n_3 = 0.000$

VEGETATION:

NONE

$n_4 = 0.000$

DEGREE OF MEANDERING

MINOR

$m_5 = 1.000$

$n_{CHANNEL} = 0.019$ ROUND TO

$n_{CHANNEL} = 0.02$

ROLL 1 PROJECT 6-15

EN-3-N
3/66

SHEET 3 OF 37

G.C. WALLACE, INC.
Engineering/Architecture
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DATE 1/14

CLIENT CCRFCD JOB NO 550.032C CALC BY

DESCRIPTION OVERBANK MANNING'S n CHECKED BY

80% [illegible]
20% [illegible]

55% [illegible]
45% [illegible]

MATERIAL:

[illegible] 0.020 COVER 0.015

$$n_o = 55\%\left[80\%(.015) + 20\%(0.020)\right] + 15\%\left[55\%(0.020) + 45\%(.015)\right] + 30\%(0.000)\Big] = 0.017$$

IRREGULARITY	VARIATIONS	OBSTRUCTION
SMOOTH	GRADUAL	NEGLIBLE
$n_1 = 0.000$	$n_2 = 0.000$	$n_3 = 0.000$

VEGETATION	DEGREE OF MEANDERING
NONE	MINOR
$n_4 = 0.000$	$m_5 = 1.000$

$n_{LEFT, RIGHT\ OVERBANK} = 0.017$ ROUND TO

$n_{OVERBANK} = 0.02$

PER [illegible] 1 => 6-15

EN-3-N
3/86

SHEET 4 OF 37

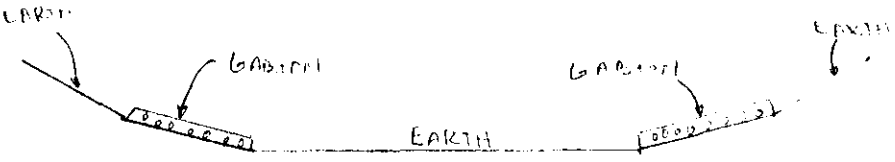
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DATE

CLIENT CCRFCD JOB NO 550.032.C CALC BY

DESCRIPTION CHANNEL MANNING'S n CHECKED BY

PICTURE ROLL 1 => 16 - 20



SECTION 1 => (REPRESENTATIVE OF THE ENTIRE REACH)

MATERIALS

EARTH = 0.020 GABION = 0.030

20% CONSIST OF GABION, 80% CONSIST OF EARTH

n_0 = 20% (0.030) + 80% (0.020) = 0.022

IRREGULARITY	VARIATIONS	OBSTRUCTION
SMOOTH	GRADUAL	NEGLIBLE
n_1 = 0.000	n_2 = 0.000	n_3 = 0.000

VEGETATION	DEGREE OF MEANDERING
LOW	MINOR
n_4 = 0.005 (MAINTENANCE AGREEMENT)	m_5 = 1.000

$n_{CHANNEL}$ = 0.027 ROUND TO

$n_{CHANNEL}$ = 0.030

PICTURE ROLL 1 => 16 - 20

EN-3-N
3/66

SHEET 5 OF 37

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DATE 6/ /

CLIENT CCRFCD JOB NO 550.032 C CALC BY

DESCRIPTION CHANNEL MANNING'S 'n' CHECKED BY

MATERIALS

[illegible] = 0.030 GABION = 0.030

70% CONCRETE AT [illegible] 30% GABIONS

MATERIAL:

n_0 = 70% (0.020) + 30% (0.030) = 0.023

IRREGULARITY %	VARIATIONS %	OBSTRUCTIONS
SMOOTH	GRADUAL	NEGLIGIBLE
n_1 = 0.000	n_2 = 0.000	n_3 = 0.000

VEGETATION %	DEGREE OF MEANDERING
NONE	MINOR
n_4 = 0.000	m_5 = 1.000

$n_{LEFT, RIGHT\ OVERBANK}$ = 0.023 ROUND TO

$n_{OVERBANK}$ = 0.025 ROLL 1 => 16-20 PICTURED

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DATE 6/-

CLIENT CCRFCD JOB NO 552.032 CALC BY

DESCRIPTION CHANNEL MANNING'S "n" CHECKED BY

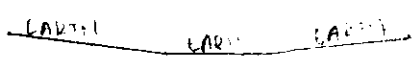
ROLL 1 => 21 - 27



90% EARTH 10% CONCRETE

SECTION 1

+



100% EARTH

SECTION 2

30% OF THE REACH IS COMPRISED OF SECTION 1

70% OF THE REACH IS COMPRISED OF SECTION 2

MATERIAL:

EARTH = 0.020 CONCRETE = 0.015

$$n_0 = 30\% \left[90\%(0.020) + 10\%(0.015) \right] + 70\%(0.020) = 0.020$$

IRREGULARITY:

MINOR

$n_1 = 0.005$

VARIATIONS:

ALTERNATING OCCASIONALLY

$n_2 = 0.005$

OBSTRUCTION:

NEGLIGIBLE

$n_3 = 0.000$

VEGETATION

LOW

$n_4 = 0.005$

DEGREE OF MEANDERING

MINOR

$m_5 = 1.000$

$n_{CHANNEL} = 0.035$

PICTURE ROLL 1 => 21-27

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DATE [illegible]

CLIENT CCRFCD JOB NO 550.032 CALC BY

DESCRIPTION [illegible] CHECKED BY

SECTION 1 b

15% CONCRETE

85% EARTH

SECTION 2 b

100% EARTH

MATERIALS

EARTH = 0.030 CONCRETE = 0.015

n_0 = 30% [15% (0.015) + 85% (0.030)] + 70% (0.030) = 0.030

IRREGULARITY:

MINOR

n_1 = 0.005

VARIATIONS:

ALTERNATING OCCASSIONALLY

n_2 = 0.005

OBSTRUCTIONS:

NEGLIGIBLE

n_3 = 0.000

VEGETATION:

LOW

n_4 = 0.005

DEGREE OF MEANDERING

MINOR

m_5 = 1.000

$n_{LEFT, RIGHT\ OVERBANK}$ = 0.035

PICTURE ROLL 1 ⇒ 21-27

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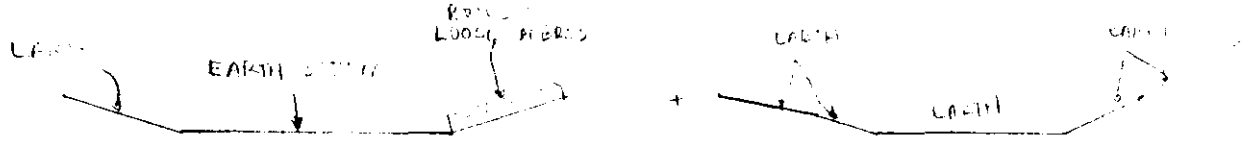
DATE _____

CLIENT CORPS JOB NO 550.[illegible] CALC BY _____

DESCRIPTION [illegible] CHECKED BY _____

PICTURE

ROLL 1 ⇒ 28-37



90% EARTH BOTTOM AND RUBBLE SIDES

10% EARTH

SECTION 1

100% EARTH

SECTION 2

60% OF THE REACH IS COMPRISED OF SECTION 1.

40% OF THE REACH IS COMPRISED OF SECTION 2

MATERIALS

EARTH BOTTOM & RUBBLE SIDES = 0.030 EARTH 0.020

$$n_o = 60\%\left[90\%(0.030) + 10\%(0.020)\right] + 40\%(0.020) = 0.025$$

IRREGULARITY %	VARIATION %	OBSTRUCTION %
SMOOTH	GRADUAL	NEGLIBLE
$n_1 = 0.000$	$n_2 = 0.000$	$n_3 = 0.000$

VEGETATION %	DEGREE OF MEANDERING	
NONE	MINOR	$n_{CHANNEL} = 0.025$
$n_4 = 0.000$	$m_5 = 1.000$	

PICTURE
ROLL 1 ⇒ 28-37

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DATE

CLIENT CORPS JOB NO 550.032 C CALC BY

DESCRIPTION OVERBANK MANNING'S 'n' CHECKED BY

SECTION 1 %

50% RUBBLE SIDES

50% EARTH

SECTION 2 %

10% EARTH

MATERIAL %

RUBBLE SIDES: 0.020 EARTH: 0.020

$n_0 = 60\% \left[50\% (0.030) + 50\% (0.020) \right] + 40\% (0.020) = 0.023$

IRREGULARITY %	VARIATION %	OBSTRUCTIONS %
SMOOTH	GRADUAL	NEGLIGIBLE
$n_1 = 0.000$	$n_2 = 0.000$	$n_3 = 0.000$

VEGETATION %	DEGREE OF MEANDERING
LOW	MINOR
$n_4 = 0.005$	$n_5 = 1.000$

$n_{LEFT, RIGHT\ OVERBANK} = 0.028$ ROUND TO

$n_{OVERBANK} = 0.03$

PICTURE ROLL 1 => 28-37

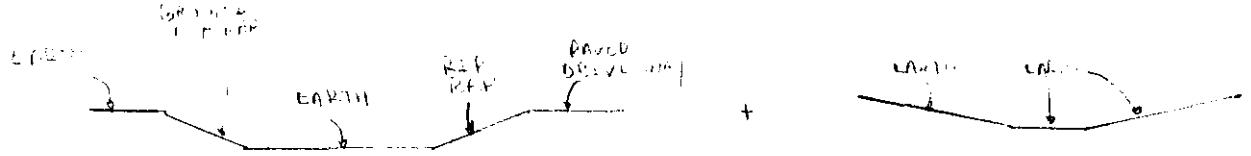
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DATE 4/[illegible]

CLIENT CCRFCD JOB NO 550.032C CALC BY

DESCRIPTION CHANNEL MANNING'S "n" CHECKED BY

PICTURE 1 - 6



≈10" 1=D 8% RIP-RAP 7% GROUND RIP RAP 100% EARTH

85% EARTH SECTION 2

SECTION 1 20% OF THE REACH IS COMPRISED OF SECTION 1

80% OF THE REACH IS COMPRISED OF SECTION 2

MATERIALS

$n_{RIP\text{-}RAP} = 0.0395 (d_{50})^{1/6} = 0.038$ $n_{GROUND\ RIP\text{-}RAP} = 0.030$ $n_{EARTH} = 0.020$

$n_0 = 20\% \left[8\% (0.038) + 7\% (0.030) + 85\% (0.020) \right] + 80\% (0.020) = 0.020$

IRREGULARITY	VARIATION	OBSTRUCTION
SMOOTH	GRADUAL	NEGLIBLE
$n_1 = 0.00$	$n_2 = 0.000$	$n_3 = 0.000$

VEGETATION	DEGREE OF MEANDERING
LOW	MINOR
$n_4 = 0.005$	$m_5 = 1.000$

$n_{CHANNEL} = 0.025$

PICTURE ROLL 2 = 1 - 6

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DATE 6/[illegible]/[illegible]

CLIENT CORPS JOB NO 550.[illegible] CALC BY

DESCRIPTION OVERBANK [illegible] CHECKED BY

SECTION 3 SECTION 4

50% RIP RAP 10% [illegible]

50% GROUTED RIP RAP

MATERIALS

$n_{RIP-RAP} = 0.0395\ (d_{50})^{1/6} = 0.038$ (FOR $d_{50} \approx 10''$) $n_{GROUTED\ RIP\ RAP} = 0.030$

$n_{EARTH} = 0.020$

$n_0 = 20\%\left[50\%\,(0.038) + 50\%\,(0.030)\right] + 80\%\,(0.020) = 0.023$

IRREGULARITY S

SMOOTH

$n_1 = 0.000$

VARIATIONS S

GRADUAL

$n_2 = 0.000$

OBSTRUCTIONS S

NEGLIGIBLE

$n_3 = 0.000$

VEGETATION S

LOW

$n_4 = 0.005$

DEGREE OF MEANDERING

MINOR

$m_5 = 1.000$

$n_{LEFT,\ RIGHT\ OVERBANK} = 0.028$ ROUND TO

$n_{OVERBANK} = 0.03$

ROLL 2 = PICTURE 1 - 6

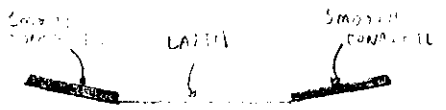
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DATE 1/7

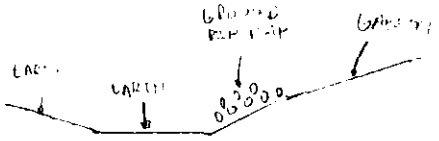
CLIENT CCRFCD JOB NO 550.036.6 CALC BY

DESCRIPTION CHANNEL MEANDERING 'n' CHECKED BY

1 ... < => +/- 10



+

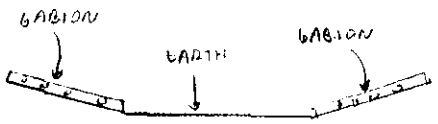


80% EARTH
20% CONCRETE

SECTION 1

90% EARTH
10% GROUTED RIP-RAP

SECTION 2



80% EARTH
20% GABION

SECTION 3

70% OF THE REACH IS COMPRISED OF SECTION 1

5% OF THE REACH IS COMPRISED OF SECTION 2

25% OF THE REACH IS COMPRISED OF SECTION 3

MATERIAL 's

$n_{EARTH} = 0.020$ $n_{CONCRETE} = 0.015$ $n_{GROUTED\ RIP\text{-}RAP} = 0.030$ $n_{GABION} = 0.030$

$$n_0 = 70\%\left[80\%(0.020) + 20\%(0.015)\right] + 5\%\left[90\%(0.020) + 10\%(0.030)\right]$$
$$+ 25\%\left[80\%(0.020) + 20\%(0.030)\right] = 0.020$$

IRREGULARITY 's
SMOOTH
$n_1 = 0.000$

VARIATION 's
GRADUAL
$n_2 = 0.000$

OBSTRUCTIONS 's
NEGLIBLE
$n_3 = 0.000$

VEGETATION 's
LOW
$n_4 = 0.005$

DEGREE OF MEANDERING 's
MINOR
$m_5 = 1.000$

$n_{CHANNEL} = 0.025$

PROJECT ROLL 2 = 17-16

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DATE

CLIENT CCRSD JOB NO 550.22a.2 CALC BY

DESCRIPTION OVERBANK CHECKED BY

[illegible]

MANNING'S

n_{BANK} = 0.030 $n_{CONCRETE}$ = 0.015 $n_{GRASS\ D}$ = 0.030 $n_{GRASS\ C}$ = [illegible]
RIP-RAP

n_0 = 70%(0.015) + 5%[50%(0.030) + 25%(0.030) + 25%(0.030)]

+ 25%(0.030) = 0.019

IRREGULARITY

SMOOTH

n_1 0.000

VARIATIONS

GRADUAL

n_2 0.000

OBSTRUCTIONS

NEGLIGIBLE

n_3 0.000

VEGETATION

NONE

n_4 = 0.000

DEGREE OF MEANDERING

MINOR

m_5 = 1.000

$n_{LEFT,\ RIGHT\ OVERBANK}$ = 0.019 ROUND TO

$n_{OVERBANK}$ = 0.02

PICTURE
ROLL 2 ⇨ 7-16

EN-3-N
3/66

SHEET 13 OF 37

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DATE 5 ...

CLIENT ... JOB NO ... CALC BY ...

DESCRIPTION CHANNEL MANNING'S "n" / OVERBANK CHECKED BY ...

PICTURE

ROLL 2 @ 17-25

MATERIALS

$n_{CONCRETE} = 0.016$

$n_0 = 0.016$

IRREGULARITY

SMOOTH

$n_1 = 0.000$

VARIATIONS

GRADUAL

$n_2 = 0.000$

OBSTRUCTIONS

NEGLIGIBLE

$n_3 = 0.000$

VEGETATION

NONE

$n_4 = 0.000$

DEGREE OF MEANDERING

MINOR

$m_5 = 1.000$

$$n_{CHANNEL} = 0.016$$

PICTURE

ROLL 2 @ 17-25

$n_{OVERBANK} = 0.100$
LEFT, RIGHT

REDUCE FOR CONVEYANCE DUE TO DEVELOPMENT

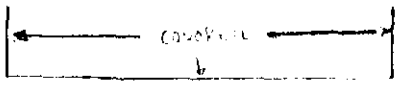
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DATE 11-[illegible]

CLIENT CCRFCD JOB NO 550.228 CALC BY

DESCRIPTION SPREADSHEET MANNING'S n CHECKED BY

[illegible] => 1-6



SECTION 2 => (DEFINES SURFACE OF [illegible] CHANNEL BOTTOM)

MATERIALS

$n_{CONCRETE}$ 0.015

$n_0 = 0.015$

IRREGULARITY'S

SMOOTH

$n_1 = 0.000$

OBSTRUCTIONS

NEGLIGIBLE

$n_3 = 0.000$

VEGETATION'S

NONE

$n_4 = 0.000$

DEGREE OF MEANDERING

MINOR

$m_5 = 1.000$

$n_{CHANNEL} = 0.015$

PICTURE ROLL 3 => 1-6

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DATE

CLIENT JOB NO CALC BY

DESCRIPTION OVERBANK CHECKED BY

MATERIALS

n_1 = 0.000

IRREGULARITY / SMOOTH

n_2 = 0.000

VARIATION IN X-SECTION

GRADUAL

n_2 = 0.000

OBSTRUCTIONS

NEGLIGIBLE

n_3 = 0.000

VEGETATION

LOW

n_4 = 0.005

DEGREE OF MEANDERING

MINOR

m_5 = 1.000

$n_{CH, BANK} = 0.025$

OVERBANK

PRESSURE

ROW 3 => 1 - 6

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DATE _____

CLIENT CARTER JOB NO _____ CALC BY _____

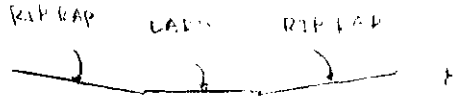
DESCRIPTION CHANNEL ROUGHNESS "n" CHECKED BY _____

ROLL 3 => 1 - 14



95% EARTH
5% RIP-RAP

SECTION 1



60% EARTH
40% RIP-RAP

SECTION 2



100% EARTH

SECTION 3

77% OF THE REACH IS COMPRISED OF SECTION 1

8% OF THE REACH IS COMPRISED OF SECTION 2

15% OF THE REACH IS COMPRISED OF SECTION 3

MATERIAL:

$n_{EARTH} = 0.020$ $n_{RIP\text{-}RAP} = 0.035 (d_{50})^{1/6} = 0.037$

$$n_0 = 77\% \left[95\% (0.020) + 5\% (0.037) \right] + 8\% \left[60\% (0.020) + 40\% (0.037) \right]$$

$$+ 15\% (0.020) = .021$$

DEGREE OF IRREGULARITY:
SMOOTH
$n_1 = 0.000$

VARIATIONS:
ALTERNATING OCCASIONALLY
$n_2 = 0.005$

OBSTRUCTION:
NEGLIBLE
$n_3 = 0.000$

VEGETATION:
NONE
$n_4 = 0.000$

MEANDERING:
MINOR
$m_5 = 1.000$

$n_{CHANNEL} = 0.026$ ROUND TO

$n_{CHANNEL} = 0.03$

PICTURE
ROLL 3 => 7 - 14

G.C. WALLACE, INC.
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DATE 7/6/17

CLIENT [illegible] JOB NO 550-23[illegible] CALC BY

DESCRIPTION OVERBANK MANNING'S 'n' CHECKED BY

SECTION 1 & [illegible] SLOPE [illegible]

50% RIP-RAP 100% [illegible] 100% [illegible]

50% [illegible]

MATERIAL:

n_{EARTH} 0.020 $n_{RIP\text{-}RAP} = 0.035 (d_{50})^{1/6} = 0.037$

$n_o = 77\% \left[50\% (0.037) + 50\% (0.020) \right] + 8\% (0.037) + 15\% (0.020)$

$n_o = 0.028$

DEGREE OF IRREGULARITY:

SMOOTH

$n_1 = 0.000$

VARIATIONS:

ALTERNATING OCCASIONALLY

$n_2 = 0.005$

OBSTRUCTIONS:

NEGLIBLE

$n_3 = 0.000$

VEGETATION:

NONE

$n_4 = 0.000$

MEANDERING:

MINOR

$m_5 = 1.000$

$n_{LEFT,\ RIGHT\ OVERBANK} = 0.033$ ROUND TO

$n_{OVERBANK} = 0.035$

PICTURE ROLL 3 => 7-14

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DATE 9/7/[illegible]

CLIENT [illegible] JOB NO [illegible] CALC BY

DESCRIPTION [illegible] CHECKED BY

& OVERBANK

PICTURE

ROLL 3 ⇒ 15 - 24



REPRESENTATIVE OF THE ENTIRE REACH

MATERIALS	IRREGULARITY	VARIATIONS
EARTH 0.020	SMOOTH	GRADUAL
$n_0 = 0.020$	$n_1 = 0.000$	$n_2 = 0.000$

OBSTRUCTIONS	VEGETATION	MEANDERING
NEGLIGIBLE	LOW	MINOR
$n_3 = 0.000$	$n_4 = 0.005$	$m_5 = 1.000$

$n_{CHANNEL \& OVERBANK} = .025$

PICTURE

ROLL 3 ⇒ 15-24

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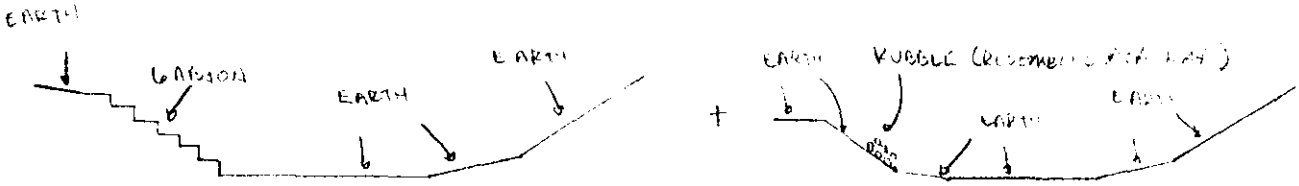
DATE 7/11/00

CLIENT [illegible] JOB NO 550.2[illegible] CALC BY

DESCRIPTION CHANNEL [illegible] "n" CHECKED BY

PICTURE

ROLL 3 => 25-31



95% EARTH
5% GABION

SECTION 1

95% EARTH
5% RUBBLE

SECTION 2

25% OF THE REACH IS COMPRISED OF SECTION 1

75% OF THE REACH IS COMPRISED OF SECTION 2

MATERIAL %

$n_{EARTH} = 0.020$ $n_{RUBBLE} = 0.035$ $n_{GABION} = 0.030$

$$n_0 = 25\%\left[95\%(0.020) + 5\%(0.030)\right] + 75\%\left[95\%(0.020) + 5\%(0.035)\right]$$

$n_0 = 0.021$

IRREGULARITY %
MINOR
$n_1 = 0.005$

VARIATION %
GRADUAL
$n_2 = 0.000$

OBSTRUCTION %
NEGLIGIBLE
$n_3 = 0.000$

VEGETATION %
NONE
$n_4 = 0.000$

MEANDERING %
MINOR
$m_5 = 1.000$

$n_{CHANNEL} = 0.025$

PICTURE
ROLL 3 => 25-28

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Engineering/Architecture
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DATE

CLIENT JOB NO CALC BY

DESCRIPTION CHECKED BY

50% [illegible]

50% EARTH

MANNING'S

$n_{EARTH} = 0.028$ $n_{GRASS} = 0.025$ $n_{GRAVEL} = 0.030$

$n_O = 25\%\left[50\%(0.030) + 50\%(0.028)\right] + 75\%\left[25\%(0.025) + 75\%(\text{illegible})\right]$

$n_O = 0.024$

IRREGULARITY:	VARIATIONS:	OBSTRUCTIONS
MINOR	GRADUAL	NEGLIGIBLE
$n_1 = 0.005$	$n_2 = 0.000$	$n_3 = 0.000$

VEGETATION:	MEANDERINGS:
NONE	MINOR
$n_4 = 0.000$	$m_5 = 1.000$

$n_{LEFT,\ RIGHT\ OVERBANK} = 0.029$ ROUND TO

$n_{OVERBANK} = 0.03$

PICTURE

ROLL 3 ⇒ 25-28

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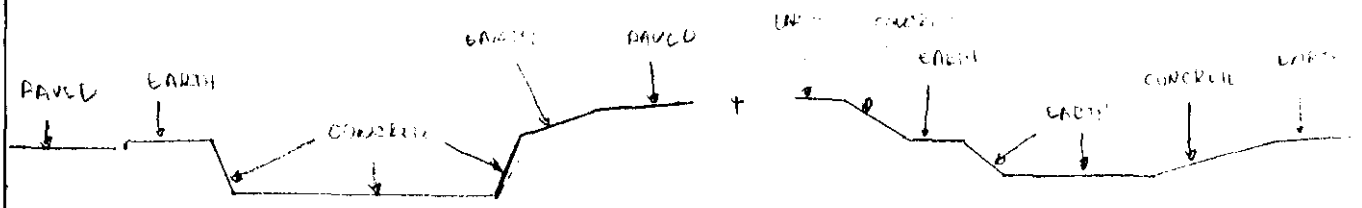
DATE

CLIENT JOB NO CALC BY

DESCRIPTION MANNING'S n CHECKED BY

PLATE 12

ROLL 3 => 32-35



100% CONCRETE

80% EARTH
20% CONCRETE

SECTION 1

SECTION 2

75 % OF THE REACH IS COMPRISED OF SECTION 1

25% OF THE REACH IS COMPRISED OF SECTION 2

MATERIALS

$n_{EARTH} = 0.020$ $n_{CONCRETE} = 0.015$

$$n_0 = 75\%(0.015) + 25\%\left[80\%(0.020) + 20\%(0.015)\right] = 0.016$$

IRREGULARITY%	VARIATION%	OBSTRUCTION%
SMOOTH	GRADUAL	NEGLIGIBLE
$n_1 = 0.000$	$n_2 = 0.000$	$n_3 = 0.000$

VEGETATION%	MEANDERING	
NONE	MINOR	$n_{CHANNEL} = 0.016$ ROUND TO PROPOSAL
$n_4 = 0.000$	$m_5 = 1.000$	$n_{CHANNEL} = 0.015$ ROLL 3 => 29-35

EN-3-N
3/66

SHEET 21 OF 37

G.C. WALLACE, INC.
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1555 SOUTH RAINBOW BLVD. / LAS VEGAS, NEVADA 89102

DATE

CLIENT CCRV JOB NO CALC BY

DESCRIPTION MANNING'S n CHECKED BY

SLOPE

100% CHECK

20% ADJUSTMENT

SLOPE

100% CHECK

20% ADJUSTMENT

MATERIALS

$n_{CHANNEL} = 0.020$ $n_{FLOODPLAIN} = 0.015$

$n_b = 75\%\left[25\%(0.020) + 75\%(0.015)\right] + 25\%\left[30\%(\text{CHANNEL}) + 70\%(0.015)\right]$

$n_0 = 0.02$

IRREGULARITY

SMOOTH

$n_1 = 0.000$

VARIATION

GRADUAL

$n_2 = 0.000$

OBSTRUCTIONS

NEGLIGIBLE

$n_3 = 0.000$

VEGETATION

LOW

$n_4 = 0.005$

MEANDERING

MINOR

$n_5 = 1.000$

$n_{LEFT/RIGHT\ OVERBANK} = 0.025$ ROUND TO

PICTURES

$n_{OVERBANK} = 0.025$

ROLL 3 ⇒ 29-35

EN-3-N
3/66

SHEET 22 OF 37

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102

DATE 4/22

CLIENT CITY JOB NO 501.002 CALC BY

DESCRIPTION CHANNEL MANNING'S n CHECKED BY

PICTURE
ROLL 3-7 36-37 & PICTURE ROLL 4 => 1-8



100% EARTH

SECTION 1

+

80% EARTH
20% GRASS

SECTION 2

10% OF THE REACH IS COMPRISED OF SECTION 1

90% OF THE REACH IS COMPRISED OF SECTION 2

MATERIALS

$n_{EARTH} = 0.020$ $n_{GRASS} = 0.030$

$$n_0 = 10\%\,(0.020) + 90\%\left[80\%\,(0.020) + 20\%\,(0.030)\right] = 0.022$$

IRREGULARITY:
SMOOTH
$n_1 = 0.000$

VARIATIONS:
GRADUAL
$n_2 = 0.000$

OBSTRUCTIONS:
NEGLIBLE
$n_3 = 0.000$

VEGETATION:
MEDIUM
$n_4 = 0.010$

MEANDERING:
MINOR
$n_5 = 1.000$

$n_{CHANNEL} = 0.032$ ROUND TO

$n_{CHANNEL} = 0.03$

PICTURE
ROLL 3 => 36-37
&
ROLL 4 => 1-8

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1555 SOUTH RAINBOW BLVD / LAS VEGAS, NEVADA 89102

DATE

CLIENT JOB NO CALC BY

DESCRIPTION MANNING'S 'n' CHECKED BY

SECTION 1 :

100% EARTH

SECTION 2 :

100% GRASS

MATERIALS

$n_{EARTH} = 0.020$ $n_{GRASS} = 0.030$

$n_0 = 10\%(0.020) + 90\%(0.030) = 0.029$

IRREGULARITY	VARIATIONS	OBSTRUCTIONS
SMOOTH	GRADUAL	NEGLIGIBLE
$n_1 = 0.000$	$n_2 = 0.000$	$n_3 = 0.000$

VEGETATION	MEANDERING
LOW	MINOR
$n_4 = 0.005$	$m_5 = 1.000$

$n_{LEFT, RIGHT\ OVERBANK} = 0.034$ ROUND TO

$n_{OVERBANK} = 0.035$

PICTURE

ROLL 3 => 36-37

&

ROLL 4 => 1-8

EN-3-N
3/66

SHEET 24 OF 37

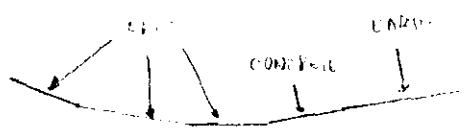
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Engineering/Architecture
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DATE 7/1/

CLIENT [illegible] JOB NO [illegible] CALC BY

DESCRIPTION [illegible] MANNING'S n CHECKED BY

[illegible] 9-18

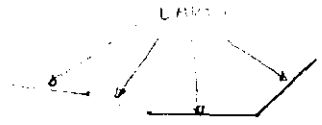


95% [illegible]

5% CONCRETE

SECTION 1

+



100% [illegible]

SECTION 2

+



95% EARTH

5% RUBBLE

SECTION 3

5% OF THE REACH IS COMPRISED OF SECTION 1

75% OF THE REACH IS COMPRISED OF SECTION 2

20% OF THE REACH IS COMPRISED OF SECTION 3

MATERIAL%

$n_{EARTH} = 0.020$ $n_{CONCRETE} = 0.015$ $n_{RUBBLE} = 0.035$

$n_0 = 5\%\left[95\%(0.020) + 5\%(0.015)\right] + 75\%(0.020) + 20\%\left[95\%(0.020) + 5\%(.03$

$n_0 = 0.020$

IRREGULARITY%

SMOOTH

$n_1 = 0.000$

VARIATION%

ALTERNATING OCCASIONALLY

$n_2 = 0.005$

OBSTRUCTION%

NEGLIGIBLE

$n_3 = 0.000$

VEGETATION%

NONE

$n_4 = 0.000$

MEANDERING

MINOR

$m_5 = 1.000$

$n_{CHANNEL} = 0.025$

PICTURE ROLL 4 => 9-18

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DATE

CLIENT [illegible] JOB NO [illegible] CALC BY

DESCRIPTION [illegible] CHECKED BY

[illegible]	[illegible]	[illegible]
[illegible]	100% [illegible]	50% [illegible]
[illegible]		50% [illegible]

MATERIALS

$n_{LINED} = 0.000$ $n_{CONCRETE} = 0.013$ $n_{GRAVEL} = 0.025$

$n_0 = 5\%[20\%(0.013) + 80\%(0.000)] + 70\%(0.000) + 25\%[50\%(0.025) + 50\%(0.025)]$

$n_0 = 0.020$

IRREGULARITY	VARIATION	OBSTRUCTION
SMOOTH	GRADUAL	NEGLIGIBLE
$n_1 = 0.000$	$n_2 = 0.000$	$n_3 = 0.000$

VEGETATION	MEANDERING
LOW	MINOR
$n_4 = 0.005$	$m_5 = 1.000$

$n_{LEFT, RIGHT} = 0.025$

OVERBANK

PLOTTED ROLL 4 ⇒ 9 - 18

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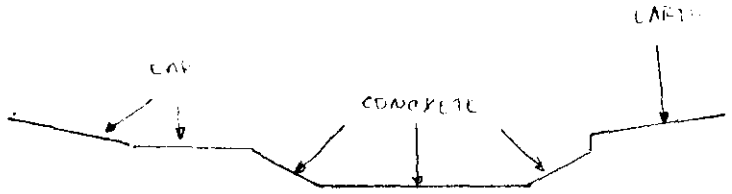
DATE

CLIENT _____ JOB NO _____ CALC BY _____

DESCRIPTION CHANNEL MANNING'S n CHECKED BY _____

PICTURE

ROLL 4 => 19-22



100% CONCRETE

REPRESENTATIVE OF THE ENTIRE REACH

SECTION 1

MATERIALS

$n_{EARTH} = 0.000$ $n_{CONCRETE} = 0.015$

IRREGULARITY:

SMOOTH

$n_1 = 0.000$

$n_0 = 0.015$

VARIATIONS:

GRADUAL

$n_2 = 0.000$

OBSTRUCTIONS:

VISIBLE

$n_3 = 0.000$

VEGETATION:

NONE

$n_4 = 0.000$

MEANDERING:

APPRECIABLE

$n_5 = 1.15$

$n_{CHANNEL} = 0.017$ ROUND TO

$n_{CHANNEL} = 0.015$

PICTURE

ROLL 4 => 19-23

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DATE

CLIENT _____ JOB NO _____ CALC BY _____

DESCRIPTION _____ CHECKED BY _____

SECTION 2

40% OVERBANK

60% CHANNEL

MATERIALS

$n_{CHANNEL}$ = 0.015 n_{BANK} = 0.030

n_0 = 40%(0.015) + 60%(0.030) = 0.018

IRREGULARITY

SMOOTH

n_1 = 0.000

VARIATION:

GRADUAL

n_2 = 0.000

OBSTRUCTIONS

NEGLIGIBLE

n_3 = 0.000

VEGETATION

NONE

n_4 = 0.000

MEANDERING

APPRECIABLE

m_5 = 1.15

$n_{LEFT,\ RIGHT\ OVERBANK}$ 0.021 ROUND TO

$n_{OVERBANK} = 0.02$

PICTURE ROLL 4 => 19-23

EN-3-N
3/66

SHEET 28 OF 37

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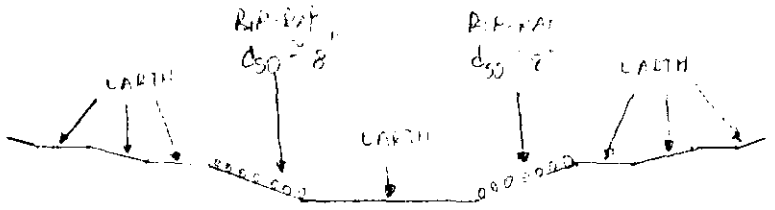
DATE

CLIENT [illegible] JOB NO [illegible] CALC BY

DESCRIPTION CHANNEL [illegible] CHECKED BY

PICTURE

ROLL 4 => 24-25



SECTION 1 (REPRESENTATIVE OF THE UPPER REACH)

40% EARTH

60% RIP-RAP

MATERIALS:

n_{EARTH} 0.020 $n_{RIP-RAP}$ d_{50} = 8" $= 0.0395\, d_{50}^{1/6} = 0.037$

$n_0 = 40\%\,(0.020) + 60\%\,(0.037) = 0.030$

IRREGULARITY:	VARIATIONS:	OBSTRUCTIONS:
SMOOTH	GRADUAL	NEGLIGIBLE
$n_1 = 0.000$	$n_2 = 0.000$	$n_3 = 0.000$

VEGETATION:	MEANDERING
NONE	MINOR
$n_4 = 0.000$	$n_5 = 1.000$

$n_{CHANNEL} = 0.030$

PICTURE
ROLL 4 => 24-25

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DATE 1/

CLIENT [illegible] JOB NO [illegible] CALC BY

DESCRIPTION [illegible] CHECKED BY

[illegible]

100 YR EVENT

MATERIALS

[illegible]

n_0 0.020

IRREGULARITIES

[illegible]

n_1 0.000

VARIATIONS

UNKNOWN

n_2 0.000

OBSTRUCTIONS

NEGLIGIBLE

n_3 0.000

VEGETATION

NONE

n_4 0.000

MEANDERING

MINOR

m_5 1.000

$n_{LEFT, RIGHT\ OVERBANK}$ = 0.000

PICTURE
ROLL 4 ⇒ 24-25

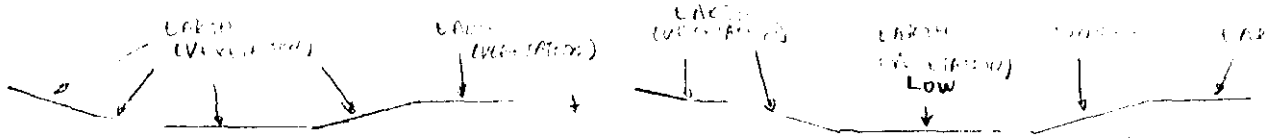
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DATE

CLIENT JOB NO CALC BY

DESCRIPTION CHECKED BY

ROLL 5 = 1 - 14



95% OF REACH

SECTION 1

95% OF THE REACH IS COMPARABLE OF SECTION 1

5% OF THE REACH IS COMPARABLE OF SECTION

MATERIALS

$n_{earth} = 0.020$ $n_{rock} = 0.015$

$n_0 = 95\%(0.020) + 5\%[95\%(0.020) + 5\%(0.015)]$ $n_1 = 0.000$

$n_0 = 0.020$

IRREGULARITY

SMOOTH

VARIATIONS

GRADUAL

$n_2 = 0.000$

OBSTRUCTIONS

NEGLIGIBLE

$n_3 = 0.000$

VEGETATION

MEDIUM

$n_4 = 0.02$

MEANDERING

MINOR

$m_5 = 1.000$

$n_{CHANNEL} = .04$ ROUND TO

$n_{CHANNEL} = 0.04$

ROLL 5 = 7 1 - 14 PICTURE

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DATE 7/1/[illegible]

CLIENT [illegible] JOB NO [illegible] CALC BY

DESCRIPTION OVERBANK MATERIALS CHECKED BY

SLOPE 1:1

[illegible]

SLOPE 30:1

30% [illegible]

70% GRASS

MATERIALS

$n_{earth} = 0.020$ $n_{concrete} = 0.015$

$n_0 = 95\%\ (0.020) + 5\%\ [30\%\ (0.015) + 70\%\ (0.020)]$

$n_0 = 0.020$

IRREGULARITY:
SMOOTH
$n_1 = 0.000$

VARIATIONS:
GRADUAL
$n_2 = 0.000$

OBSTRUCTIONS:
NEGLIGIBLE
$n_3 = 0.000$

VEGETATION:
LOW
$n_4 = 0.005$

MEANDERINGS:
MINOR
$m_5 = 1.000$

$n_{LEFT, RIGHT\ OVERBANK} = 0.025$

ROLL 5 ⇒ PICTURE 1-14

EN-3-N
3/66

SHEET 32 OF 37

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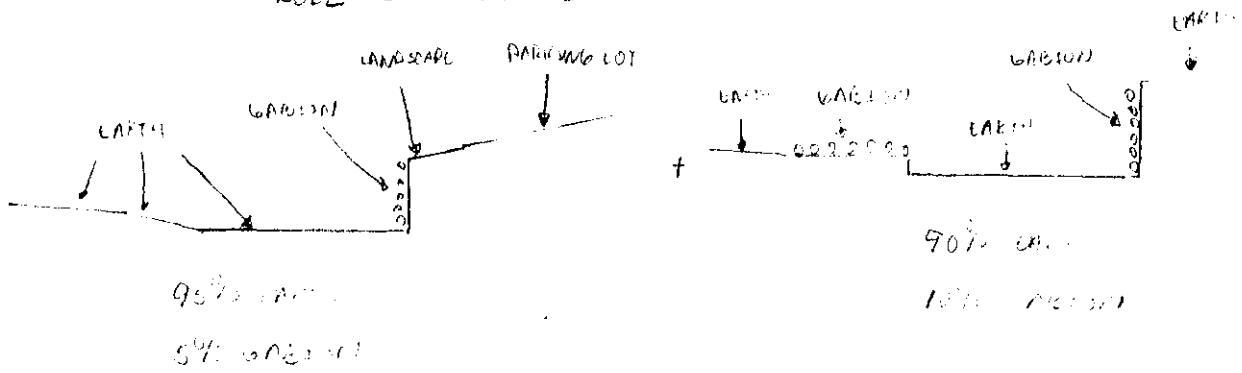
DATE 7/8/[illegible]

CLIENT [illegible] JOB NO 55[illegible] CALC BY

DESCRIPTION CHANNEL MANNING'S "n" CHECKED BY

PICTURE

ROLL 5 => 15 - 16



95% [illegible]

5% [illegible]

90% [illegible]

10% [illegible]

SECTION 1

SECTION 2

30% OF THE REACH IS COMPRISED OF SECTION 1

70% OF THE REACH IS COMPRISED OF SECTION 2

MATERIALS:

n_{EARTH} 0.020 n_{GABION} 0.030

$$n_0 = 30\%\left[95\%(0.020) + 5\%(0.030)\right] + 70\%\left[90\%(0.020) + 10\%(0.030)\right]$$

$n_0 = 0.021$

IRREGULARITY:

SMOOTH

$n_1 = 0.000$

VARIATIONS:

GRADUAL

$n_2 = 0.000$

OBSTRUCTIONS:

NEGLIGIBLE

$n_3 = 0.000$

VEGETATION:

NONE

$n_4 = 0.000$

MEANDERING:

MINOR

$n_5 = 1.000$

$n_{CHANNEL} = 0.021$ ROUND TO

$n_{CHANNEL} = 0.020$

PICTURE

ROLL 5 => 15 - 16

EN-3-N
3/66

SHEET 33 OF 37

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD. / LAS VEGAS, NEVADA 89102

DATE

CLIENT CORPS JOB NO CALC BY

DESCRIPTION CHECKED BY

SECTION 1 — 75% LINED — 25% UNLINED

SECTION 2 — 75% UNLINED — 25% LINED

MATERIALS

$n_{LINED} = 0.020$ $n_{UNLINED} = 0.030$

$n_0 = 30\%\left[75\%(0.020) + 25\%(0.030)\right] + 70\%\left[75\%(0.030) + 25\%(0.050)\right]$

$n_0 = 0.026$

IRREGULARITIES

SMOOTH

$n_1 = 0.000$

VARIATIONS

GRADUAL

$n_2 = 0.000$

OBSTRUCTIONS

NEGLIGIBLE

$n_3 = 0.000$

VEGETATION

LOW

$n_4 = 0.005$

MEANDERING

MINOR

$m_5 = 1.000$

$n_{LEFT,\ RIGHT\ OVERBANK} = 0.031$ ROUND TO

$n_{OVERBANK} = 0.03$

PICTURE

ROLL 5 ⇒ 15-16

EN-3-N
3/66

SHEET 34 OF 37

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD / LAS VEGAS, NEVADA 89102

DATE 7/6/99

CLIENT [illegible] JOB NO [illegible] CALC BY

DESCRIPTION CHANNEL [illegible] CHECKED BY

& OVERBANK

ROLL 5 ⇒ 19-25



100% EARTH

RECTANGULAR OF THE [illegible] REACH

SECTION 1

MATERIALS	IRREGULARITYS	VARIATIONS
n_{EARTH} 0.030	SMOOTH	GRADUALS
n_0 = 0.000	n_1 = 0.000	n_2 = 0.020

OBSTRUCTIONS	VEGETATIONS	MEANDERING &
NEGLIBLE	NONE	MINOR
n_3 = 0.000	n_4 = 0.000	m_5 = 1.000

$n_{CHANNEL}$ = 0.03
& OVERBANK

ROLL 5 ⇒ 19-25

PICTURE

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DATE 7/6/[illegible]

CLIENT SCPPCV JOB NO 550.06[illegible] CALC BY

DESCRIPTION CHANNEL MANNING'S 'n' CHECKED BY

PICTURE
ROLL 6 => 1-3



10% EARTH

90% GRASS

SECTION 1

MATERIALS

$n_{GRASS} = 0.030$ $n_{EARTH} = 0.020$

$n_0 = 10\%(0.020) + 90\%(0.030)$

$n_0 = 0.029$

IRREGULARITY:

SMOOTH

$n_1 = 0.000$

VARIATIONS:

GRADUAL

$n_2 = 0.000$

OBSTRUCTIONS:

NEGLIGIBLE

$n_3 = 0.000$

VEGETATION:

NONE

$n_4 = 0.000$

MEANDERING:

MINOR

$m_5 = 1.000$

$n_{CHANNEL} = 0.029$ ROUND TO

$n_{CHANNEL} = 0.03$

PICTURE
ROLL 6 => 1-3

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DATE 7/2/00

CLIENT CCRFCD JOB NO 552.0302 CALC BY

DESCRIPTION OVERBANK MANNING'S "n" CHECKED BY

SECTION 1-2

100% GRASS

MATERIAL %

$n_{GRASS} = 0.030$

$n_0 = 0.030$

IRREGULARITY %

SMOOTH

$n_1 = 0.000$

VARIATION %

GRADUAL

$n_2 = 0.000$

OBSTRUCTIONS %

NEGLIGIBLE

$n_3 = 0.000$

VEGETATION %

NONE

$n_4 = 0.000$

MEANDERING

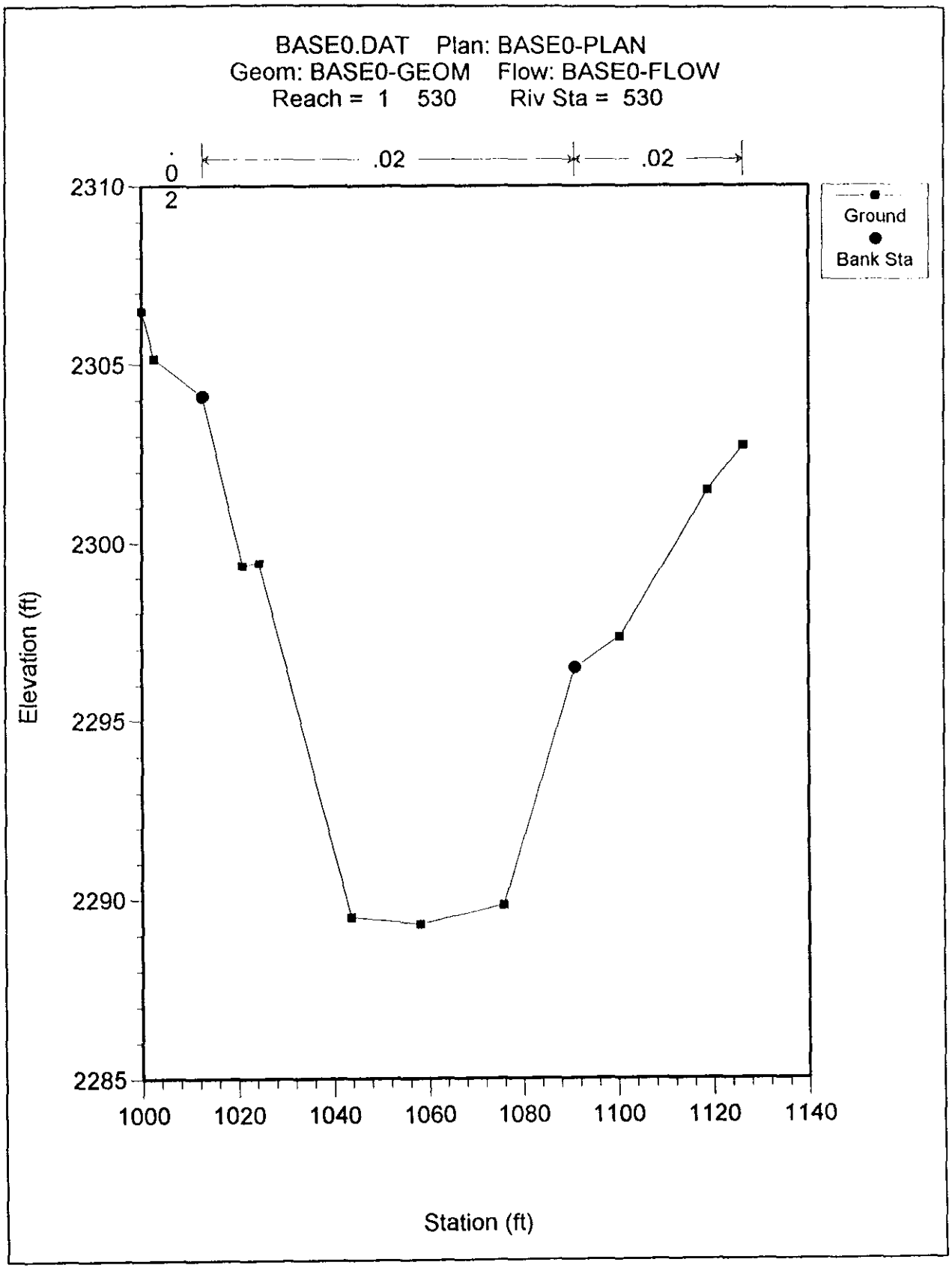
MINOR

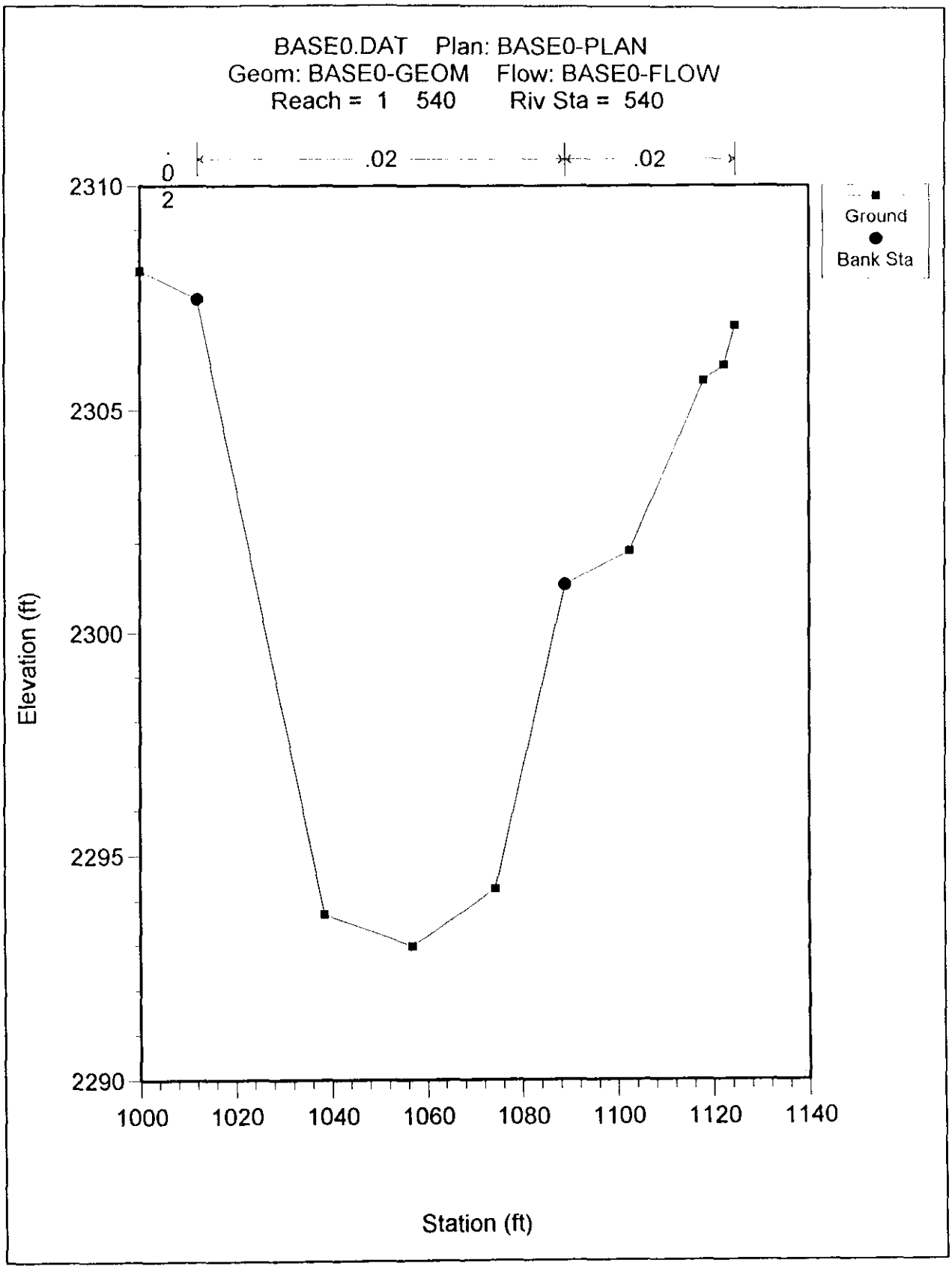
$m_5 = 1.000$

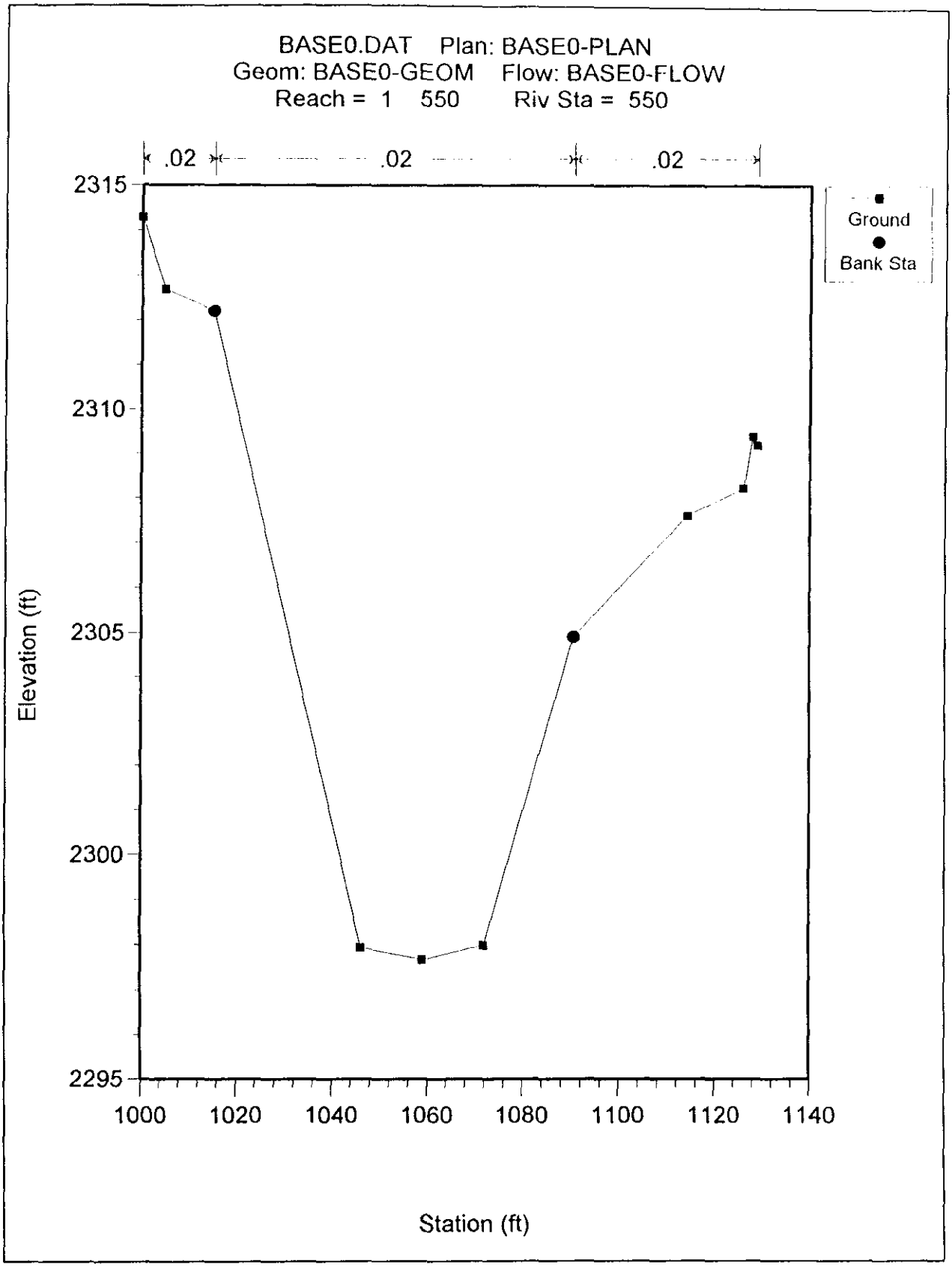
$n_{LEFT, RIGHT} = 0.03$
OVERBANK

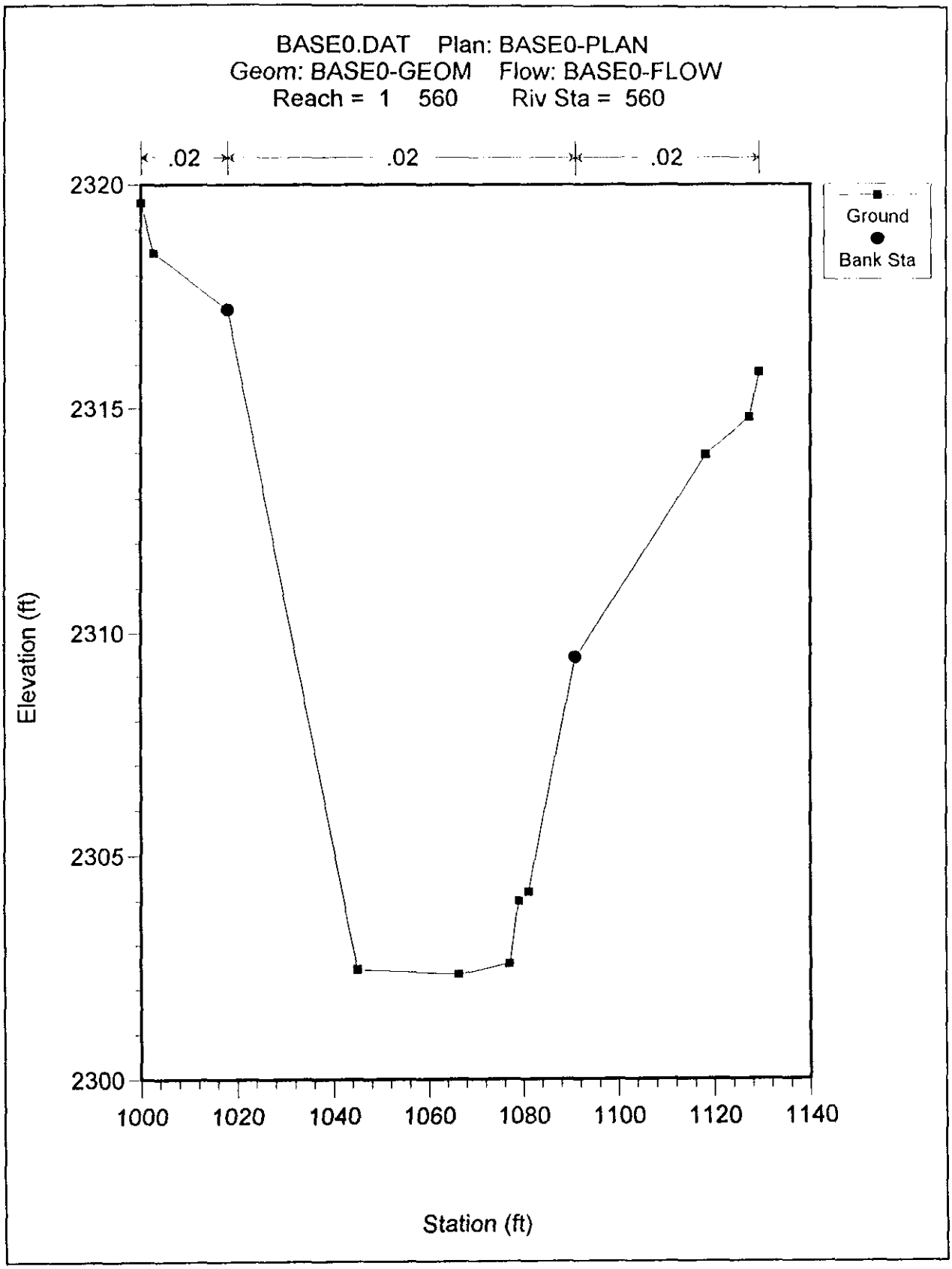
PICTURE
ROLL 6 ⇒ 1 - 3

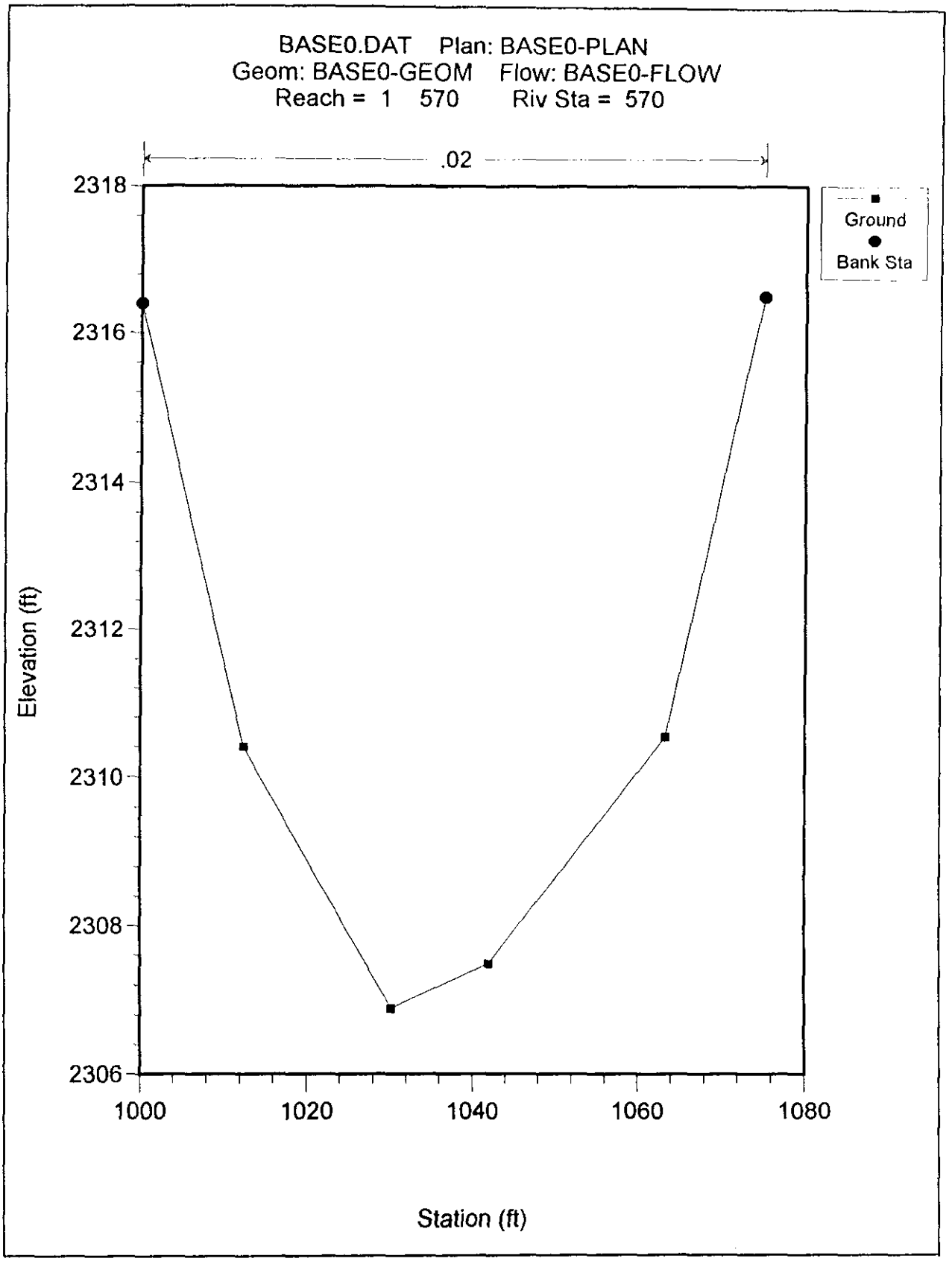
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Engineering/Architecture
1555 SOUTH RAINBOW BLVD. / LAS VEGAS, NEVADA 89102

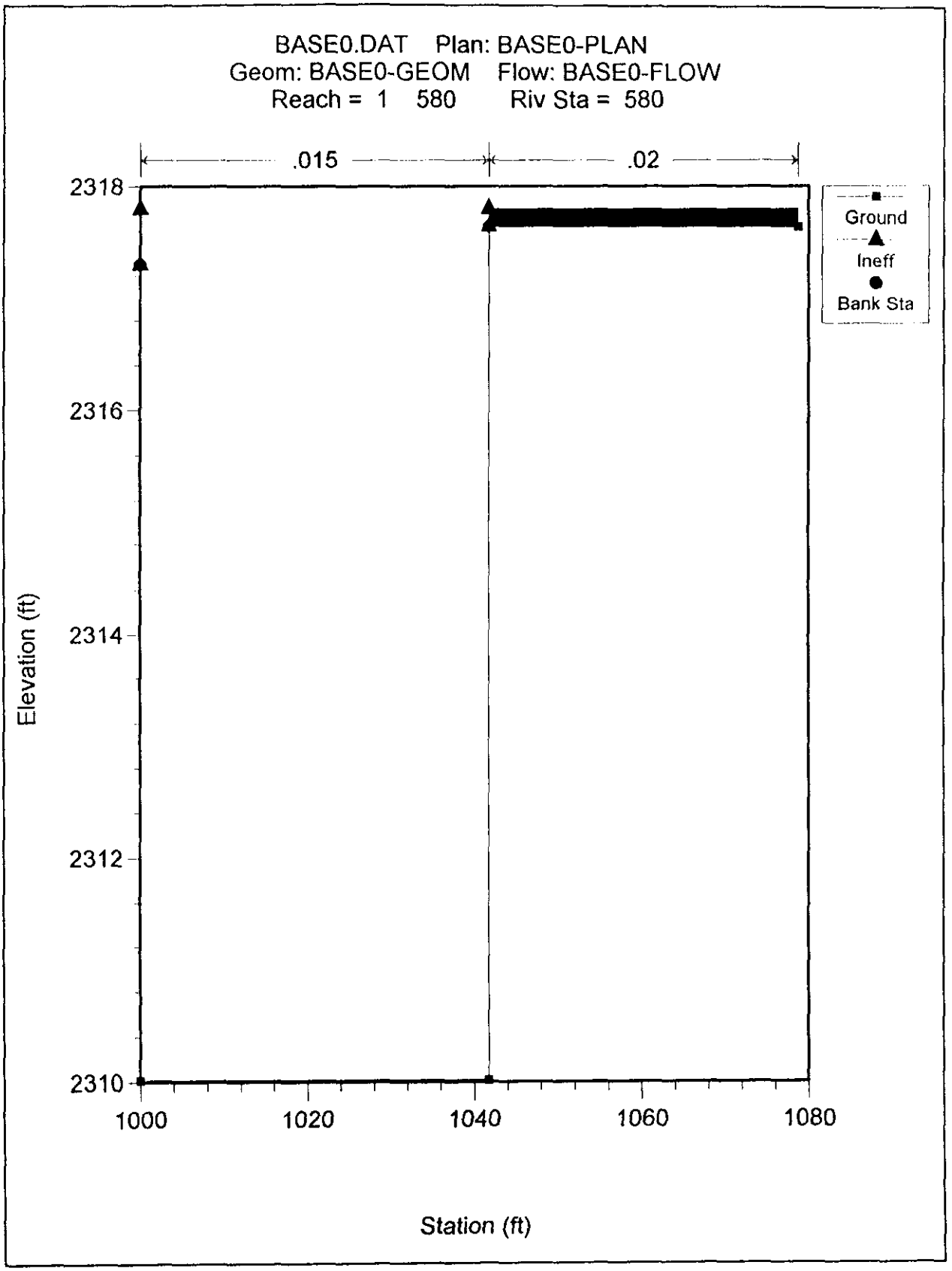

BASE0.DAT Plan: BASE0-PLAN
Geom: BASE0-GEOM Flow: BASE0-FLOW
Reach = 1 530 Riv Sta = 530
.02
.02
0
2
Ground
Bank Sta
2310
2305
2300
2295
2290
2285
Elevation (ft)
1000
1020
1040
1060
1080
1100
1120
1140
Station (ft)

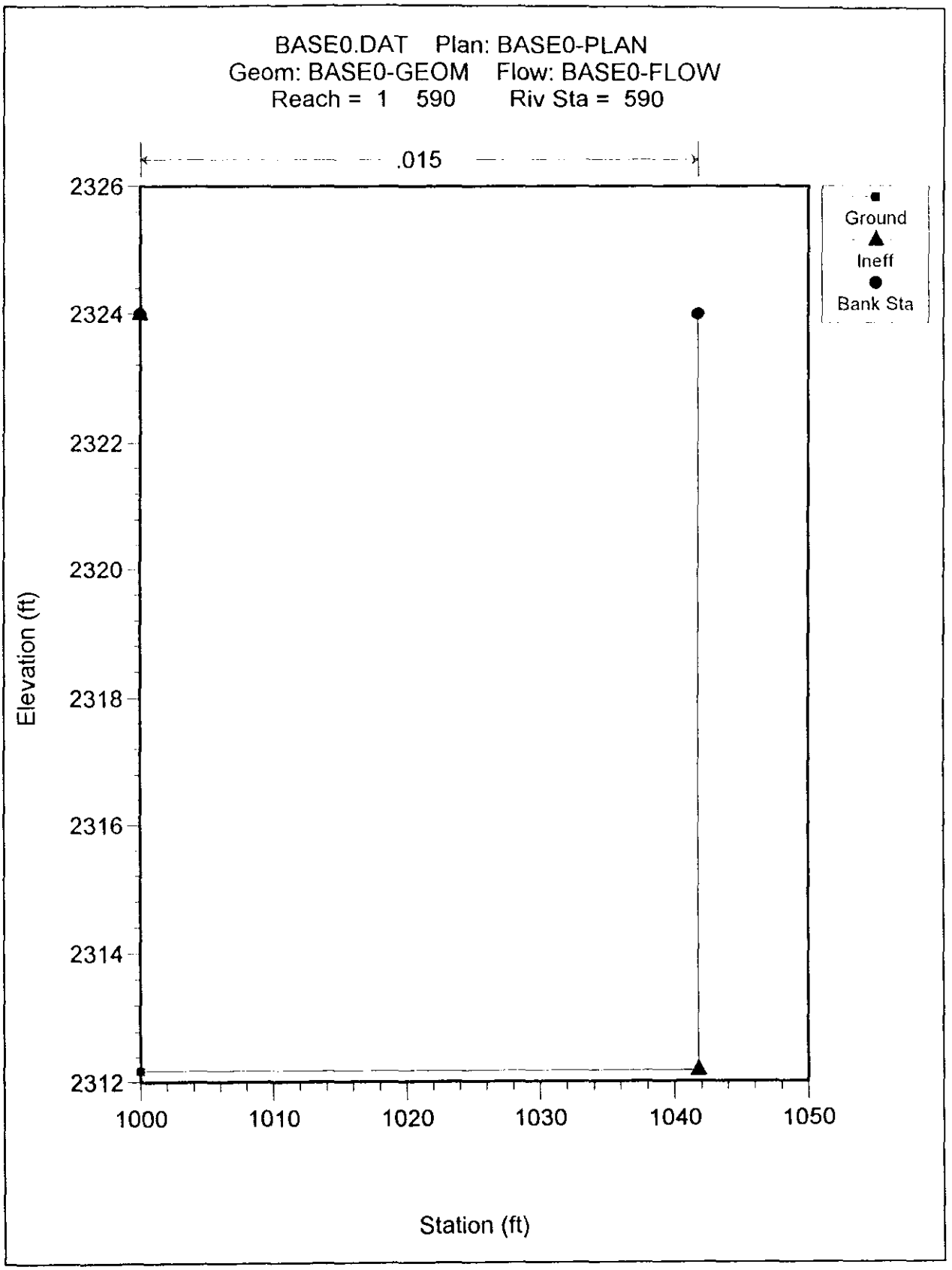

BASE0.DAT Plan: BASE0-PLAN
Geom: BASE0-GEOM Flow: BASE0-FLOW
Reach = 1 540 Riv Sta = 540
.02
.02
0
2
Ground
Bank Sta
2310
2305
2300
2295
2290
Elevation (ft)
1000
1020
1040
1060
1080
1100
1120
1140
Station (ft)

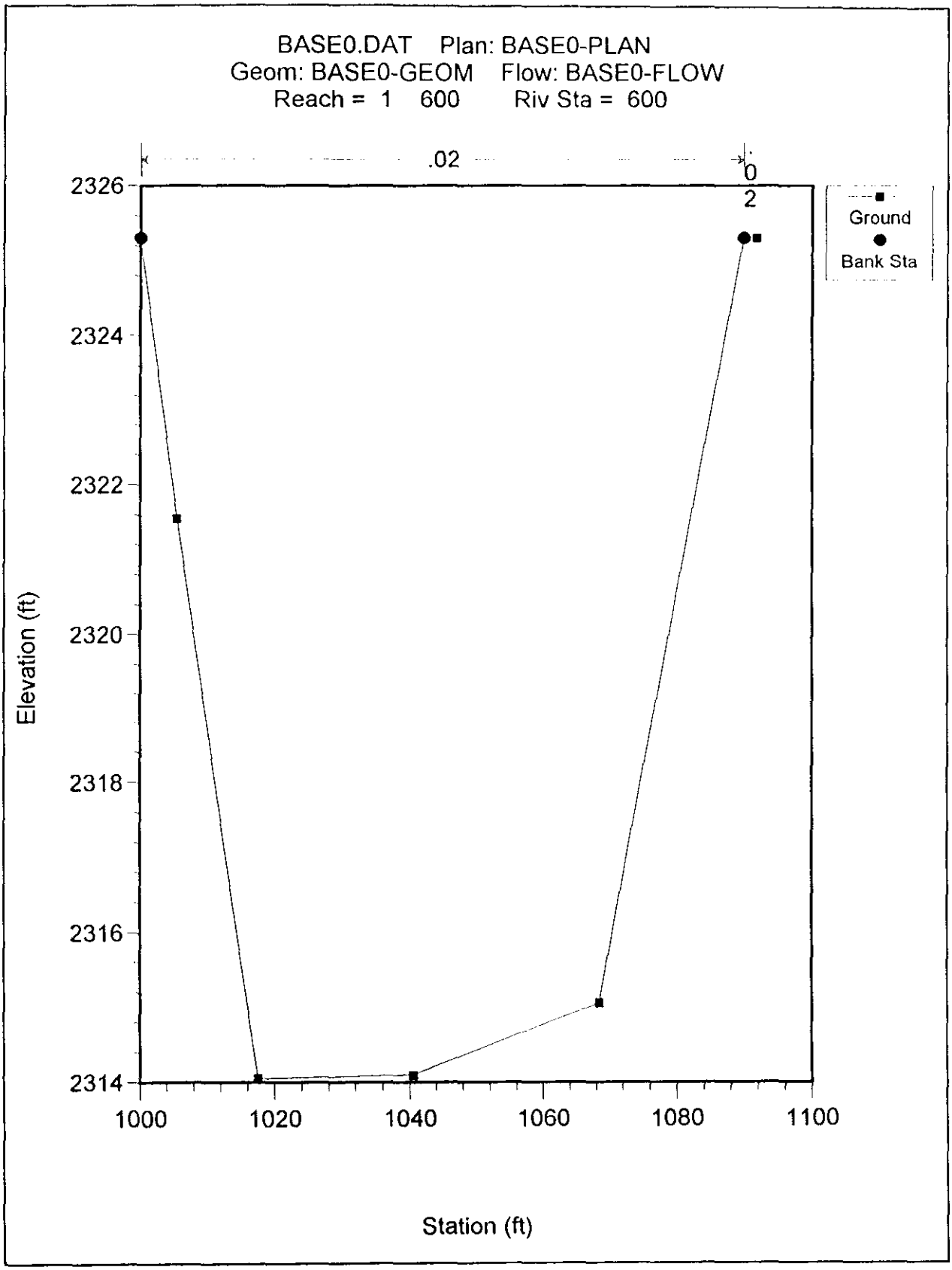

BASE0.DAT Plan: BASE0-PLAN
Geom: BASE0-GEOM Flow: BASE0-FLOW
Reach = 1 550 Riv Sta = 550
.02
.02
.02
Ground
Bank Sta
2315
2310
2305
2300
2295
Elevation (ft)
1000
1020
1040
1060
1080
1100
1120
1140
Station (ft)

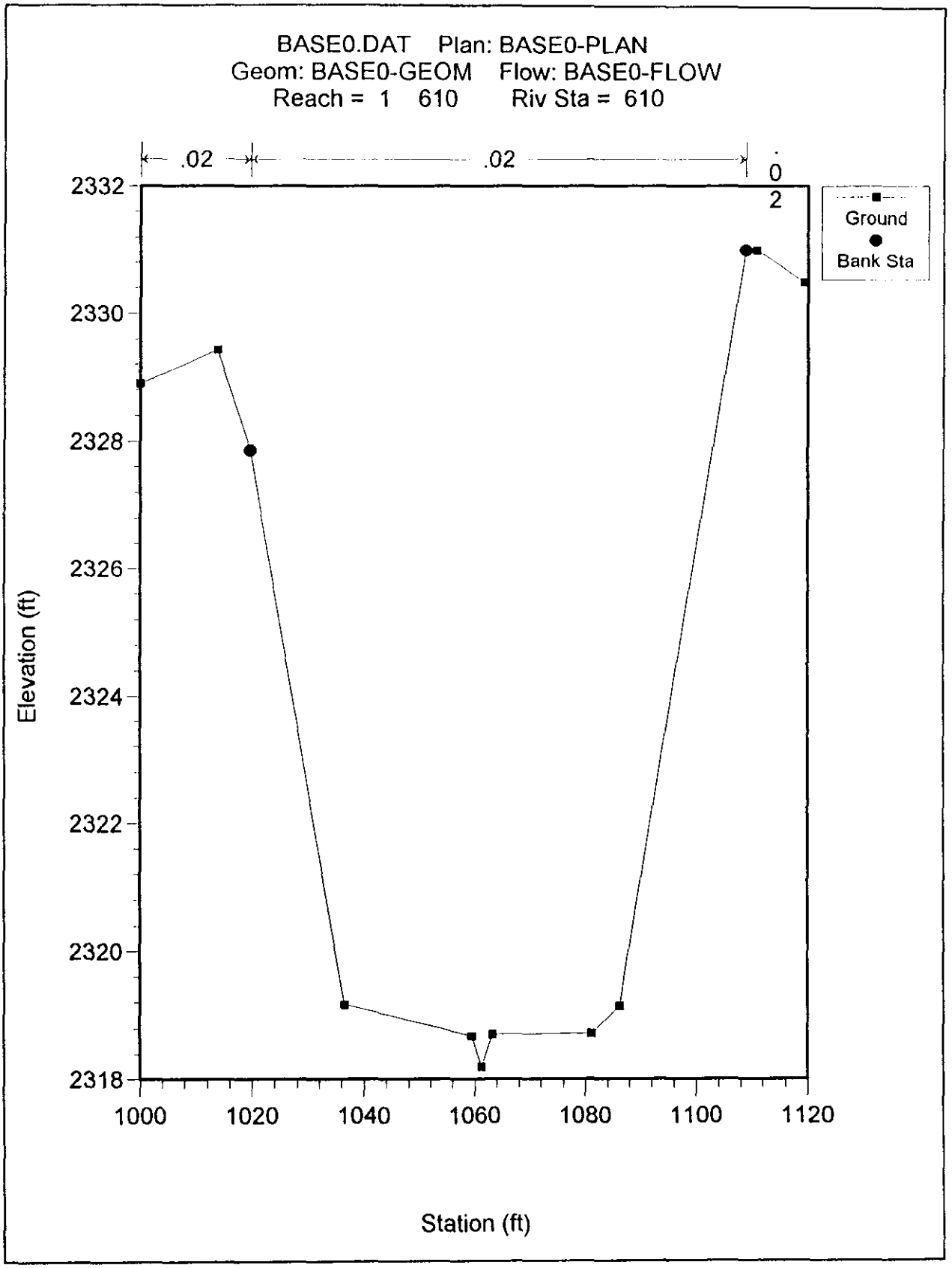

BASE0.DAT Plan: BASE0-PLAN
Geom: BASE0-GEOM Flow: BASE0-FLOW
Reach = 1 560 Riv Sta = 560
.02
.02
.02
Ground
Bank Sta
2320
2315
2310
2305
2300
Elevation (ft)
1000
1020
1040
1060
1080
1100
1120
1140
Station (ft)

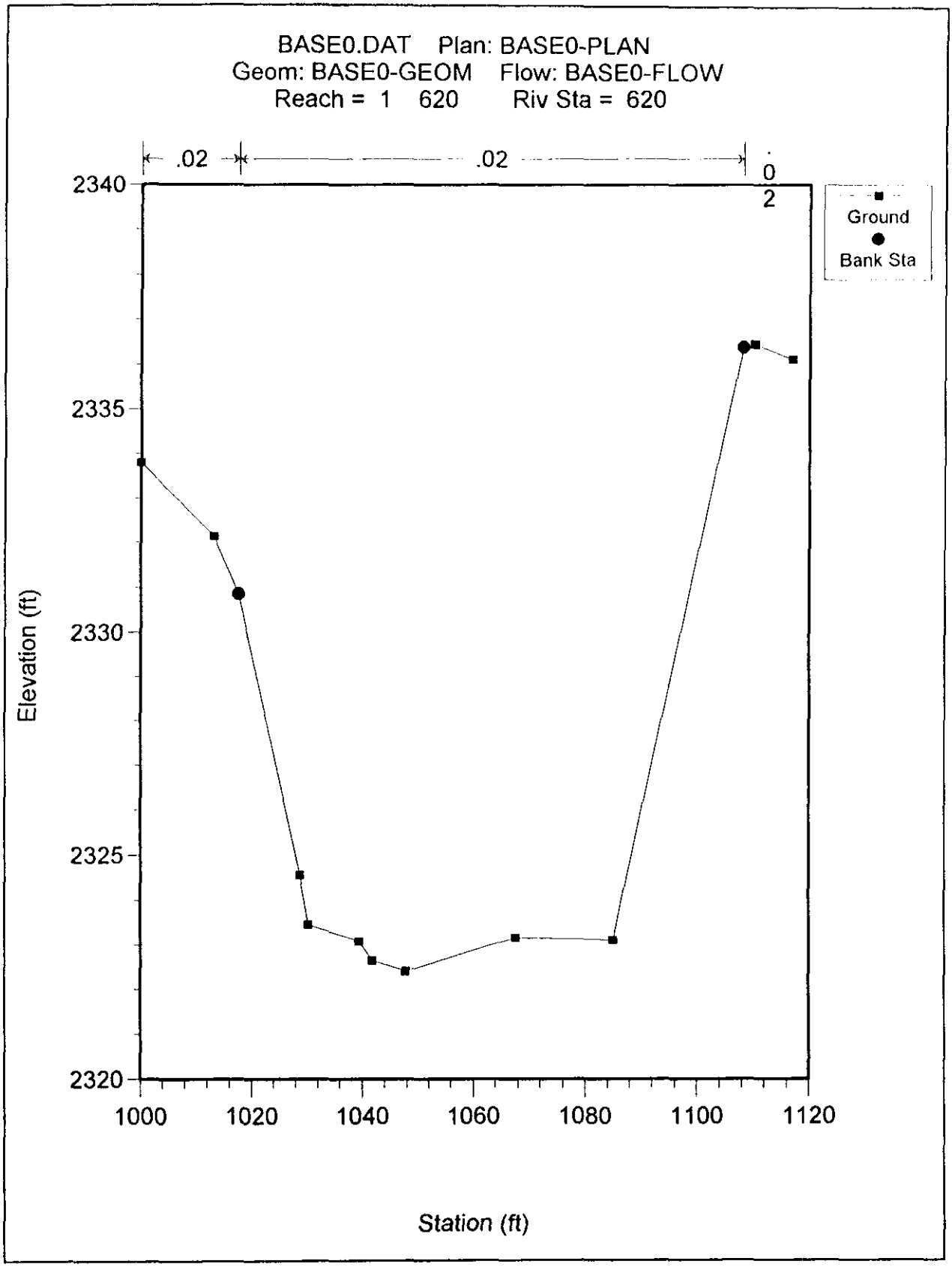

BASE0.DAT Plan: BASE0-PLAN
Geom: BASE0-GEOM Flow: BASE0-FLOW
Reach = 1 570 Riv Sta = 570
.02
Ground
Bank Sta
Elevation (ft)
2318
2316
2314
2312
2310
2308
2306
1000
1020
1040
1060
1080
Station (ft)

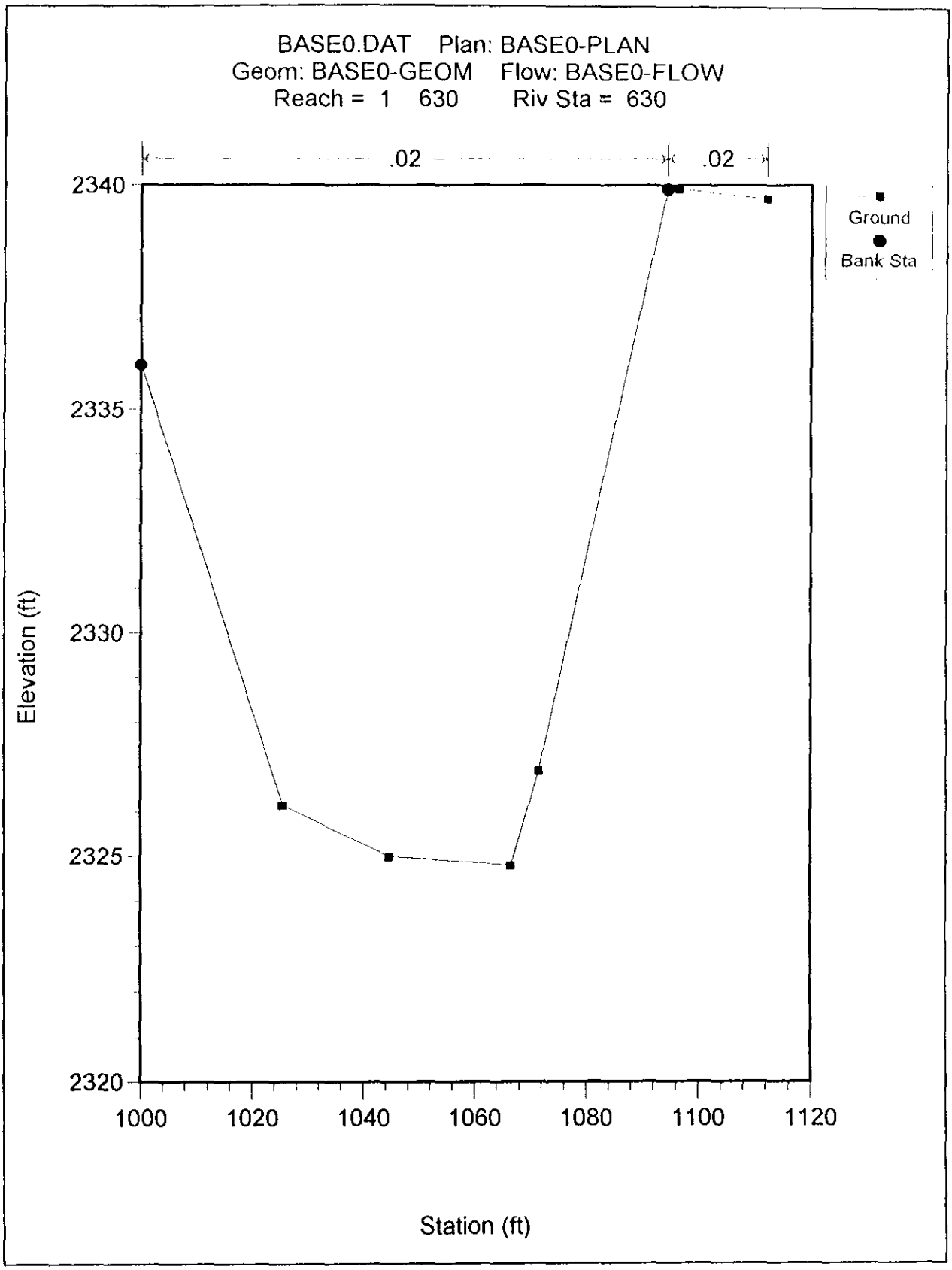

BASE0.DAT Plan: BASE0-PLAN
Geom: BASE0-GEOM Flow: BASE0-FLOW
Reach = 1 580 Riv Sta = 580
.015
.02
Ground
Ineff
Bank Sta
2318
2316
2314
2312
2310
Elevation (ft)
1000
1020
1040
1060
1080
Station (ft)

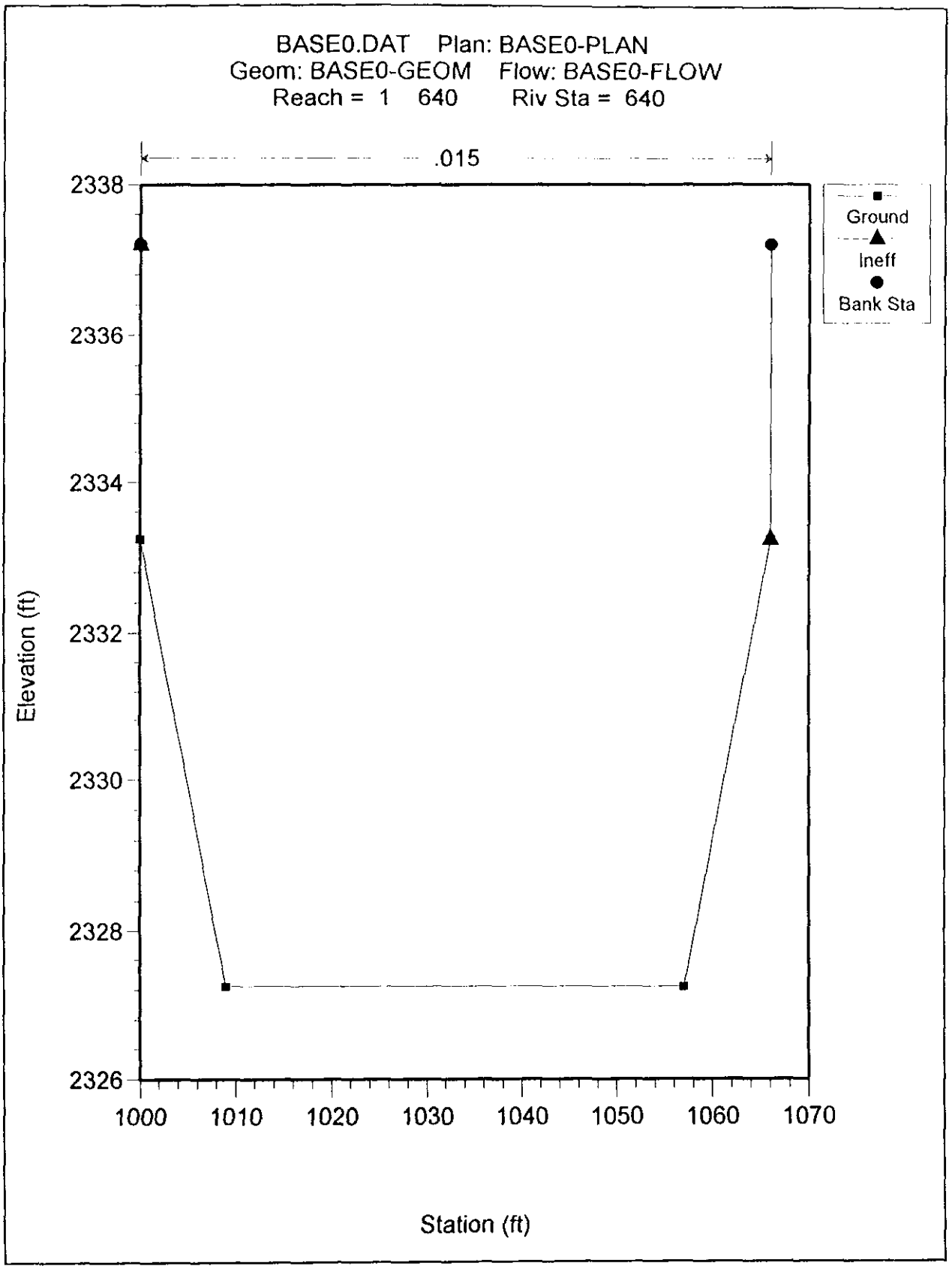

BASE0.DAT Plan: BASE0-PLAN
Geom: BASE0-GEOM Flow: BASE0-FLOW
Reach = 1 590 Riv Sta = 590
.015
Ground
Ineff
Bank Sta
Elevation (ft)
2326
2324
2322
2320
2318
2316
2314
2312
1000
1010
1020
1030
1040
1050
Station (ft)

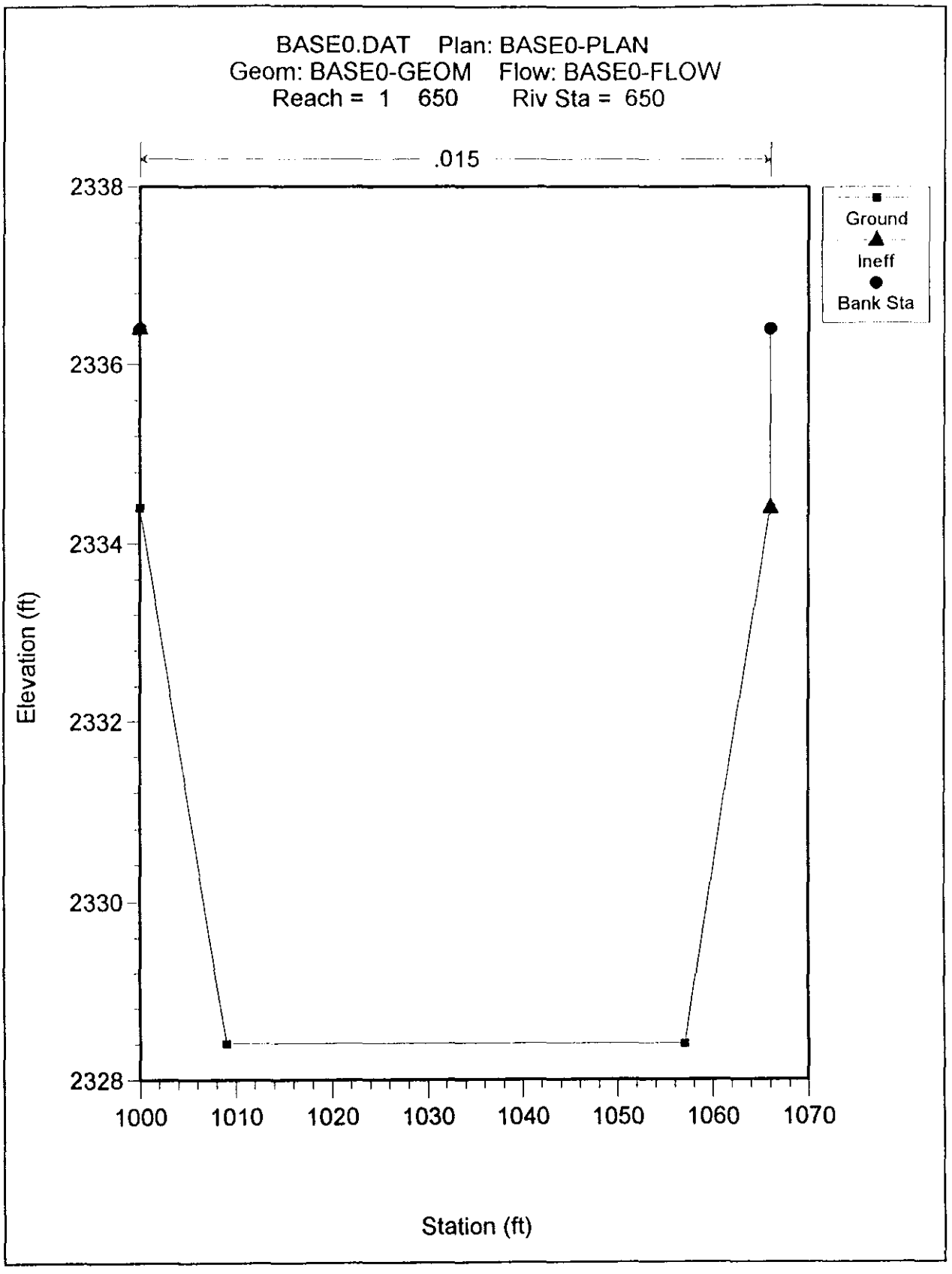

BASE0.DAT Plan: BASE0-PLAN
Geom: BASE0-GEOM Flow: BASE0-FLOW
Reach = 1 600 Riv Sta = 600
.02
0
2
Ground
Bank Sta
2326
2324
2322
2320
2318
2316
2314
Elevation (ft)
1000
1020
1040
1060
1080
1100
Station (ft)

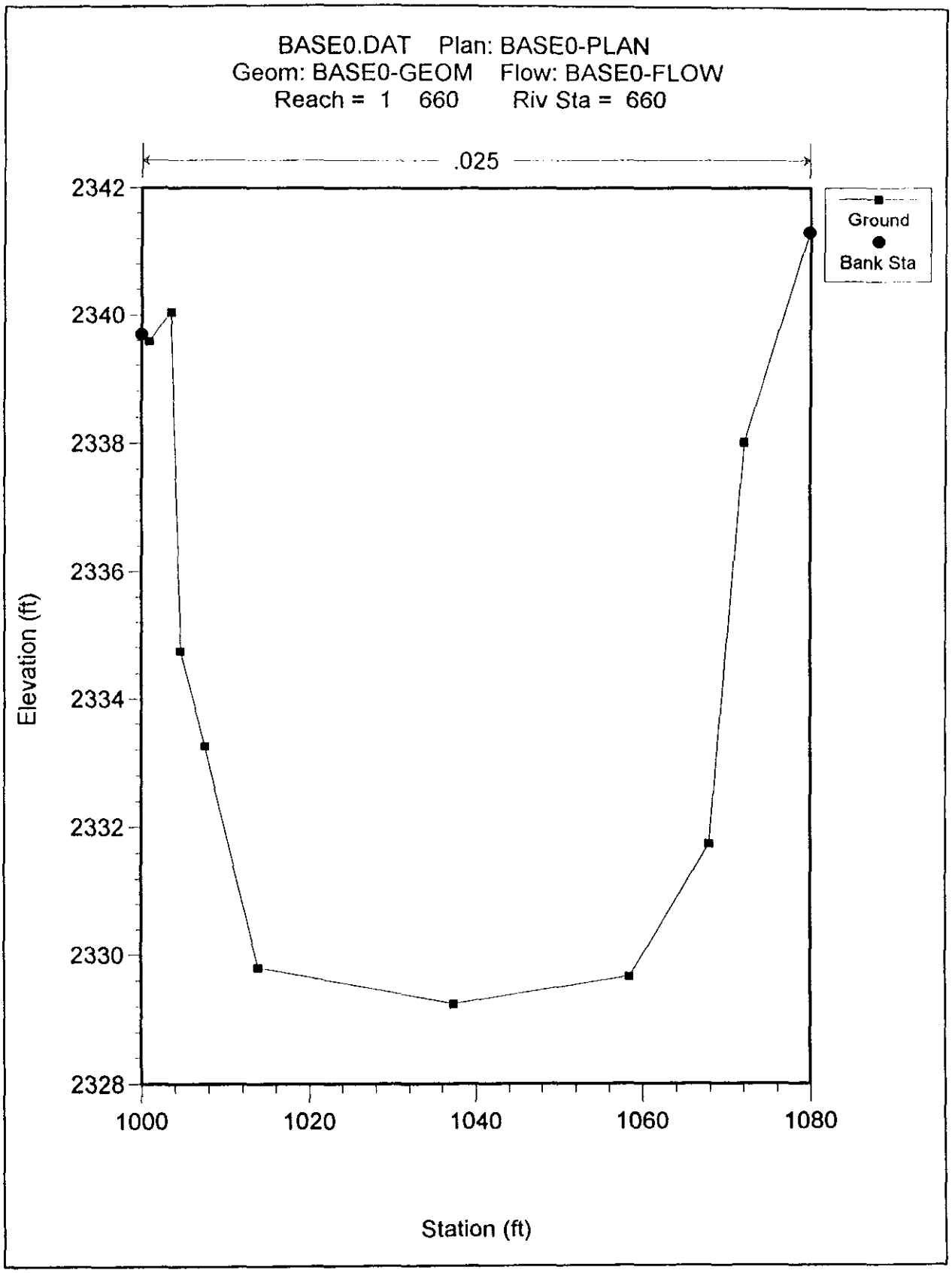

BASE0.DAT Plan: BASE0-PLAN
Geom: BASE0-GEOM Flow: BASE0-FLOW
Reach = 1 610 Riv Sta = 610
.02
.02
.02
Ground
Bank Sta
Elevation (ft)
2332
2330
2328
2326
2324
2322
2320
2318
1000
1020
1040
1060
1080
1100
1120
Station (ft)

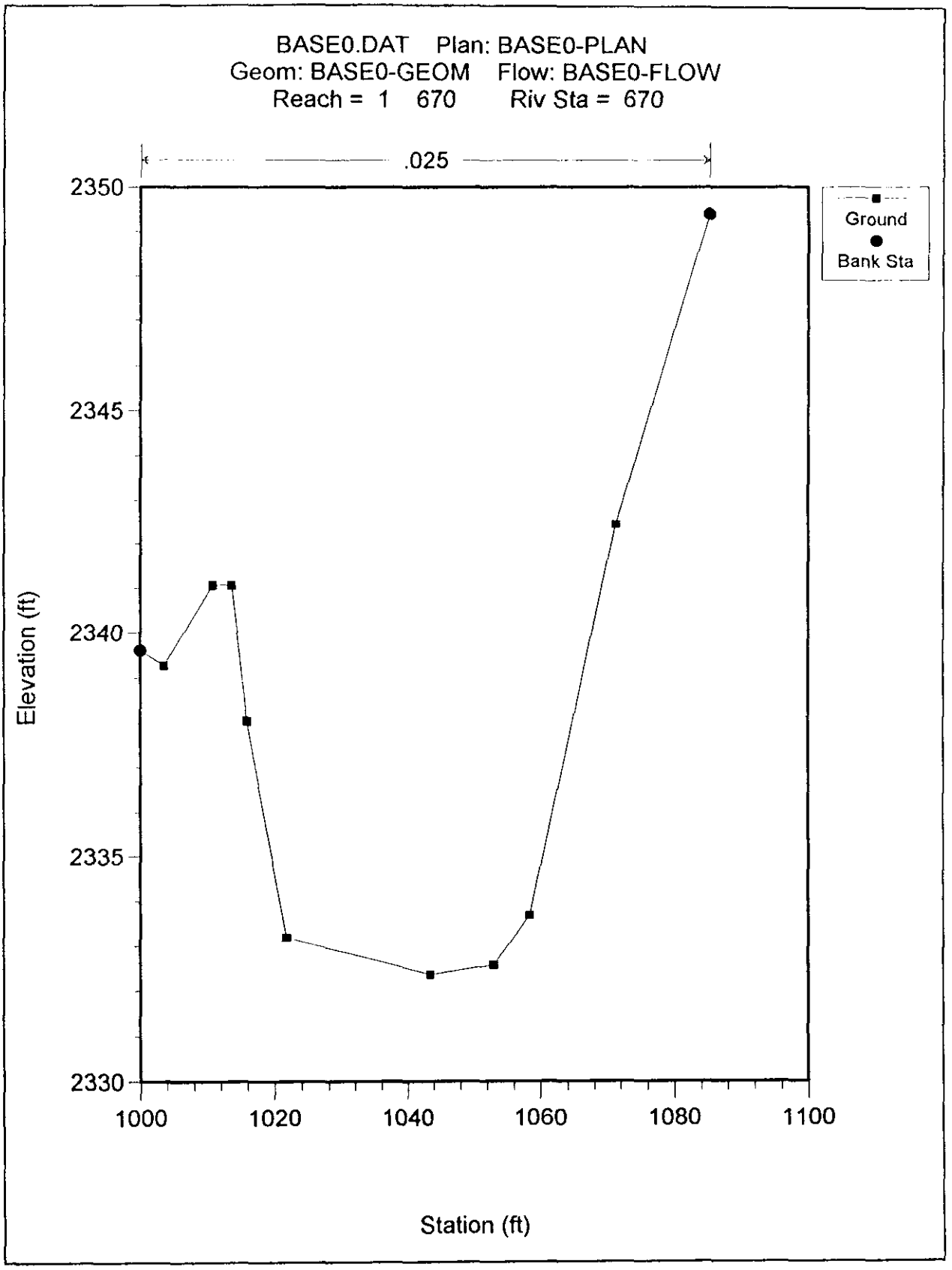

BASE0.DAT Plan: BASE0-PLAN
Geom: BASE0-GEOM Flow: BASE0-FLOW
Reach = 1 620 Riv Sta = 620
.02
.02
.0
2
Ground
Bank Sta
2340
2335
2330
2325
2320
Elevation (ft)
1000
1020
1040
1060
1080
1100
1120
Station (ft)

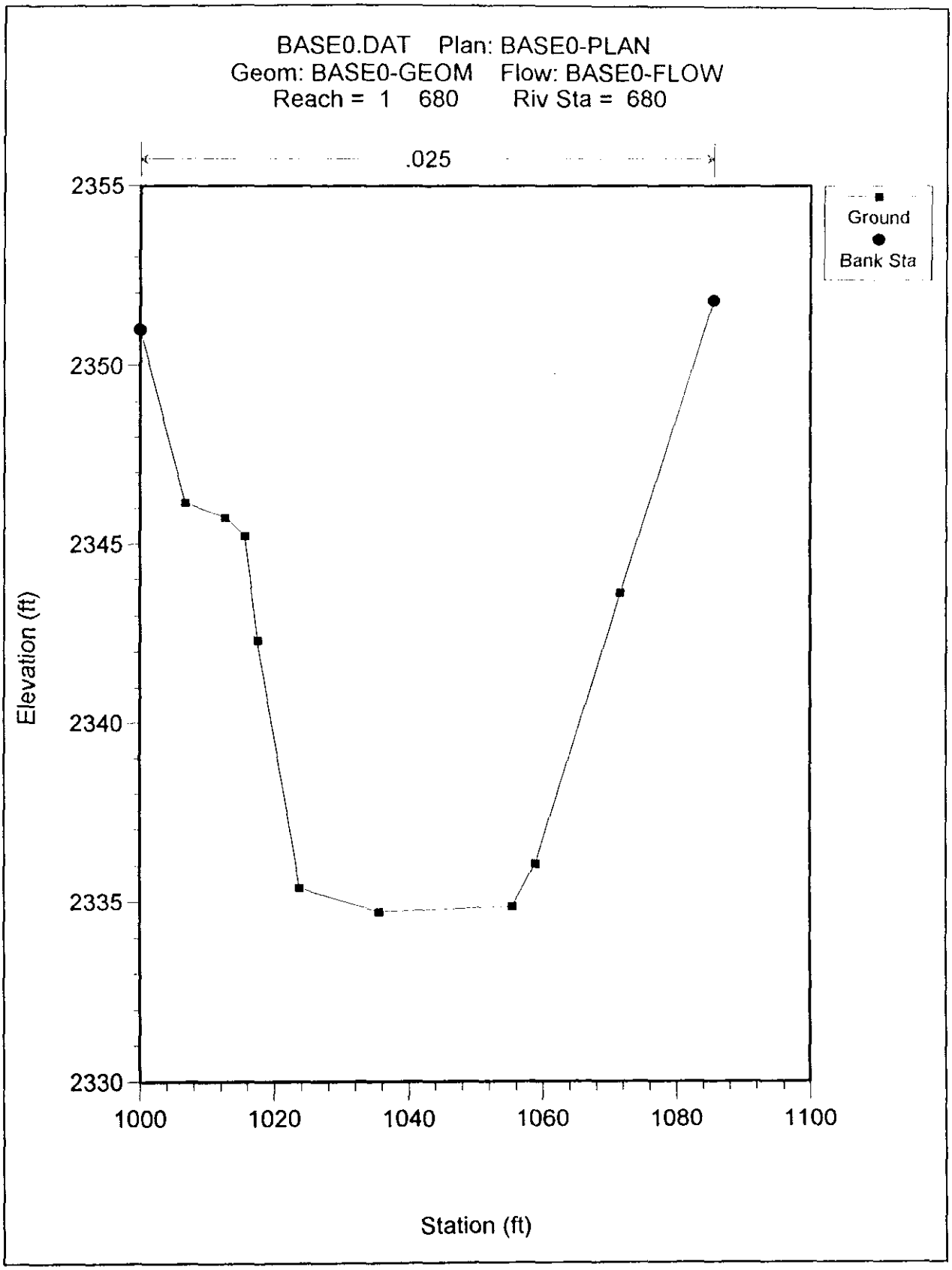

BASE0.DAT Plan: BASE0-PLAN
Geom: BASE0-GEOM Flow: BASE0-FLOW
Reach = 1 630 Riv Sta = 630
.02
.02
Ground
Bank Sta
2340
2335
2330
2325
2320
Elevation (ft)
1000
1020
1040
1060
1080
1100
1120
Station (ft)

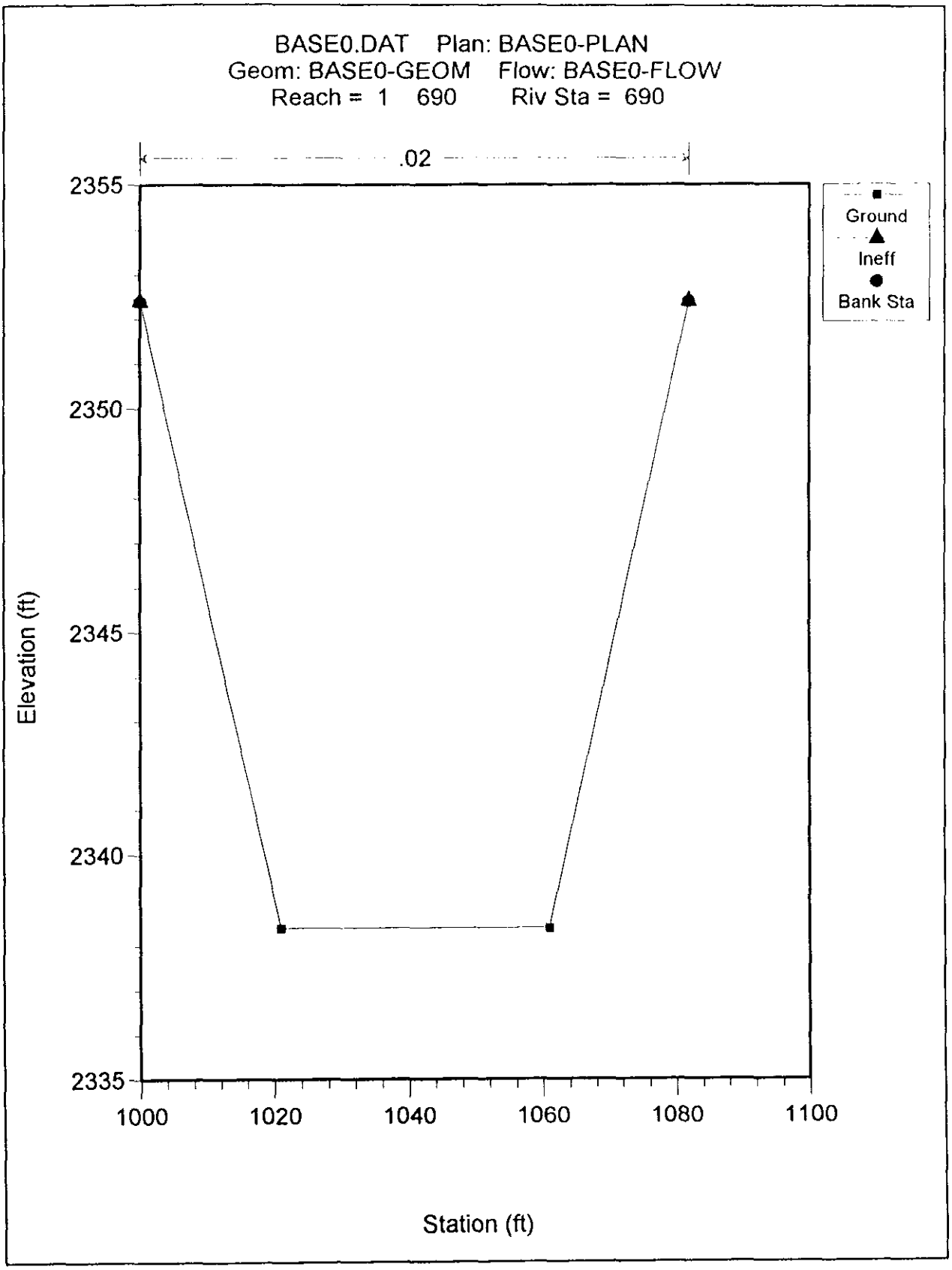

BASE0.DAT Plan: BASE0-PLAN
Geom: BASE0-GEOM Flow: BASE0-FLOW
Reach = 1 640 Riv Sta = 640
.015
Ground
Ineff
Bank Sta
Elevation (ft)
2338
2336
2334
2332
2330
2328
2326
1000
1010
1020
1030
1040
1050
1060
1070
Station (ft)

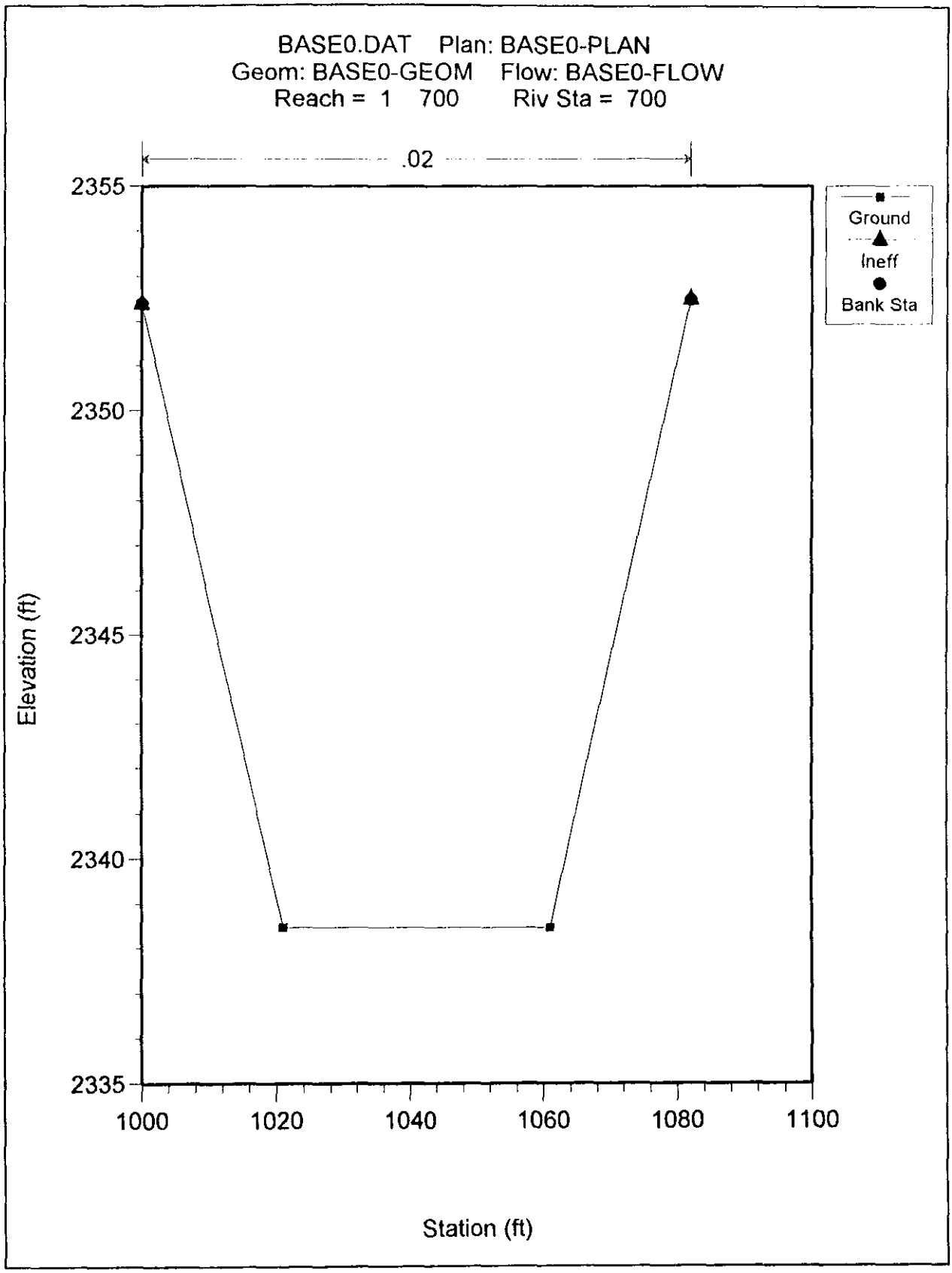

BASE0.DAT Plan: BASE0-PLAN
Geom: BASE0-GEOM Flow: BASE0-FLOW
Reach = 1 650 Riv Sta = 650
.015
Ground
Ineff
Bank Sta
Elevation (ft)
2338
2336
2334
2332
2330
2328
1000
1010
1020
1030
1040
1050
1060
1070
Station (ft)

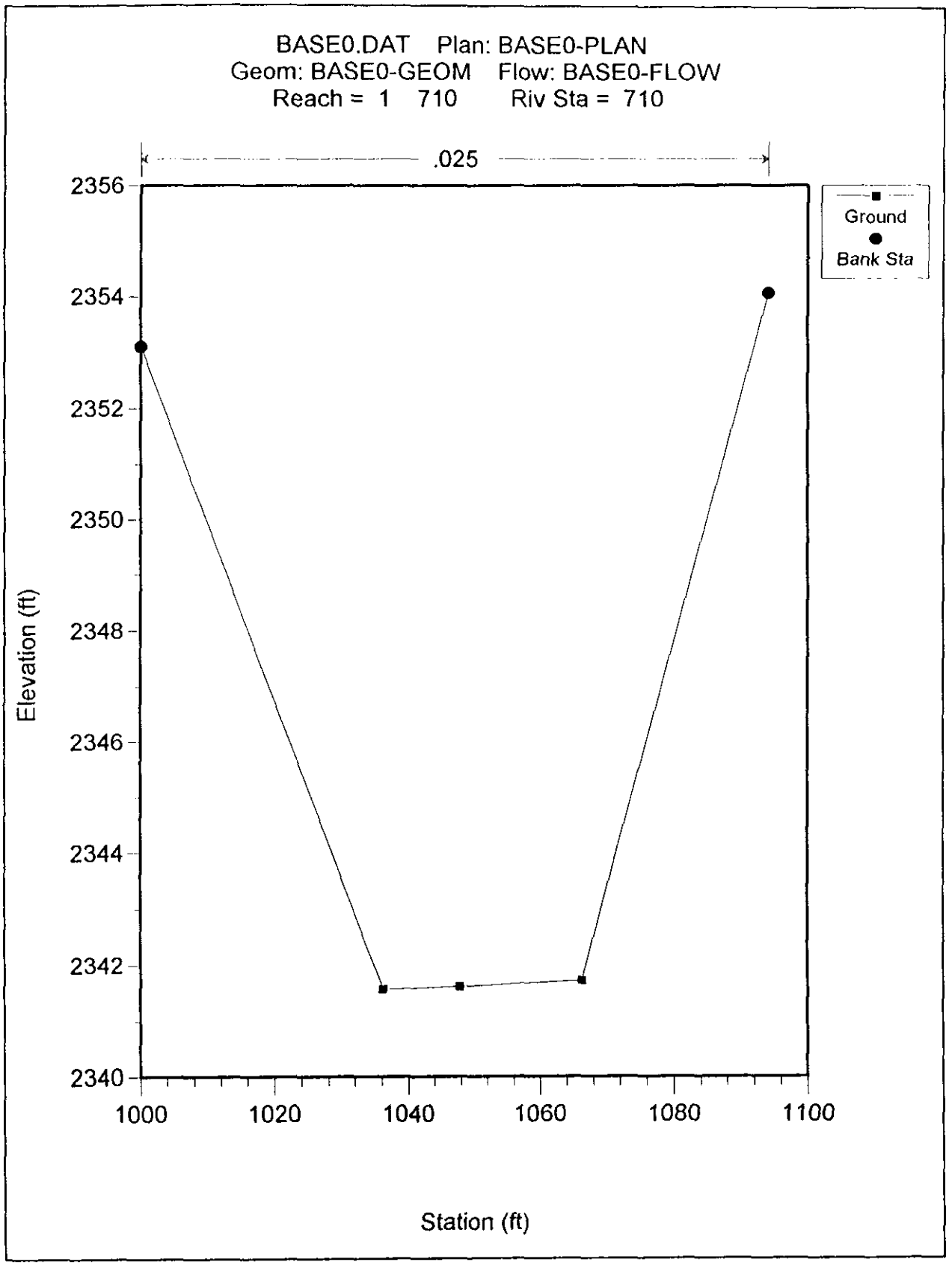

BASE0.DAT Plan: BASE0-PLAN
Geom: BASE0-GEOM Flow: BASE0-FLOW
Reach = 1 660 Riv Sta = 660
.025
Ground
Bank Sta
Elevation (ft)
2342
2340
2338
2336
2334
2332
2330
2328
1000
1020
1040
1060
1080
Station (ft)


BASE0.DAT Plan: BASE0-PLAN
Geom: BASE0-GEOM Flow: BASE0-FLOW
Reach = 1 670 Riv Sta = 670
.025
Ground
Bank Sta
Elevation (ft)
2350
2345
2340
2335
2330
1000
1020
1040
1060
1080
1100
Station (ft)


BASE0.DAT Plan: BASE0-PLAN
Geom: BASE0-GEOM Flow: BASE0-FLOW
Reach = 1 680 Riv Sta = 680
.025
Ground
Bank Sta
2355
2350
2345
2340
2335
2330
Elevation (ft)
1000
1020
1040
1060
1080
1100
Station (ft)


BASE0.DAT Plan: BASE0-PLAN
Geom: BASE0-GEOM Flow: BASE0-FLOW
Reach = 1 690 Riv Sta = 690
.02
Ground
Ineff
Bank Sta
2355
2350
2345
2340
2335
Elevation (ft)
1000
1020
1040
1060
1080
1100
Station (ft)


BASE0.DAT Plan: BASE0-PLAN
Geom: BASE0-GEOM Flow: BASE0-FLOW
Reach = 1 700 Riv Sta = 700
.02
Ground
Ineff
Bank Sta
Elevation (ft)
2355
2350
2345
2340
2335
1000
1020
1040
1060
1080
1100
Station (ft)


BASE0.DAT Plan: BASE0-PLAN
Geom: BASE0-GEOM Flow: BASE0-FLOW
Reach = 1 710 Riv Sta = 710
.025
Ground
Bank Sta
Elevation (ft)
2356
2354
2352
2350
2348
2346
2344
2342
2340
1000
1020
1040
1060
1080
1100
Station (ft)

2.3.2 JONES BLVD. TO INDUSTRIAL RD. REACH

MANNING'S NUMBER ("n")

PROJECT: FLAMINGO WASH FIS RESTUDY
DRAWING: FLLDWG

HEC-2 STATION	$n_{channel}$	$n_{left\ overbank}$	$n_{right\ overbank}$	ROLL#/PICTURE#	PAGE# CALC. SHEET
10	0.025	0.020	0.020	2 / 7-16	12 & 13 of 37
20	0.015	0.020	0.020	2 / 14	BRIDGE
30	0.015	0.020	0.020	2 / 13	BRIDGE
40	0.025	0.020	0.020	2 / 7-16	12 & 13 of 37
50	0.025	0.020	0.020	2 / 7-16	12 & 13 of 37
60	0.015	0.020	0.020	2 / 11	
70	0.015	0.020	0.020	2 / 11	
80	0.015	0.020	0.020	2 / 11	
90	0.015	0.020	0.020	2 / 11	BRIDGE
100	0.015	0.020	0.020	2 / 11	BRIDGE
110	0.025	0.020	0.020	2 / 7-16	12 & 13 of 37
120	0.025	0.020	0.020	2 / 7-16	12 & 13 of 37
130	0.015	0.020	0.020	2 / 10	BRIDGE
140	0.015	0.020	0.020	2 / 9	BRIDGE
150	0.020	0.020	0.020	2 / 7-8	
160	0.020	0.030	0.030	2 / 1-6	10 & 11 of 37
170	0.015	0.030	0.030	2 / 6	BRIDGE
180	0.015	0.030	0.030	2 / 5	BRIDGE
190	0.025	0.030	0.030	2 / 1-6	10 & 11 of 37
200	0.025	0.030	0.030	2 / 1-6	10 & 11 of 37
210	0.025	0.030	0.030	2 / 1-6	10 & 11 of 37
220	0.025	0.030	0.030	2 / 1-6	10 & 11 of 37
230	0.025	0.030	0.030	2 / 1-6	10 & 11 of 37
240	0.025	0.030	0.030	2 / 1-6	10 & 11 of 37
250	0.025	0.030	0.030	1 / 28-37	9 & 10 of 37
260	0.015	0.030	0.030	1 / 36-37	BRIDGE
270	0.015	0.030	0.030	1 / 35	BRIDGE
280	0.025	0.030	0.030	1 / 28-37	9 & 10 of 37
290	0.025	0.030	0.030	1 / 28-37	9 & 10 of 37
300	0.015	0.030	0.030	1 / 31	
310	0.015	0.030	0.030	1 / 33	BRIDGE
320	0.015	0.030	0.030	1 / 30	BRIDGE
330	0.015	0.030	0.030	1 / 28-37	9 & 10 of 37
340	0.025	0.030	0.030	1 / 28-37	9 & 10 of 37
350	0.030	0.030	0.030	1 / 27	
360	0.015	0.030	0.030	1 / 27	BRIDGE
370	0.015	0.030	0.030	1 / 26	BRIDGE
380	0.035	0.035	0.035	1 / 21-27	7 & 8 of 37
390	0.035	0.035	0.035	1 / 21-27	7 & 8 of 37
400	0.035	0.035	0.035	1 / 21-27	7 & 8 of 37
410	0.035	0.035	0.035	1 / 21-27	7 & 8 of 37
420	0.035	0.035	0.035	1 / 21-27	7 & 8 of 37
430	0.030	0.025	0.025	1 / 16-20	5 & 6 of 37
440	0.030	0.025	0.025	1 / 16-20	5 & 6 of 37
450	0.030	0.025	0.025	1 / 16-20	5 & 6 of 37

460	0.030	0.025	0.025	1 / 16-20	5 & 6 of 37
470	0.030	0.025	0.025	1 / 16-20	5 & 6 of 37
480	0.015	0.025	0.025	1 / 12	
490	0.015	0.020	0.020	1 / 12	BRIDGE
500	0.015	0.020	0.020	1 / 11	BRIDGE
510	0.020	0.020	0.020	1 / 6-15	3 & 4 of 37
520	0.020	0.020	0.020	1 / 6-15	3 & 4 of 37
1001	0.016	0.016	0.016	NONE	SEE TEXT
1002	0.016	0.010	0.030	NONE	SEE TEXT
1003	0.016	0.010	0.030	NONE	SEE TEXT
1004	0.016	0.010	0.030	NONE	SEE TEXT
1005	0.016	0.100	0.030	NONE	SEE TEXT
1006	0.016	0.100	0.030	NONE	SEE TEXT
1007	0.016	0.100	0.030	NONE	SEE TEXT
1008	0.016	0.100	0.030	NONE	SEE TEXT
1009	0.016	0.100	0.030	NONE	SEE TEXT

DATE 6/

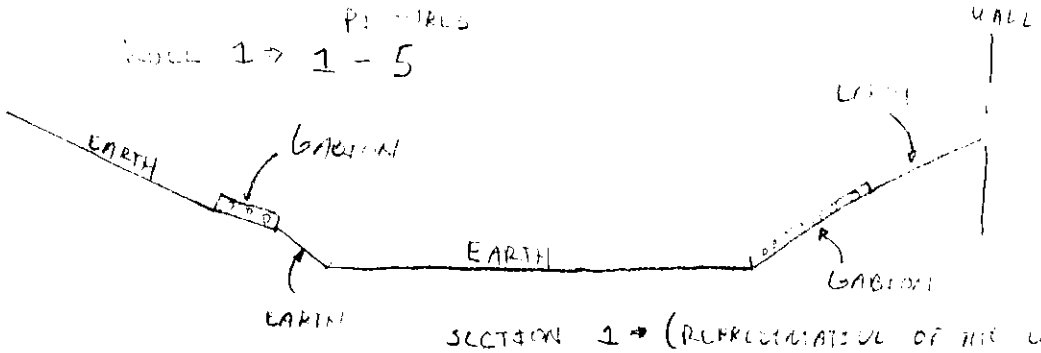
CLIENT [illegible] JOB NO 550.032 C CALC BY

DESCRIPTION [illegible] CHECKED BY

$n_c = (n_0 + n_1 + n_2 + n_3 + n_4) m_5$

PICTURES

ROLL 1 → 1 - 5



SECTION 1 → (REPRESENTATIVE OF THE LOWER REACH)

MATERIALS

EARTH = 0.020 GABION = 0.030

12% CONSIST OF GABIONS, 88% CONSIST OF EARTH

$n_0 = 12\%\,(.030) + 88\%\,(0.020) = .021$

IRREGULARITY:

SMOOTH

$n_1 = 0.000$

VARIATIONS:

GRADUAL

$n_2 = 0.000$

OBSTRUCTIONS:

NEGLIBLE

$n_3 = 0.000$

VEGETATION:

LOW

$n_4 = 0.005$

DEGREE OF MEANDERING

MINOR

$m_5 = 1.000$

$n_{CHANNEL} = 0.0262$ ROUND TO

$n_{CHANNEL} = 0.025$

PICTURE ROLL 1 → 1 - 5

EN-3-N
3/66

SHEET 1 OF 37

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD / LAS VEGAS, NEVADA 89102

DATE _____

CLIENT CCRFCD JOB NO 550.022.2 CALC BY _____

DESCRIPTION OVERBANK MANNING'S n CHECKED BY _____

MANNING'S n

LAND USE: GRASS LAND USE: TREES

30% CANOPY OF GRASS 70% CANOPY OF TREES

n_0 = 30% (.030) + 70% (0.020) = .023

IRREGULARITY:

SMOOTH

n_1 = 0.000

VARIATIONS:

GRADUAL

n_2 = 0.000

OBSTRUCTIONS:

NEGLIGIBLE

n_3 = 0.000

VEGETATION

LOW

n_4 = 0.005

DEGREE OF MEANDERING

MINOR

n_5 = 1.000

$n_{LEFT, RIGHT\ OVERBANK}$ = .028 ROUND TO

$n_{OVERBANK}$ = 0.03

PICTURE

ROLL 1 => 1-5

EN-3-N
3/66

SHEET 2 OF 37

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102

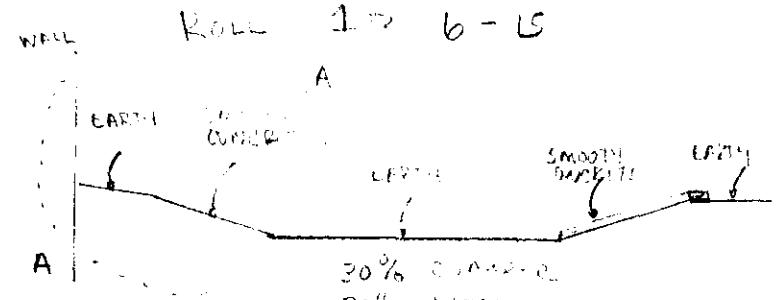
DATE 6/

CLIENT CCRFCD JOB NO 550.032C CALC BY

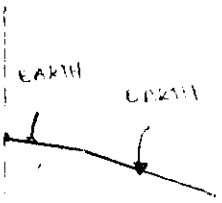
DESCRIPTION CHANNEL MANNING'S "n" CHECKED BY

PHOTOS

ROLL 1 → 6-15

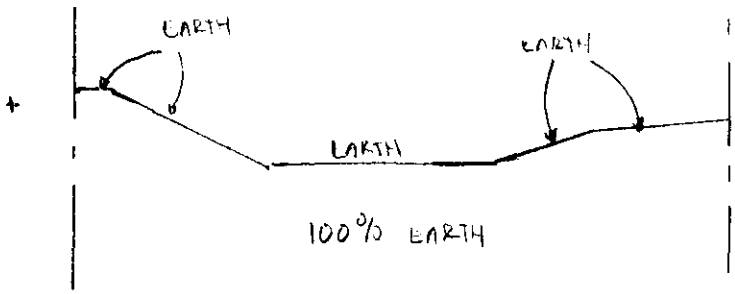


30% CONCRETE
90% WIDTH
SECTION 1



⇒ SAME AS SECTION 1

15% CONCRETE
85% EARTH
SECTION 1A



SECTION 2

15% OF THE REACH IS COMPRISED OF SECTION 1A

30% OF THE REACH IS COMPRISED OF SECTION 2

55% OF THE REACH IS COMPRISED OF SECTION 1

MATERIAL:

EARTH = 0.020 CONCRETE = 0.015

$$n_0 = 55\%\left[30\%(.015) + 70\%(.020)\right] + 15\%\left[15\%(.015) + 85\%(.020)\right] + 30\%(.020)\Big] = .019$$

IRREGULARITY:

SMOOTH

$n_1 = 0.000$

VARIATION:

GRADUAL

$n_2 = 0.000$

OBSTRUCTION:

NEGLIBLE

$n_3 = 0.000$

VEGETATION:

NONE

$n_4 = 0.000$

DEGREE OF MEANDERING

MINOR

$m_5 = 1.000$

$n_{CHANNEL} = 0.019$ ROUND TO

$n_{CHANNEL} = 0.02$

ROLL 1 PICTURE 6-15

EN-3-N
3/66

SHEET 3 OF 37

G.C. WALLACE, INC.
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1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102

DATE

CLIENT SCRTCD JOB NO 550.032 CALC BY

DESCRIPTION OVERBANK MANNINGS 'n' CHECKED BY

80% [illegible]

20% [illegible]

55% [illegible]

45% [illegible]

MATERIAL

LEFT 0.030 RIGHT 0.015

$$n_o = 55\%\left[80\%(.015) + 20\%(0.030)\right] + 15\%\left[55\%(0.020) + 45\%(.015)\right]$$

$$+ 30\%(0.000)\Big] = 0.017$$

IRREGULARITY	VARIATIONS	OBSTRUCTION
SMOOTH	GRADUAL	NEGLIBLE
$n_1 = 0.000$	$n_2 = 0.000$	$n_3 = 0.000$

VEGETATION	DEGREE OF MEANDERING
NONE	MINOR
$n_4 = 0.000$	$m_5 = 1.000$

$n_{LEFT, RIGHT\ OVERBANK} = 0.017$ ROUND TO

$n_{OVERBANK} = 0.02$

PICKED ROLL 1 = 6-15

EN-3-N
3/66

SHEET 4 OF 37

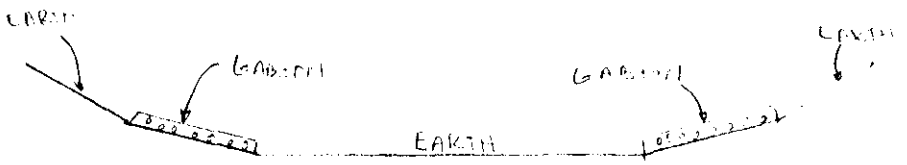
G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD / LAS VEGAS, NEVADA 89102

DATE

CLIENT CCRFCD JOB NO 550.032.C CALC BY

DESCRIPTION CHANNEL CHECKED BY

ROLL 1 ⇒ 16-20



SECTION 1 ⇒ (REMAINDER OF THE CHANNEL)

MATERIALS

EARTH: 0.020 GABION: 0.030

20% CONSIST OF GABION, 80% CONSIST OF EARTH

n_o: 20% (0.030) + 80% (0.020) = 0.022

IRREGULARITY'S	VARIATIONS	OBSTRUCTION
SMOOTH	GRADUAL	NEGLIBLE
$n_1 = 0.000$	$n_2 = 0.000$	$n_3 = 0.000$

VEGETATION	DEGREE OF MEANDERING
LOW	MINOR
$n_4 = 0.005$ (MAINTENANCE AGREEMENT)	$m_5 = 1.000$

$n_{CHANNEL}$: 0.027 ROUND TO

$n_{CHANNEL} = 0.030$

ROLL 1 ⇒ PICTURE 16-20

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1555 SOUTH RAINBOW BLVD / LAS VEGAS, NEVADA 89102

DATE 6/ .

CLIENT CCRFCD JOB NO 550.032.S CALC BY

DESCRIPTION [illegible] MANNING'S 'n' CHECKED BY

NATURAL 3

[illegible] GABION = 2.[illegible]

70% [illegible] 30% [illegible]

MATERIAL :

n_0 = 70% (0.040) + 30% (0.030) = 0.037

IRREGULARITY %	VARIATIONS %	OBSTRUCTIONS %
SMOOTH	GRADUAL	NEGLIGIBLE
n_1 = 0.000	n_2 = 0.000	n_3 = 0.000

VEGETATION %	DEGREE OF MEANDERING
NONE	MINOR
n_4 = 0.000	m_5 = 1.000

$n_{LEFT,\ RIGHT\ OVERBANK}$ = 0.037 ROUND TO

$n_{OVERBANK}$ = 0.025 ROLL 1 => 16-20 PREFERRED

G.C. WALLACE, INC.
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DATE 6/[illegible]-9

CLIENT CCRFCD JOB NO 552.032 CALC BY

DESCRIPTION CHANNEL MANNING'S "n" CHECKED BY

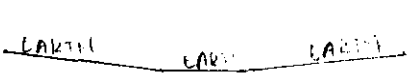
ROLL 1 ⇒ 21 - 27



90% EARTH 10% CONCRETE

SECTION 1

+



100% EARTH

SECTION 2

30% OF THE REACH IS COMPRISED OF SECTION 1

70% OF THE REACH IS COMPRISED OF SECTION 2

MATERIAL:

EARTH = 0.020 CONCRETE = 0.015

$$n_0 = 30\% \left[90\%(0.020) + 10\%(0.015) \right] + 70\%(0.020) = 0.020$$

IRREGULARITY:

MINOR

$n_1 = 0.005$

VARIATIONS:

ALTERNATING OCCASIONALLY

$n_2 = 0.005$

OBSTRUCTION:

NEGLIGIBLE

$n_3 = 0.000$

VEGETATION

LOW

$n_4 = 0.005$

DEGREE OF MEANDERING

MINOR

$m_5 = 1.000$

PICTURE ROLL 1 ⇒ 21-27

$$n_{CHANNEL} = 0.035$$

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DATE 6/[illegible]/97

CLIENT CCRFCD JOB NO 550.032 C CALC BY

DESCRIPTION OVERBANK MANNING'S "n" CHECKED BY

SECTION 1 @

15% CONCRETE

85% EARTH

SECTION 2 @

100% EARTH

MATERIALS

EARTH = 0.020 CONCRETE = 0.015

$n_0 = 30\%\left[15\%\,(0.015) + 85\%\,(0.020)\right] + 70\%\,(0.020) = 0.020$

IRREGULARITY:

MINOR

$n_1 = 0.005$

VARIATIONS:

ALTERNATING OCCASSIONALLY

$n_2 = 0.005$

OBSTRUCTIONS:

NEGLIBLE

$n_3 = 0.000$

VEGETATION:

LOW

$n_4 = 0.005$

DEGREE OF MEANDERING

MINOR

$m_5 = 1.000$

$n_{LEFT,\,RIGHT\ OVERBANK} = 0.035$

PICTURE ROLL 1 ⇒ 21-27

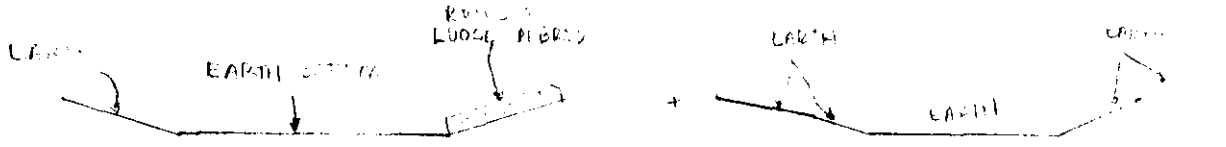
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CLIENT CORTEZ JOB NO 550.C22.2 CALC BY

DESCRIPTION CHANNEL ROUGHNESS CHECKED BY

PICTURE
ROLL 1 => 28-37



90% EARTH BOTTOM AND RUBBLE SIDES

10% EARTH

SECTION 1

100% EARTH

SECTION 2

60% OF THE REACH IS COMPARABLE TO SECTION 1

40% OF THE REACH IS COMPARABLE OF SECTION 2

MATERIALS

EARTH BOTTOM & RUBBLE SIDES = 0.030 EARTH = 0.020

$$n_o = 60\%\left[90\%(0.030) + 10\%(0.020)\right] + 40\%(0.020) = 0.025$$

IRREGULARITY %	VARIATION %	OBSTRUCTION %
SMOOTH	GRADUAL	NEGLIBLE
$n_1 = 0.000$	$n_2 = 0.000$	$n_3 = 0.000$

VEGETATION %	DEGREE OF MEANDERING	$n_{CHANNEL}$
NONE	MINOR	$= 0.025$
$n_4 = 0.000$	$m_5 = 1.000$	

PICTURE
ROLL 1 => 28-37

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DATE _____

CLIENT CCRFCD JOB NO 550.038.C CALC BY _____

DESCRIPTION OVERBANK MANNING'S n CHECKED BY _____

SECTION 1 & SECTION 2

50% RUBBLE SIDES 50% EARTH

MATERIALS

RUBBLE SIDES: 0.020 EARTH: 0.020

$n_0 = 60\%\left[50\%(0.030) + 50\%(0.030)\right] + 40\%(0.020) = 0.023$

IRREGULARITY	VARIATIONS	OBSTRUCTIONS
SMOOTH	GRADUAL	NEGLIGIBLE
$n_1 = 0.000$	$n_2 = 0.000$	$n_3 = 0.000$

VEGETATION	DEGREE OF MEANDERING
LOW	MINOR
$n_4 = 0.005$	$n_5 = 1.000$

$n_{LEFT,\ RIGHT\ OVERBANK} = 0.028$ ROUND TO

$n_{OVERBANK} = 0.03$

PICTURE ROLL 1 => 28-37

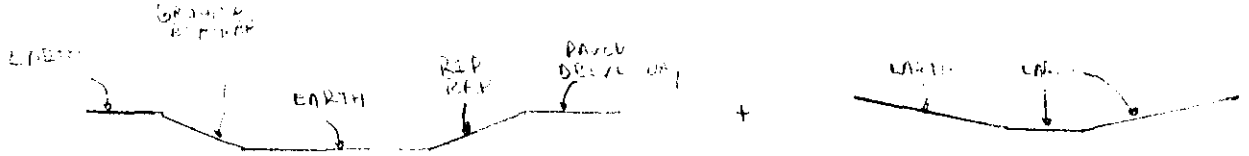
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DATE

CLIENT CCRFCD JOB NO 550.032 CALC BY

DESCRIPTION CHANNEL MANNING'S "n" CHECKED BY

1 - 6



≈10" ⇐⇒ 8% RIP-RAP 7% GROUTED RIP RAP 100% EARTH

85% EARTH SECTION 2

SECTION 1 20% OF THE REACH IS COMPRISED OF SECTION 1

80% OF THE REACH IS COMPRISED OF SECTION 2

MATERIALS

$n_{RIP\text{-}RAP} = 0.0395 (d_{50})^{1/6} = 0.038$ $n_{GROUTED\ RIP\text{-}RAP} = 0.030$ $n_{EARTH} = 0.020$

$$n_0 = 20\% \left[8\% (0.038) + 7\% (0.030) + 85\% (0.020) \right] + 80\% (0.020) = 0.020$$

IRREGULARITY %	VARIATION %	OBSTRUCTION %
SMOOTH	GRADUAL	NEGLIBLE
$n_1 = 0.00$	$n_2 = 0.000$	$n_3 = 0.000$

VEGETATION %	DEGREE OF MEANDERING %
LOW	MINOR
$n_4 = 0.005$	$m_5 = 1.000$

$n_{CHANNEL} = 0.025$

PICTURE ROLL 2 = 1 - 6

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DATE 6/1/99

CLIENT CCRFCD JOB NO 550.1.2a.c CALC BY

DESCRIPTION OVERBANK MANNING'S 'n' CHECKED BY

SECTION 1-3

50% RIP RAP

50% GROUTED RIP-RAP

SECTION 4-13

100% EARTH

MATERIALS

$n_{RIP\text{-}RAP} = 0.0395\,(d_{50})^{1/6} = 0.038$ (FOR $d_{50} \cong 10''$) $\quad n_{GROUTED\ RIP\text{-}RAP} = 0.020$

$n_{EARTH} = 0.020$

$n_0 = 20\%\left[50\%(0.038) + 50\%(0.030)\right] + 80\%(0.020) = 0.023$

IRREGULARITY:

SMOOTH

$n_1 = 0.000$

VARIATIONS:

GRADUAL

$n_2 = 0.000$

OBSTRUCTIONS:

NEGLIGIBLE

$n_3 = 0.000$

VEGETATION:

LOW

$n_4 = 0.005$

DEGREE OF MEANDERING:

MINOR

$m_5 = 1.000$

$n_{LEFT,\ RIGHT\ OVERBANK} = 0.028$ ROUND TO

$n_{OVERBANK} = 0.03$

PICTURE ROLL 2 = 1-6

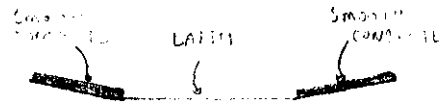
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DATE 1/7

CLIENT CCRFCD JOB NO 550.032.C CALC BY

DESCRIPTION CHANNEL MANNING'S n CHECKED BY

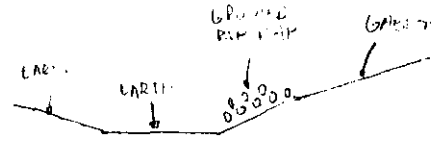
[illegible] => +/- 10



80% EARTH
80% CONCRETE

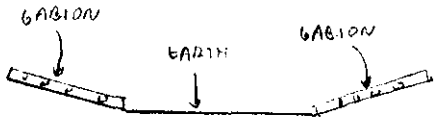
SECTION 1

+



90% EARTH
10% GROUTED RIP-RAP

SECTION 2



80% EARTH
20% GABION

SECTION 3

70% OF THE REACH IS COMPRISED OF SECTION 1

5% OF THE REACH IS COMPRISED OF SECTION 2

25% OF THE REACH IS COMPRISED OF SECTION 3

MATERIAL:

$n_{EARTH} = 0.020$ $n_{CONCRETE} = 0.015$ $n_{GROUTED\ RIP\text{-}RAP} = 0.030$ $n_{GABION} = 0.030$

$$n_0 = 70\%\left[80\%(0.020) + 20\%(0.015)\right] + 5\%\left[90\%(0.020) + 10\%(0.030)\right]$$
$$+ 25\%\left[80\%(0.020) + 20\%(0.030)\right] = 0.020$$

IRREGULARITY:	VARIATION:	OBSTRUCTION:
SMOOTH	GRADUAL	NEGLIBLE
$n_1 = 0.000$	$n_2 = 0.000$	$n_3 = 0.000$

VEGETATION:	DEGREE OF MEANDERING:
LOW	MINOR
$n_4 = 0.005$	$m_5 = 1.000$

$n_{CHANNEL} = 0.025$

PICTURE ROLL 2 = 17-16

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DATE

CLIENT SCE&G JOB NO 550.03 CALC BY

DESCRIPTION OVERBANK CHECKED BY

[illegible]

MATERIALS

n_{BENTO} = 0.030 $n_{CONCRETE}$ = 0.015 $n_{GRAVEL\ RIPRAP}$ = 0.030 $n_{[illegible]}$ [illegible]

n_b = 70%(0.015) + 5%[50%(0.020) + [illegible] + 25%(0.030)]

+ 25%(0.030) = 0.019

IRREGULARITY	VARIATIONS	OBSTRUCTIONS
SMOOTH	GRADUAL	NEGLIGIBLE
n_1 0.000	n_2 0.000	n_3 0.000

VEGETATION	DEGREE OF MEANDERING
NONE	MINOR
n_4 = 0.000	m_5 = 1.000

$n_{LEFT,\ RIGHT\ OVERBANK}$ = 0.019 ROUND TO

$n_{OVERBANK}$ = 0.02

PICTURE ROLL 2 ⇨ 7-16

EN-3-N
3/66

SHEET 13 OF 27

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DATE

CLIENT JOB NO CALC BY

DESCRIPTION CHANNEL MANNING'S 'n' / OVERBANK CHECKED BY

PICTURE

ROLL 2 ⇒ 17-25

MATERIALS

$n_{CONCRETE} = 0.016$

$n_0 =$

IRREGULARITY

SMOOTH

$n_1 =$

VARIATIONS

GRADUAL

$n_2 = 0.000$

OBSTRUCTIONS

NEGLIGIBLE

$n_3 = 0.000$

VEGETATION

NONE

$n_4 = 0.000$

DEGREE OF MEANDERING

MINOR

$m_5 = 1.000$

$n_{CHANNEL} = 0.016$

PICTURE

ROLL 2 ⇒ 17-25

$n_{OVERBANK} = 0.100$
LEFT, RIGHT

REDUCE IN CONVEYANCE DUE TO DEVELOPMENT

EN-3-N
3/66

SHEET 13A OF 37

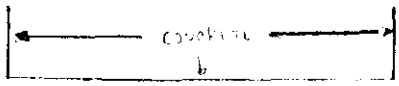
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DATE

CLIENT CCRFCD JOB NO 550.[illegible]2 C CALC BY

DESCRIPTION CHANNEL MANNING'S n CHECKED BY

[illegible] => 1-6



SECTION 4 => (REFERENCE [illegible])

MATERIALS

$n_{CONCRETE}$ 0.015

$n_0 = 0.015$

IRREGULARITY

SMOOTH

$n_1 = 0.000$

OBSTRUCTIONS

NEGLIGIBLE

$n_3 = 0.000$

VEGETATION

NONE

$n_4 = 0.000$

DEGREE OF MEANDERING

MINOR

$m_5 = 1.000$

$n_{CHANNEL} = 0.015$

PICTURE ROLL 3 => 1-6

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DATE

CLIENT JOB NO CALC BY

DESCRIPTION Overbank CHECKED BY

MATERIALS

n_1 = 0.000

IRREGULARITY/S
SMOOTH

n_2 = 0.000

VARIATION OF
GRADUAL

n_2 = 0.000

OBSTRUCTIONS
NEGLIGIBLE

n_3 = 0.000

VEGETATION %
LOW

n_4 = 0.005

DEGREE OF MEANDERING
MINOR

m_5 = 1.000

$n_{LOB, ROB}$ = 0.025
OVERBANK

PERTURE
ROW 3 => 1-6

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DATE _____

CLIENT CARSON JOB NO _____ CALC BY _____

DESCRIPTION CHANNEL ROUGHNESS "n" CHECKED BY _____

ROLL 3 ⇒ 1 - 14



95% EARTH
5% RIP-RAP

$d_{50} \approx 8"$

SECTION 1



100% EARTH

SECTION 3

+



60% EARTH

40% RIP-RAP

$d_{50} \approx 8"$

SECTION 2

77% OF THE REACH IS COMPRISED OF SECTION 1

8% OF THE REACH IS COMPRISED OF SECTION 2

15% OF THE REACH IS COMPRISED OF SECTION 3

MATERIAL:

$n_{EARTH} = 0.020$ $\quad n_{RIP\text{-}RAP} = 0.035 (d_{50})^{1/6} = 0.037$

$$n_0 = 77\% \left[95\% (0.020) + 5\% (0.037) \right] + 8\% \left[60\% (0.020) + 40\% (0.037) \right]$$

$$+ 15\% (0.020) = .021$$

DEGREE OF IRREGULARITY:

SMOOTH

$n_2 = 0.000$

VARIATIONS:

ALTERNATING OCCASSIONALLY

$n_2 = 0.005$

OBSTRUCTION:

NEGLIBLE

$n_3 = 0.000$

VEGETATION:

NONE

$n_4 = 0.000$

MEANDERING:

MINOR

$m_5 = 1.000$

$n_{CHANNEL} = 0.026$ ROUND TO PICTURE

$\boxed{n_{CHANNEL} = 0.03}$

ROLL 3 ⇒ 7 - 14

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DATE 5/1/97

CLIENT [illegible] JOB NO 550.23-2 CALC BY

DESCRIPTION OVERBANK MANNING'S 'n' CHECKED BY

SECTION 1 & [illegible] SECTION 2 &

50% RIP RAP 1.23% [illegible]

50% [illegible]

MATERIAL:

n_{EARTH} 0.040 $n_{RIP\text{-}RAP} = 0.038 (d_{50})^{1/6} = 0.038 (0.037)^{1/6} = 0.037$

$n_b = 77\% [50\%(0.037) + 50\%(0.040)] + 8\%(0.037) + 15\%(0.040)$

$n_b = 0.028$

DEGREE OF IRREGULARITY:

SMOOTH

$n_1 = 0.000$

VARIATIONS:

ALTERNATING OCCASIONALLY

$n_2 = 0.005$

OBSTRUCTIONS:

NEGLIBLE

$n_3 = 0.000$

VEGETATION:

NONE

$n_4 = 0.000$

MEANDERING:

MINOR

$m_5 = 1.000$

$n_{LEFT, RIGHT\ OVERBANK} = 0.033$ ROUND TO

$n_{OVERBANK} = 0.035$

PICTURE ROLL 3 => 7-14

EN-3-N
3/66

SHEET 17 OF 37

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DATE 3/[illegible]/[illegible]

CLIENT [illegible] JOB NO [illegible] CALC BY [illegible]

DESCRIPTION CHANNEL [illegible] CHECKED BY [illegible]

& OVERBANK

PICTURE
ROLL 3 ⇒ 15 - 24



REPRESENTATIVE OF THE MAIN CHANNEL

MATERIALS
EARTH: 0.020
$n_0 = 0.020$

IRREGULARITY
SMOOTH
$n_1 = 0.000$

VARIATIONS
GRADUAL
$n_2 = 0.000$

OBSTRUCTIONS
NEGLIGIBLE
$n_3 = 0.000$

VEGETATION
LOW
$n_4 = 0.005$

MEANDERING
MINOR
$m_5 = 1.000$

$n_{CHANNEL} = .025$
& OVERBANK

PICTURE
ROLL 3 ⇒ 15-24

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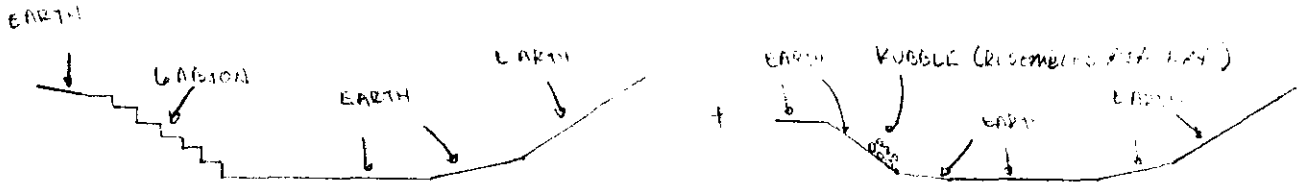
DATE 7/[illegible]/[illegible]

CLIENT [illegible] JOB NO [illegible] CALC BY

DESCRIPTION CHANNEL [illegible] "n" CHECKED BY

PICTURE

ROLL 3 => 25-31



95% EARTH
5% GABION

SECTION 1

95% EARTH
5% RUBBLE

SECTION 2

25% OF THE REACH IS COMPRISED OF SECTION 1

75% OF THE REACH IS COMPRISED OF SECTION 2

MATERIAL %

$n_{EARTH} = 0.020$ $n_{RUBBLE} = 0.035$ $n_{GABION} = 0.030$

$$n_0 = 25\%\left[95\%(0.020) + 5\%(0.030)\right] + 75\%\left[95\%(0.020) + 5\%(0.035)\right]$$

$$n_0 = 0.021$$

IRREGULARITY %
MINOR
$n_1 = 0.005$

VARIATION %
GRADUAL
$n_2 = 0.000$

OBSTRUCTION %
NEGLIGIBLE
$n_3 = 0.000$

VEGETATION %
NONE
$n_4 = 0.000$

MEANDERING %
MINOR
$m_5 = 1.000$

PICTURE

$n_{CHANNEL} = 0.025$ ROLL 3 => 25-29

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DATE

CLIENT JOB NO CALC BY

DESCRIPTION CHECKED BY

SLOPES

50% EARTH

50% EARTH

SLOPES

25% EARTH

75% EARTH

MATERIALS

$n_{EARTH} = 0.040$ $n_{RIPRAP} = 0.035$ $n_{GABION} = 0.030$

$n_o = 25\%\left[50\%(0.030) + 50\%(0.040)\right] + 75\%\left[25\%(0.035) + 75\%(0.040)\right]$

$n_o = 0.024$

IRREGULARITY:
MINOR
$n_1 = 0.005$

VARIATIONS:
GRADUAL
$n_2 = 0.000$

OBSTRUCTIONS
NEGLIGIBLE
$n_3 = 0.000$

VEGETATION:
NONE
$n_4 = 0.000$

MEANDERINGS
MINOR
$m_5 = 1.000$

$n_{LEFT, RIGHT\ OVERBANK} = 0.029$ ROUND TO

$n_{OVERBANK} = 0.03$

PICTURE
ROLL 3 ⇒ 25-28

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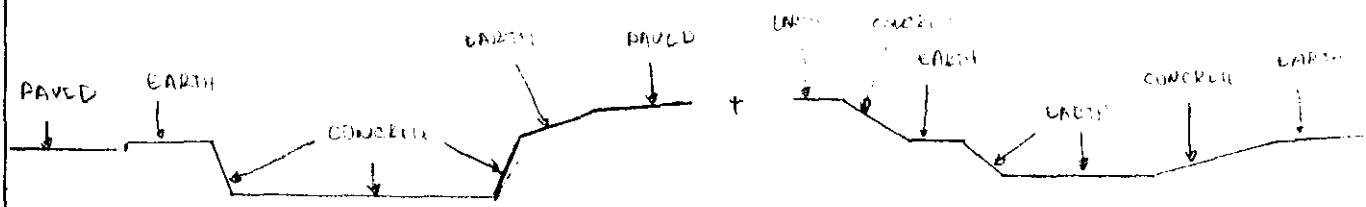
DATE

CLIENT JOB NO CALC BY

DESCRIPTION MANNING'S n CHECKED BY

PAGE 21

ROLL 3 → 32-35



75 % of THE REACH IS COMPRISED OF SECTION 1

25% of THE REACH IS COMPRISED OF SECTION 2

MATERIALS

$n_{EARTH} = 0.020$ $n_{CONCRETE} = 0.015$

$$n_0 = 75\%\,(0.015) + 25\%\left[80\%\,(0.020) + 20\%\,(0.015)\right] = 0.016$$

IRREGULARITY%	VARIATION%	OBSTRUCTIONS%
SMOOTH	GRADUAL	NEGLIBLE
$n_1 = 0.000$	$n_2 = 0.000$	$n_3 = 0.000$

VEGETATION%	MEANDERING	
NONE	MINOR	$n_{CHANNEL} = 0.016$ ROUND TO
$n_4 = 0.000$	$m_5 = 1.000$	$n_{CHANNEL} = 0.015$ ROLL 3 → 29-35

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DATE

CLIENT JOB NO CALC BY

DESCRIPTION CHECKED BY

MATERIALS

$n_{CMP} = 0.020$ $n_{CONCRETE} = 0.015$

$n_0 = 75\%\left[25\%(0.020) + 75\%(0.015)\right] + 25\%\left[30\%(\quad) + 70\%(0.015)\right]$

$n_0 = 0.02$

IRREGULARITY	VARIATION	OBSTRUCTIONS
SMOOTH	GRADUAL	NEGLIGIBLE
$n_1 = 0.000$	$n_2 = 0.000$	$n_3 = 0.000$

VEGETATION	MEANDERING
LOW	MINOR
$n_4 = 0.005$	$m_5 = 1.000$

$n_{LEFT,\ RIGHT\ OVERBANK} = 0.025$ ROUND TO

PICTURE

$n_{OVERBANK} = 0.025$ ROLL 3 ⇒ 29-35

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DATE 9/

CLIENT CITY JOB NO 503.002 CALC BY

DESCRIPTION CHANNEL MANNING'S n CHECKED BY

PICTURE
ROLL 3 => 36-37 & ROLL 4 => 1-8



100% EARTH
SECTION 1

+

80% EARTH
20% GRASS
SECTION 2

10% OF THE REACH IS COMPRISED OF SECTION 1
90% OF THE REACH IS COMPRISED OF SECTION 2

MATERIALS

$n_{EARTH} = 0.020$ $n_{GRASS} = 0.030$

$$n_0 = 10\%(0.020) + 90\%\left[80\%(0.020) + 20\%(0.030)\right] = 0.022$$

IRREGULARITY %	VARIATIONS %	OBSTRUCTIONS %
SMOOTH	GRADUAL	NEGLIBLE
$n_1 = 0.000$	$n_2 = 0.000$	$n_3 = 0.000$

VEGETATION %	MEANDERINGS
MEDIUM	MINOR
$n_4 = 0.010$	$m_5 = 1.000$

$n_{CHANNEL} = 0.032$ ROUND TO

$n_{CHANNEL} = 0.03$

PICTURE
ROLL 3 => 36-37
&
ROLL 4 => 1-8

EN-3-N
3/66

SHEET 23 OF 31

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DATE 11/[illegible]

CLIENT [illegible] JOB NO [illegible] CALC BY

DESCRIPTION OVERBANK MANNING'S 'n' CHECKED BY

SECTION 1 & | SECTION 2 E

100% EARTH | 100% GRASS

MATERIALS

$n_{EARTH} = 0.020$ $n_{GRASS} = 0.030$

$n_b = 10\%(0.020) + 90\%(0.030) = 0.029$

IRREGULARITY %	VARIATIONS %	OBSTRUCTIONS %
SMOOTH	GRADUAL	NEGLIBLE
$n_1 = 0.000$	$n_2 = 0.000$	$n_3 = 0.000$

VEGETATION	MEANDERING
LOW	MINOR
$n_4 = 0.005$	$m_5 = 1.000$

$n_{LEFT, RIGHT\ OVERBANK} = 0.034$ ROUND TO

$n_{OVERBANK} = 0.035$

PICTURE

ROLL 3 => 36-37

&

ROLL 4 => 1-8

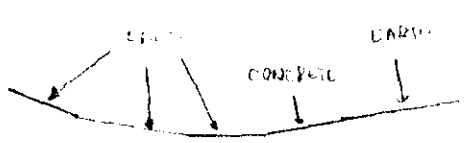
G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD / LAS VEGAS, NEVADA 89102

DATE 4/4/00

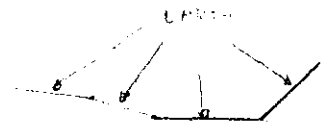
CLIENT [illegible] JOB NO [illegible] CALC. BY

DESCRIPTION [illegible] MANNING'S n CHECKED BY

[illegible] 9-18



+



95% [illegible]

5% CONCRETE

SECTION 1

100% [illegible]

SECTION 2

+



95% EARTH

5% RUBBLE

SECTION 3

5% OF THE REACH IS [illegible]
OF SECTION 1

75% OF THE REACH IS COMPRISED
OF SECTION 2

20% OF THE REACH IS COMPRISED
OF SECTION 3

MATERIAL:

$n_{EARTH} = 0.020$ $n_{CONCRETE} = 0.015$ $n_{RUBBLE} = 0.035$

$n_0 = 5\%\left[95\%(0.020) + 5\%(0.015)\right] + 75\%(0.020) + 20\%\left[95\%(0.020) + 5\%(.03\right.$

$n_0 = 0.020$

IRREGULARITY:

SMOOTH

$n_1 = 0.000$

VARIATION:

ALTERNATING OCCASIONALLY

$n_2 = 0.005$

OBSTRUCTION:

NEGLIGIBLE

$n_3 = 0.000$

VEGETATION:

NONE

$n_4 = 0.000$

MEANDERING

MINOR

$m_5 = 1.000$

$n_{CHANNEL} = 0.025$

PICTURE ROLL 4 ⇒ 9-18

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DATE

CLIENT [illegible] JOB NO [illegible] CALC BY

DESCRIPTION [illegible] CHECKED BY

SECTION 1	SECTION 2	SECTION 3
20% [illegible]	100% [illegible]	50% [illegible]
80% [illegible]		50% [illegible]

MATERIALS

$n_{LAKE} = 0.030$ $n_{CONCRETE} = 0.015$ $n_{GRAVEL} = 0.025$

$n_0 = 5\%[20\%(0.015) + 80\%(0.030)] + 70\%(0.030) + 25\%[50\%(0.030) + 50\%(0.025)]$

$n_0 = 0.020$

IRREGULARITY	VARIATION	OBSTRUCTION
SMOOTH	GRADUAL	NEGLIGIBLE
$n_1 = 0.000$	$n_2 = 0.000$	$n_3 = 0.000$

VEGETATION	MEANDERING
LOW	MINOR
$n_4 = 0.005$	$m_5 = 1.000$

$n_{LEFT, RIGHT} = 0.025$
OVERBANK

PICTURE
ROLL 4 ⇒ 9-18

EN-3-N
3/66

SHEET 26 OF 37

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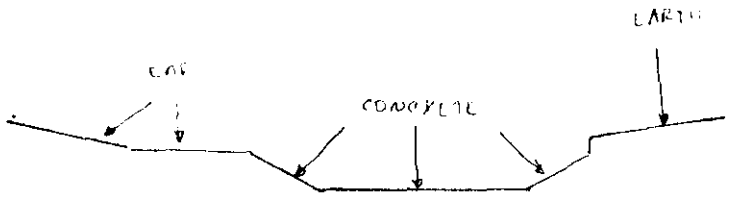
DATE 5/[illegible]

CLIENT [illegible] JOB NO [illegible] CALC BY

DESCRIPTION CHANNEL MANNING'S n CHECKED BY

PICTURE

ROLL 4 => 19-23



[illegible] CONCRETE

REPRESENTATIVE OF THE [illegible] REACH

SECTION 1

MATERIALS

n_{EARTH} 0.000 $n_{CONCRETE}$ 0.015

$n_0 = 0.015$

IRREGULARITY

SMOOTH

$n_1 = 0.000$

VARIATIONS

GRADUAL

$n_2 = 0.000$

OBSTRUCTIONS

NEGLIBLE

$n_3 = 0.000$

VEGETATION

NONE

$n_4 = 0.000$

MEANDERING

APPRECIABLE

$m_5 = 1.15$

$n_{CHANNEL} = 0.017$ ROUND TO

$n_{CHANNEL} = 0.015$

PICTURE

ROLL 4 => 19-23

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DATE

CLIENT _____ JOB NO _____ CALC BY _____

DESCRIPTION _____ CHECKED BY _____

SECTION 2

40% CONCRETE

60% EARTH

MATERIALS

$n_{CONC.}$ = 0.015 n_{EARTH} = 0.030

n_0 = 40%(0.015) + 60%(0.030) = 0.018

IRREGULARITY

SMOOTH

n_1 = 0.000

VARIATION

GRADUAL

n_2 = 0.000

OBSTRUCTIONS

NEGLIGIBLE

n_3 = 0.000

VEGETATION

NONE

n_4 = 0.000

MEANDERING

APPRECIABLE

m_5 = 1.15

$n_{LEFT,\ RIGHT\ OVERBANK}$ 0.021 ROUND TO

$n_{OVERBANK} = 0.02$

PICTURE ROLL 4 => 19-23

EN-3-N
3/66

SHEET 28 OF 37

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DATE

CLIENT JOB NO CALC BY

DESCRIPTION CHANNEL CHECKED BY

PICTURE

ROLL 4 => 24-25



SECTION 1 (REPRESENTATIVE OF THE UPPER REACH)

40% EARTH

60% RIP-RAP

MATERIALS

n_{EARTH} = 0.020 $n_{RIP\text{-}RAP}$ (d_{50} = 8") $= 0.0395\, d_{50}^{1/6} = 0.037$

$n_0 = 40\%(0.020) + 60\%(0.037) = 0.030$

IRREGULARITY	VARIATIONS	OBSTRUCTIONS
SMOOTH	GRADUAL	NEGLIBLE
$n_1 = 0.000$	$n_2 = 0.000$	$n_3 = 0.000$

VEGETATION	MEANDERING
NONE	MINOR
$n_4 = 0.000$	$n_5 = 1.000$

$n_{CHANNEL} = 0.030$

PICTURE
ROLL 4 => 24-25

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DATE 7/

CLIENT [illegible] JOB NO 35 CALC BY

DESCRIPTION [illegible] CHECKED BY

[illegible] 15

100% EARTH

MATERIALS

n_{EARTH} = 0.020

n_0 0.020

IRREGULARITY

SMOOTH

n_1 = 0.000

VARIATIONS

GRADUAL

n_2 = 0.000

OBSTRUCTIONS

NEGLIGIBLE

n_3 = 0.000

VEGETATION

NONE

n_4 = 0.000

MEANDERING

MINOR

m_5 = 1.000

$n_{LEFT, RIGHT\ OVERBANK}$ = 0.020

PICTURE

ROLL 4 @ 24-25

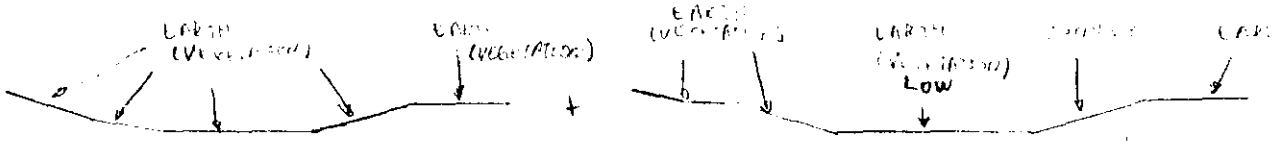
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DATE

CLIENT CORPS JOB NO CALC BY

DESCRIPTION CHANNEL & MANNING'S n CHECKED BY

ROLL 5 ⇒ 1 - 14



100% EARTH

SECTION 1

95% EARTH

5% CONCRETE

SECTION 2

95% OF THE REACH IS COMPRISED OF SECTION 1

5% OF THE REACH IS COMPRISED OF SECTION 2

MATERIALS

$n_{earth} = 0.020$ $n_{conc} = 0.015$

$n_0 = 95\%(0.020) + 5\%\left[\begin{matrix}95\%(0.020)\\ +5\%(0.015)\end{matrix}\right]$ $n_0 = 0.020$

IRREGULARITY

SMOOTH

$n_1 = 0.000$

VARIATIONS

GRADUAL

$n_2 = 0.000$

OBSTRUCTIONS

NEGLIBLE

$n_3 = 0.000$

VEGETATION

MEDIUM

$n_4 = 0.02$

MEANDERING

MINOR

$m_5 = 1.000$

$n_{CHANNEL} = .04$ ROUND TO

$n_{CHANNEL} = 0.04$

PICTURE

ROLL 5 ⇒ 1 - 14

EN-3-N
3/66

SHEET 31 OF 37

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DATE 2/[illegible]/[illegible]

CLIENT [illegible] JOB NO [illegible] CALC BY [illegible]

DESCRIPTION OVERBANK MANNING'S n CHECKED BY [illegible]

SLOPE 1%

[illegible]

SLOPE 5%

30% [illegible]

70% EARTH

MATERIALS:

$n_{Earth} = 0.030$ $n_{Concrete} = 0.015$

$n_0 = 95\%(0.000) + 5\%\left[30\%(0.015) + 70\%(0.030)\right]$

$n_0 = 0.020$

IRREGULARITY:

SMOOTH

$n_1 = 0.000$

VARIATIONS:

GRADUAL

$n_2 = 0.000$

OBSTRUCTIONS:

NEGLIBLE

$n_3 = 0.000$

VEGETATION:

LOW

$n_4 = 0.005$

MEANDERINGS:

MINOR

$n_5 = 1.000$

$n_{LEFT, RIGHT} = 0.025$
OVERBANK

PICTURE
ROLL 5 ⇒ 1-14

EN-3-N
3/66

SHEET 32 OF 37

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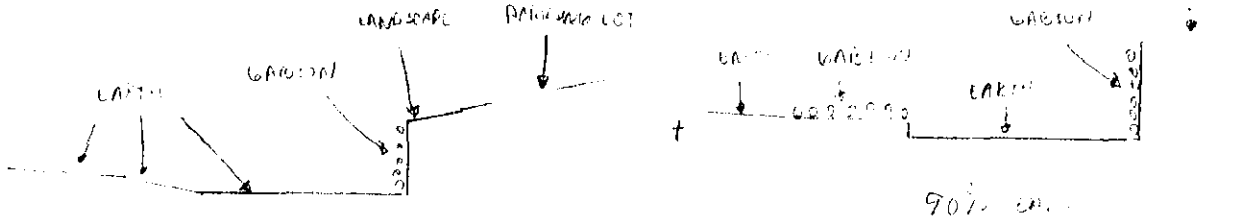
DATE 7/21...

CLIENT ... JOB NO 550, 50 ... CALC BY ...

DESCRIPTION ... CHECKED BY ...

PAGE 15

ROLL 5 OF 15 - 16



95% ...

5% ...

SECTION 1

90% ...

10% ...

SECTION 2

30% OF THE REACH IS COMPRISED OF SECTION 1

70% OF THE REACH IS COMPRISED OF SECTION 2

MATERIALS:

n_{EARTH} 0.020 n_{CARBON} 0.030

$$n_0 = 30\%\left[95\%(0.020) + 5\%(0.030)\right] + 70\%\left[90\%(0.020) + 10\%(0.030)\right]$$

$n_0 = 0.021$

IRREGULARITY:

SMOOTH

$n_1 = 0.000$

VARIATIONS:

GRADUAL

$n_2 = 0.000$

OBSTRUCTIONS:

NEGLIGIBLE

$n_3 = 0.000$

VEGETATION:

NONE

$n_4 = 0.000$

MEANDERING:

MINOR

$m_5 = 1.000$

$n_{CHANNEL} = 0.021$ ROUND TO

$n_{CHANNEL} = 0.020$

PICTURE ROLL 5 OF 15 - 16

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DATE

CLIENT [illegible] JOB NO CALC BY

DESCRIPTION [illegible] CHECKED BY

[illegible]

MATERIALS

$n_{CHANNEL} = 0.040$ $n_{BANK} = 0.030$

$n_0 = 30\%[75\%(0.040) + 25\%(0.030)] + 70\%[75\%(0.035) + 25\%(\quad)]$

$n_0 = 0.036$

IRREGULARITY

SMOOTH

$n_1 = 0.000$

VARIATIONS

GRADUAL

$n_2 = 0.000$

OBSTRUCTIONS

NEGLIGIBLE

$n_3 = 0.000$

VEGETATION

LOW

$n_4 = 0.005$

MEANDERING

MINOR

$m_5 = 1.000$

$n_{L/T,\ RIGHT\ OVERBANK} = 0.031$ ROUND TO

$n_{OVERBANK} = 0.03$

PICTURE

ROLL 5 ⇒ 15-16

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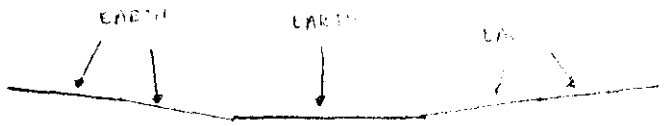
DATE 7/8/97

CLIENT CCRD JOB NO [illegible] CALC BY

DESCRIPTION CHANNEL MANNING'S 'n' CHECKED BY

5 OVERBANK

ROLL 5 ⇒ 17-05



100% EARTH

REPRESENTATIVE OF THE ENTIRE REACH

SECTION 1

MATERIALS	IRREGULARITY	VARIATIONS
n_{EARTH} 0.020	SMOOTH	GRADUAL
n_3 0.020	n_1 = 0.000	n_2 = 0.020

OBSTRUCTIONS	VEGETATIONS	MEANDERING
NEGLIBLE	NONE	MINOR
n_3 = 0.000	n_4 = 0.000	m_5 = 1.000

$n_{CHANNEL}$ = 0.040
& OVERBANK

ROLL 5 ⇒ 17-25

PICTURE

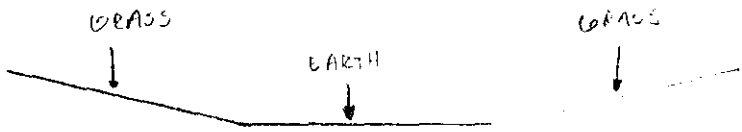
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Engineering/Architecture
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DATE 7/6/17

CLIENT SCVTCV JOB NO 550.0[illegible] CALC BY

DESCRIPTION CHANNEL MANNING'S "n" CHECKED BY

PICTURE
ROLL 6 => 1-3



10% EARTH
90% GRASS

SECTION 1

MATERIALS

$n_{GRASS} = 0.030$ $n_{EARTH} = 0.020$

$n_0 = 10\%(0.020) + 90\%(0.030)$

$n_0 = 0.029$

IRREGULARITY:

SMOOTH

$n_1 = 0.000$

VARIATIONS:

GRADUAL

$n_2 = 0.000$

OBSTRUCTIONS

NEGLIGIBLE

$n_3 = 0.000$

VEGETATION:

NONE

$n_4 = 0.020$

MEANDERING:

MINOR

$n_5 = 1.000$

$n_{CHANNEL} = 0.049$ ROUND TO

$n_{CHANNEL} = 0.05$

PICTURE
ROLL 6 => 1-3

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DATE 7/21/00

CLIENT CCRFCD JOB NO 5[illegible] CALC BY

DESCRIPTION OVERBANK MANNING'S "n" CHECKED BY

SECTION 1 & 2

100% GRASS

MATERIAL:

$n_{GRASS} = 0.030$

IRREGULARITY:

SMOOTH

$n_1 = 0.000$

VARIATION:

GRADUAL

$n_2 = 0.000$

$n_0 = 0.030$

OBSTRUCTIONS:

NEGLIBLE

$n_3 = 0.000$

VEGETATION:

NONE

$n_4 = 0.000$

MEANDERING:

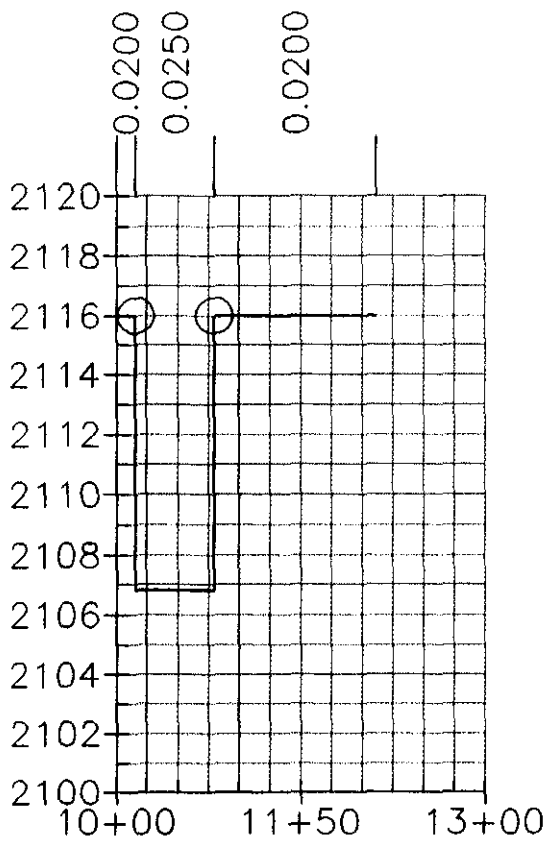
MINOR

$m_5 = 1.000$

$n_{LEFT, RIGHT} = 0.03$
OVERBANK

PICTURES
ROLL 6 => 1 - 3

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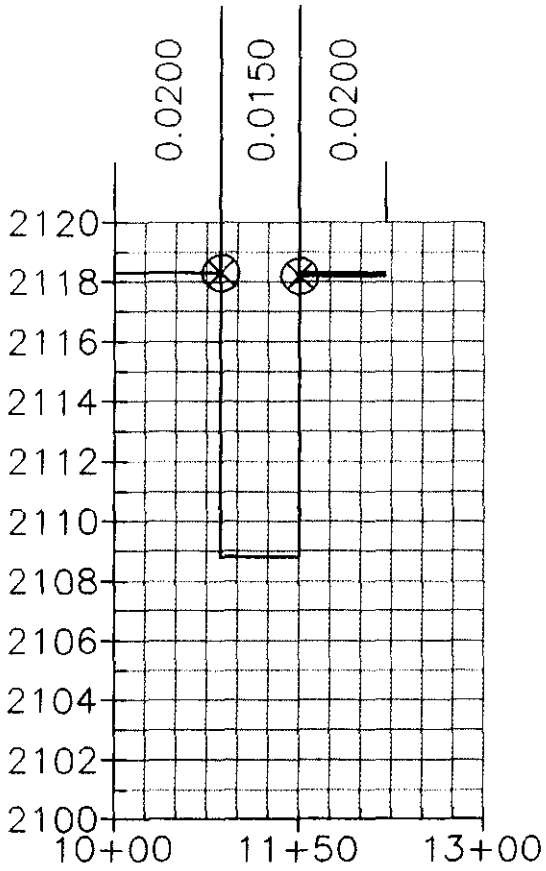


NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 10
DRAWING FL1.DWG

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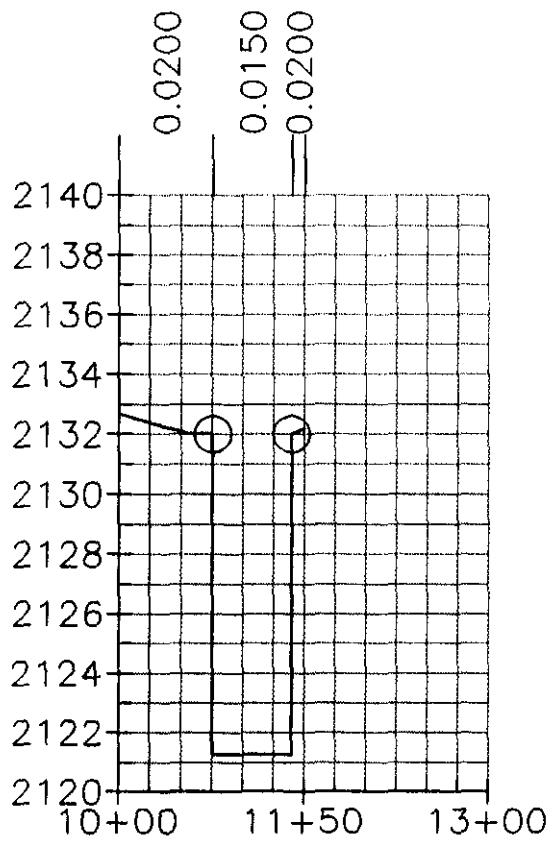


NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 20
DRAWING FL1.DWG

G.C. WALLACE, INC.
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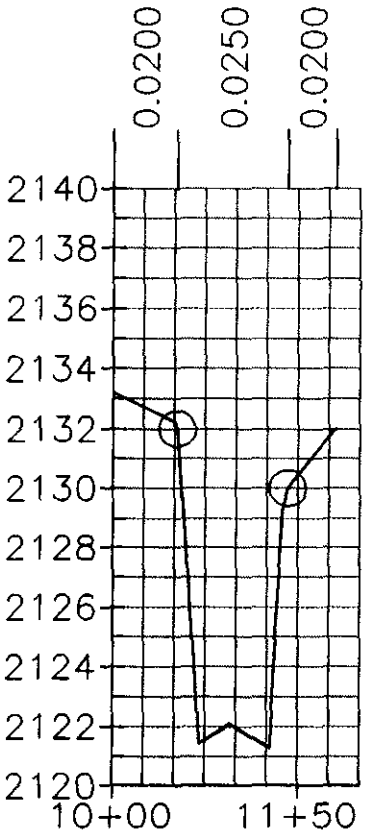


NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 30
DRAWING FL1.DWG

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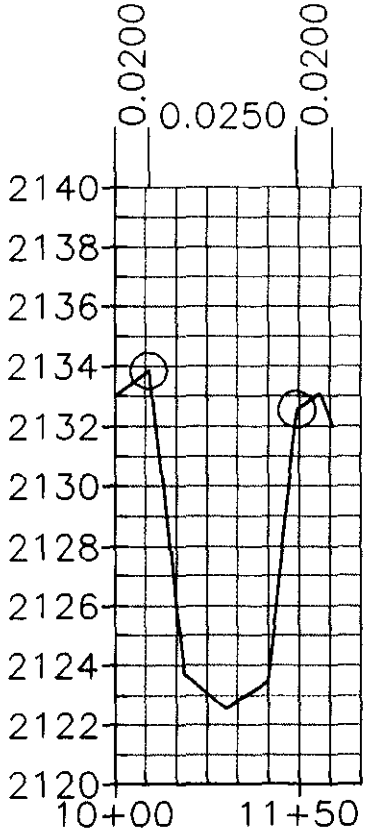


NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 40
DRAWING FL1.DWG

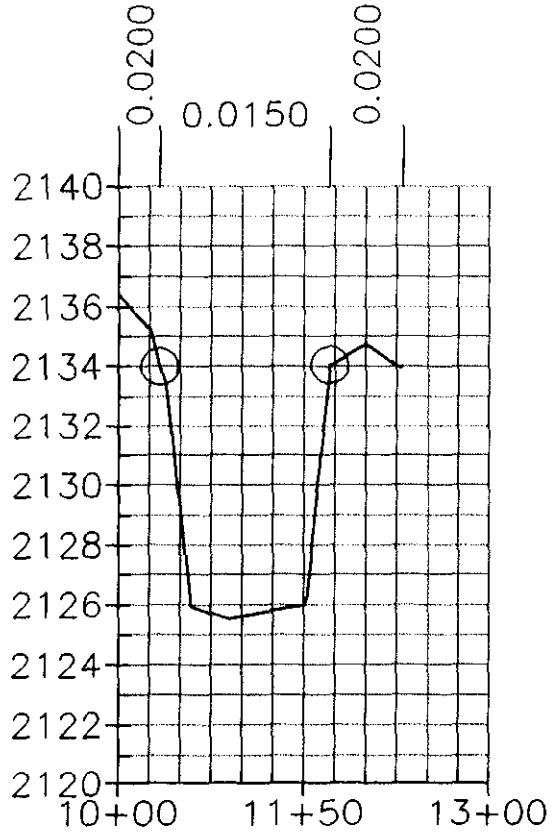
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NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 50
DRAWING FL1.DWG
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NOTE:

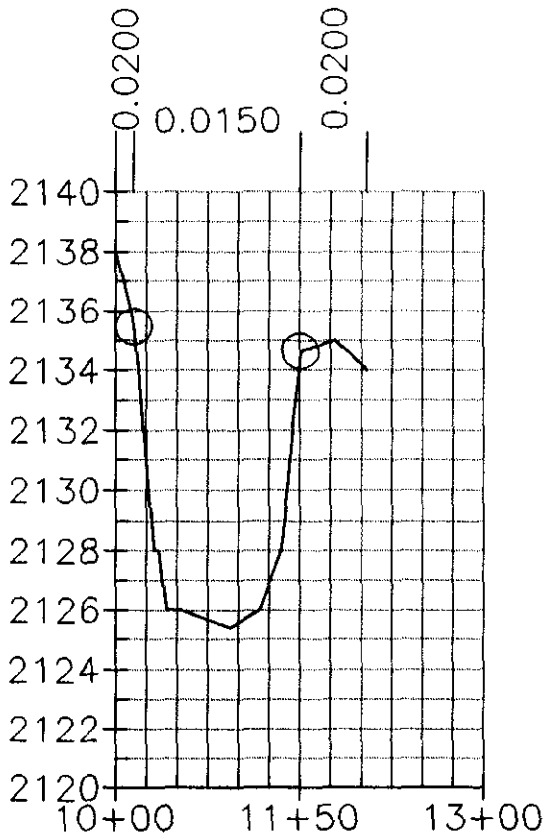
1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY
CCRFCD

CROSS SECTION NO. 60

DRAWING FL1.DWG

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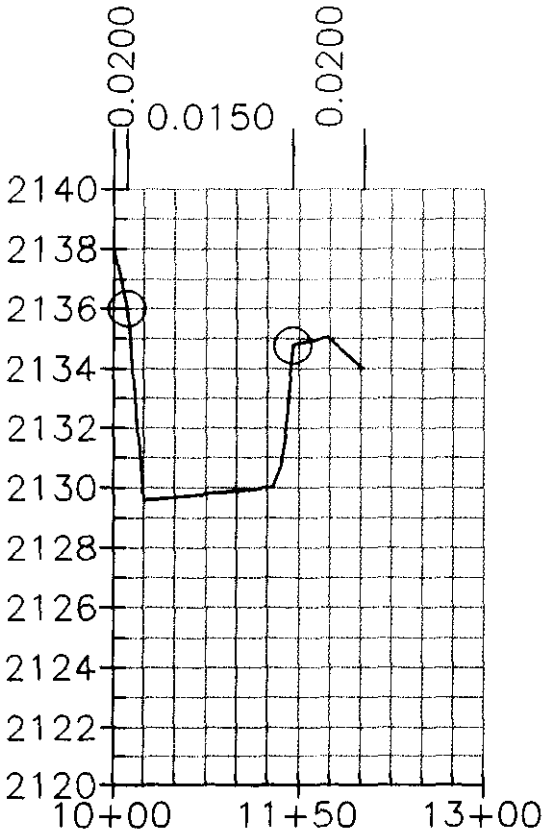


NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 70
DRAWING FL1.DWG

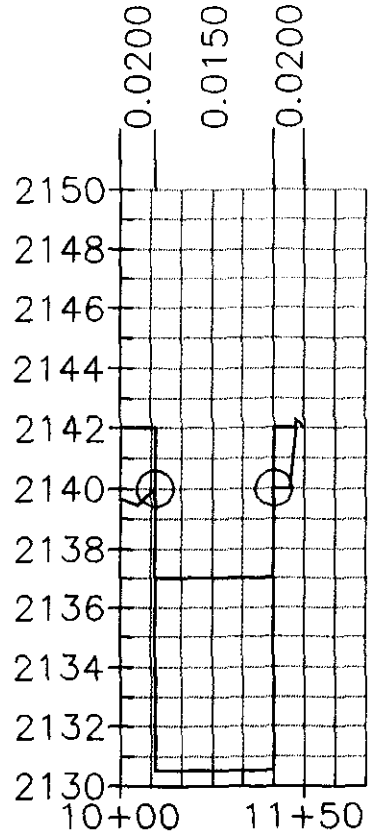
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NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 80
DRAWING FL1.DWG
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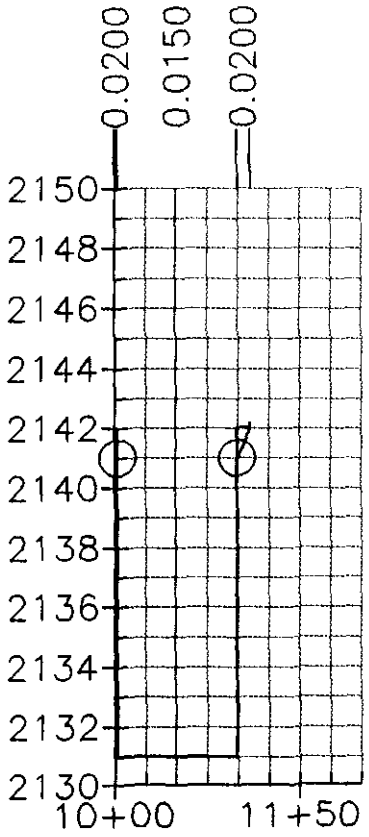


NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 90
DRAWING FL1.DWG

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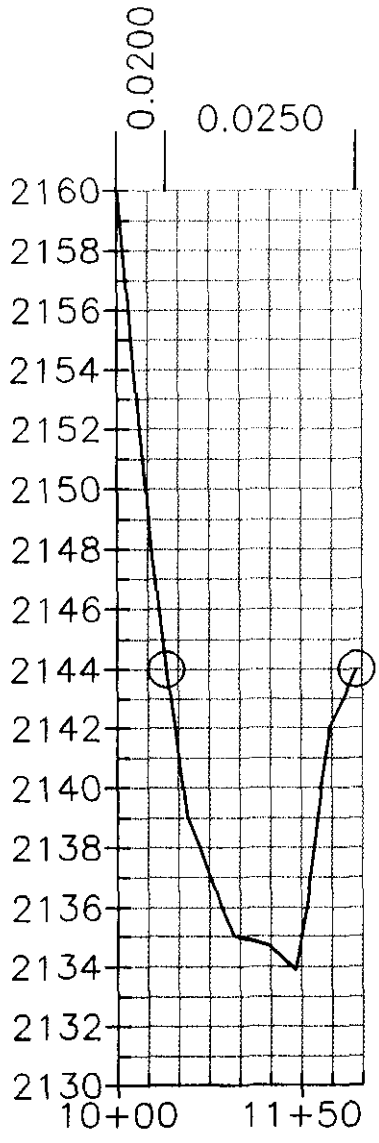


NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 100
DRAWING FL1.DWG

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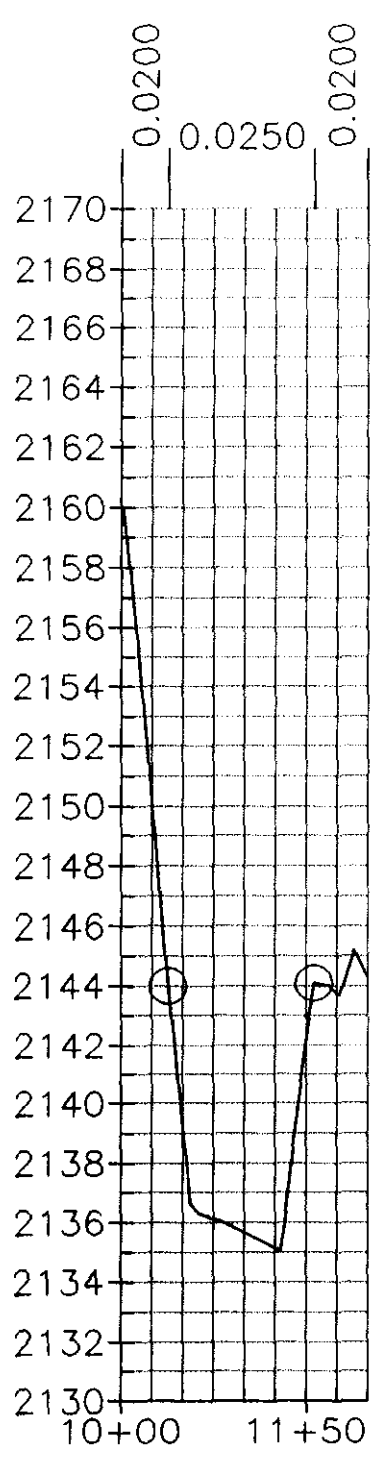


NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 110
DRAWING FL1.DWG

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102

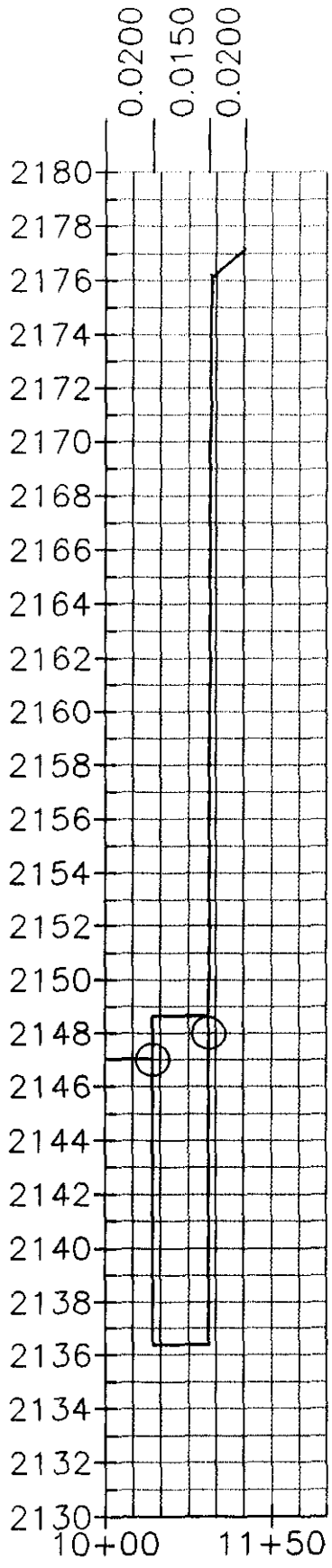


NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 120
DRAWING FL1.DWG

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102

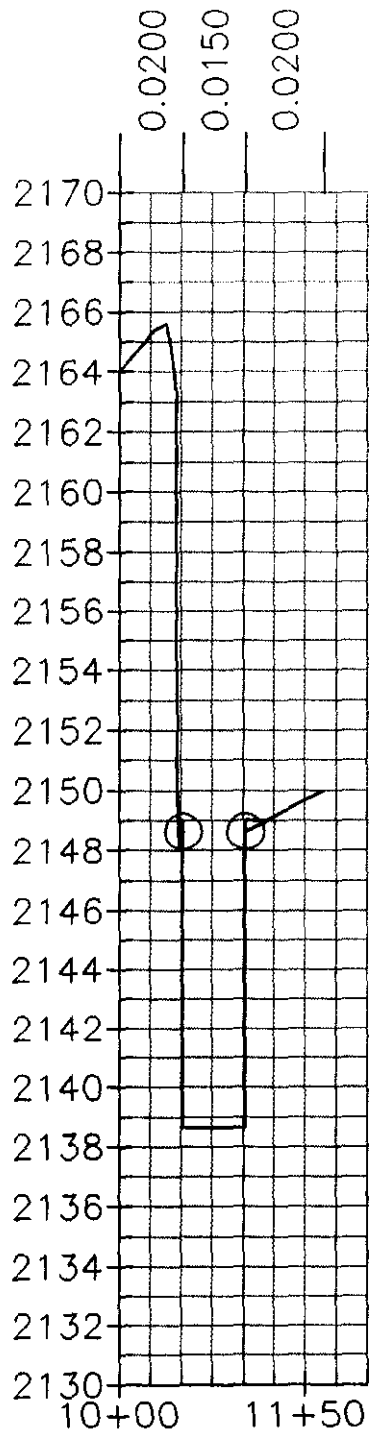


NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 130
DRAWING FL1.DWG

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD, LAS VEGAS, NEVADA 89102



NOTE:

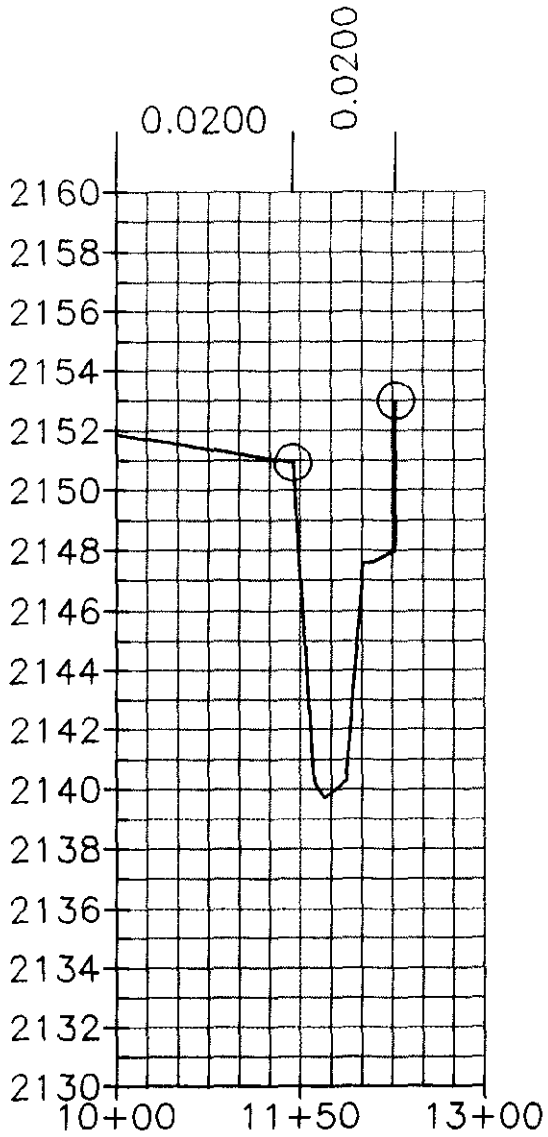
1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY
CCRFCD

CROSS SECTION NO. 140

DRAWING FL1.DWG

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102

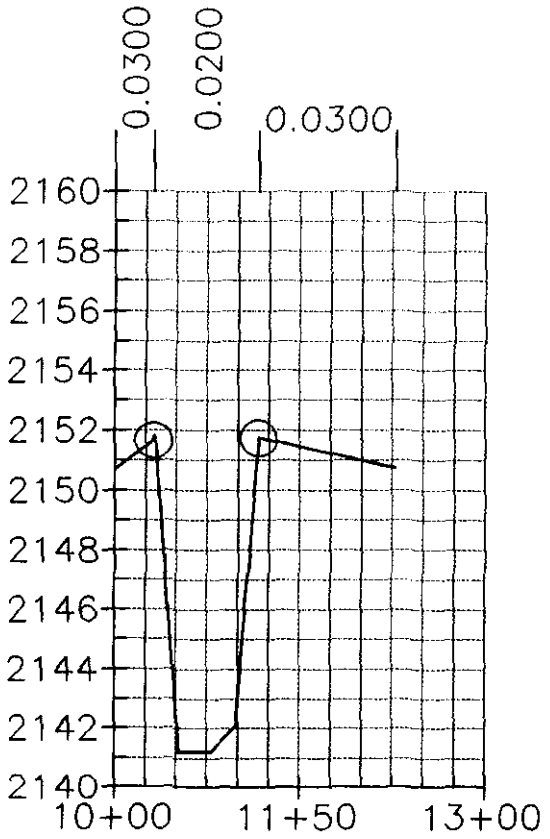


NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 150
DRAWING FL1.DWG

G.C. WALLACE, INC.
Engineering/Architecture 1555 SOUTH RAINBOW BLVD.,LAS VEGAS, NEVADA 89102

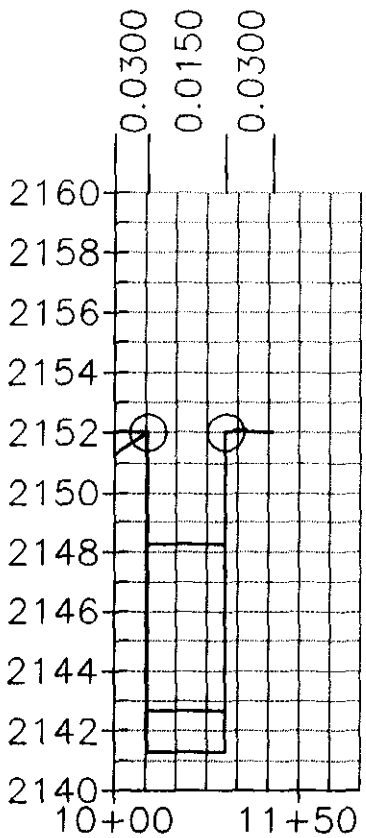


NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 160
DRAWING FL1.DWG

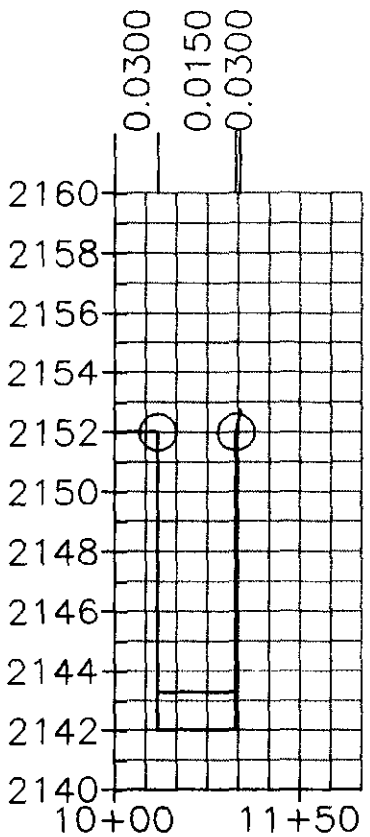
G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102



NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 170
DRAWING FL1.DWG
G.C. WALLACE, INC. Engineering/Architecture 1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102



NOTE:

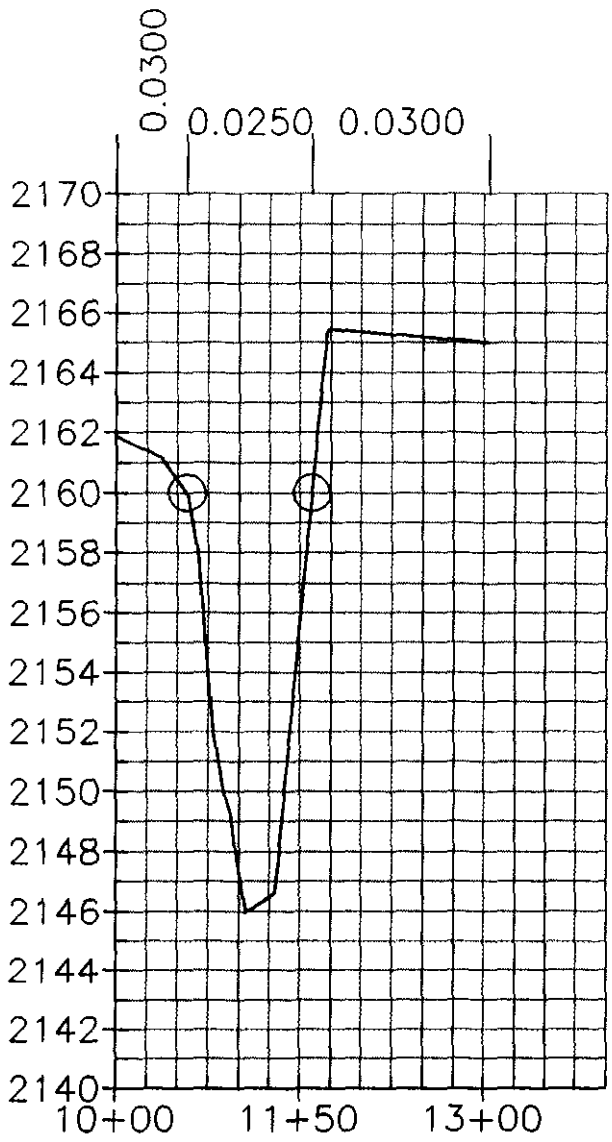
1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY
CCRFCD

CROSS SECTION NO. 180

DRAWING FL1.DWG

G.C. WALLACE, INC.
Engineering/Architecture
1556 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102

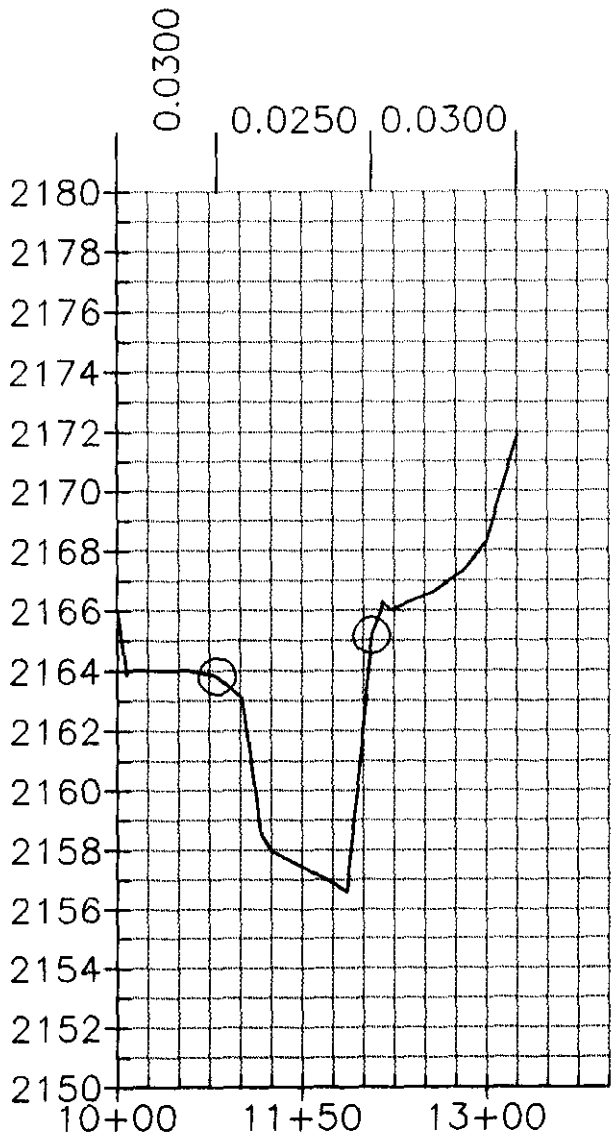


NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 190
DRAWING FL1.DWG

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102

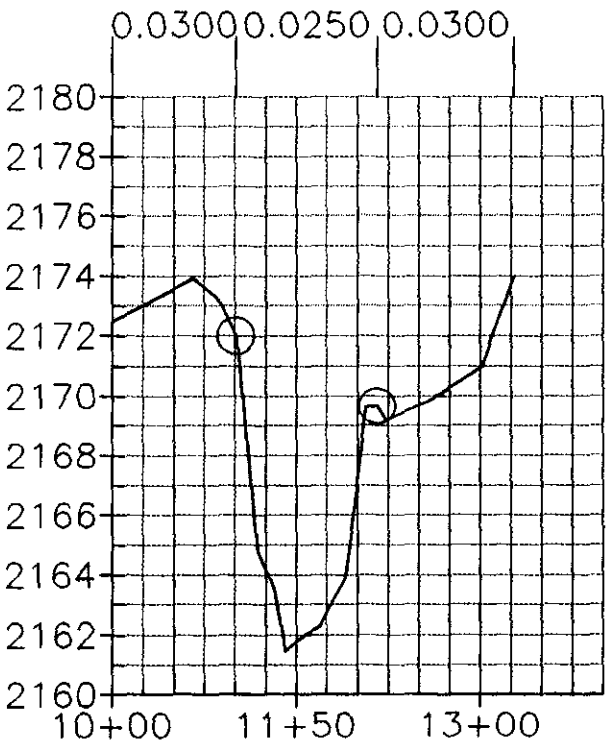


NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 200
DRAWING FL1.DWG

G.C. WALLACE, INC.
Engineering/Architecture 1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102

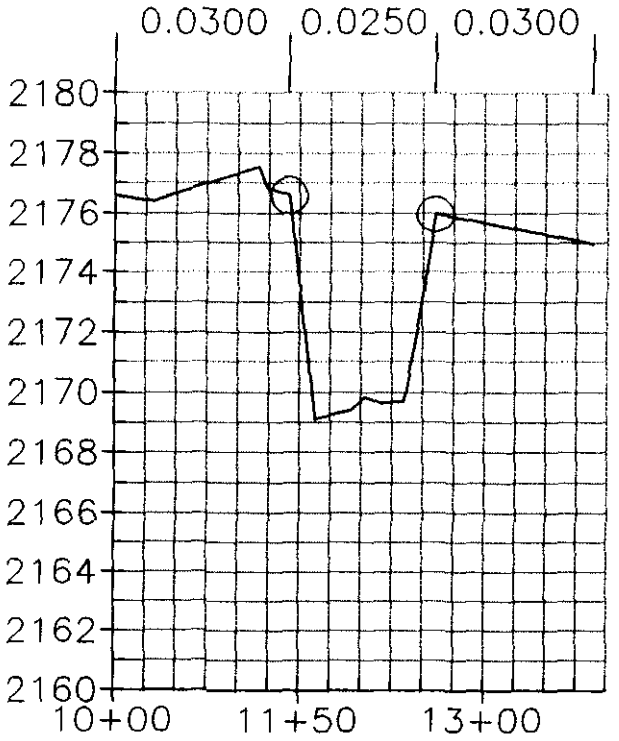


NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 210
DRAWING FL1.DWG

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102

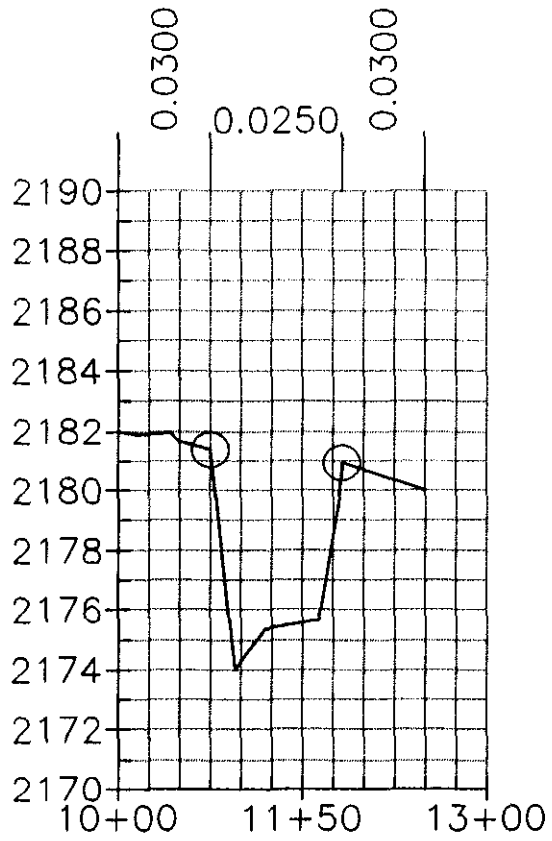


NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 220
DRAWING FL1.DWG

G.C. WALLACE, INC.
Engineering/Architecture
1556 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102

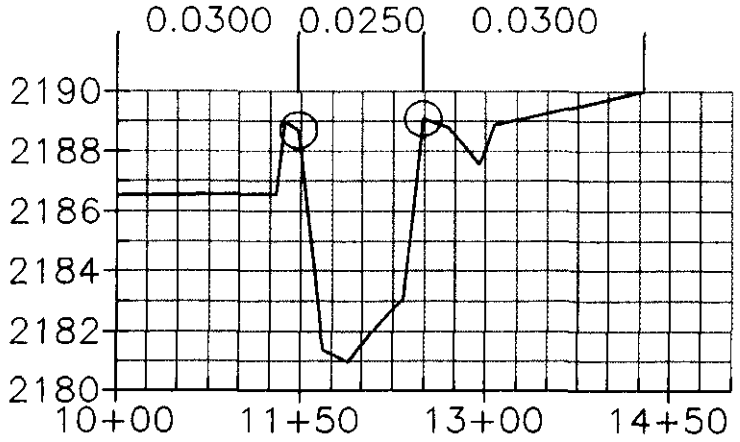


NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 230
DRAWING FL1.DWG

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102

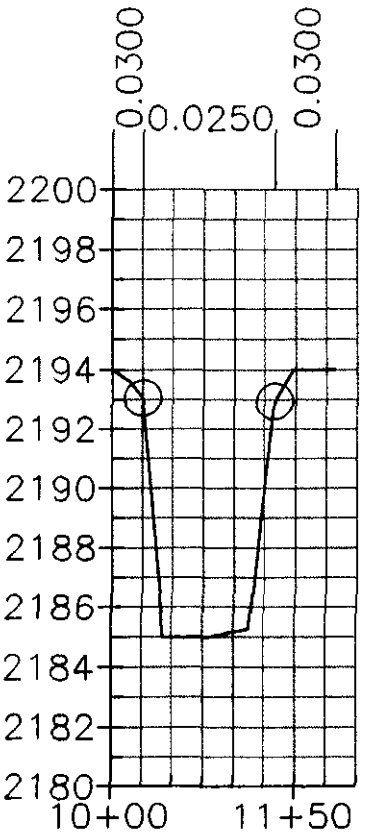


NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 240
DRAWING FL1.DWG

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102

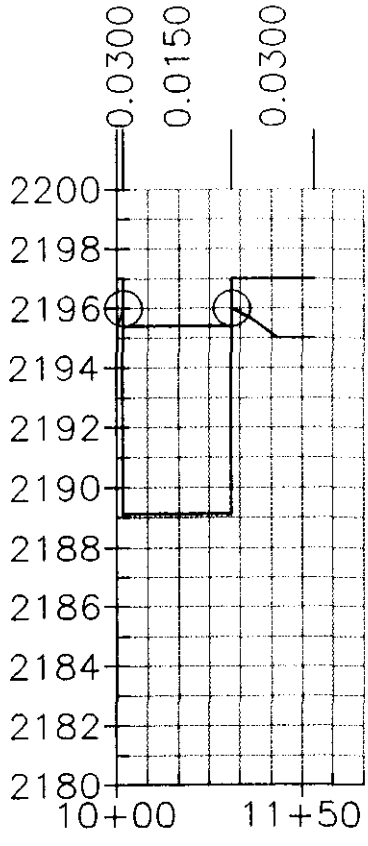


NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 250
DRAWING FL1.DWG

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102

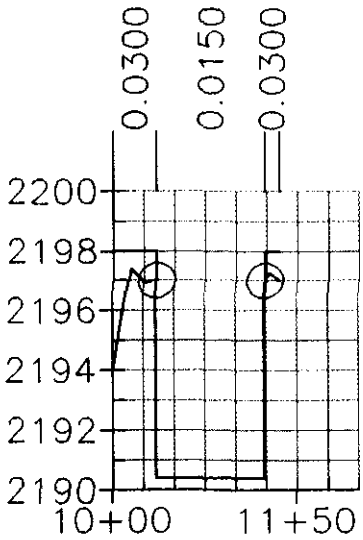


NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 260
DRAWING FL1.DWG

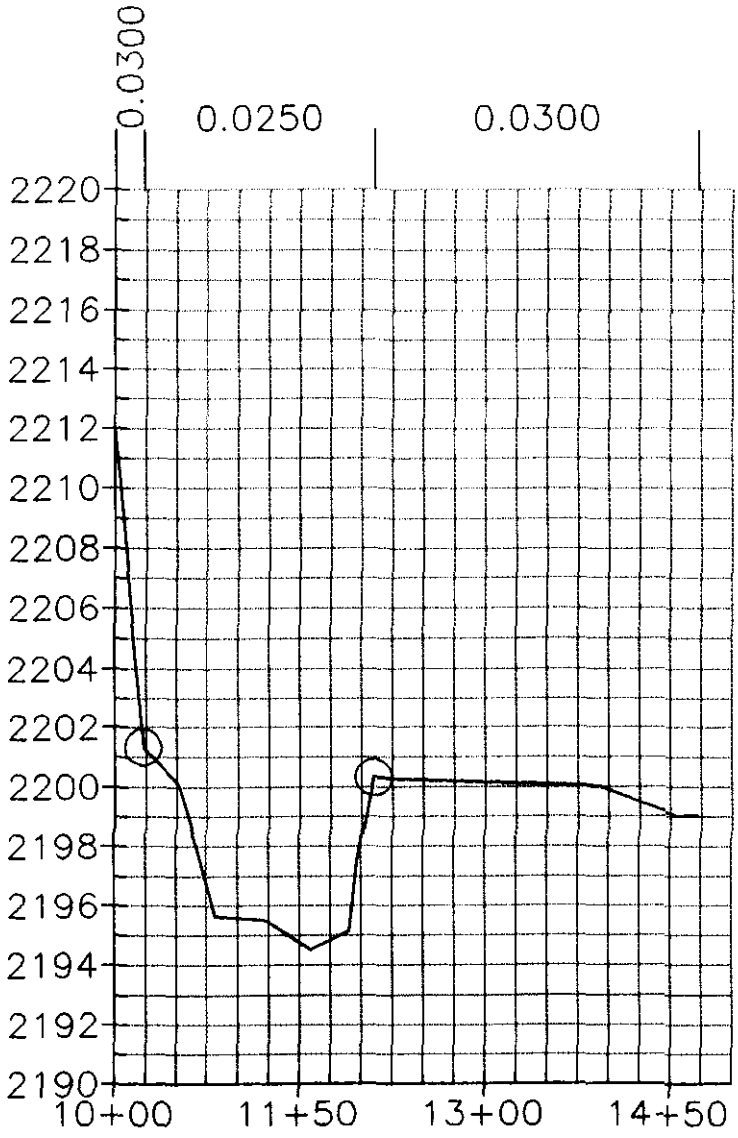
G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102



NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 270
DRAWING FL1.DWG
G.C. WALLACE, INC. Engineering/Architecture 1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102

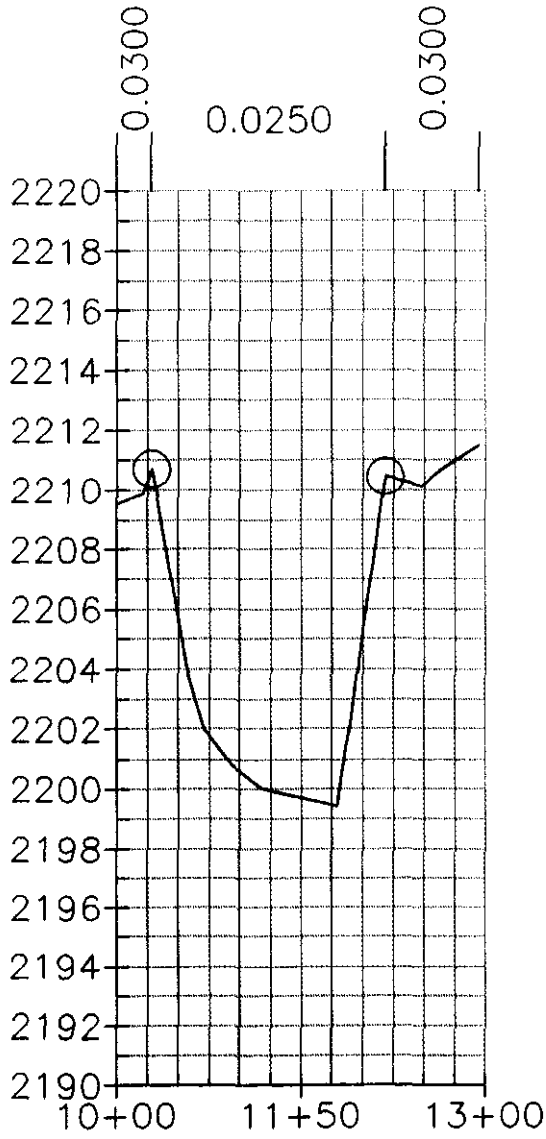


NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 280
DRAWING FL1.DWG

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102

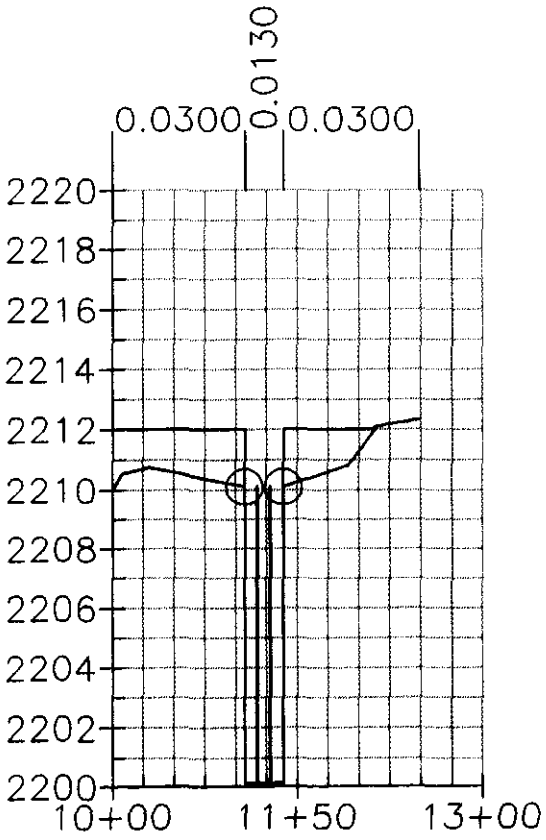


NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 290
DRAWING FL1.DWG

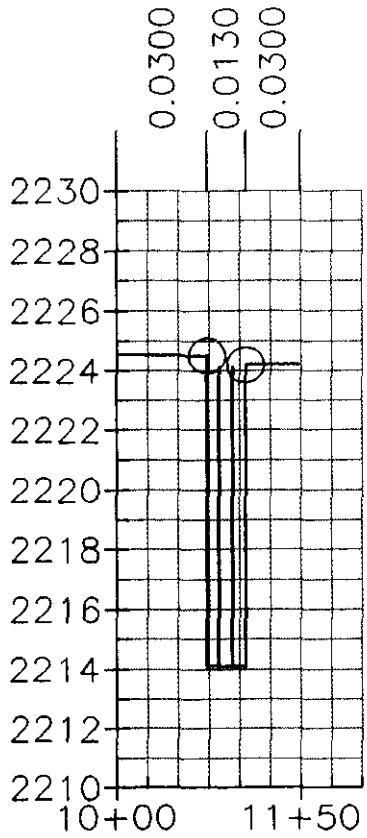
G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102



NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 300
DRAWING FL1.DWG
G.C. WALLACE, INC. Engineering/Architecture 1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102

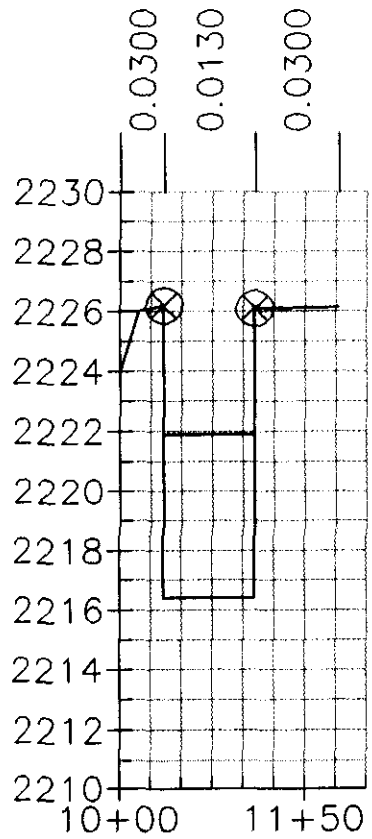


NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 310
DRAWING FL1.DWG

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102

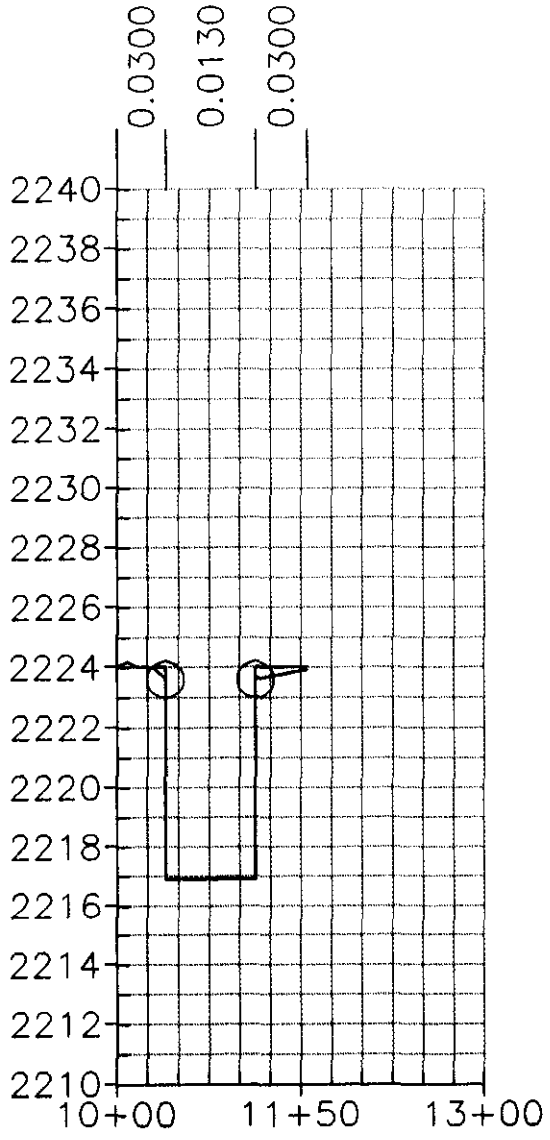


NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 320
DRAWING FL1.DWG

G.C. WALLACE, INC.
Engineering/Architecture 1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102

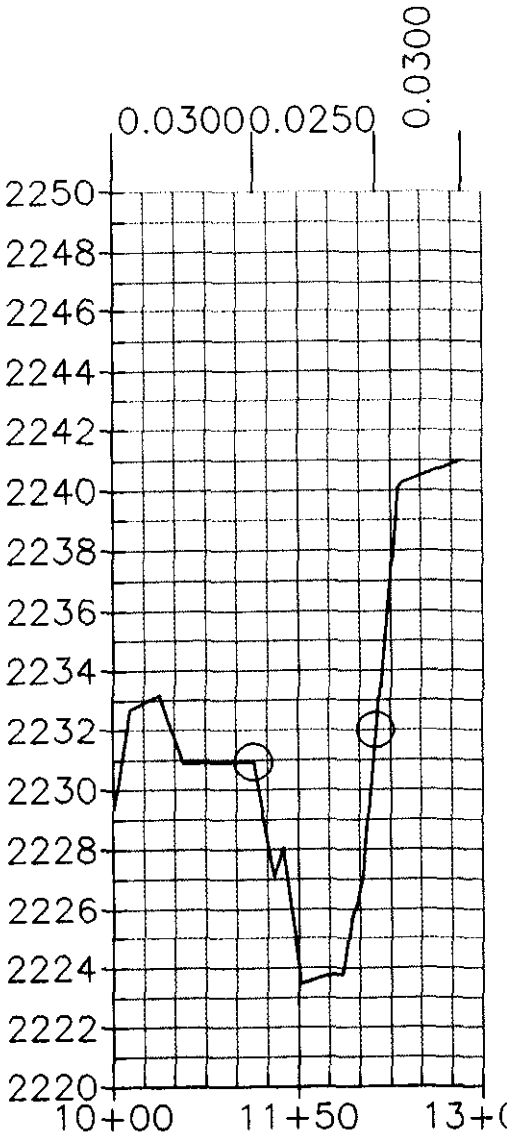


NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 330
DRAWING FL1.DWG

G.C. WALLACE, INC.
Engineering/Architecture 1555 SOUTH RAINBOW BLVD, LAS VEGAS, NEVADA 89102

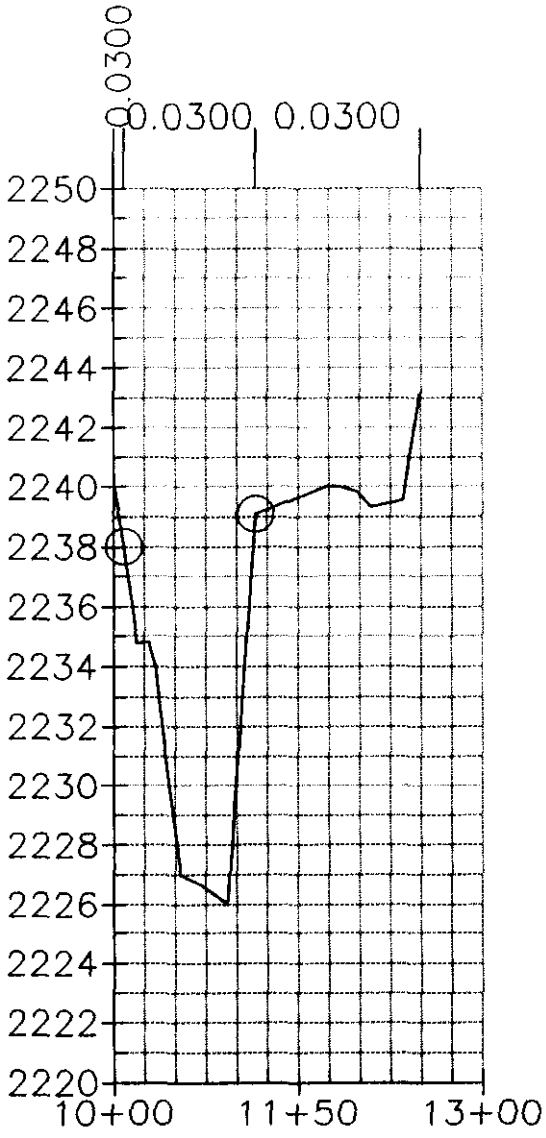


NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
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DRAWING FL1.DWG

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102

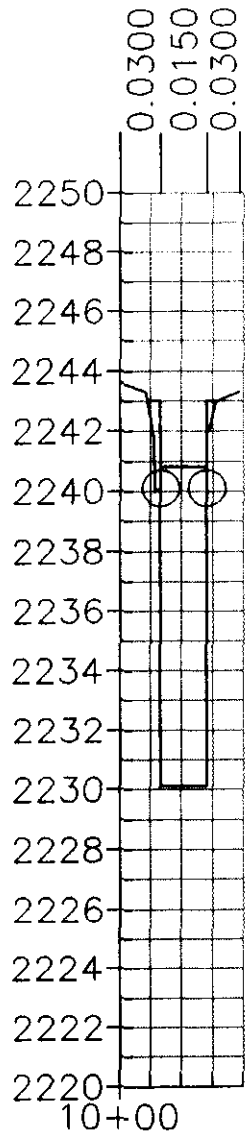


NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 350
DRAWING FL1.DWG

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102

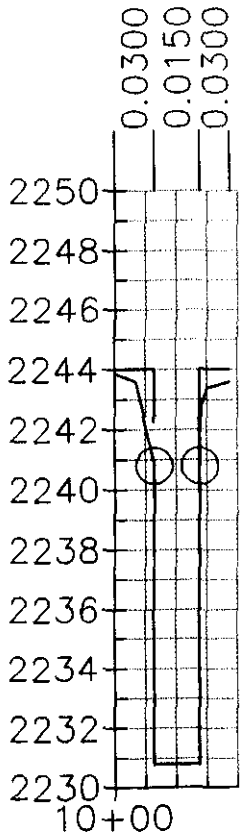


NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 360
DRAWING FL1.DWG

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102

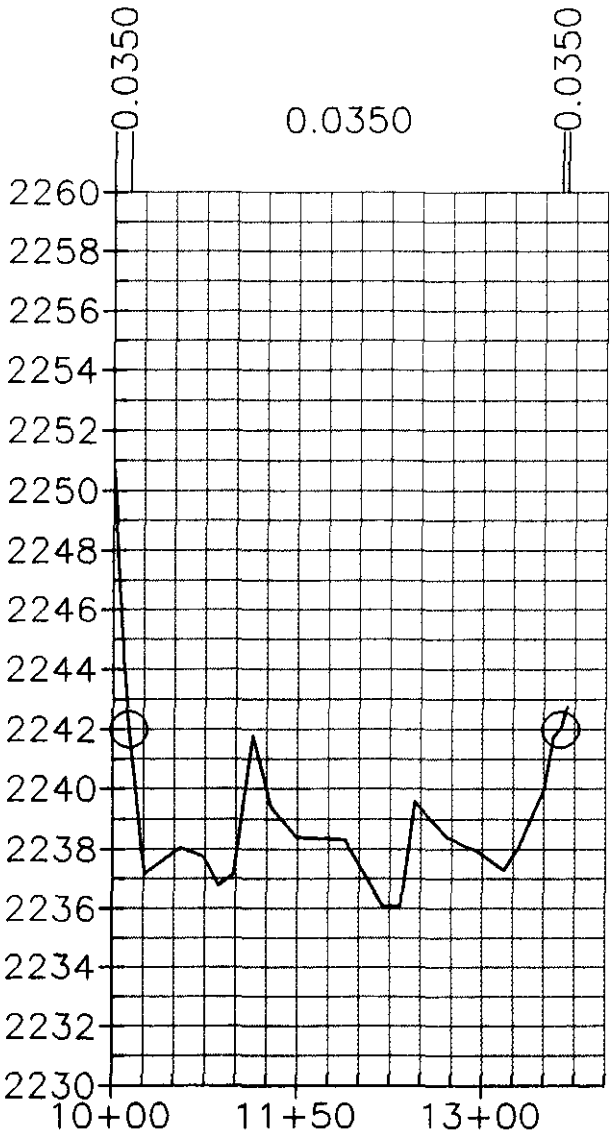


NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 370
DRAWING FL1.DWG

G.C. WALLACE, INC.
Engineering/Architecture 1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102

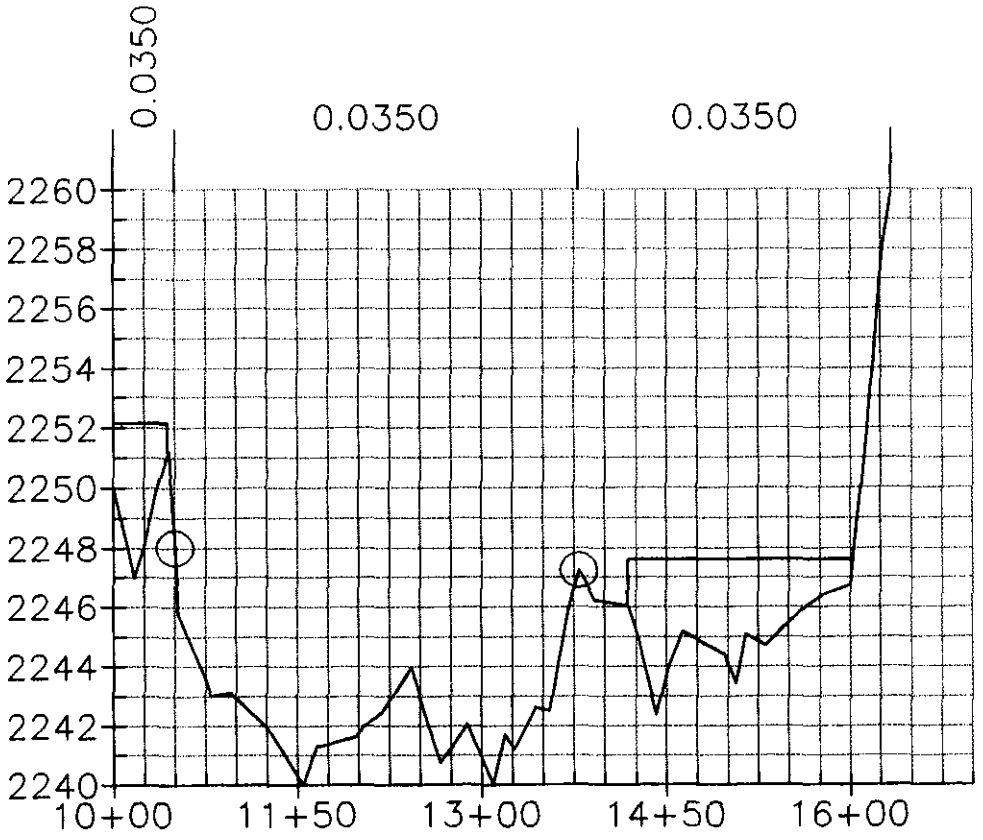


NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 380
DRAWING FL1.DWG

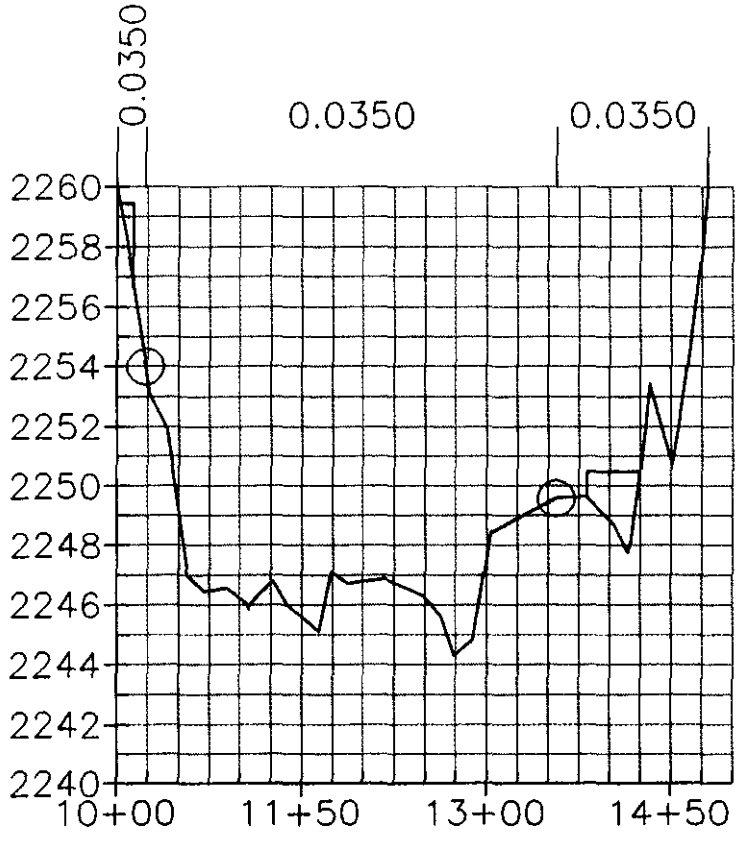
G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102



NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 390
DRAWING FL1.DWG
G.C. WALLACE, INC. Engineering/Architecture 1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102

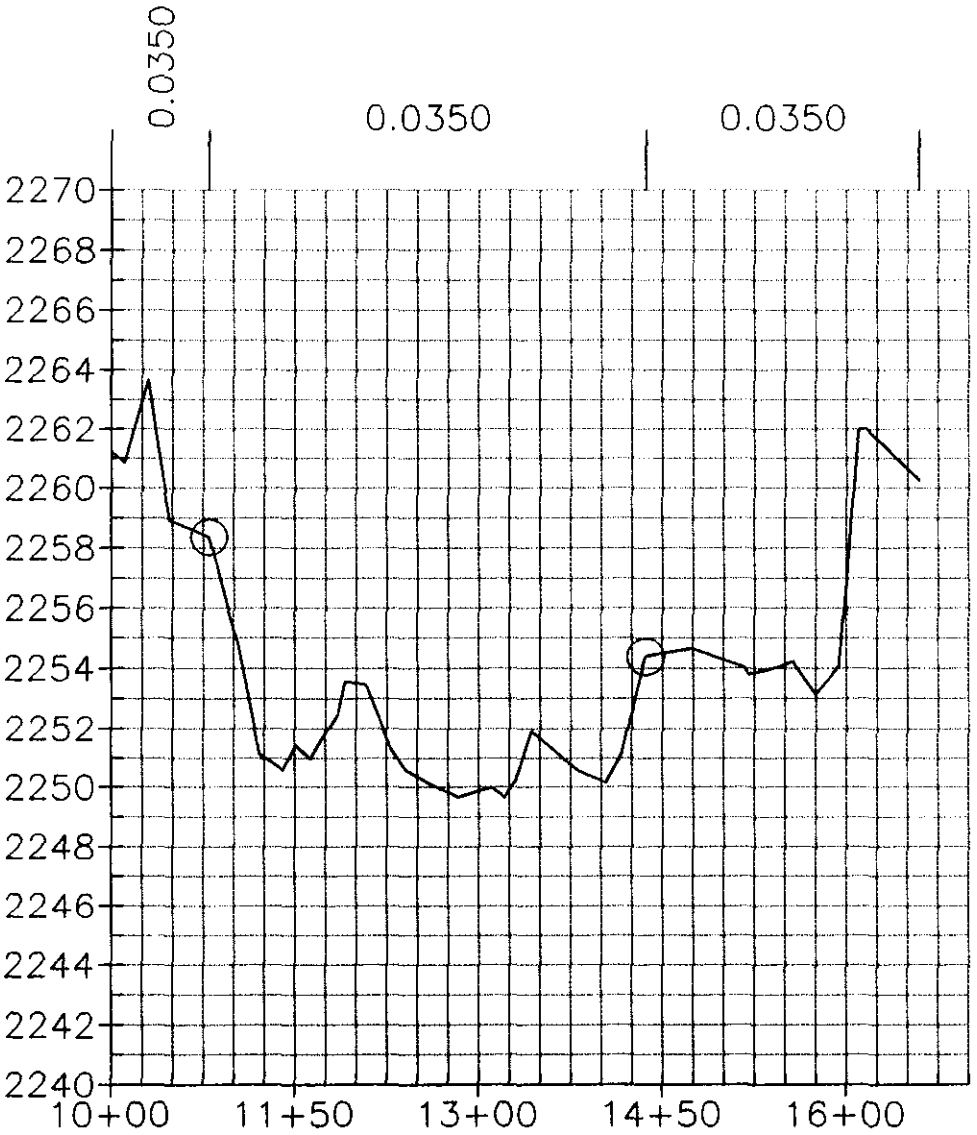


NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 400
DRAWING FL1.DWG

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102



NOTE:

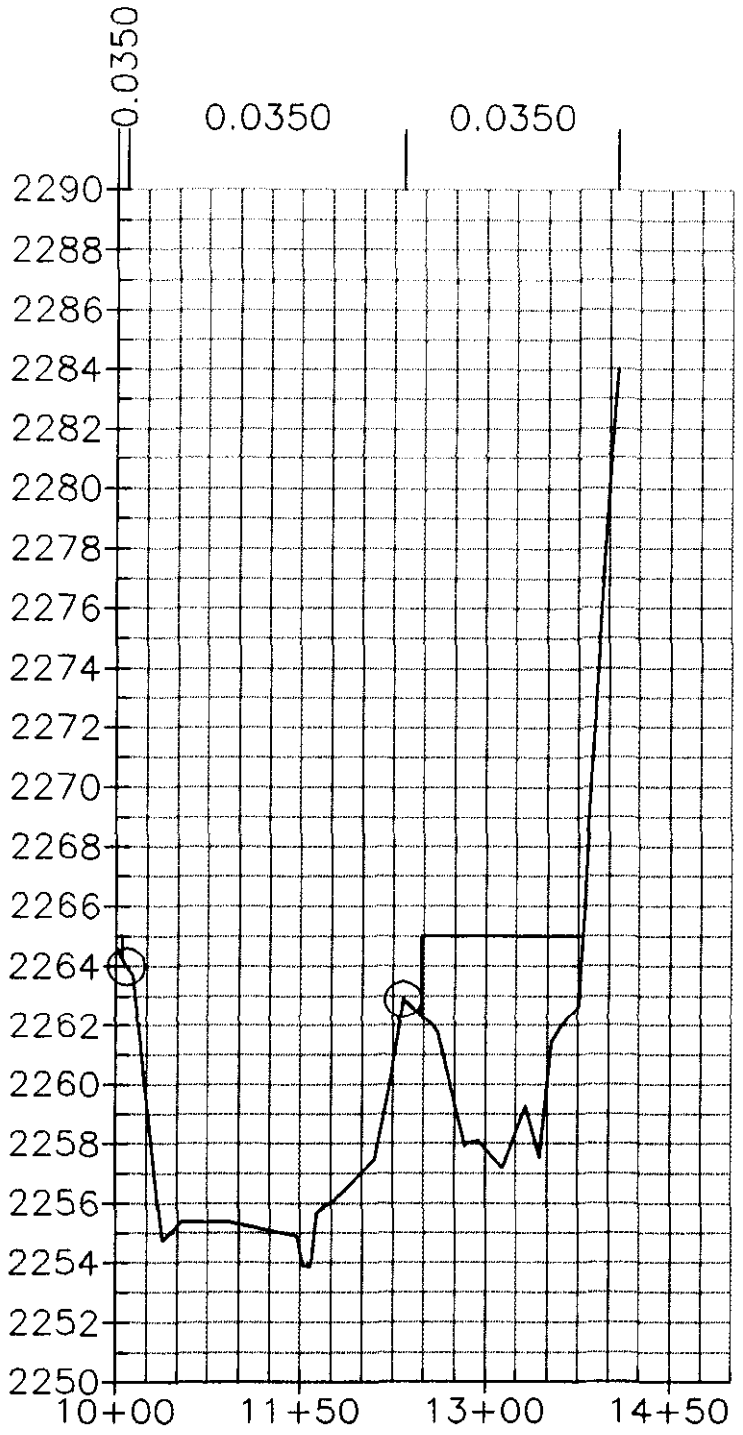
1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY
CCRFCD

CROSS SECTION NO. 410

DRAWING FL1.DWG

G.C. WALLACE, INC.
Engineering/Architecture 1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102

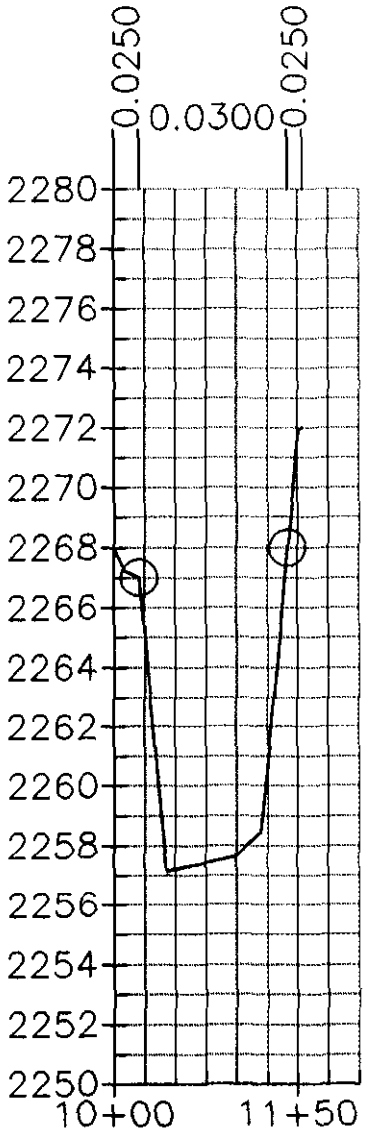


NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 420
DRAWING FL1.DWG

G.C. WALLACE, INC.
Engineering/Architecture 1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102

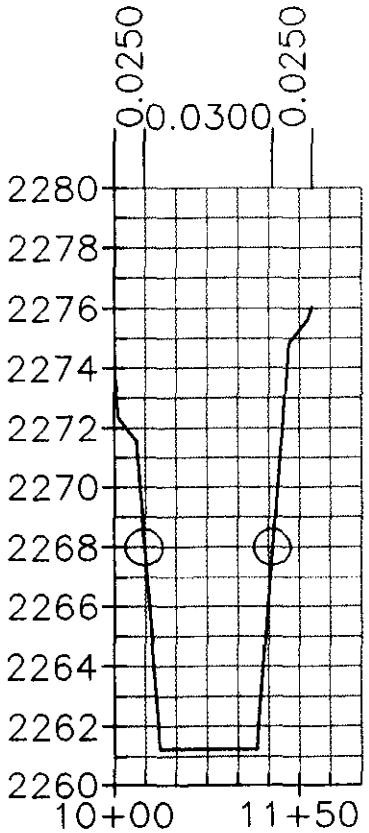


NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 430
DRAWING FL1.DWG

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102

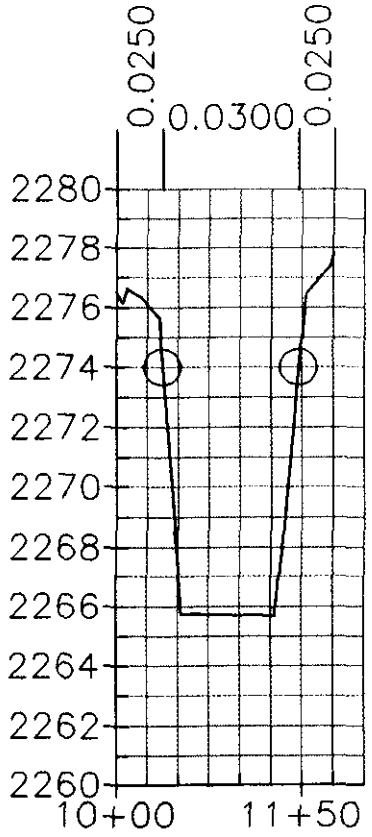


NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 440
DRAWING FL1.DWG

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102

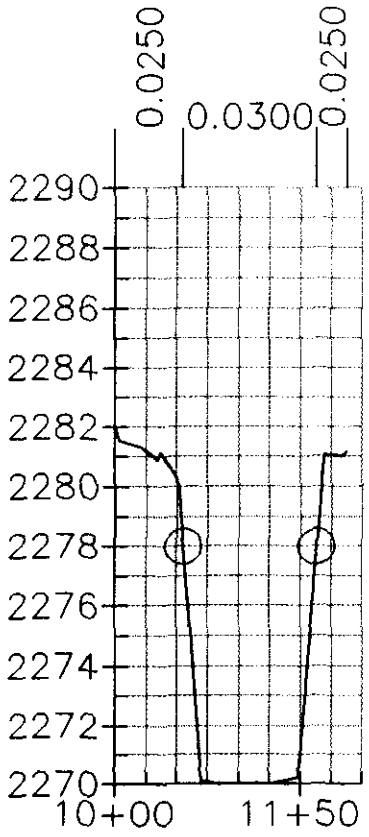


NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 450
DRAWING FL1.DWG

G.C. WALLACE, INC.
Engineering/Architecture 1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102

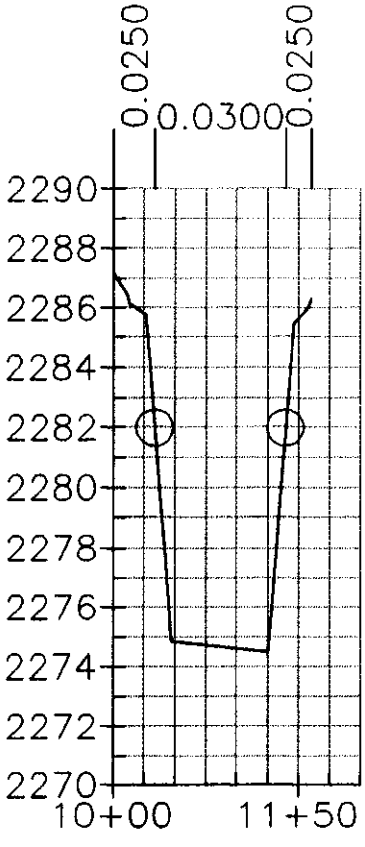


NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 460
DRAWING FL1.DWG

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102

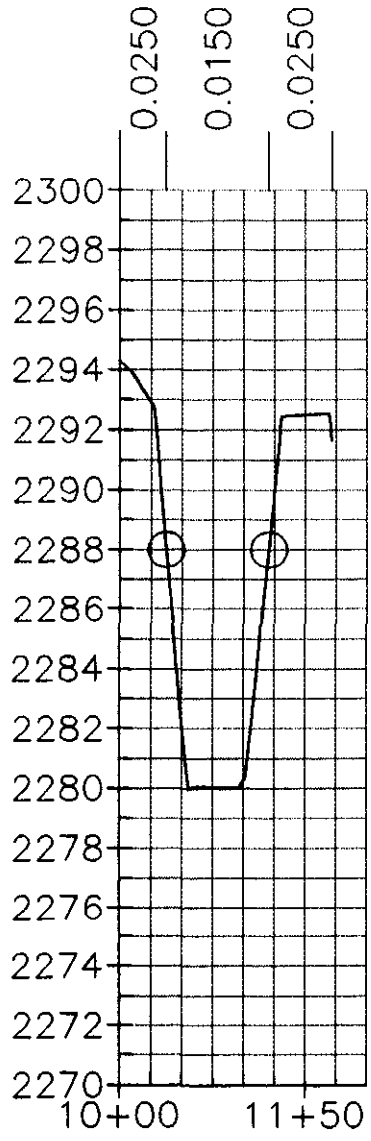


NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 470
DRAWING FL1.DWG

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102

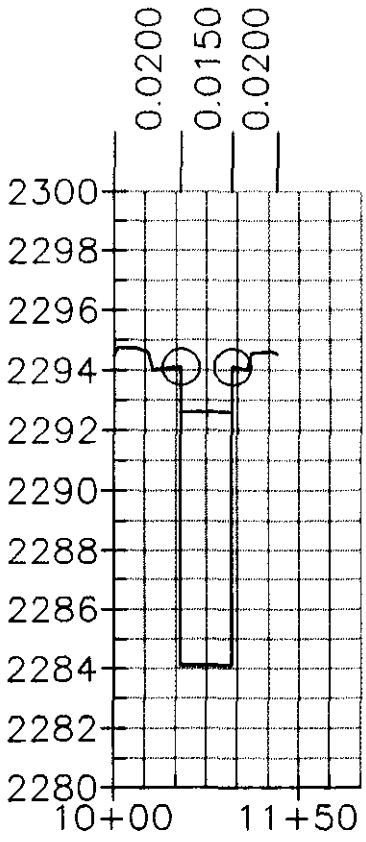


NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 480
DRAWING FL1.DWG

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102

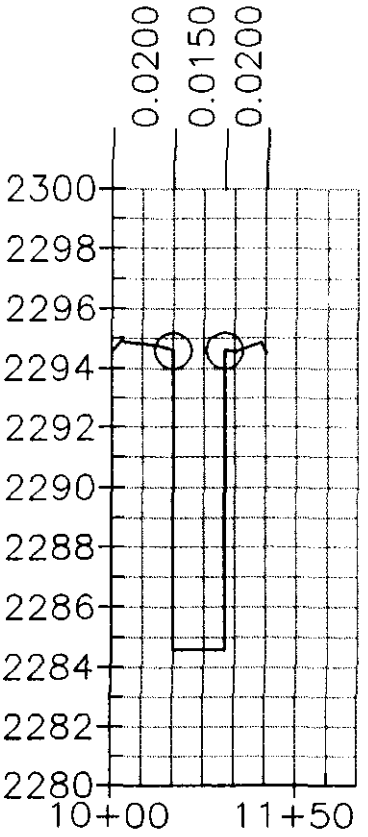


NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 490
DRAWING FL1.DWG

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102

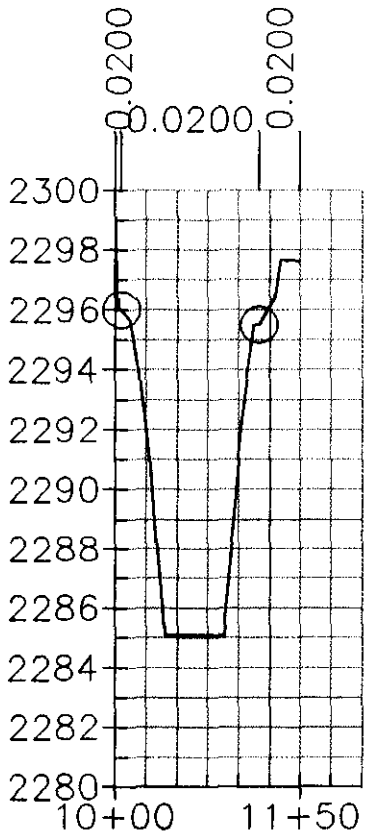


NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 500
DRAWING FL1.DWG

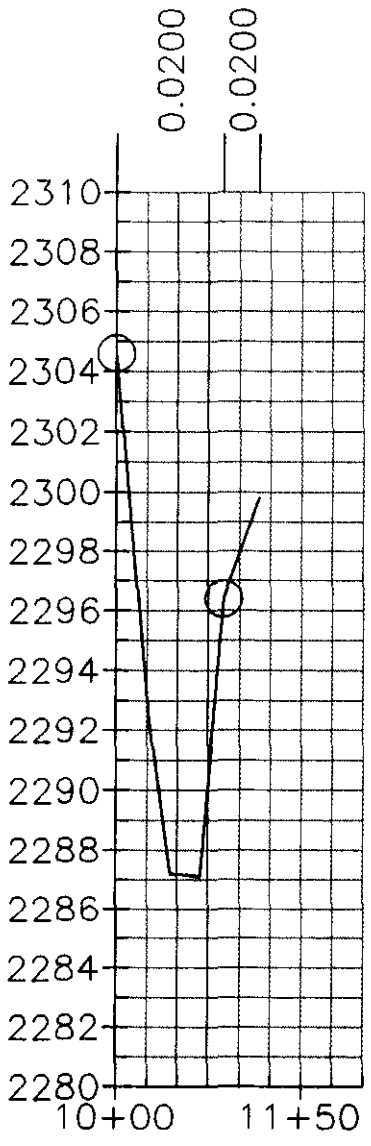
G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102



NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 510
DRAWING FL1.DWG
G.C. WALLACE, INC. Engineering/Architecture 1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102

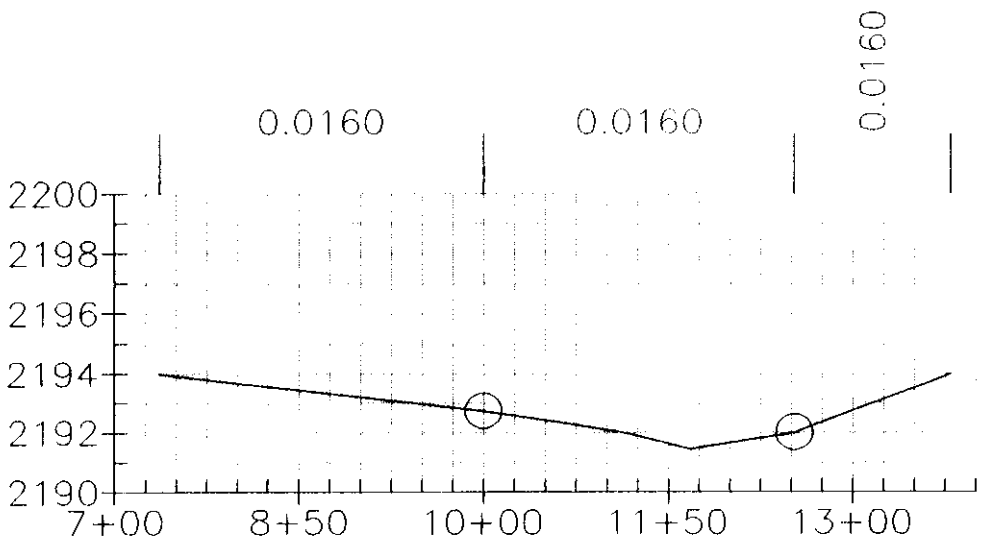


NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 520
DRAWING FL1.DWG

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102



NOTE:

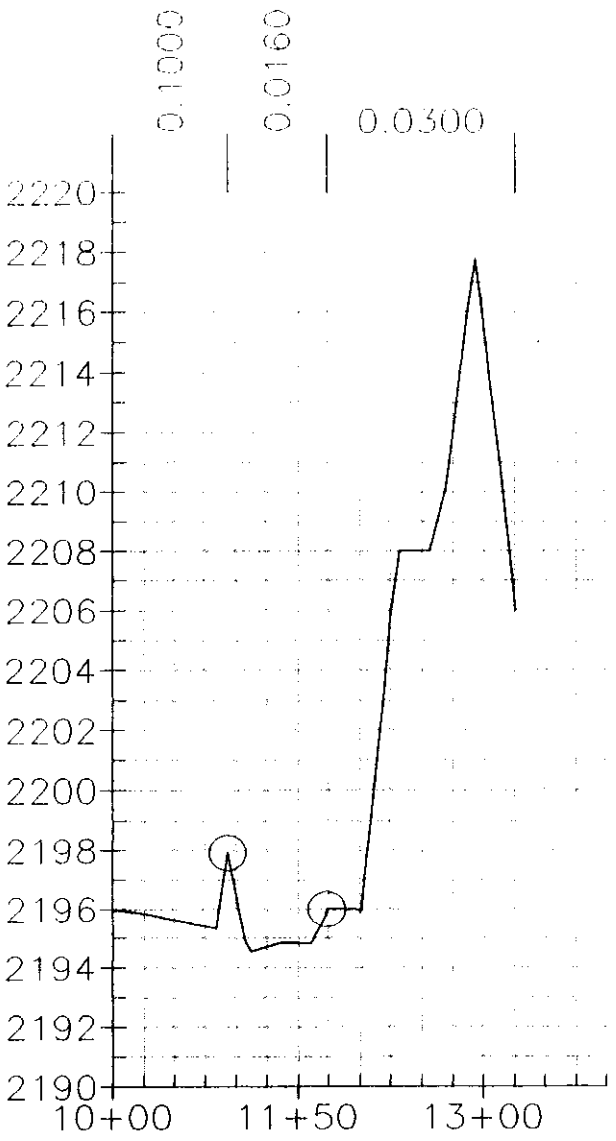
1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY
CCRFCD

CROSS SECTION NO. 1001

DRAWING FL1.DWG

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD., LAS VEGAS, NEVADA 89102



NOTE:

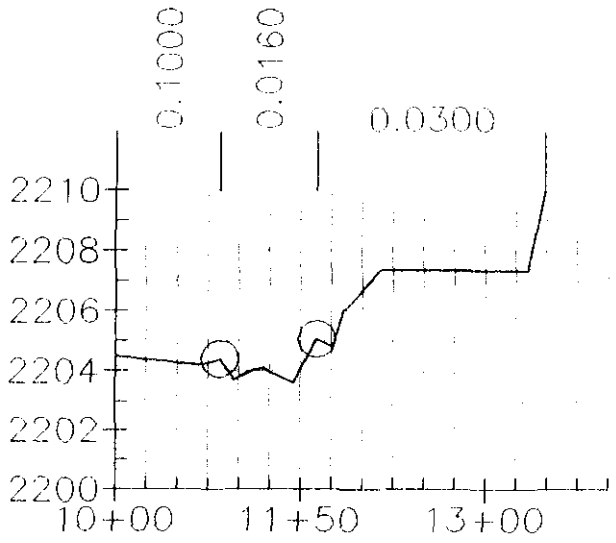
1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY
CCRFCD

CROSS SECTION NO. 1002

DRAWING FL1.DWG

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102



NOTE:

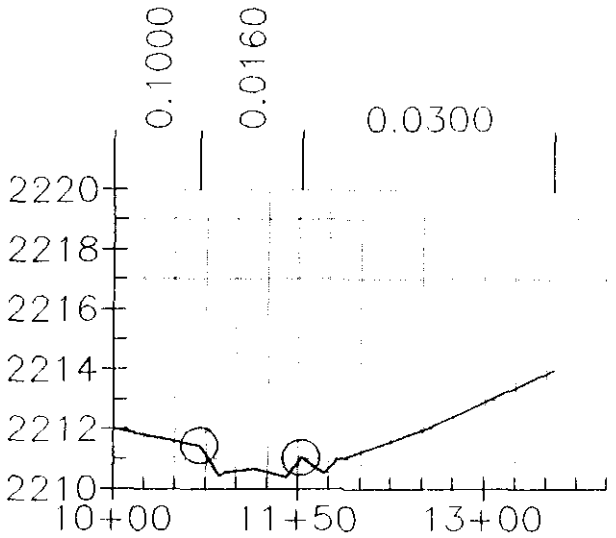
1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY
CCRFCD

CROSS SECTION NO. 1003

DRAWING FL1.DWG

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102

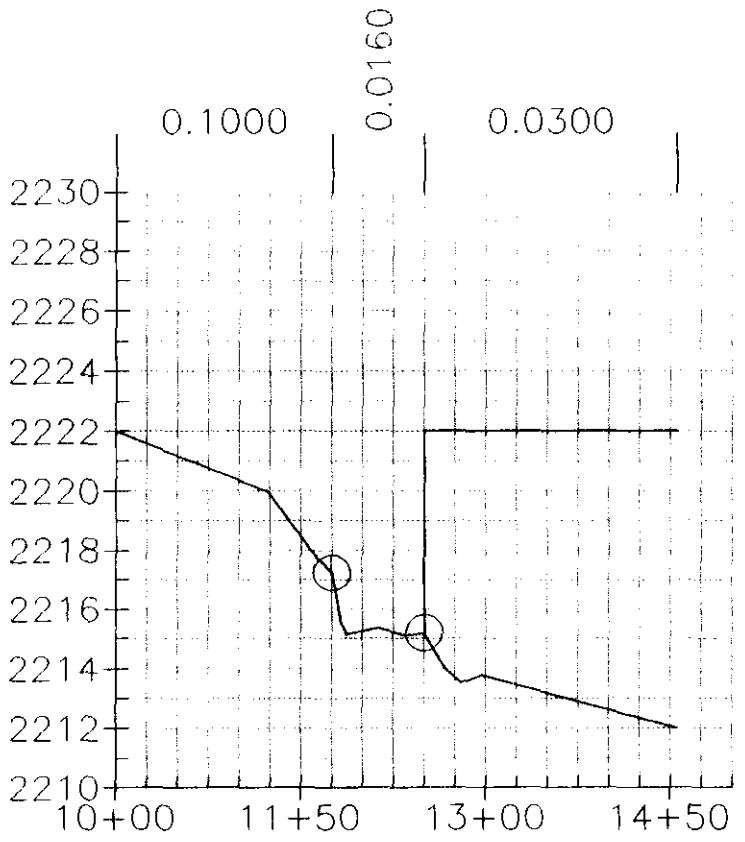


NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 1004
DRAWING FL1.DWG

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102

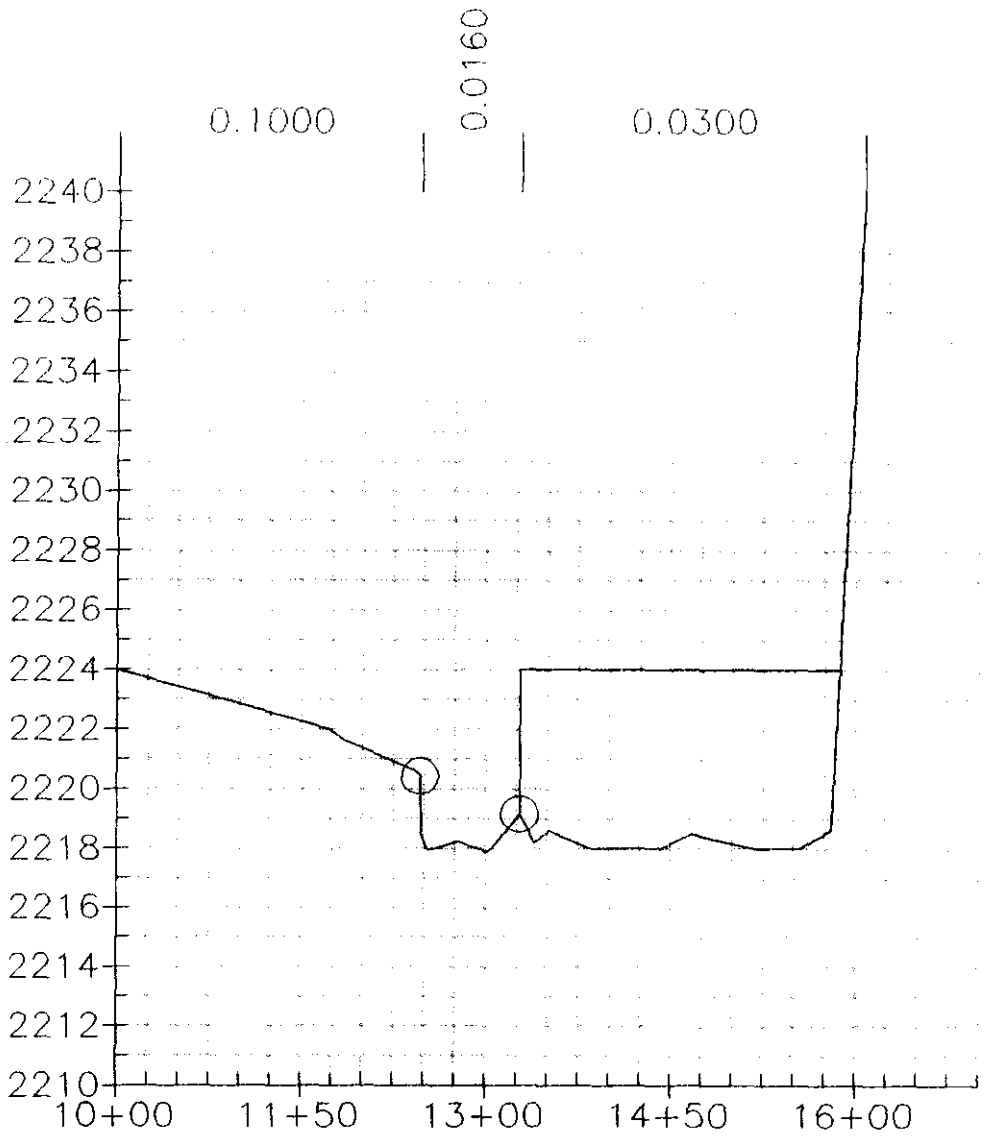


NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 1005
DRAWING FL1.DWG

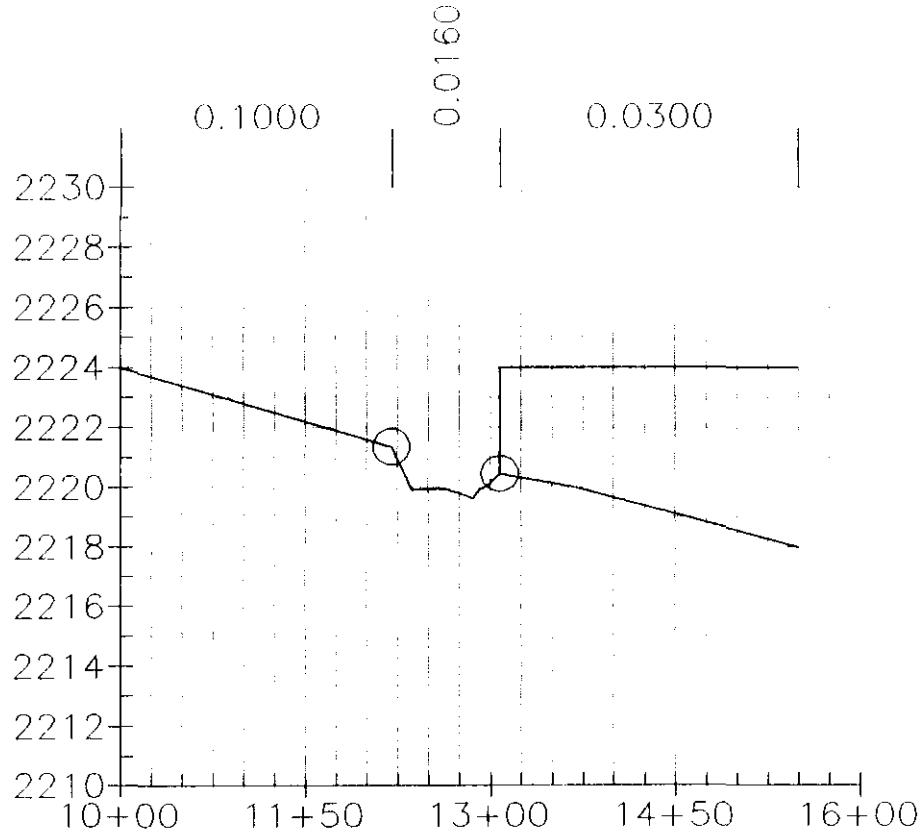
G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102



NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 1006
DRAWING FL1.DWG
G.C. WALLACE, INC. Engineering/Architecture 1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102



NOTE:

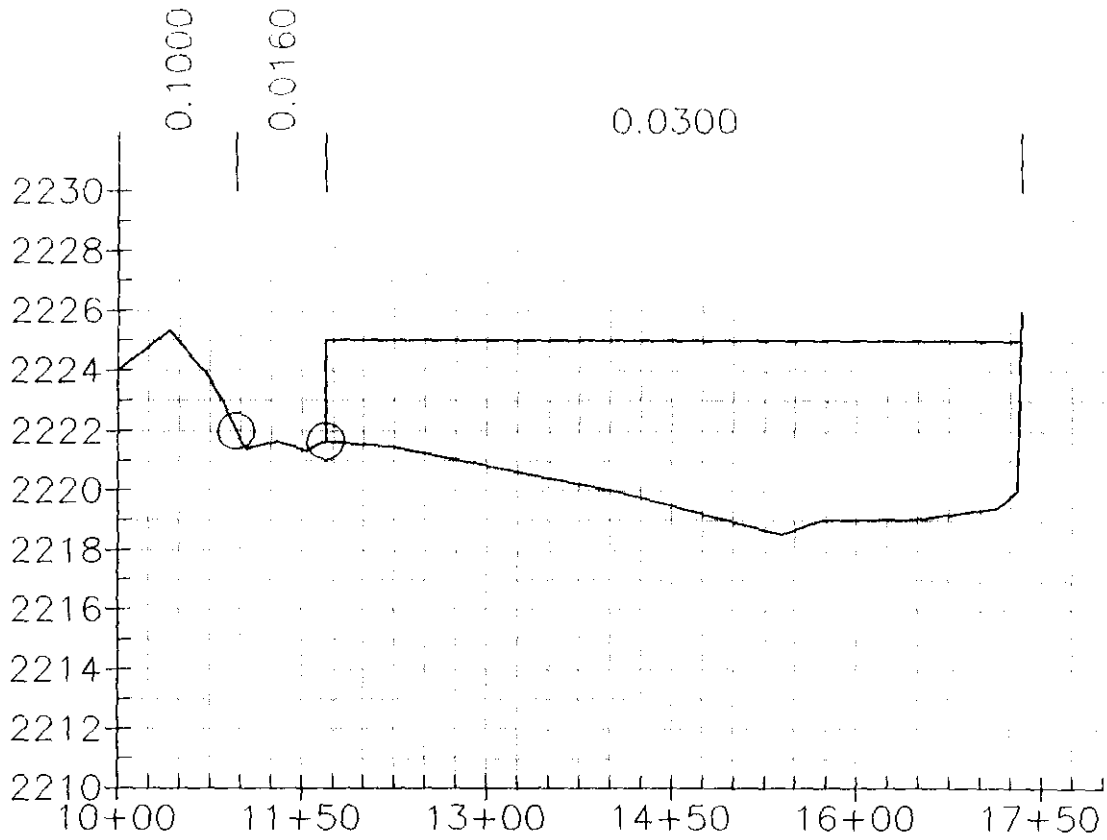
1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY
CCRFCD

CROSS SECTION NO. 1007

DRAWING FL1.DWG

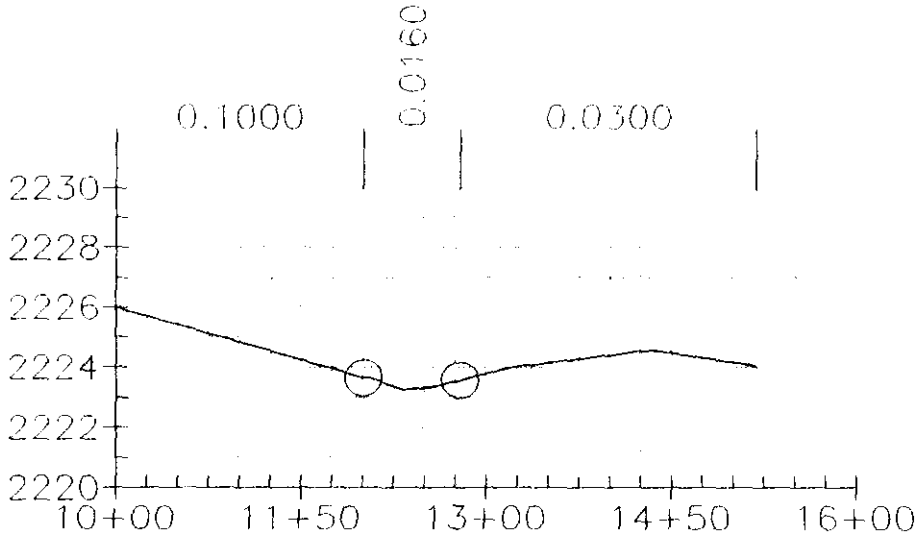
G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102



NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 1008
DRAWING FL1.DWG
G.C. WALLACE, INC. Engineering/Architecture 1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102



NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 1009
DRAWING FL1.DWG

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102

2.3.3 IMPERIAL PALACE TO SPENCER ST. REACH

MANNING'S NUMBER ("n")

PROJECT: FLAMINGO WASH FIS RESTUDY
DRAWING: FL2.DWG

HEC-2 STATION	$n_{channel}$	$n_{left\ overbank}$	$n_{right\ overbank}$	ROLL#/PICTURE#	PAGE# CALC. SHEET
10	0.030	0.035	0.035	3 / 36-37 & 4 / 1-8	23 & 24 of 37
20	0.030	0.035	0.035	3 / 36-37 & 4 / 1-8	23 & 24 of 37
30	0.015	0.025	0.025	3 / 29-35	21 & 22 of 37
40	0.015	0.025	0.025	3 / 35	BRIDGE
50	0.015	0.025	0.025	3 / 34	BRIDGE
60	0.015	0.025	0.025	3 / 29-35	21 & 22 of 37
70	0.015	0.025	0.025	3 / 29-35	21 & 22 of 37
80	0.015	0.025	0.025	3 / 29-35	21 & 22 of 37
90	0.015	0.025	0.025	3 / 29-35	21 & 22 of 37
100	0.015	0.025	0.025	3 / 29-35	21 & 22 of 37
110	0.015	0.025	0.025	3 / 29-35	21 & 22 of 37
120	0.015	0.025	0.025	3 / 29-35	21 & 22 of 37
130	0.015	0.025	0.025	3 / 29-35	21 & 22 of 37
140	0.015	0.025	0.025	3 / 29-35	21 & 22 of 37
150	0.015	0.025	0.025	3 / 29-35	21 & 22 of 37
160	0.015	0.025	0.025	3 / 29-35	21 & 22 of 37
170	0.015	0.025	0.025	3 / 29-35	21 & 22 of 37
180	0.025	0.030	0.030	3 / 25-28	19 & 20 of 37
190	0.025	0.030	0.030	3 / 25-28	19 & 20 of 37
200	0.025	0.030	0.030	3 / 25-28	19 & 20 of 37
210	0.015	0.025	0.025	3 / 24	
220	0.015	0.025	0.025	3 / 24	BRIDGE
230	0.015	0.025	0.025	3 / 23	BRIDGE
240	0.025	0.025	0.025	3 / 23	
250	0.025	0.025	0.025	3 / 15-24	18 of 37
260	0.025	0.025	0.025	3 / 15-24	18 of 37
270	0.020	0.025	0.025	3 / 19	BRIDGE
280	0.020	0.025	0.025	3 / 18	BRIDGE
290	0.025	0.025	0.025	3 / 15-24	18 of 37
300	0.025	0.025	0.025	3 / 15-24	18 of 37
310	0.015	0.025	0.025	3 / 15	BRIDGE
320	0.015	0.025	0.025	3 / 14	BRIDGE
330	0.030	0.035	0.035	3 / 7-14	16 & 17 of 37
340	0.030	0.035	0.035	3 / 7-14	16 & 17 of 37
350	0.015	0.025	0.025	3 / 10	BRIDGE
360	0.015	0.025	0.025	3 / 9	BRIDGE
370	0.015	0.025	0.025	3 / 9	
380	0.015	0.025	0.025	3 / 9	
390	0.030	0.035	0.035	3 / 7-14	16 & 17 of 37
400	0.015	0.025	0.025	3 / 1-6	14 & 15 of 37
410	0.015	0.025	0.025	3 / 1-6	14 & 15 of 37
420	0.015	0.025	0.025	3 / 1-6	14 & 15 of 37
430	0.015	0.025	0.025	3 / 5	BRIDGE
440	0.015	0.025	0.025	3 / 4	BRIDGE
450	0.015	0.025	0.025	3 / 1-6	14 & 15 of 37

460	0.015	0.025	0.025	3 / 1-6	14 & 15 of 37
470	0.015	0.025	0.025	3 / 1-6	14 & 15 of 37
480	0.015	0.025	0.025	2 / 25	
490	0.016	0.100	0.100	2 / 17-25	13A of 37
500	0.016	0.100	0.100	2 / 17-25	13A of 37
510	0.016	0.100	0.100	2 / 17-25	13A of 37
520	0.016	0.100	0.100	2 / 17-25	13A of 37
530	0.016	0.100	0.100	2 / 17-25	13A of 37
540	0.016	0.100	0.100	2 / 17-25	13A of 37
550	0.016	0.100	0.100	2 / 17-25	13A of 37
560	0.015	0.016	0.016	2 / 18	

DATE 6/

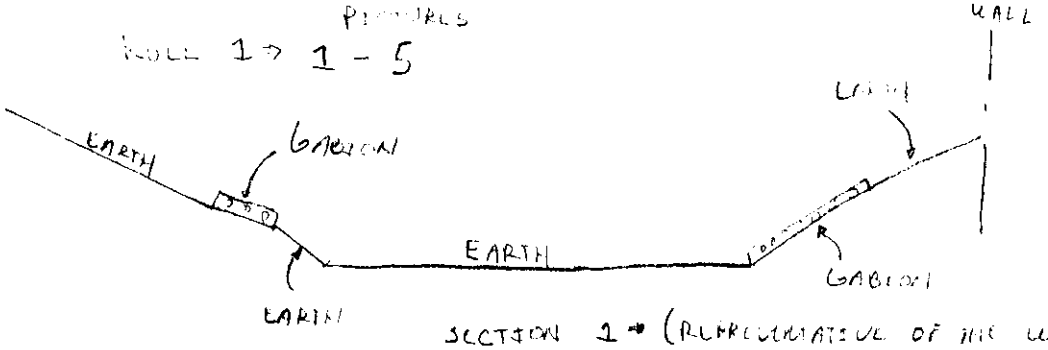
CLIENT [illegible] / [illegible] JOB NO 550.032 C CALC BY

DESCRIPTION CHANNEL MANNING'S 'N' CHECKED BY

$n = (n_0 + n_1 + n_2 + n_3 + n_4) m_5$

PICTURES

ROLL 1 → 1 - 5



SECTION 1 → (REPRESENTATIVE OF THE WHOLE REACH)

MATERIAL:

EARTH = 0.020 GABION = 0.030

12% CONSIST OF GABION, 88% CONSIST OF EARTH

$n_0 = 12\%\,(.030) + 88\%\,(0.020) = .021$

IRREGULARITY:

SMOOTH

$n_1 = 0.000$

VARIATIONS:

GRADUAL

$n_2 = 0.000$

OBSTRUCTIONS:

NEGLIBLE

$n_3 = 0.000$

VEGETATION:

LOW

$n_4 = 0.005$

DEGREE OF MEANDERING

MINOR

$m_5 = 1.000$

$n_{CHANNEL} = 0.0262$ ROUND TO

$n_{CHANNEL} = 0.025$

PICTURE

ROLL 1 → 1 - 5

EN-3-N
3/66

SHEET 1 OF 37

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD. / LAS VEGAS, NEVADA 89102

DATE _____

CLIENT CCRFCD JOB NO 550.02 & 3 CALC BY _____

DESCRIPTION OVERBANK MANNING'S 'n' CHECKED BY _____

MANNING'S n

LAND [illegible]

30% CANOE OF CHANNEL 70% [illegible]

n_O = 30% (.030) + 70% (0.020) = .023

IRREGULARITY:

SMOOTH

n_1 = 0.000

VARIATIONS:

GRADUAL

n_2 = 0.000

OBSTRUCTIONS:

NEGLIGIBLE

n_3 = 0.000

VEGETATION

LOW

n_4 = 0.005

DEGREE OF MEANDERING

MINOR

n_5 = 1.000

$n_{LEFT, RIGHT\ OVERBANK}$ = .028 ROUND TO

$n_{OVERBANK}$ = 0.03

PICTURE

ROLL 1 => 1-5

EN-3-N
3/66

SHEET 2 OF 37

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD. / LAS VEGAS, NEVADA 89102

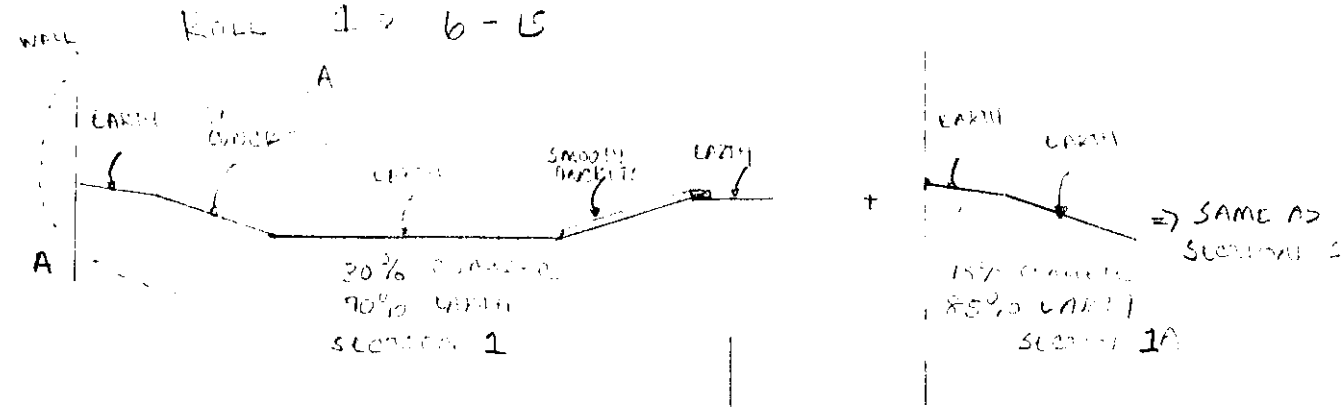
DATE 6/

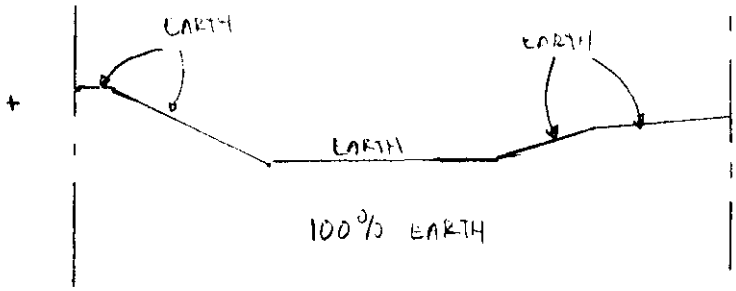
CLIENT CORPS JOB NO 550.022C CALC BY

DESCRIPTION CHANNEL MANNING'S "n" CHECKED BY

REACH

ROLL 1 = 6 - 6





SECTION 2

15% OF THE REACH IS COMPRISED OF SECTION 1A

30% OF THE REACH IS COMPRISED OF SECTION 2

55% OF THE REACH IS COMPRISED OF SECTION 1

MATERIAL:

EARTH = 0.020 CONCRETE = 0.015

$$n_0 = 55\%\left[30\%(.015) + 70\%(.020)\right] + 15\%\left[15\%(.015) + 85\%(.020) + 30\%(.020)\right] = .019$$

IRREGULARITY:

SMOOTH

$n_1 = 0.000$

VARIATION:

GRADUAL

$n_2 = 0.000$

OBSTRUCTION:

NEGLIBLE

$n_3 = 0.000$

VEGETATION:

NONE

$n_4 = 0.000$

DEGREE OF MEANDERING

MINOR

$m_5 = 1.000$

$n_{CHANNEL} = 0.019$ ROUND TO

$n_{CHANNEL} = 0.02$

ROLL 1 FIGURE E-15

EN-3-N
3/66

SHEET 3 OF 37

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102

DATE

CLIENT SCRTCD JOB NO 550.032 CALC BY

DESCRIPTION OVERBANK MANNING'S n CHECKED BY

80% [illegible]

30% [illegible]

55% [illegible]

45% [illegible]

100% [illegible]

MATERIAL

LAND 0.030 CHANNEL 0.015

$$n_o = 55\%\left[80\%(.015) + 20\%(0.030)\right] + 15\%\left[55\%(0.020) + 45\%(.015)\right]$$

$$+ \ 30\%(0.000)\Big] = 0.017$$

IRREGULARITY	VARIATION'S	OBSTRUCTION
SMOOTH	GRADUAL	NEGLIBLE
$n_1 = 0.000$	$n_2 = 0.000$	$n_3 = 0.000$

VEGETATION	DEGREE OF MEANDERING
NONE	MINOR
$n_4 = 0.000$	$m_5 = 1.000$

$n_{LEFT, RIGHT\ OVERBANK} = 0.017$ ROUND TO

$n_{OVERBANK} = 0.02$

PERMISSIBLE

BALL 1 = 6-15

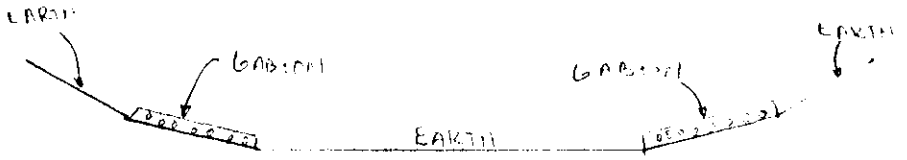
G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD. / LAS VEGAS, NEVADA 89102

DATE _____

CLIENT CCRFCD JOB NO 550.032.C CALC BY _____

DESCRIPTION CHANNEL MANNING'S n CHECKED BY _____

ROLL 1 : 16 - 20



SECTION 1 ⇒ (REPRESENTATIVE OF THE ENTIRE REACH)

MATERIALS

EARTH = 0.020 GABION = 0.030

20% CONSIST OF GABION, 80% CONSIST OF EARTH

n_o = 20% (0.030) + 80% (0.020) = 0.022

IRREGULARITY'S	VARIATIONS	OBSTRUCTION
SMOOTH	GRADUAL	NEGLIBLE
n_1 = 0.000	n_2 = 0.000	n_3 = 0.000

VEGETATION	DEGREE OF MEANDERING
LOW	MINOR
n_4 = 0.005 (MAINTENANCE AGREEMENT)	m_5 = 1.000

$n_{CHANNEL}$ = 0.027 ROUND TO

$n_{CHANNEL}$ = 0.030

ROLL 1 ⇒ PICTURE 16-20

EN-3-N
3/66

SHEET 5 OF 37

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD. / LAS VEGAS, NEVADA 89102

DATE 6/ [illegible]

CLIENT CCRFCD JOB NO 550.632.5 CALC BY

DESCRIPTION Overbank Manning's n CHECKED BY

MATERIAL 1

[illegible] GABIONS

70% [illegible] 30% GABIONS

MATERIAL 2

n_0 = 70% (0.020) + 30% (0.030) = 0.023

IRREGULARITY %	VARIATIONS	OBSTRUCTIONS
SMOOTH	GRADUAL	NEGLIGIBLE
n_1 = 0.000	n_2 = 0.000	n_3 = 0.000

VEGETATION %	DEGREE OF MEANDERING
NONE	MINOR
n_4 = 0.000	m_5 = 1.000

$n_{LEFT, RIGHT\ OVERBANK}$ = 0.023 ROUND TO

$n_{OVERBANK}$ = 0.025 ACCEPTED ROLL 1 => 16-20

EN-3-N
3/66

SHEET 6 OF 37

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD. / LAS VEGAS, NEVADA 89102

DATE 6/-

CLIENT CCRFCD JOB NO 552.032 CALC BY

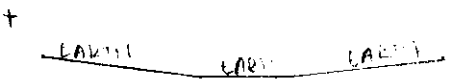
DESCRIPTION CHANNEL MANNING'S "n" CHECKED BY

ROLL 1 => 21 - 27



90% EARTH 10% CONCRETE

SECTION 1



100% EARTH

SECTION 2

30% OF THE REACH IS COMPRISED OF SECTION 1

70% OF THE REACH IS COMPRISED OF SECTION 2

MATERIAL:

EARTH = 0.020 CONCRETE = 0.015

$$n_0 = 30\% \left[90\% (0.020) + 10\% (0.015) \right] + 70\% (0.020) = 0.020$$

IRREGULARITY:

MINOR

$n_1 = 0.005$

VARIATIONS:

ALTERNATING OCCASIONALLY

$n_2 = 0.005$

OBSTRUCTION:

NEGLIGIBLE

$n_3 = 0.000$

VEGETATION

LOW

$n_4 = 0.005$

DEGREE OF MEANDERING

MINOR

$m_5 = 1.000$

PICTURE ROLL 1 => 21-27

$n_{CHANNEL} = 0.035$

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD. / LAS VEGAS, NEVADA 89102

DATE 6/[illegible]/97

CLIENT CCRFCD JOB NO 550.032 C CALC BY

DESCRIPTION Overbank Manning's "n" CHECKED BY

SECTION 1 B SECTION 2 B

15% [illegible] 100% [illegible]

85% [illegible]

MATERIALS

EARTH = 0.030 CONCRETE = 0.015

n_0 = 30% [15% (0.015) + 85% (0.030)] + 70% (0.030) = 0.030

IRREGULARITY:

MINOR

n_1 = 0.005

VARIATIONS:

ALTERNATING OCCASSIONALLY

n_2 = 0.005

OBSTRUCTIONS:

NEGLIGIBLE

n_3 = 0.000

VEGETATION:

LOW

n_4 = 0.005

DEGREE OF MEANDERING

MINOR

m_5 = 1.000

$n_{LEFT, RIGHT\ OVERBANK}$ = 0.035

PICTURE ROLL 1 => 21-27

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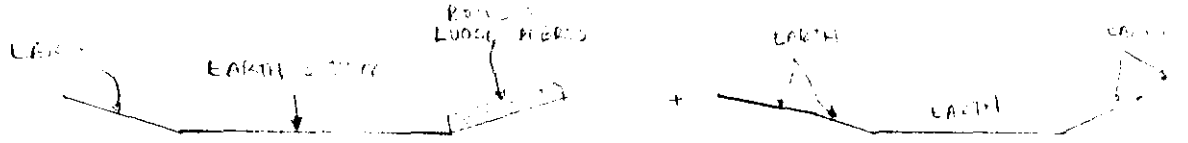
DATE

CLIENT CCRFCD JOB NO 550.5.26.3 CALC BY

DESCRIPTION CHANNEL ROUGHNESS CHECKED BY

PICTURE

ROLL 1 => 28-37



90% EARTH BOTTOM AND RUBBLE SIDES

10% EARTH

SECTION 1

100% EARTH

SECTION 2

60% OF THE REACH IS COMPRISED OF SECTION 1.

40% OF THE REACH IS COMPRISED OF SECTION 2

MATERIALS

EARTH BOTTOM & RUBBLE SIDES = 0.030 EARTH = 0.020

$$n_o = 60\%\left[90\%(0.030) + 10\%(0.020)\right] + 40\%(0.020) = 0.025$$

IRREGULARITY %	VARIATION %	OBSTRUCTION %
SMOOTH	GRADUAL	NEGLIBLE
$n_1 = 0.000$	$n_2 = 0.000$	$n_3 = 0.000$

VEGETATION %	DEGREE OF MEANDERING	$n_{CHANNEL}$ = 0.025
NONE	MINOR	
$n_4 = 0.000$	$m_5 = 1.000$	

PICTURE
ROLL 1 => 28-37

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DATE 1/

CLIENT CRFD JOB NO 550.034.C CALC BY

DESCRIPTION OVERBANK MEANDER 'n' CHECKED BY

SECTION 1 SECTION 2

50% RUBBLE SIDES 10% ASH

50% EARTH

MATERIALS

RUBBLE SIDES = 0.030 EARTH = 0.020

$n_0 = 60\%\left[50\%(0.030) + 50\%(0.030)\right] + 40\%(0.020) = 0.023$

IRREGULARITY	VARIATIONS	OBSTRUCTIONS
SMOOTH	GRADUAL	NEGLIGIBLE
$n_1 = 0.000$	$n_2 = 0.000$	$n_3 = 0.000$

VEGETATION	DEGREE OF MEANDERING
LOW	MINOR
$n_4 = 0.005$	$n_5 = 1.000$

$n_{LEFT,\ RIGHT\ OVERBANK} = 0.028$ ROUND TO

$n_{OVERBANK} = 0.03$

PICTURE ROLL 1 => 28-37

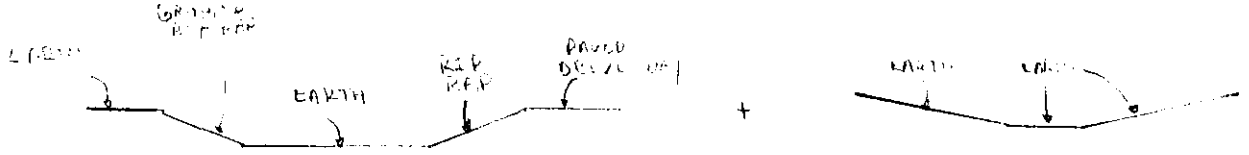
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DATE

CLIENT CCRFCD JOB NO 550.032.2 CALC BY

DESCRIPTION CHANNEL MANNING'S 'n' CHECKED BY

PICTURE 1 - 6



≈10" ⇐⇒ 8% RIP-RAP 7% GROUTED RIP RAP 100% EARTH

85% EARTH SECTION 2

SECTION 1 20% OF THE PERIMETER IS COMPRISED OF SECTION 1

80% OF THE PERIM IS COMPRISED OF SECTION 2

MATERIALS

$n_{RIP\text{-}RAP} = 0.0395 (d_{50})^{1/6} = 0.038$ $n_{GROUTED\ RIP\text{-}RAP} = 0.030$ $n_{EARTH} = 0.020$

$$n_0 = 20\% \left[8\% (0.038) + 7\% (0.030) + 85\% (0.020) \right] + 80\% (0.020) = 0.020$$

IRREGULARITY %	VARIATION %	OBSTRUCTION %
SMOOTH	GRADUAL	NEGLIBLE
$n_1 = 0.00$	$n_2 = 0.000$	$n_3 = 0.000$

VEGETATION %	DEGREE OF MEANDERING %
LOW	MINOR
$n_4 = 0.005$	$m_5 = 1.000$

$n_{CHANNEL} = 0.025$

PICTURE ROLL 2 = 1 - 6

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DATE 6/[illegible]/99

CLIENT CCRFCD JOB NO 550.[illegible] CALC BY

DESCRIPTION OVERBANK MANNING'S n CHECKED BY

SECTION [illegible]

50% RIP RAP

50% GROUTED RIP RAP

SECTION [illegible]

100% [illegible]

MATERIALS

$n_{RIP\text{-}RAP} = 0.0395\ (d_{50})^{1/6} = 0.038$ (FOR $d_{50} \cong 10''$)

$n_{GROUTED\ RIP\text{-}RAP} = 0.020$

$n_{CONCRETE} = 0.020$

$n_0 = 20\%\left[50\%(0.038) + 50\%(0.030)\right] + 80\%(0.020) = 0.023$

IRREGULARITY:

SMOOTH

$n_1 = 0.000$

VARIATIONS

GRADUAL

$n_2 = 0.000$

OBSTRUCTIONS

NEGLIBLE

$n_3 = 0.000$

VEGETATION

LOW

$n_4 = 0.005$

DEGREE OF MEANDERING

MINOR

$m_5 = 1.000$

$n_{LEFT,\ RIGHT\ OVERBANK} = 0.028$ ROUND TO

$n_{OVERBANK} = 0.03$

PICTURE ROLL 2 = 1 - 6

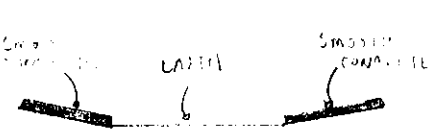
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DATE 1/7

CLIENT CCRFCD JOB NO 550.03[illegible] CALC BY

DESCRIPTION CHANNEL [illegible] "A" CHECKED BY

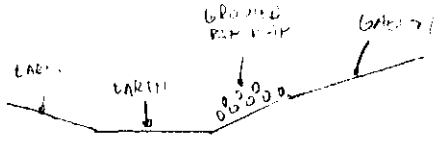
FLOW <= 17-16



80% EARTH
20% CONCRETE

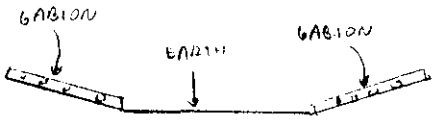
SECTION 1

+



90% EARTH
10% GROUTED RIP-RAP

SECTION 2



80% EARTH
20% GABION

SECTION 3

70% OF THE REACH IS COMPRISED OF SECTION 1

5% OF THE REACH IS COMPRISED OF SECTION 2

25% OF THE REACH IS COMPRISED OF SECTION 3

MATERIAL:

$n_{EARTH} = 0.020$ $n_{CONCRETE} = 0.015$ $n_{GROUTED\ RIP\text{-}RAP} = 0.030$ $n_{GABION} = 0.030$

$$n_o = 70\%\left[80\%(0.020) + 20\%(0.015)\right] + 5\%\left[90\%(0.020) + 10\%(0.030)\right]$$
$$+ 25\%\left[80\%(0.020) + 20\%(0.030)\right] = 0.020$$

IRREGULARITY:
SMOOTH
$n_1 = 0.000$

VARIATION:
GRADUAL
$n_2 = 0.000$

OBSTRUCTIONS:
NEGLIBLE
$n_3 = 0.000$

VEGETATION:
LOW
$n_4 = 0.005$

DEGREE OF MEANDERING:
MINOR
$m_5 = 1.000$

$n_{CHANNEL} = 0.025$

PICTURE ROLL 2 = 17-16

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DATE

CLIENT [illegible] JOB NO 550.220.2 CALC BY

DESCRIPTION OVERBANK [illegible] CHECKED BY

[illegible]

MATERIALS

n_{BASE} = 0.040 $n_{CONCRETE}$ = 0.012 $n_{GRAVEL\ BED\ RIP\ RAP}$ = 0.030 $n_{[illegible]}$ [illegible]

n_b = 70%(0.015) + 5%[50%(0.040) + [illegible] + 25%(0.030)]

+ 25%(0.000) = 0.019

IRREGULARITY

SMOOTH

n_1 = 0.000

VARIATIONS

GRADUAL

n_2 = 0.000

OBSTRUCTIONS

NEGLIGIBLE

n_3 = 0.000

VEGETATION

NONE

n_4 = 0.000

DEGREE OF MEANDERING

MINOR

m_5 = 1.000

$n_{LEFT,\ RIGHT\ OVERBANK}$ = 0.019 ROUND TO

$n_{OVERBANK}$ = 0.02

PICTURE ROLL 2 ⇒ 7-16

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DATE

CLIENT JJJ JOB NO CALC BY

DESCRIPTION CHANNEL ROUGHNESS [illegible] / OVERBANK CHECKED BY

PICTURE

ROLL 2 ⇒ 17-25

MATERIALS

$n_{concrete}$ = 0.016

n_0 = 0.016

IRREGULARITY

SMOOTH

n_1 = 0.000

VARIATIONS

GRADUAL

n_2 = 0.000

OBSTRUCTIONS

NEGLIGIBLE

n_3 = 0.000

VEGETATION

NONE

n_4 = 0.000

DEGREE OF MEANDERING

MINOR

m_5 = 1.000

$n_{CHANNEL}$ = 0.016

PICTURE

ROLL 2 ⇒ 17-25

$n_{OVERBANK}$ = 0.100 LEFT, RIGHT

REDUCE IN CONVEYANCE DUE TO DEVELOPMENT

EN-3-N
3/66

SHEET 13A OF 37

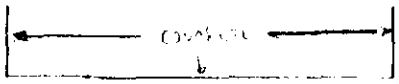
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DATE

CLIENT CCRTCD JOB NO 550.122.2 CALC BY

DESCRIPTION STORM DRAIN CHECKED BY

[illegible] => 1-6



SECTION 4 => (REF: SECTION 21 [illegible])

MATERIALS

$n_{CONCRETE}$ 0.015

n_0 = 0.015

IRREGULARITY'S

SMOOTH

n_1 = 0.000

OBSTRUCTIONS

NEGLIBLE

n_3 = 0.000

VEGETATION'S

NONE

n_4 = 0.000

DEGREE OF MEANDERING

MINOR

m_5 = 1.000

$n_{CHANNEL}$ = 0.015

PICTURE ROLL 3 => 1-6

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DATE

CLIENT JOB NO CALC BY

DESCRIPTION OVERBANK CHECKED BY

ROUGHNESS

ROLL 2 => 1-5

MATERIALS

n_1 = 1/APP = 0.000

IRREGULARITY/SMOOTH

n_2 = 0.000

VARIATION:

GRADUAL

n_2 = 0.000

OBSTRUCTIONS:

NEGLIGIBLE

n_3 = 0.000

VEGETATION:

LOW

n_4 = 0.005

DEGREE OF MEANDERING:

MINOR

m_5 = 1.000

$n_{LOW, REACH}$ OVERBANK = 0.025

ROUGHNESS

ROLL 3 => 1-6

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DATE _____

CLIENT CARSON JOB NO _____ CALC BY _____

DESCRIPTION CHANNEL MANNING'S "n" CHECKED BY _____

ROLL 3 => 7 - 14



95% EARTH
5% RIP-RAP

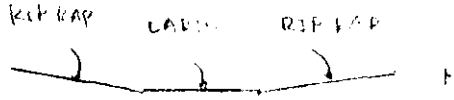
$d_{50} \approx 8"$

SECTION 1



100% EARTH

SECTION 3



60% EARTH

40% RIP-RAP

SECTION 2

77% OF THE REACH IS COMPRISED OF SECTION 1

8% OF THE REACH IS COMPRISED OF SECTION 2

15% OF THE REACH IS COMPRISED OF SECTION 3

MATERIAL:

$n_{EARTH} = 0.020$ $\quad n_{RIP\text{-}RAP} = 0.035 (d_{50})^{1/6} = 0.037$

$$n_0 = 77\% \left[95\% (0.020) + 5\% (0.037) \right] + 8\% \left[60\% (0.020) + 40\% (0.037) \right]$$

$$+ 15\% (0.020) = .021$$

DEGREE OF IRREGULARITY: SMOOTH $n_1 = 0.000$

VARIATIONS: ALTERNATING OCCASIONALLY $n_2 = 0.005$

OBSTRUCTION: NEGLIBLE $n_3 = 0.000$

VEGETATION: NONE $n_4 = 0.000$

MEANDERING: MINOR $m_5 = 1.000$

$n_{CHANNEL} = 0.026$ ROUND TO PICTURE

$n_{CHANNEL} = 0.03$

ROLL 3 => 7 - 14

EN-3-N
3/66

SHEET 16 OF 37

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DATE 7/6/95

CLIENT [illegible] JOB NO 550.03a.2 CALC BY

DESCRIPTION OVERBANK MANNING'S 'n' CHECKED BY

SECTION 1 &

50% RIP-RAP

50% EARTH

[illegible]

[illegible]

MATERIAL:

n_{EARTH} 0.020 $n_{RIP\text{-}RAP}$ $0.032 (D_{50})^{1/6}$ = 0.037

$n_b = 77\% \left[50\%(0.037) + 50\%(0.020) \right] + 8\%(0.037) + 15\%(0.030)$

$n_b = 0.028$

DEGREE OF IRREGULARITY:

SMOOTH

$n_1 = 0.000$

VARIATIONS:

ALTERNATING OCCASIONALLY

$n_2 = 0.005$

OBSTRUCTIONS:

NEGLIBLE

$n_3 = 0.000$

VEGETATION:

NONE

$n_4 = 0.000$

MEANDERING:

MINOR

$m_5 = 1.000$

$n_{LEFT,\ RIGHT\ OVERBANK} = 0.033$ ROUND TO

$n_{OVERBANK} = 0.035$

PICTURE ROLL 3 => 7-14

EN-3-N
3/66

SHEET 17 OF 37

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DATE 7/7/-

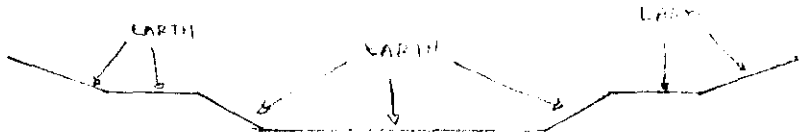
CLIENT CITY OF JOB NO 557 CALC BY

DESCRIPTION CHANNEL IMPROVEMENTS CHECKED BY

& OVERBANK

PICTURE

ROLL 3 ⇒ 15 - 24



REPRESENTATIVE OF THE LOWER REACH

MATERIALS

EARTH, CLEAN

$n_0 = 0.020$

IRREGULARITY

SMOOTH

$n_1 = 0.000$

VARIATIONS

GRADUAL

$n_2 = 0.000$

OBSTRUCTIONS

NEGLIGIBLE

$n_3 = 0.000$

VEGETATION

LOW

$n_4 = 0.005$

MEANDERING

MINOR

$m_5 = 1.000$

$n_{CHANNEL} = .025$
& OVERBANK

PICTURE

ROLL 3 ⇒ 15-24

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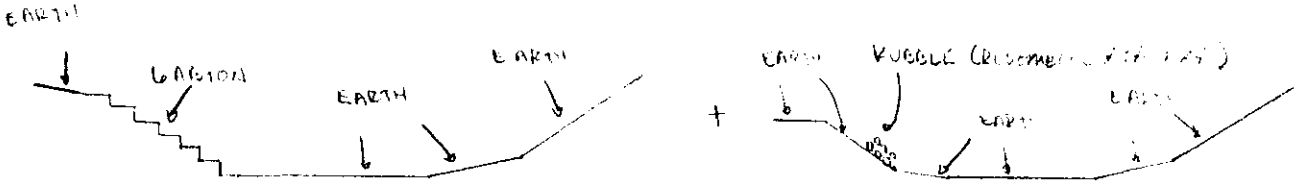
DATE 7/[illegible]/[illegible]

CLIENT [illegible] JOB NO 550.[illegible] CALC BY

DESCRIPTION CHANNEL [illegible] "n" CHECKED BY

PROJECT

ROLL 3 => 25-31



95% EARTH
5% GABION

SECTION 1

95% EARTH
5% RUBBLE

SECTION 2

25% OF THE REACH IS COMPRISED OF SECTION 1

75% OF THE REACH IS COMPRISED OF SECTION 2

MATERIAL %

$n_{EARTH} = 0.020$ $n_{RUBBLE} = 0.035$ $n_{GABION} = 0.030$

$$n_0 = 25\%\left[95\%(0.020) + 5\%(0.030)\right] + 75\%\left[95\%(0.020) + 5\%(0.035)\right]$$

$$n_0 = 0.021$$

IRREGULARITY %
MINOR
$n_1 = 0.005$

VARIATION %
GRADUAL
$n_2 = 0.000$

OBSTRUCTION %
NEGLIGIBLE
$n_3 = 0.000$

VEGETATION %
NONE
$n_4 = 0.000$

MEANDERING %
MINOR
$n_5 = 1.000$

$n_{CHANNEL} = 0.025$

PICTURE
ROLL 3 => 25-28

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DATE

CLIENT CLIENT JOB NO 552 CALC BY

DESCRIPTION OVERBANKS CHECKED BY

SECTION 2-2

50% GRAVEL

50% EARTH

SECTION 3-3

25% [illegible]

75% GRAVEL

MATERIALS

$n_{EARTH} = 0.020$ $n_{GRAVEL} = 0.035$ $n_{GABION} = 0.030$

$n_0 = 25\%\left[50\%(0.030) + 50\%(0.020)\right] + 75\%\left[25\%(0.035) + 75\%(\text{illegible})\right]$

$n_0 = 0.024$

IRREGULARITY:

MINOR

$n_1 = 0.005$

VARIATIONS:

GRADUAL

$n_2 = 0.000$

OBSTRUCTIONS:

NEGLIGIBLE

$n_3 = 0.000$

VEGETATION:

NONE

$n_4 = 0.000$

MEANDERING:

MINOR

$m_5 = 1.000$

$n_{LEFT, RIGHT\ OVERBANK} = 0.029$ ROUND TO

$n_{OVERBANK} = 0.03$

PICTURE

ROLL 3 ⇒ 25-28

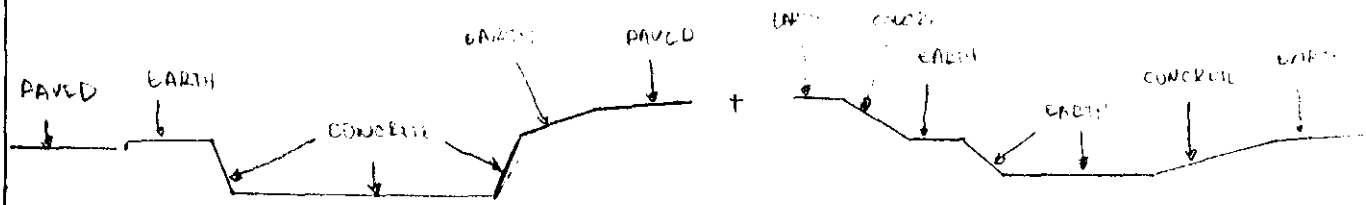
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DATE _____

CLIENT _____ JOB NO _____ CALC BY _____

DESCRIPTION _____ CHECKED BY _____

ROLL 3 ⇒ 32-35



100% CONCRETE

80% EARTH
20% GRAVEL

SECTION 1

SECTION 2

75 % OF THE REACH IS COMPRISED OF SECTION 1

25% OF THE REACH IS COMPRISED OF SECTION 2

MATERIALS

$n_{EARTH} = 0.020$ $n_{CONCRETE} = 0.015$

$$n_0 = 75\%(0.015) + 25\%\left[80\%(0.020) + 20\%(0.015)\right] = 0.016$$

IRREGULARITY%	VARIATION%	OBSTRUCTION%
SMOOTH	GRADUAL	NEGLIBLE
$n_1 = 0.000$	$n_2 = 0.000$	$n_3 = 0.000$

VEGETATION%	MEANDERING	
NONE	MINOR	$n_{CHANNEL} = 0.016$ ROUND TO
$n_4 = 0.000$	$m_5 = 1.000$	$n_{CHANNEL} = 0.015$ ROLL 3 ⇒ 29-35

EN-3-N
3/66

SHEET 21 OF 37

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DATE

CLIENT JOB NO CALC BY

DESCRIPTION CHECKED BY

MATERIAL:

$n_{EARTH} = 0.020$ $n_{VEGETATION} = 0.015$

$n_0 = 75\%\left[25\%(0.020) + 75\%(0.015)\right] + 25\%\left[25\%(\quad) + 75\%(0.015)\right]$

$n_0 = 0.02$

IRREGULARITY:	VARIATION:	OBSTRUCTIONS:
SMOOTH	GRADUAL	NEGLIGIBLE
$n_1 = 0.000$	$n_2 = 0.000$	$n_3 = 0.000$

VEGETATION:	MEANDERING:
LOW	MINOR
$n_4 = 0.005$	$m_5 = 1.000$

$n_{LEFT,\ RIGHT\ OVERBANK} = 0.025$ ROUND TO

PICTURE

$n_{OVERBANK} = 0.025$ ROLL 3 ⇒ 29-35

EN-3-N
3/66

SHEET 32 OF 37

G.C. WALLACE, INC.
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DATE 4/2[illegible]

CLIENT CITY JOB NO [illegible] CALC BY

DESCRIPTION CHANNEL MANNING'S n CHECKED BY

PICTURE OF ROLL 3 => 36-37 & PICTURE OF ROLL 4 => 1-8



100% EARTH

SECTION 1

+

80% EARTH

20% GRASS

SECTION 2

10% OF THE REACH IS COMPRISED OF SECTION 1

90% OF THE REACH IS COMPRISED OF SECTION 2

MATERIALS

$n_{EARTH} = 0.020$ $n_{GRASS} = 0.030$

$$n_0 = 10\%(0.020) + 90\%\left[80\%(0.020) + 20\%(0.030)\right] = 0.022$$

IRREGULARITY:

SMOOTH

$n_1 = 0.000$

VARIATIONS:

GRADUAL

$n_2 = 0.000$

OBSTRUCTIONS:

NEGLIBLE

$n_3 = 0.000$

VEGETATION:

MEDIUM

$n_4 = 0.010$

MEANDERING:

MINOR

$n_5 = 1.000$

$n_{CHANNEL} = 0.032$ ROUND TO

$n_{CHANNEL} = 0.03$

PICTURE ROLL 3 => 36-37 & ROLL 4 => 1-8

EN-3-N
3/66

SHEET 22 OF 31

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DATE 11/[illegible]

CLIENT [illegible] JOB NO 55[illegible] CALC BY

DESCRIPTION OVERBANK MANNING'S 'n' CHECKED BY

SECTION 3 % | SECTION 22

100% EARTH | 100% GRASS

MATERIALS

$n_{EARTH} = 0.020$ $n_{GRASS} = 0.030$

$n_b = 10\%(0.020) + 90\%(0.030) = 0.029$

IRREGULARITY %	VARIATIONS %	OBSTRUCTION %
SMOOTH	GRADUAL	NEGLIBLE
$n_1 = 0.000$	$n_2 = 0.000$	$n_3 = 0.000$

VEGETATION	MEANDERING
LOW	MINOR
$n_4 = 0.005$	$m_5 = 1.000$

$n_{LEFT, RIGHT\ OVERBANK} = 0.034$ ROUND TO

$n_{OVERBANK} = 0.035$

PICTURE

ROLL 3 => 36-37

&

ROLL 4 => 1-8

EN-3-N
3/66

SHEET 24 OF 37

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Engineering/Architecture
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102

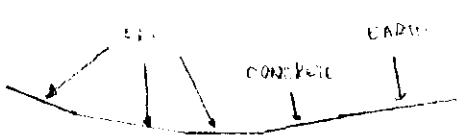
DATE 7/1/--

CLIENT [illegible] JOB NO [illegible] CALC BY

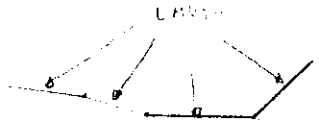
DESCRIPTION [illegible] MANNING'S n CHECKED BY

P[illegible]

[illegible] => 9-18



+



95% EARTH

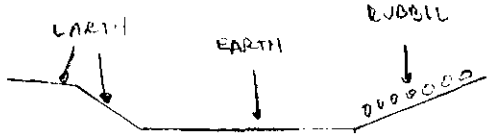
5% CONCRETE

SECTION 1

100% EARTH

SECTION 2

+



95% EARTH

5% RUBBLE

SECTION 3

5% OF THE REACH IS COMPRISED OF SECTION 1

75% OF THE REACH IS COMPRISED OF SECTION 2

20% OF THE REACH IS COMPRISED OF SECTION 3

MATERIAL:

$n_{EARTH} = 0.020$ $n_{CONCRETE} = 0.015$ $n_{RUBBLE} = 0.035$

$n_0 = 5\%\left[95\%(0.020) + 5\%(0.015)\right] + 75\%(0.020) + 20\%\left[95\%(0.020) + 5\%(.03$

$n_0 = 0.020$

IRREGULARITY:

SMOOTH

$n_1 = 0.000$

VARIATION:

ALTERNATING OCCASIONALLY

$n_2 = 0.005$

OBSTRUCTION:

NEGLIGIBLE

$n_3 = 0.000$

VEGETATION:

NONE

$n_4 = 0.000$

MEANDERING

MINOR

$m_5 = 1.000$

$n_{CHANNEL} = 0.025$

PICTURE ROLL 4 => 9-18

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD. / LAS VEGAS, NEVADA 89102

DATE

CLIENT JOB NO CALC BY

DESCRIPTION CHECKED BY

SECTION %	SECTION %	SECTION %
20% [illegible]	100% [illegible]	50% [illegible]
80% [illegible]		50% [illegible]

MATERIAL %

$n_{[illegible]} = 0.020$ $n_{CONCRETE} = 0.013$ $n_{[illegible]} = 0.025$

$n_0 = 5\%[20\%(0.013) + 80\%(0.020)] + 70\%(0.[illegible]) + 25\%[[illegible](0.[illegible]) + 50\%(0.025)]$

$n_0 = 0.020$

IRREGULARITY %	VARIATION %	OBSTRUCTION %
SMOOTH	GRADUAL	NEGLIGIBLE
$n_1 = 0.000$	$n_2 = 0.000$	$n_3 = 0.000$

VEGETATION %	MEANDERING %
LOW	MINOR
$n_4 = 0.005$	$m_5 = 1.000$

$n_{LEFT, RIGHT} = 0.025$
OVERBANK

PECTURE
ROLL 4 ⇒ 9 - 18

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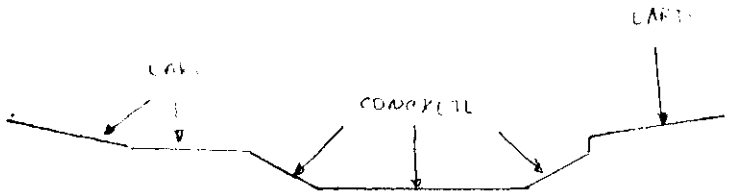
DATE

CLIENT JOB NO CALC BY

DESCRIPTION CHECKED BY

PICTURE

ROLL 4 => 19-23



100% CONCRETE

REPRESENTATIVE OF THE UPPER REACH

SECTION 1

MATERIALS

n_{BANK} = 0.000 n_{BOTTOM} = 0.015

n_0 = 0.015

IRREGULARITY:

SMOOTH

n_1 = 0.000

VARIATIONS:

GRADUAL

n_2 = 0.000

OBSTRUCTIONS:

VEGETATION

n_3 = 0.000

VEGETATION:

NONE

n_4 = 0.000

MEANDERING:

APPRECIABLE

n_5 = 1.15

$n_{CHANNEL}$ = 0.017 ROUND TO

$n_{CHANNEL}$ = 0.015

PICTURE

ROLL 4 => 19-23

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DATE

CLIENT JOB NO CALC BY

DESCRIPTION CHECKED BY

SLOPE

40%

60%

MATERIAL

$n_{concrete}$ n_{grass}

$n_0 = 40\%(0.015) + 60\%(0.035) = 0.018$

IN CHANNEL

SMOOTH

$n_1 = 0.030$

VARIATIONS

GRAVEL

n_2 0.000

OBSTRUCTIONS

NEGLIGIBLE

$n_3 = 0.000$

VEGETATION

NONE

$n_4 = 0.000$

MEANDERING

APPRECIABLE

$m_5 = 1.15$

$n_{LEFT\ OVERBANK}$ 0.021 ROUND TO

$n_{OVERBANK} = 0.02$

PICTURE ROLL 4 => 19-23

G.C. WALLACE, INC.
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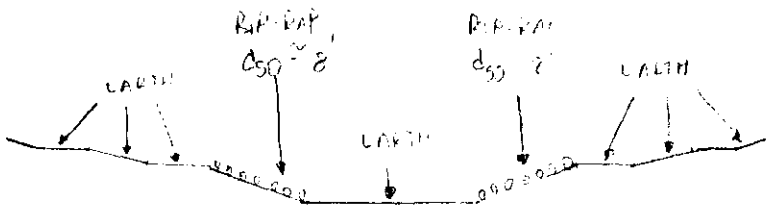
DATE _____

CLIENT _____ JOB NO _____ CALC BY _____

DESCRIPTION CHANNEL MANNING'S n CHECKED BY _____

PICTURE

ROLL 4 => 24-25



SECTION 1 (REPRESENTATIVE OF THE ENTIRE REACH)

40% EARTH

60% RIP-RAP

MATERIALS:

$n_{EARTH} = 0.020$ $\quad n_{RIP\text{-}RAP} = 0.0395 d_{50}^{1/6} = 0.037$ ($d_{50} = 8$")

$n_0 = 40\%(0.020) + 60\%(0.037) = 0.030$

IRREGULARITY:	VARIATIONS:	OBSTRUCTIONS:
SMOOTH	GRADUAL	NEGLIBLE
$n_1 = 0.000$	$n_2 = 0.000$	$n_3 = 0.000$

VEGETATION:	MEANDERINGS
NONE	MINOR
$n_4 = 0.000$	$m_5 = 1.000$

$n_{CHANNEL} = 0.030$

PICTURE
ROLL 4 => 24-25

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1555 SOUTH RAINBOW BLVD / LAS VEGAS, NEVADA 89102

DATE 7/11

CLIENT CCSD JOB NO 35 CALC BY

DESCRIPTION CHANNEL MANNING'S n CHECKED BY

SECTION 15

100% EARTH

MATERIALS

$n_{EARTH} = 0.040$

$n_0 = 0.020$

IRREGULARITY

SMOOTH

$n_1 = 0.000$

VARIATION

GRADUAL

$n_2 = 0.000$

OBSTRUCTION

NEGLIGIBLE

$n_3 = 0.000$

VEGETATION

NONE

$n_4 = 0.000$

MEANDERING

MINOR

$m_5 = 1.000$

$n_{LEFT, RIGHT\ OVERBANK} = 0.040$

PICTURE
ROLL 4 ⇒ 24-25

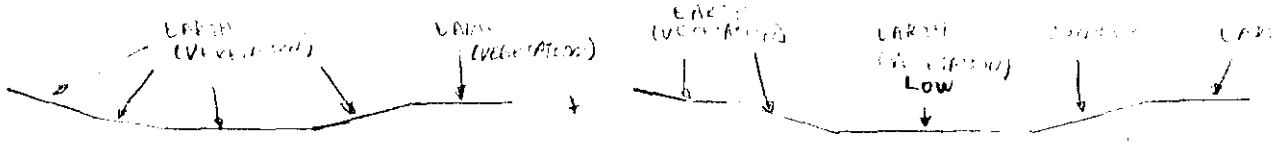
G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102

DATE 9/

CLIENT COE JOB NO CALC BY

DESCRIPTION CHANNEL MANNING'S n CHECKED BY

ROLL 5 OF 1 - 14



100% EARTH

SECTION 1

95% EARTH

5% VEGETATION

SECTION 2

95% OF THE REACH IS COMPRISED OF SECTION 1

5% OF THE REACH IS COMPRISED OF SECTION 2

MATERIALS

$n_{earth} = 0.020$ $n_{fine} = 0.015$

IRREGULARITIES

SMOOTH

VARIATIONS

GRADUAL

$n_0 = 95\%(0.020) + 5\%\left[\begin{matrix}95\%(0.020) \\ +5\%(0.015)\end{matrix}\right]$ $n_1 = 0.000$ $n_2 = 0.000$

$n_0 = 0.020$

OBSTRUCTIONS

NEGLIGIBLE

$n_3 = 0.000$

VEGETATION

MEDIUM

$n_4 = 0.02$

MEANDERING

MINOR

$m_5 = 1.000$

$n_{CHANNEL} = .04$ ROUND TO

$n_{CHANNEL} = 0.04$

ROLL 5 OF 1 - 14 PICTURE

EN-3-N
3/86

SHEET 31 OF 37

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD. / LAS VEGAS, NEVADA 89102

DATE 7/[illegible]

CLIENT [illegible] JOB NO [illegible] CALC BY [illegible]

DESCRIPTION OVERBANK MATERIALS CHECKED BY [illegible]

[illegible]

[illegible]

MATERIALS

$n_{earth} = 0.030$ $n_{concrete} = 0.015$

$n_0 = 95\%\ (0.030) + 5\%\ [30\%\ (0.015) + 70\%\ (0.000)]$

$n_0 = 0.020$

IRREGULARITY:
SMOOTH
$n_1 = 0.000$

VARIATIONS:
GRADUAL
$n_2 = 0.000$

OBSTRUCTIONS:
NEGLIGIBLE
$n_3 = 0.000$

VEGETATION:
LOW
$n_4 = 0.005$

MEANDERING:
MINOR
$n_5 = 1.000$

$n_{LEFT, RIGHT\ OVERBANK} = 0.025$

PICTURE
ROLL 5 ⇒ 1 - 14

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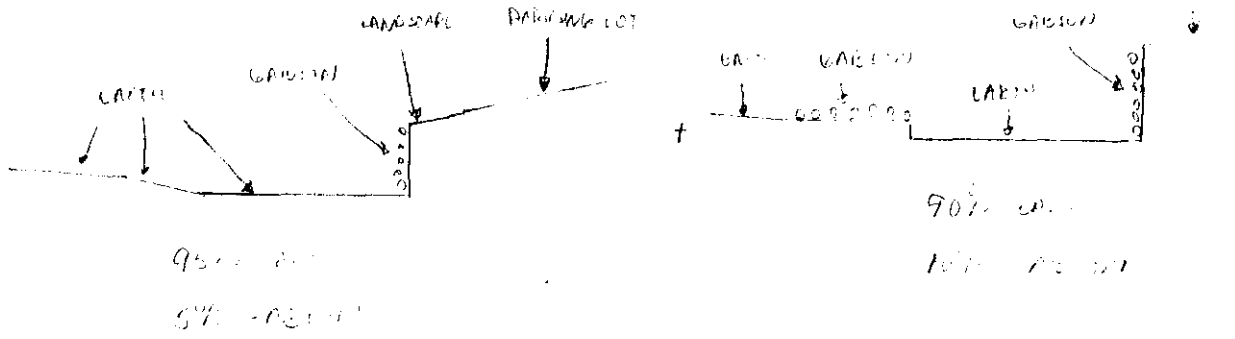
DATE 7/21...

CLIENT CCRFCD JOB NO 550, 50 2 CALC BY

DESCRIPTION ...ARROYO & McCULLOUGH "N" CHECKED BY

PICTURE

ROLL 5 -> 15 - 16



95% ...

5% ...

SECTION 1

90% ...

10% ...

SECTION 2

30% OF THE REACH IS COMPRISED OF SECTION 1

70% OF THE REACH IS COMPRISED OF SECTION 2

MATERIALS:

n_{EARTH} 0.020 n_{GABION} 0.030

$n_0 = 30\%\left[95\%(0.020) + 5\%(0.030)\right] + 70\%\left[90\%(0.020) + 10\%(0.030)\right]$

$n_0 = 0.021$

IRREGULARITY:

SMOOTH

$n_1 = 0.000$

VARIATIONS:

GRADUAL

$n_2 = 0.000$

OBSTRUCTIONS:

NEGLIGIBLE

n_3 0.000

VEGETATION:

NONE

$n_4 = 0.000$

MEANDERING:

MINOR

$m_5 = 1.000$

$n_{CHANNEL}$ 0.021 ROUND TO

$n_{CHANNEL} = 0.02$

PICTURE

ROLL 5 -> 15 - 16

EN-3-N
3/66

SHEET 33 OF 37

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD. / LAS VEGAS, NEVADA 89102

DATE 9/...

CLIENT CCRCD JOB NO ... CALC BY ...

DESCRIPTION OVERBANK ... CHECKED BY ...

SECTION 1 — 75% ... 25% ...

SECTION 2 — 70% ... 25% ...

MATERIALS

$n_{UNIT} = 0.020$ $n_{GRAVEL} = 0.030$

$n_0 = 30\%[75\%(0.020) + 25\%(0.030)] + 70\%[75\%(0.030) + \ldots]$

$n_0 = 0.026$

IRREGULARITY

SMOOTH

$n_1 = 0.000$

VARIATIONS

GRADUAL

$n_2 = 0.000$

OBSTRUCTIONS

NEGLIGIBLE

$n_3 = 0.000$

VEGETATION

LOW

$n_4 = 0.005$

MEANDERING

MINOR

$m_5 = 1.000$

$n_{LEFT, RIGHT} = 0.031$ ROUND TO OVERBANK

$n_{OVERBANK} = 0.03$

PICTURE

ROLL 5 ⇒ 15-16

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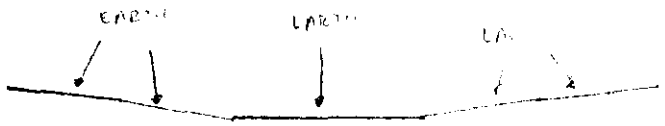
DATE 7/8/97

CLIENT CCRFCD JOB NO 96-[illegible] CALC BY

DESCRIPTION CHANNEL MANNING'S 'n' CHECKED BY

5 OVERBANK

ROLL 5 ⇒ 19-25



100% EARTH

REPRESENTATIVE OF THE ENTIRE REACH

SECTION 1

MATERIALS	IRREGULARITY'S	VARIATIONS
n_{EARTH} = 0.000	SMOOTH	GRADUAL'S
n_0 = 0.000	n_1 = 1.000	n_2 = 0.000

OBSTRUCTION'S	VEGETATIONS	MEANDERING'S
NEGLIBLE	NONE	MINOR
n_3 = 0.000	n_4 = 0.000	m_5 = 1.000

$n_{CHANNEL}$ = 0.00
& OVERBANK

ROLL 5 ⇒ 19-25

PICTURE

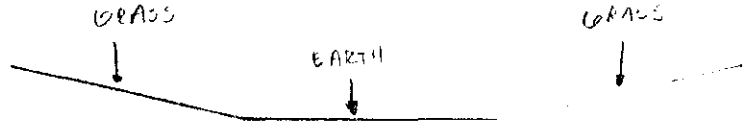
G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102

DATE 4/6/17

CLIENT CCRFCD JOB NO 550.032 CALC BY

DESCRIPTION CHANNEL MANNING'S n" CHECKED BY

PICTURE
ROLL 6 => 1-3



10% EARTH
90% GRASS

SECTION 1

MATERIALS

$n_{GRASS} = 0.030$ $n_{EARTH} = 0.020$

$n_0 = 10\%(0.020) + 90\%(0.030)$

$n_0 = 0.029$

IRREGULARITY:
SMOOTH
$n_1 = 0.000$

VARIATIONS:
GRADUAL
$n_2 = 0.000$

OBSTRUCTIONS:
NEGLIGIBLE
$n_3 = 0.000$

VEGETATION:
NONE
$n_4 = 0.000$

MEANDERING:
MINOR
$m_5 = 1.000$

$n_{CHANNEL} = 0.029$ ROUND TO

$n_{CHANNEL} = 0.03$

PICTURE
ROLL 6 => 1-3

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1555 SOUTH RAINBOW BLVD. / LAS VEGAS, NEVADA 89102

DATE 12/6/...

CLIENT CCRTSD JOB NO [illegible] CALC BY

DESCRIPTION OVERBANK MANNING'S "n" CHECKED BY

SECTION 8

100% GRASS

MATERIALS

$n_{GRASS} = 0.030$

$n_0 = 0.030$

IRREGULARITY

SMOOTH

$n_1 = 0.000$

VARIATION

GRADUAL

n_2 [illegible]

OBSTRUCTIONS

NEGLIGIBLE

$n_3 = 0.000$

VEGETATION

NONE

$n_4 = 0.000$

MEANDERING

MINOR

$n_5 = 1.000$

$n_{CURVE, PLANT} = 0.03$
OVERBANK

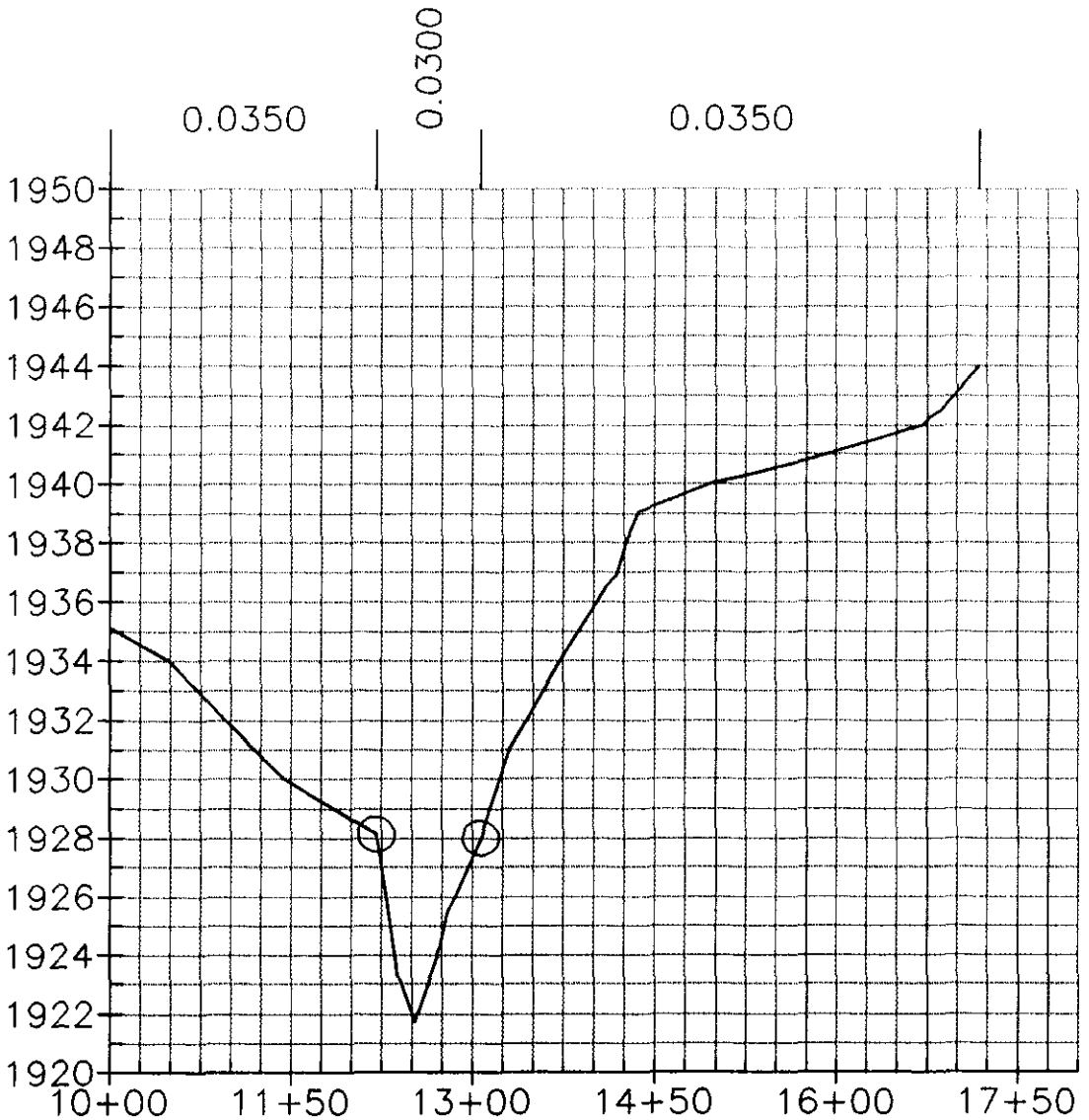
PICTURE

ROLL 6 => 1 - 3

EN-3-N
3/66

SHEET 37 OF 37

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1555 SOUTH RAINBOW BLVD / LAS VEGAS, NEVADA 89102



NOTE:

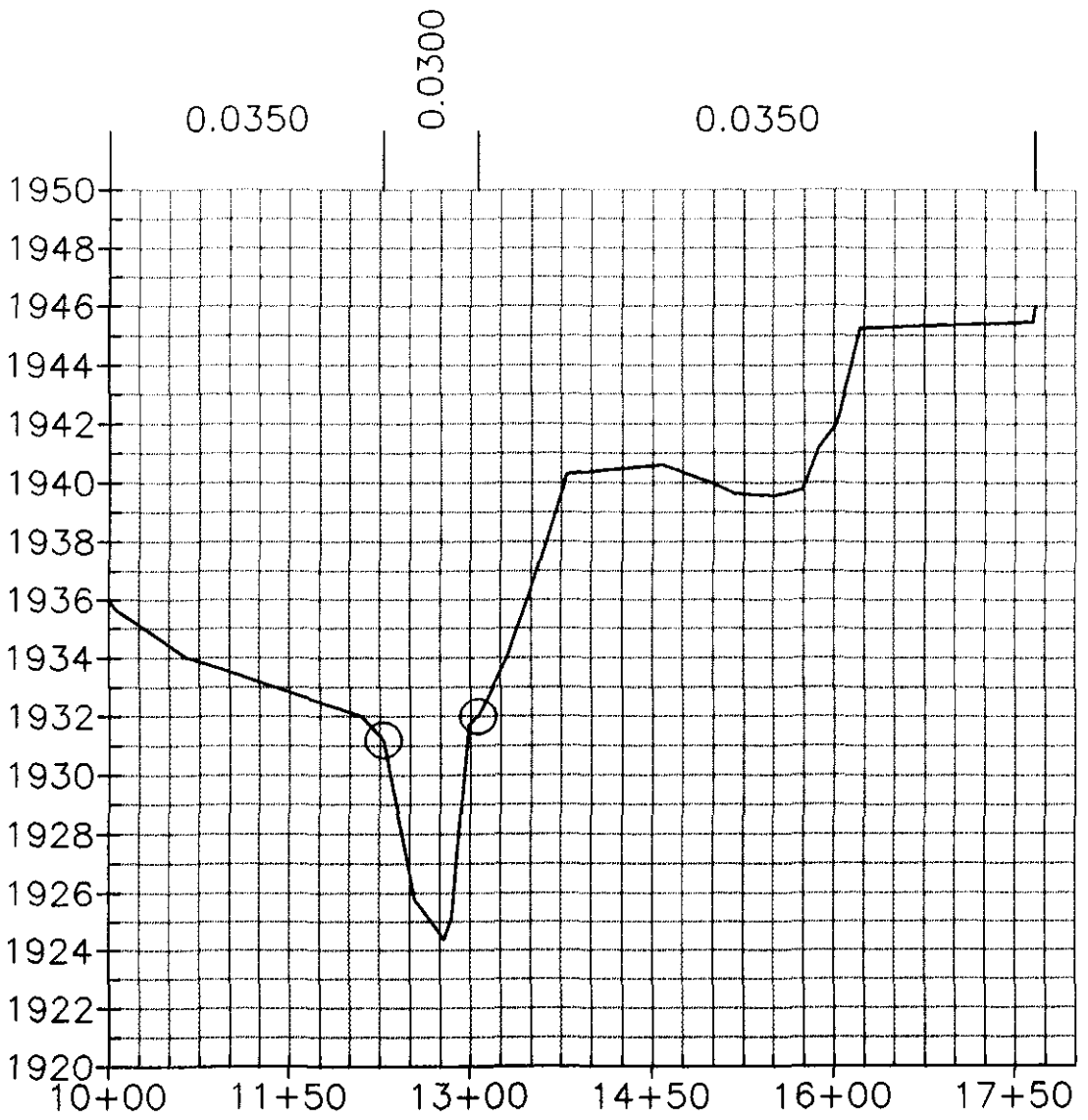
1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY
CCRFCD

CROSS SECTION NO. 10

DRAWING FL2.DWG

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102



NOTE:

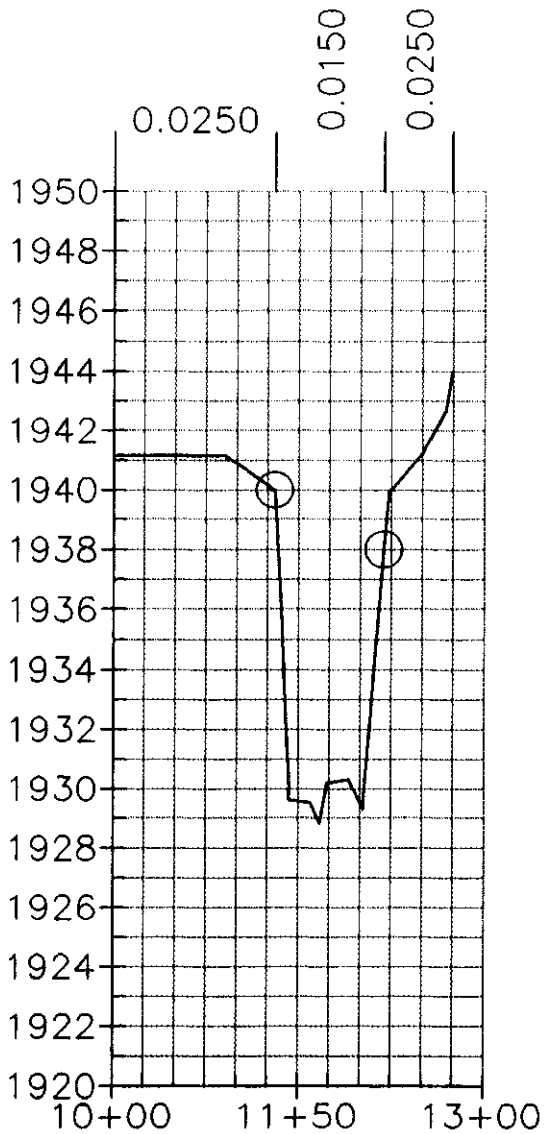
1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY
CCRFCD

CROSS SECTION NO. 20

DRAWING FL2.DWG

G.C. WALLACE, INC.
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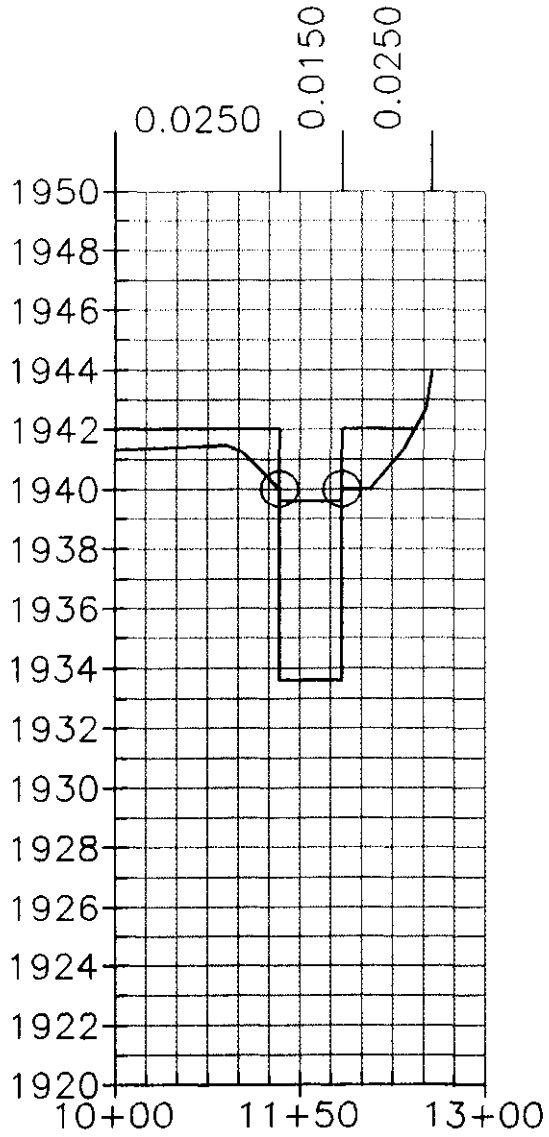


NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 30
DRAWING FL2.DWG

G.C. WALLACE, INC.
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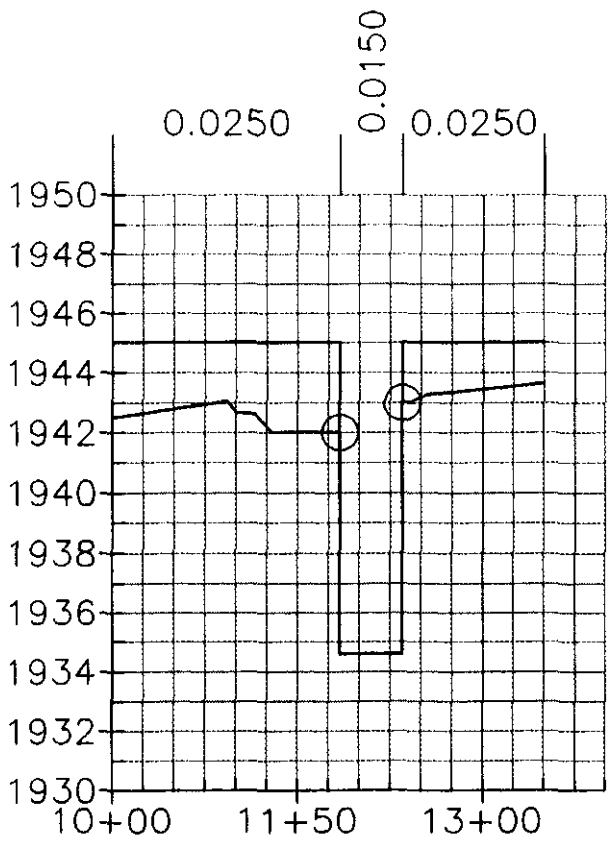


NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 40
DRAWING FL2.DWG

G.C. WALLACE, INC.
Engineering/Architecture 1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102

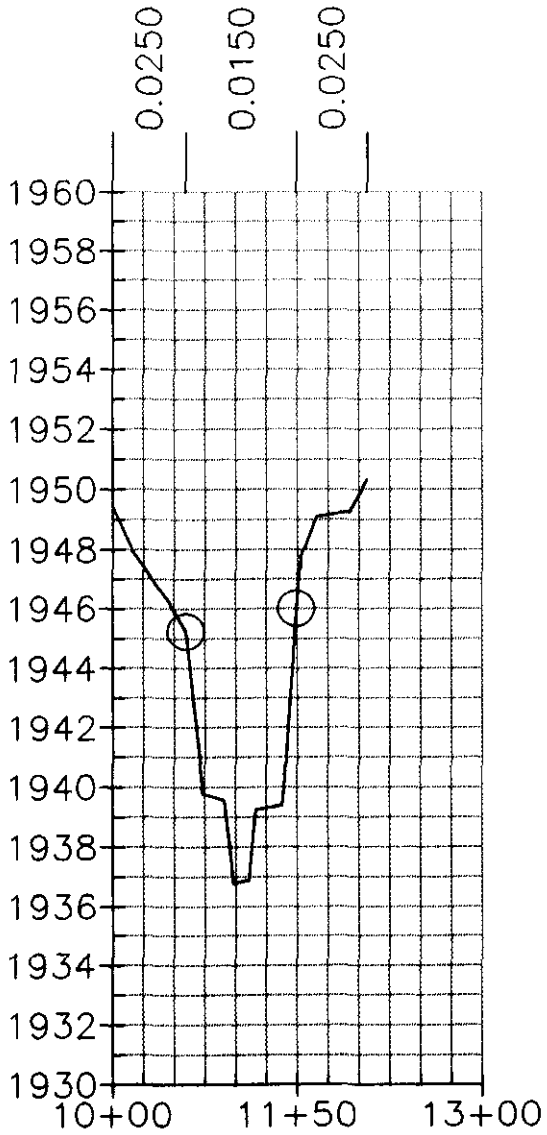


NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 50
DRAWING FL2.DWG

G.C. WALLACE, INC.
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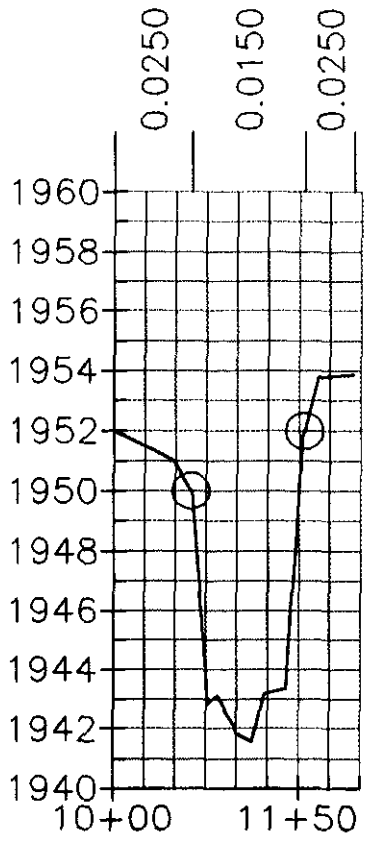


NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 60
DRAWING FL2.DWG

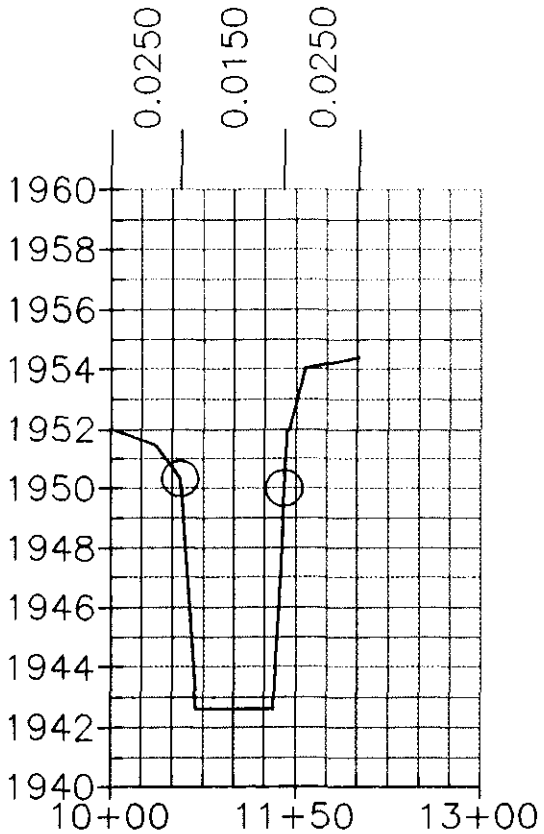
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NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 70
DRAWING FL2.DWG
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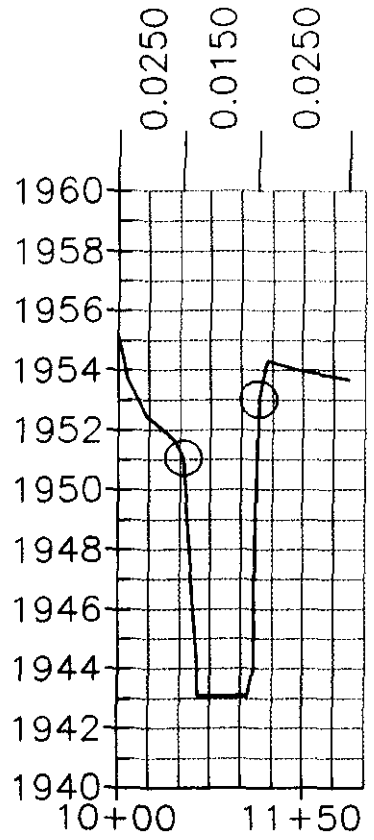


NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 80
DRAWING FL2.DWG

G.C. WALLACE, INC.
Engineering/Architecture
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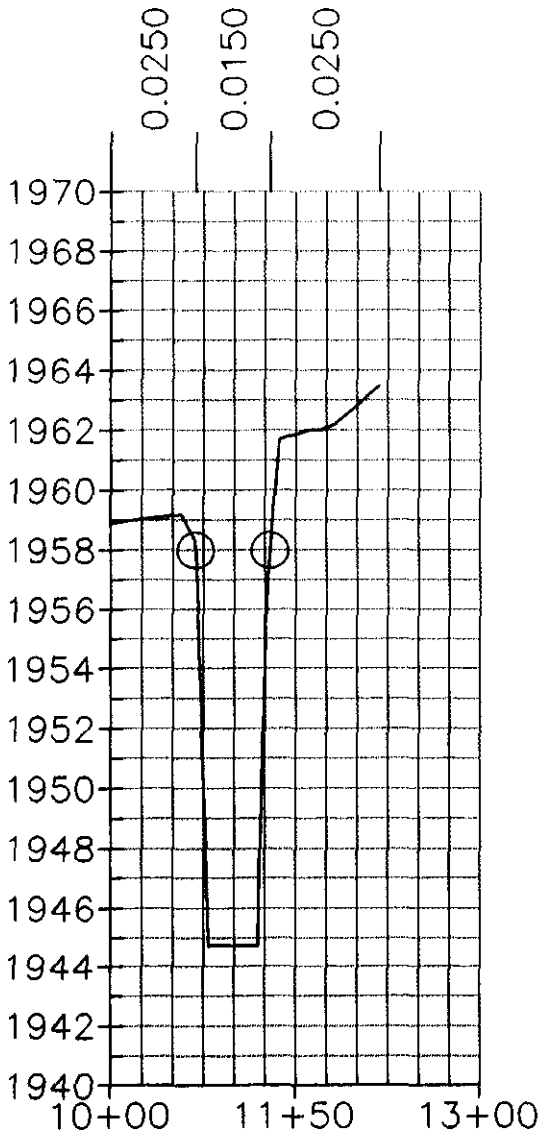


NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 90
DRAWING FL2.DWG

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD, LAS VEGAS, NEVADA 89102

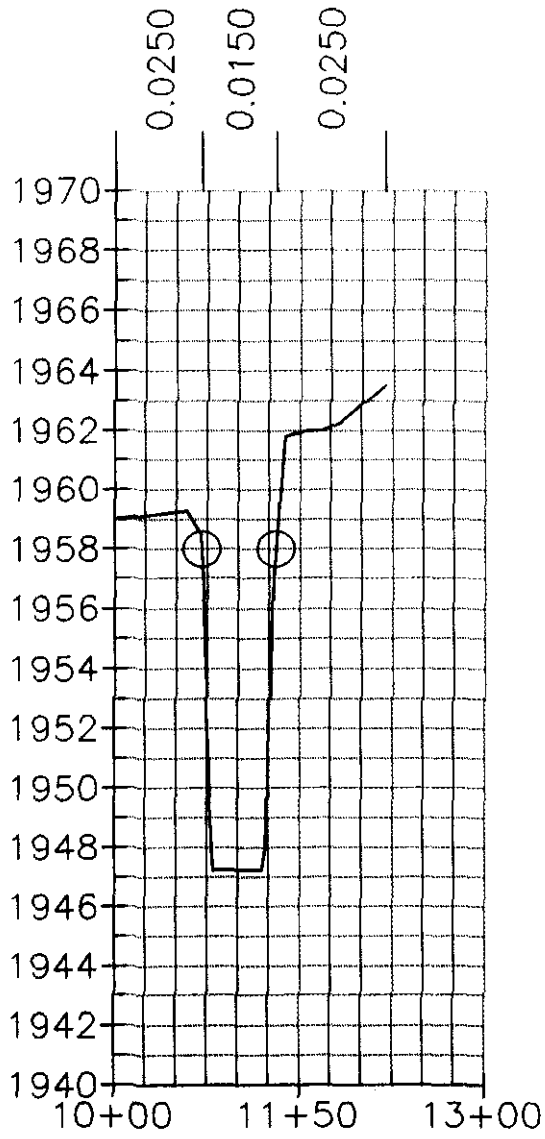


NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 100
DRAWING FL2.DWG

G.C. WALLACE, INC.
Engineering/Architecture
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NOTE:

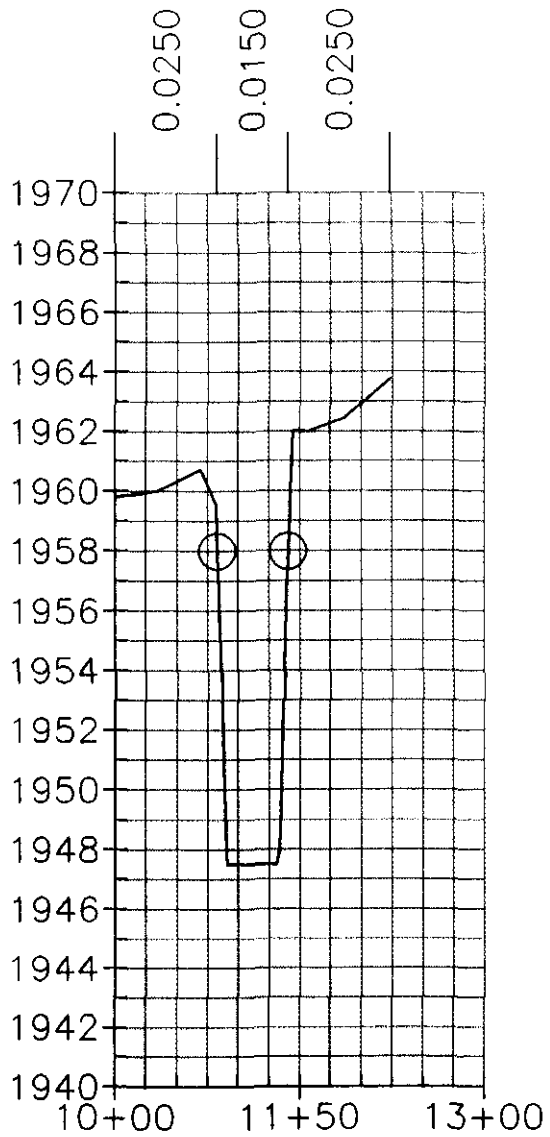
1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY
CCRFCD

CROSS SECTION NO. 110

DRAWING FL2.DWG

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102

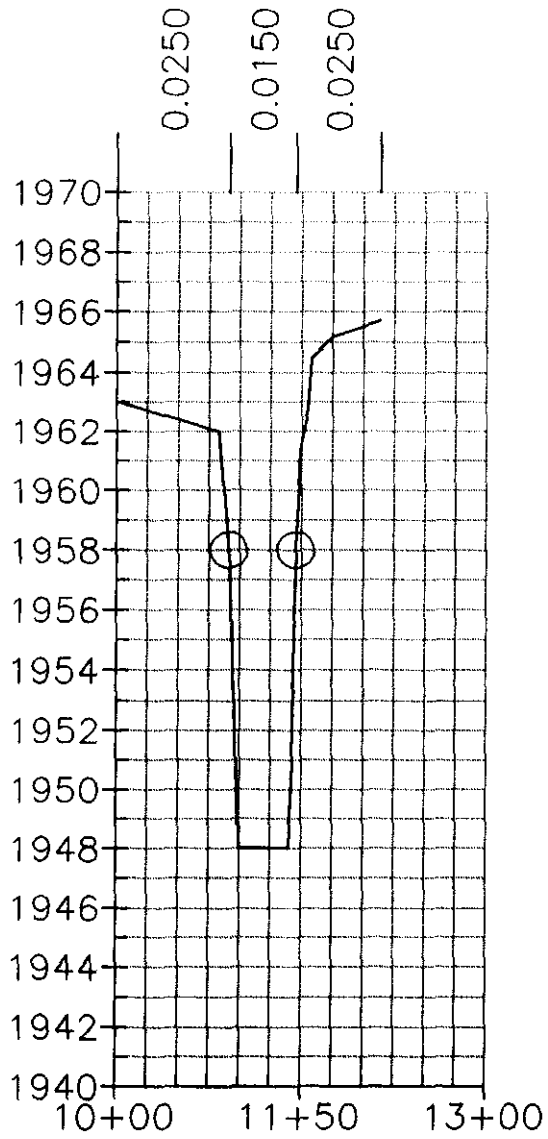


NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 120
DRAWING FL2.DWG

G.C. WALLACE, INC.
Engineering/Architecture 1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102



NOTE:

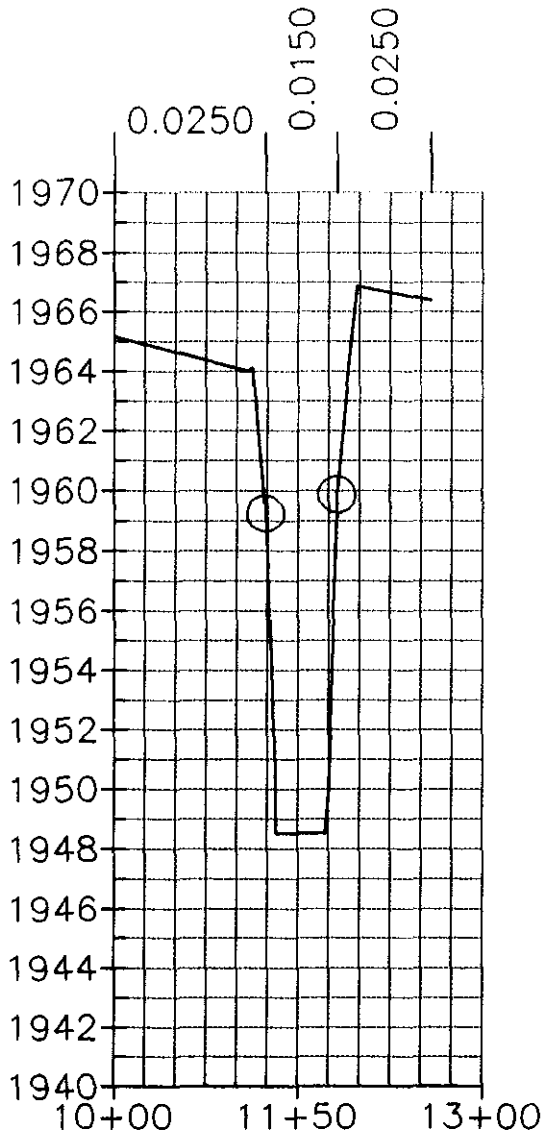
1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY
CCRFCD

CROSS SECTION NO. 130

DRAWING FL2.DWG

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102

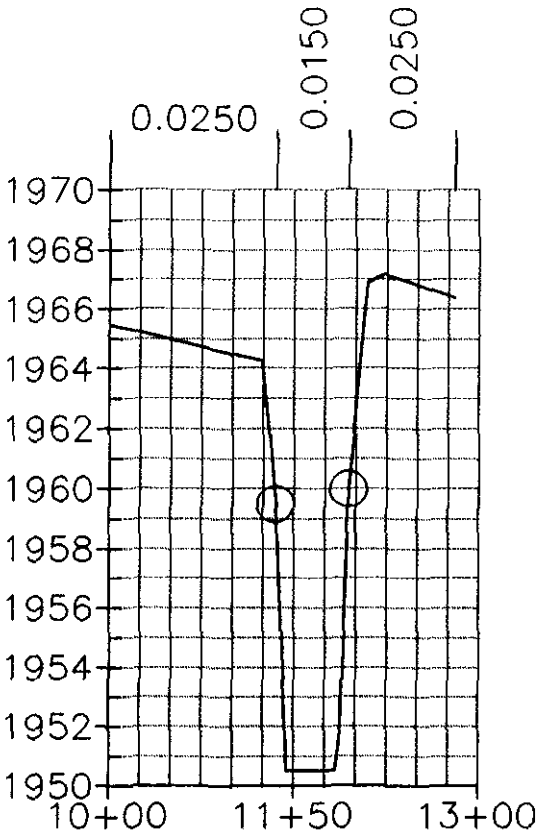


NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 140
DRAWING FL2.DWG

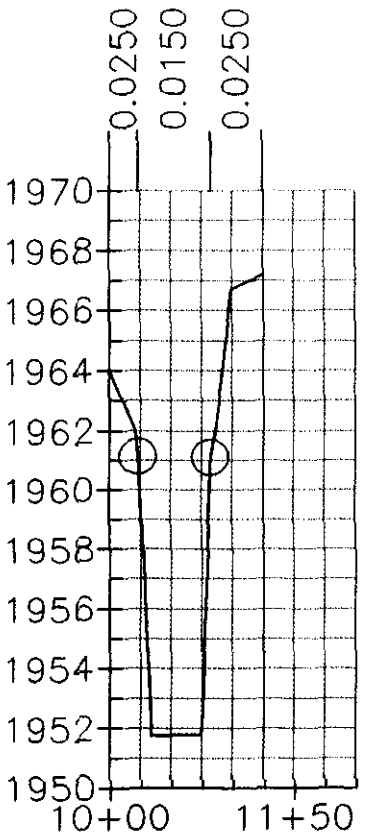
G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102



NOTE:

1. NOT TO SCALE

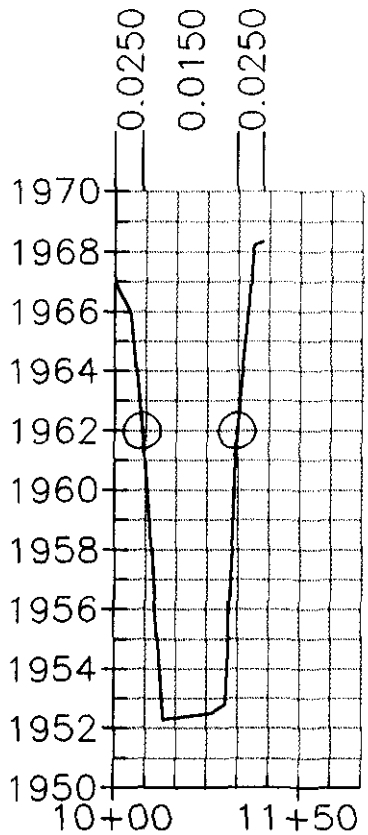
FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 150
DRAWING FL2.DWG
G.C. WALLACE, INC. Engineering/Architecture 1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102



NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 160
DRAWING FL2.DWG
G.C. WALLACE, INC. Engineering/Architecture 1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102



NOTE:

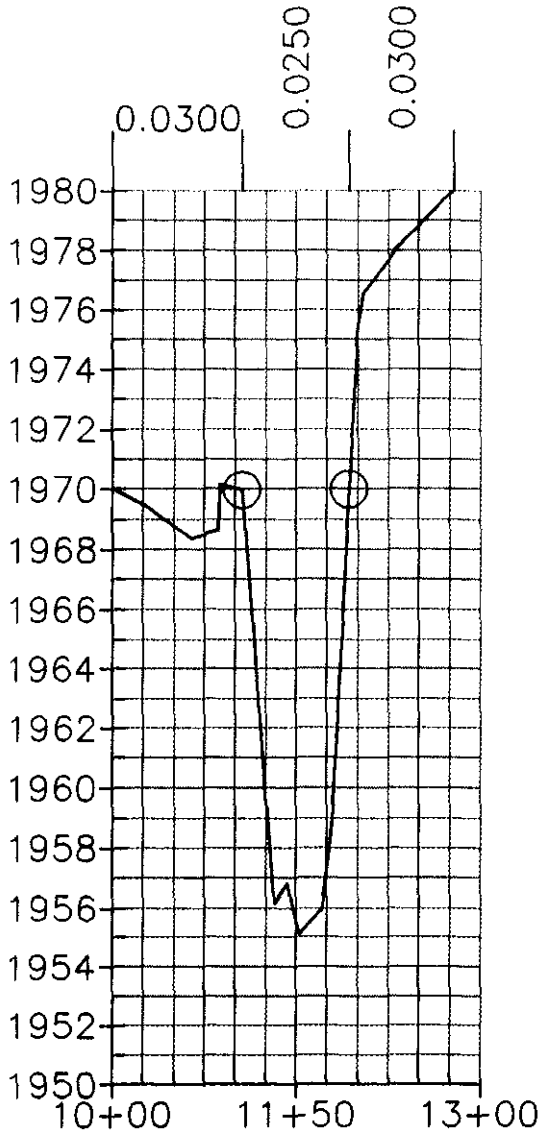
1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY
CCRFCD

CROSS SECTION NO. 170

DRAWING FL2.DWG

G.C. WALLACE, INC.
Engineering/Architecture 1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102

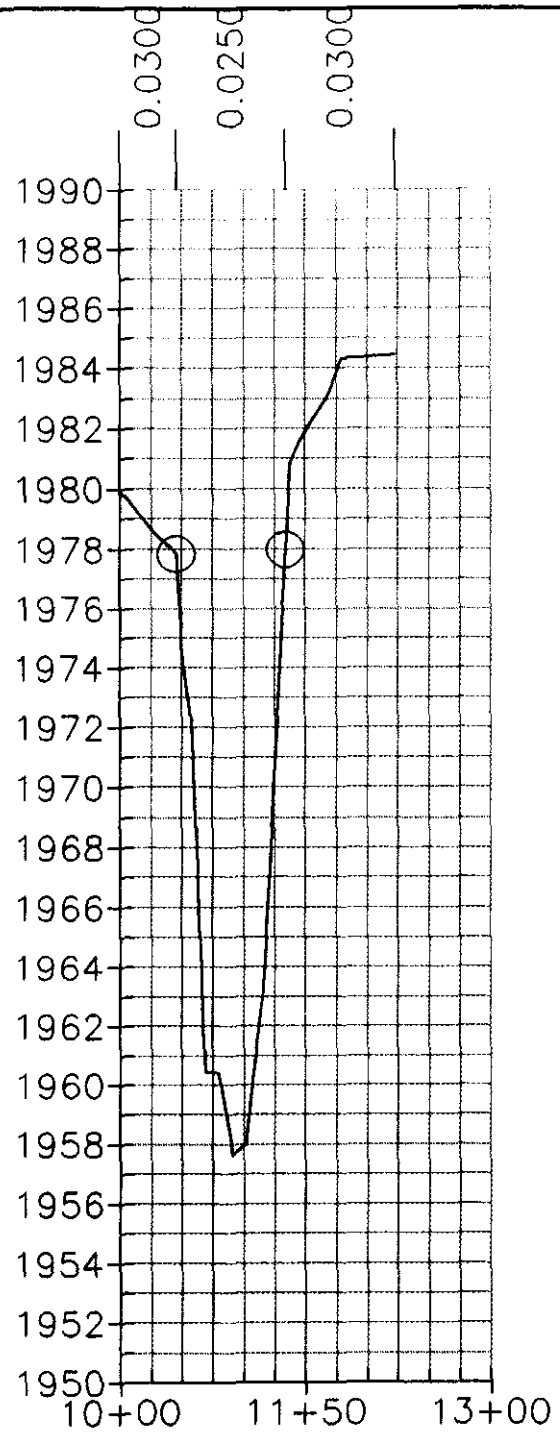


NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 180
DRAWING FL2.DWG

G.C. WALLACE, INC.
Engineering/Architecture 1555 SOUTH RAINBOW BLVD, LAS VEGAS, NEVADA 89102



NOTE:

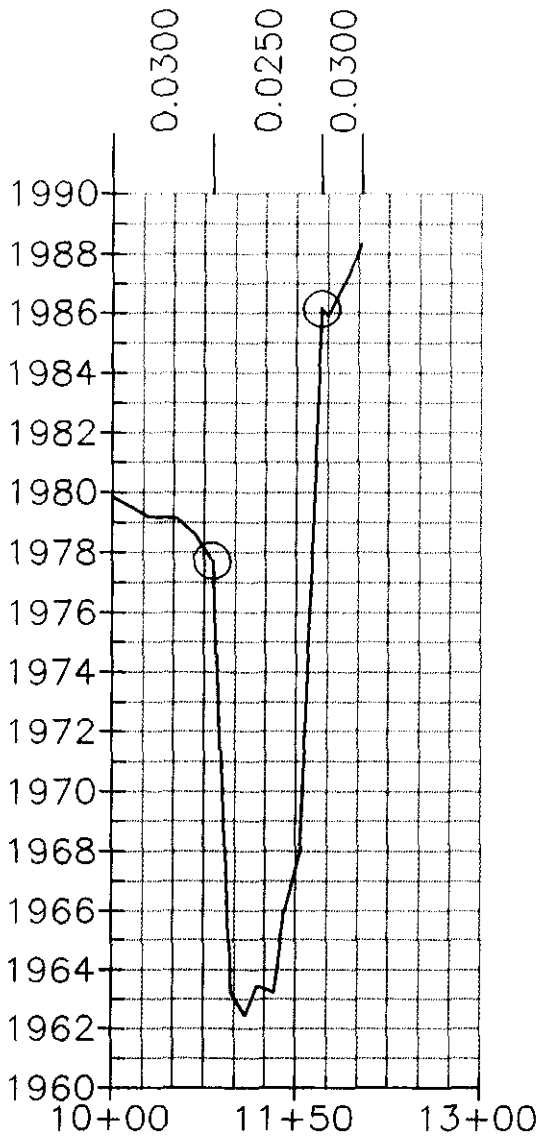
1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY
CCRFCD

CROSS SECTION NO. 190

DRAWING FL2.DWG

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102



NOTE:

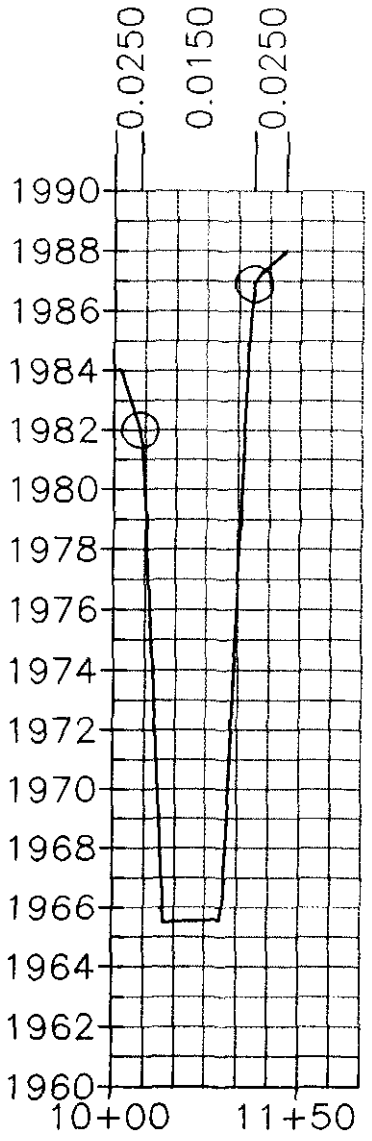
1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY
CCRFCD

CROSS SECTION NO. 200

DRAWING FL2.DWG

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102

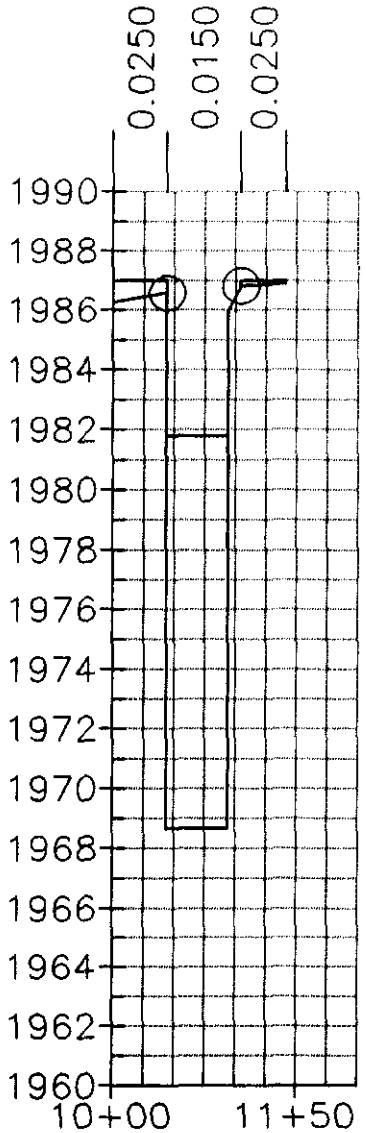


NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 210
DRAWING FL2.DWG

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102

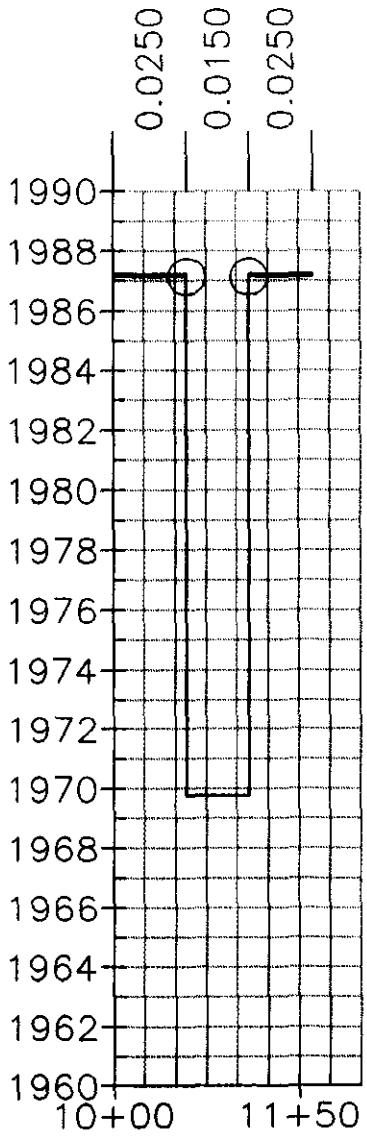


NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 220
DRAWING FL2.DWG

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102

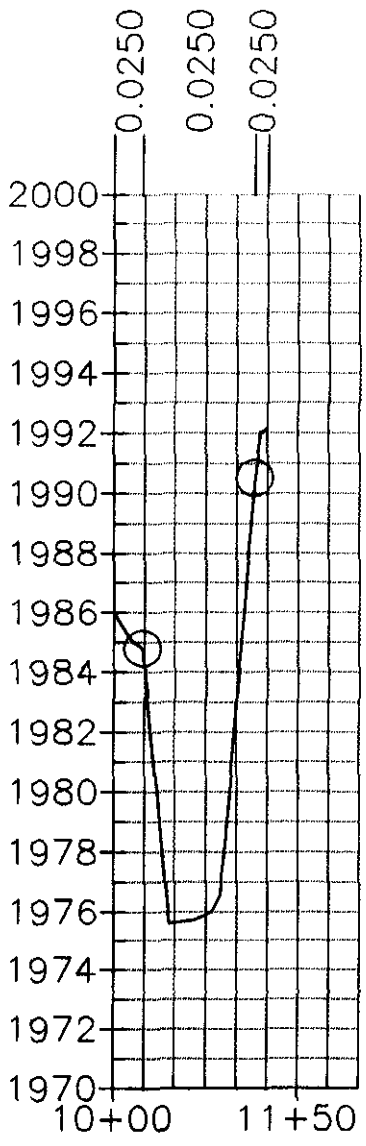


NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 230
DRAWING FL2.DWG

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102



NOTE:

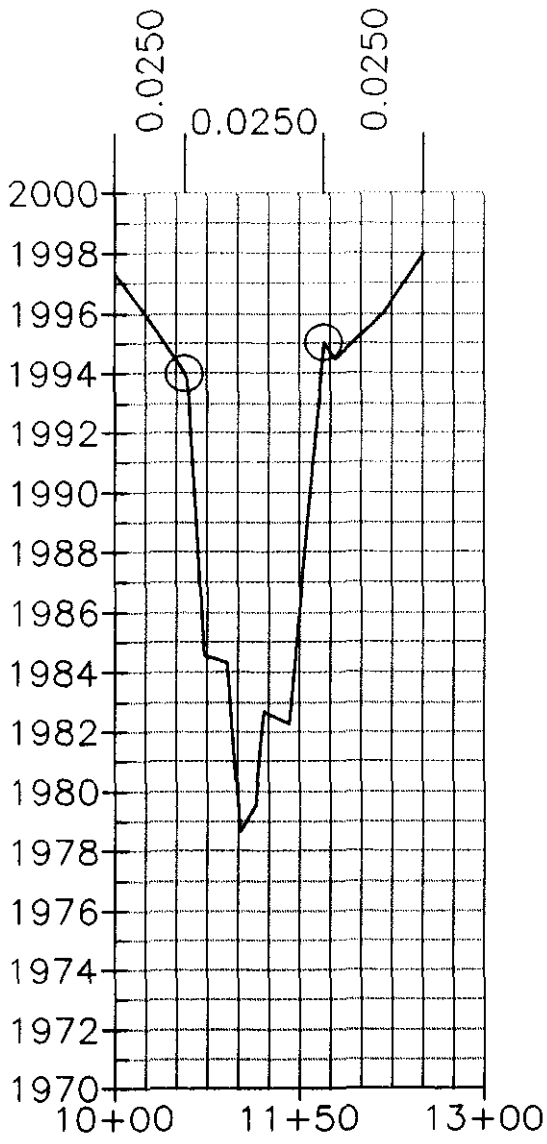
1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY
CCRFCD

CROSS SECTION NO. 240

DRAWING FL2.DWG

G.C. WALLACE, INC.
Engineering/Architecture 1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102

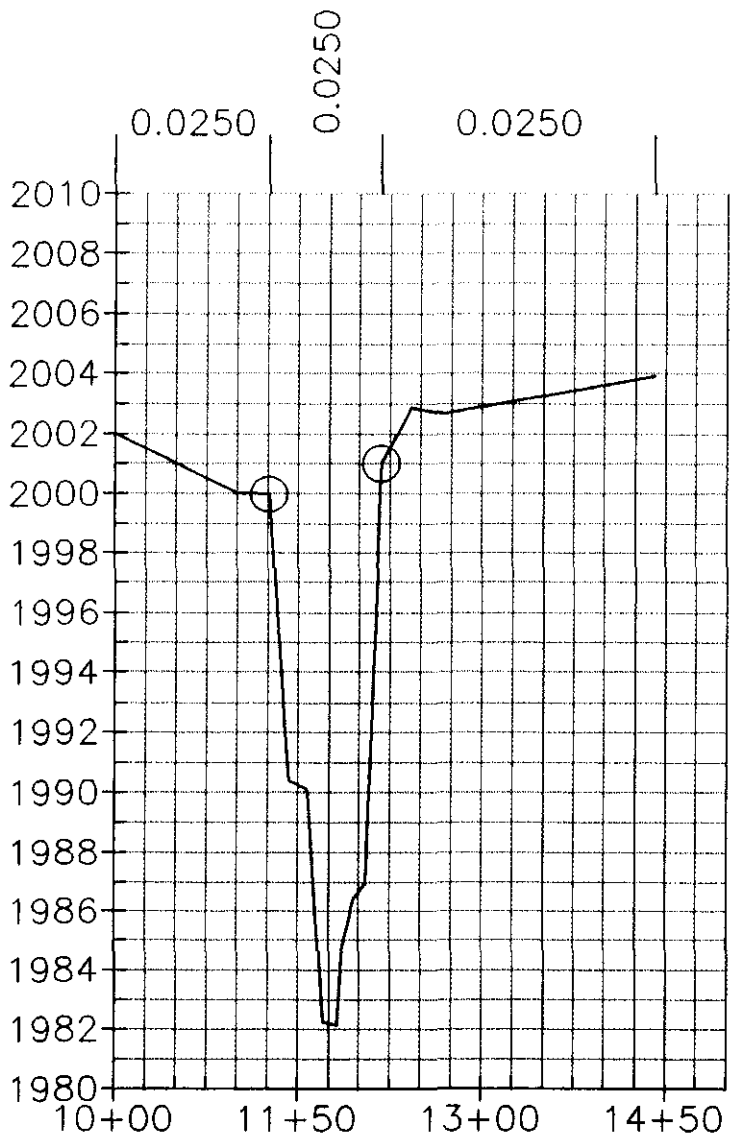


NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 250
DRAWING FL2.DWG

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102

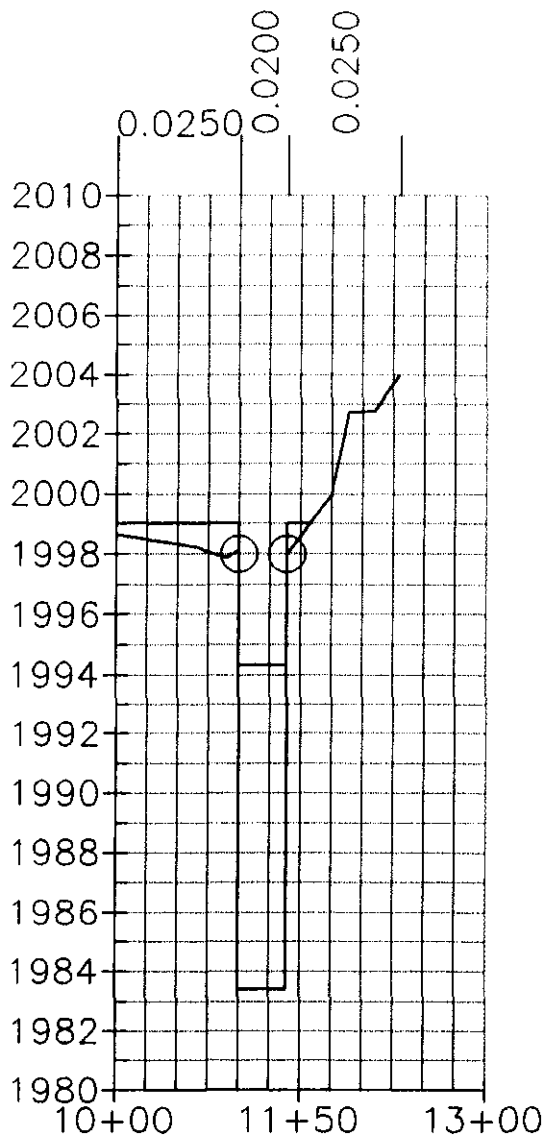


NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 260
DRAWING FL2.DWG

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102

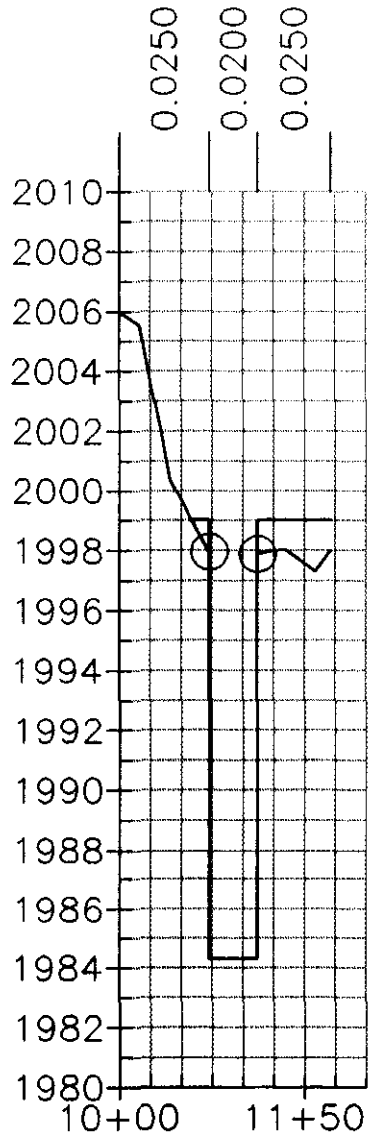


NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 270
DRAWING FL2.DWG

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102



NOTE:

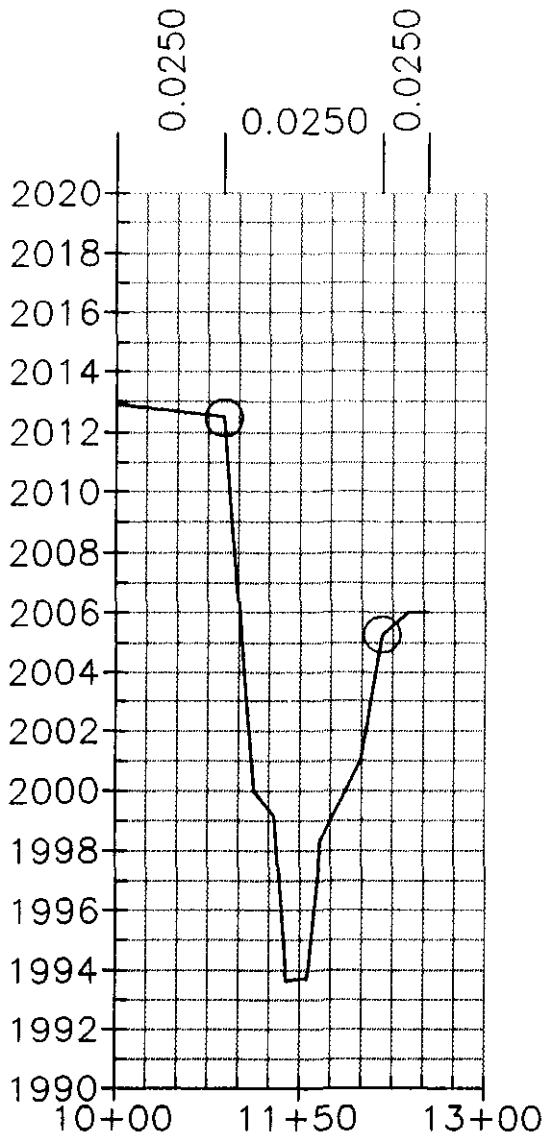
1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY
CCRFCD

CROSS SECTION NO. 280

DRAWING FL2.DWG

G.C. WALLACE, INC.
Engineering/Architecture 1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102



NOTE:

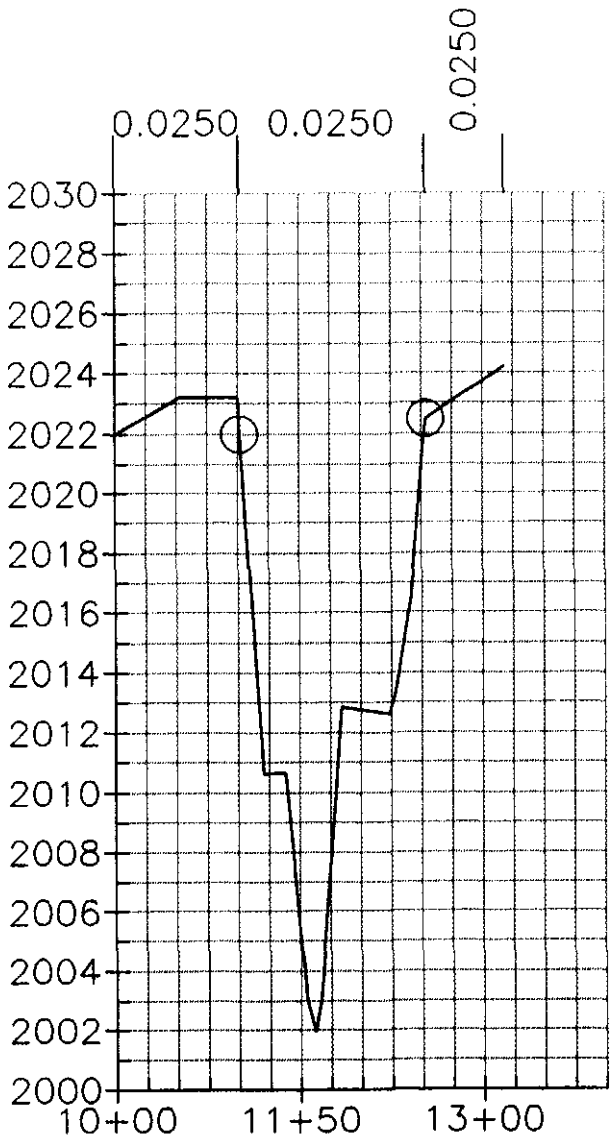
1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY
CCRFCD

CROSS SECTION NO. 290

DRAWING FL2.DWG

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102

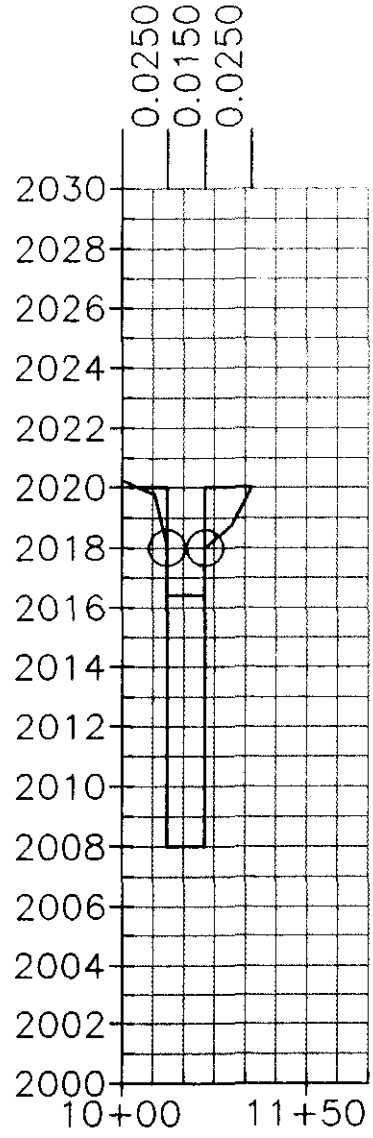


NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 300
DRAWING FL2.DWG

G.C. WALLACE, INC.
Engineering/Architecture
1500 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102

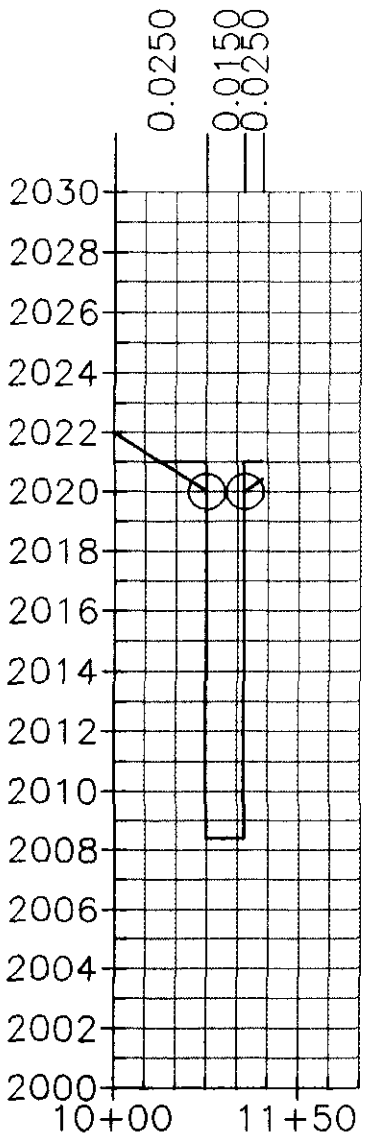


NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 310
DRAWING FL2.DWG

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102

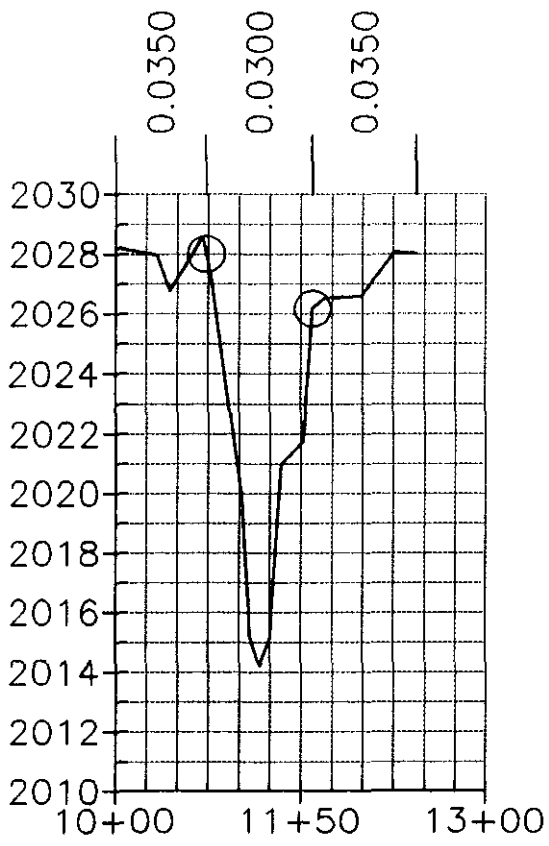


NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 320
DRAWING FL2.DWG

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102



NOTE:

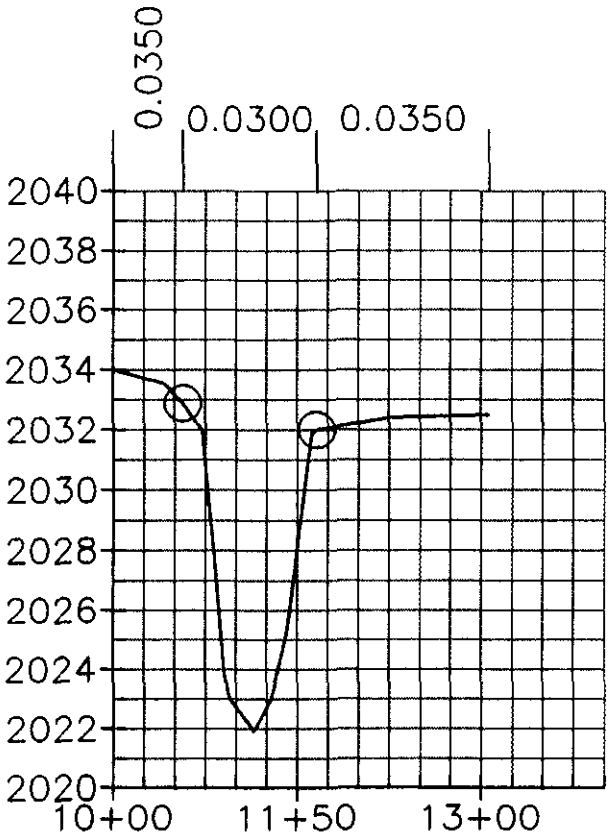
1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY
CCRFCD

CROSS SECTION NO. 330

DRAWING FL2.DWG

G.C. WALLACE, INC.
Engineering/Architecture 1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102

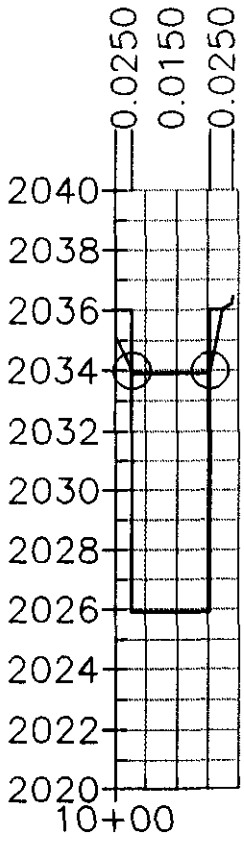


NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 340
DRAWING FL2.DWG

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD.,LAS VEGAS, NEVADA 89102

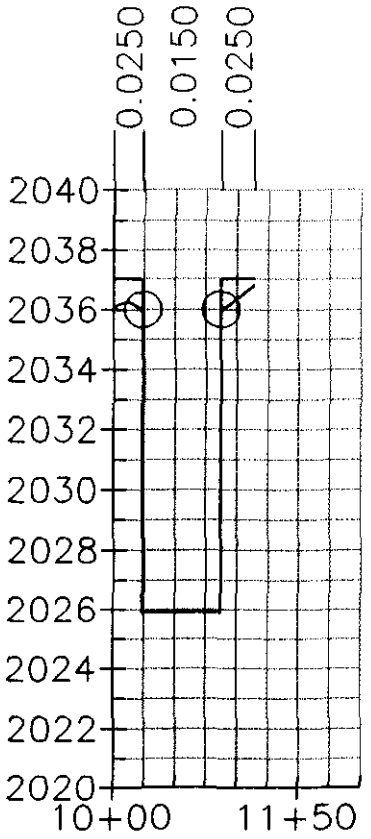


NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 350
DRAWING FL2.DWG

G.C. WALLACE, INC.
Engineering/Architecture 1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102

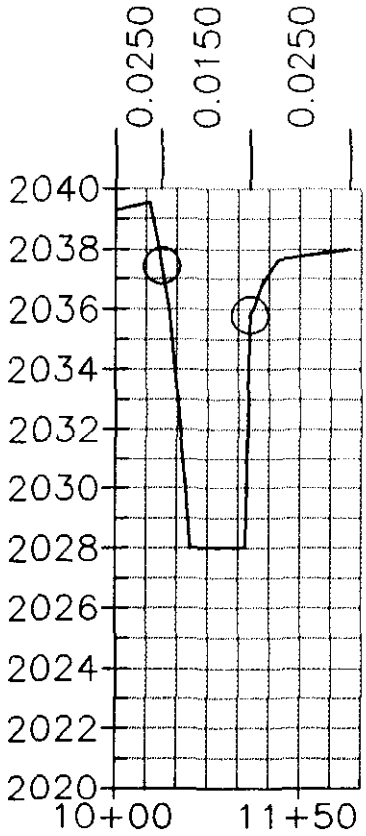


NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 360
DRAWING FL2.DWG

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102

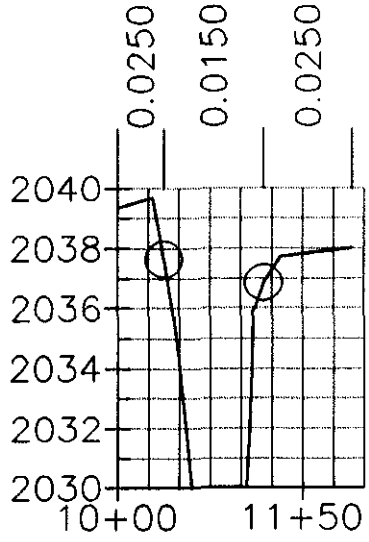


NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 370
DRAWING FL2.DWG

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD, LAS VEGAS, NEVADA 89102

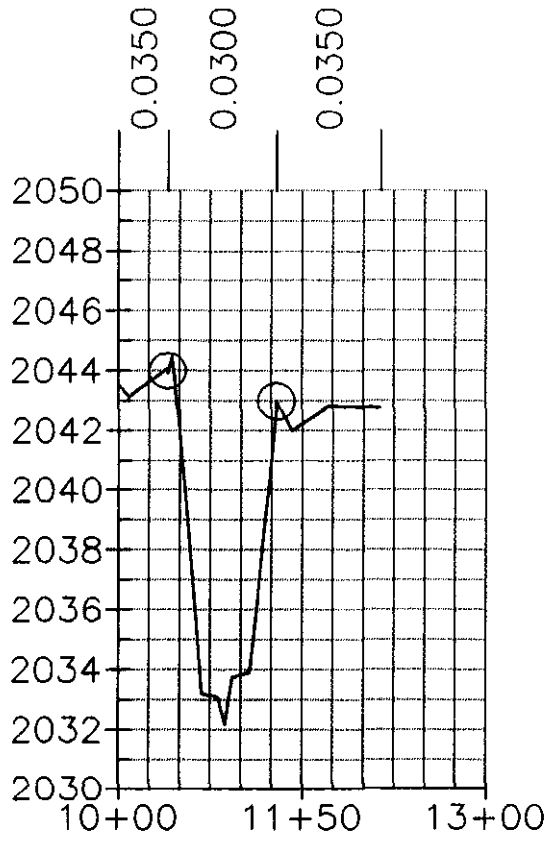


NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 380
DRAWING FL2.DWG

G.C. WALLACE, INC.
Engineering/Architecture 1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102



NOTE:

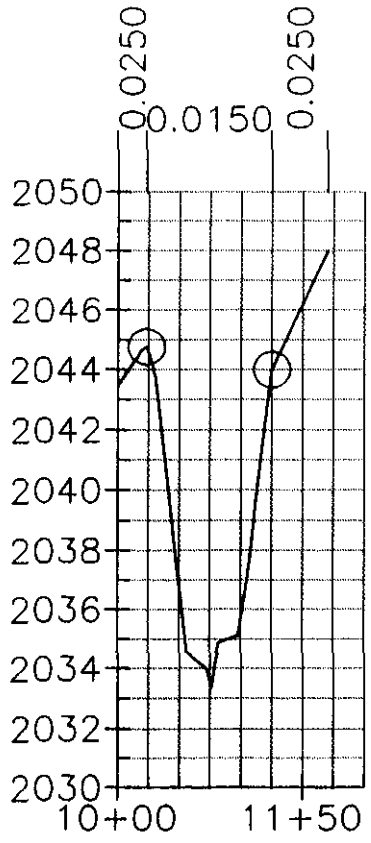
1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY
CCRFCD

CROSS SECTION NO. 390

DRAWING FL2.DWG

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102

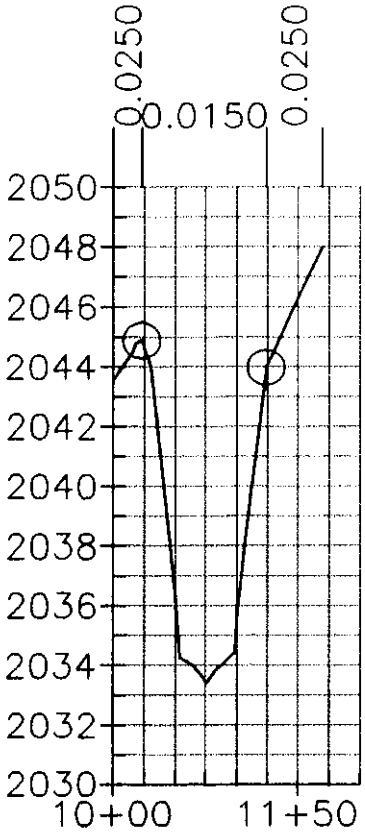


NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 400
DRAWING FL2.DWG

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102

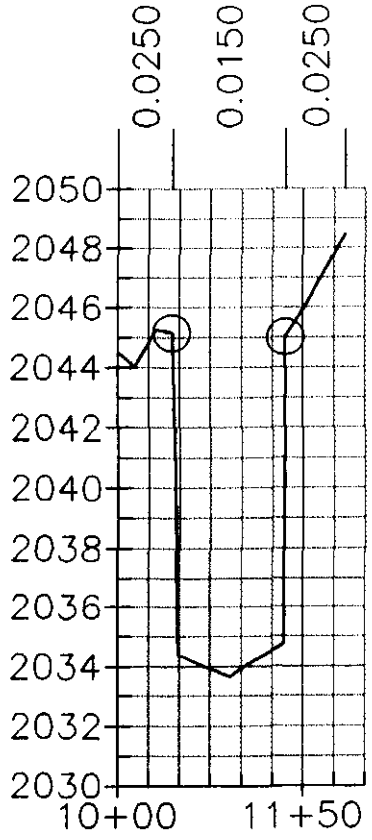


NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 410
DRAWING FL2.DWG

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD, LAS VEGAS, NEVADA 89102

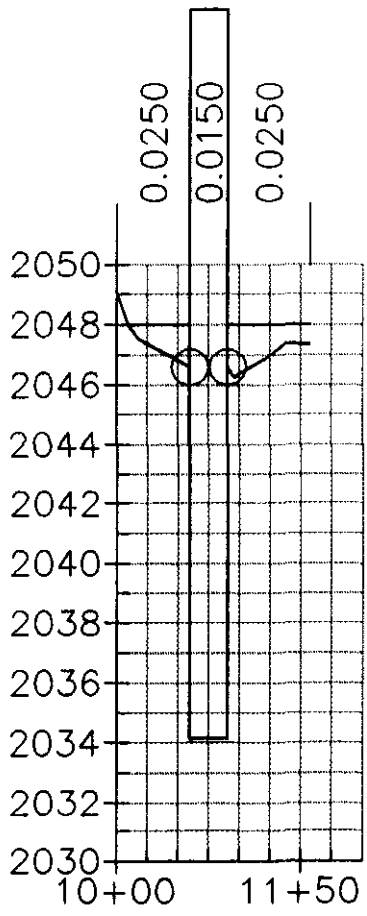


NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 420
DRAWING FL2.DWG

G.C. WALLACE, INC.
Engineering/Architecture 1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102

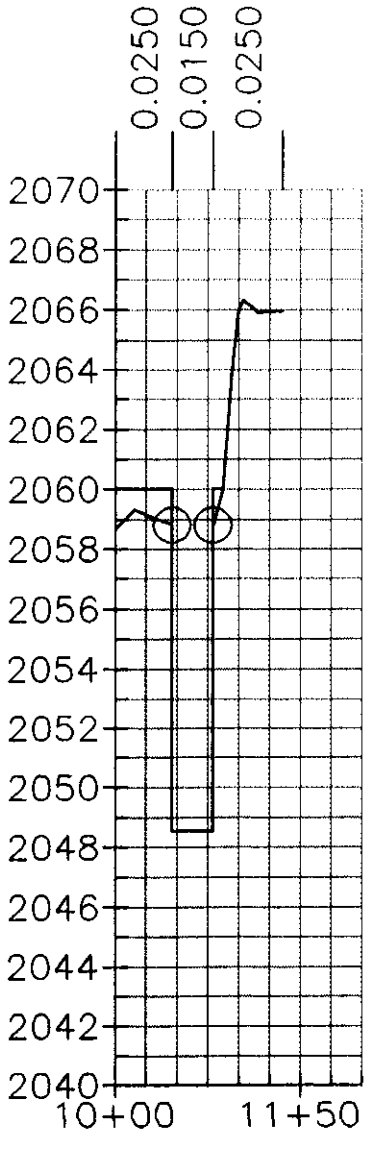


NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 430
DRAWING FL2.DWG

G.C. WALLACE, INC.
Engineering/Architecture 1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102

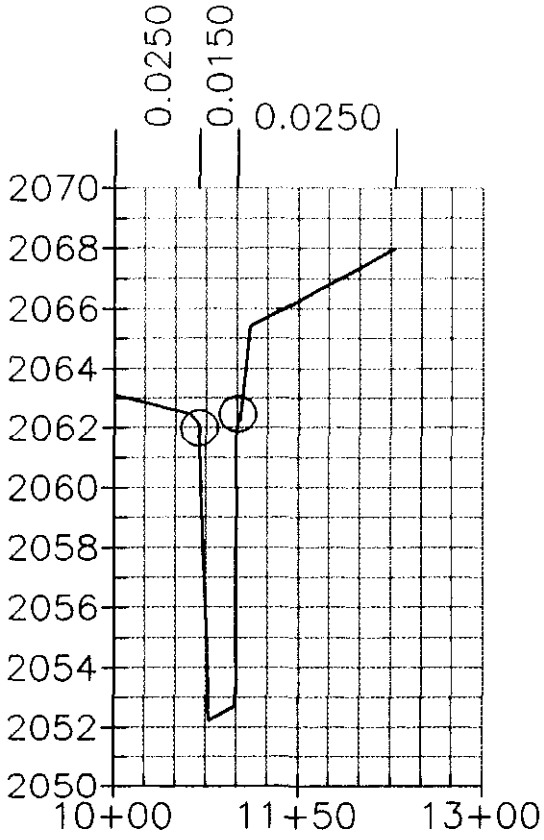


NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 440
DRAWING FL2.DWG

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD., LAS VEGAS, NEVADA 89102

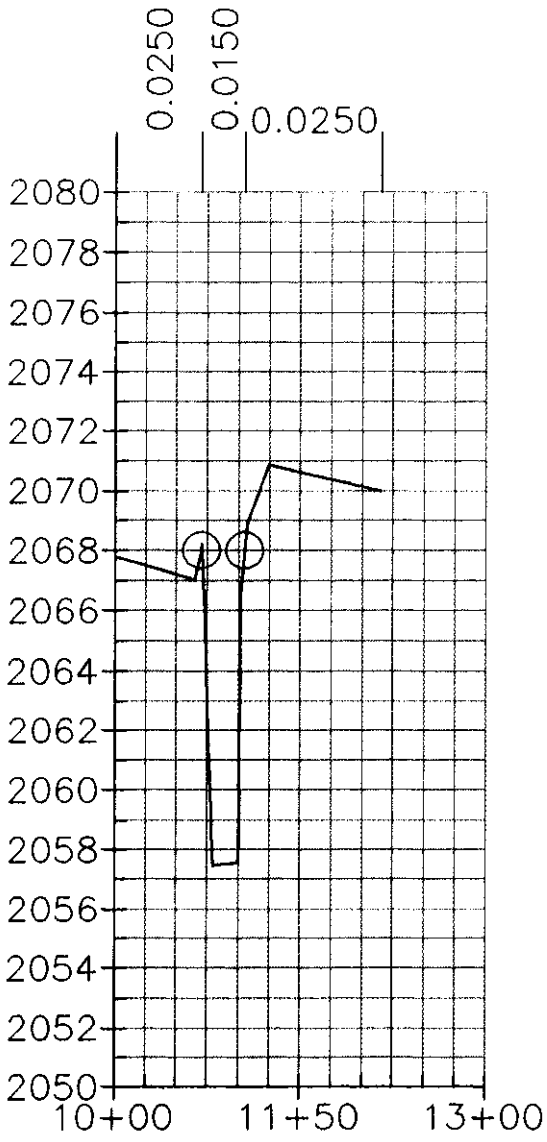


NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 450
DRAWING FL2.DWG

G.C. WALLACE, INC.
Engineering/Architecture 1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102

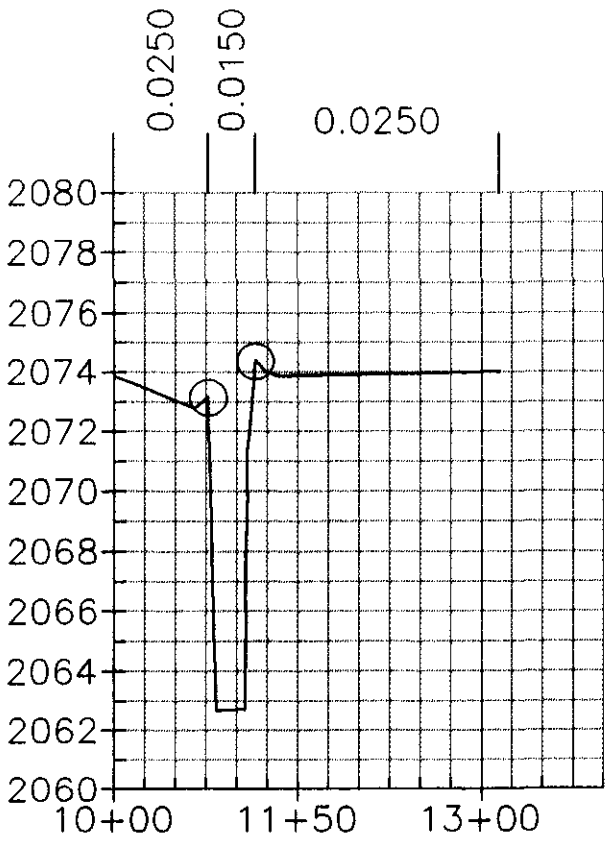


NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 460
DRAWING FL2.DWG

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102



NOTE:

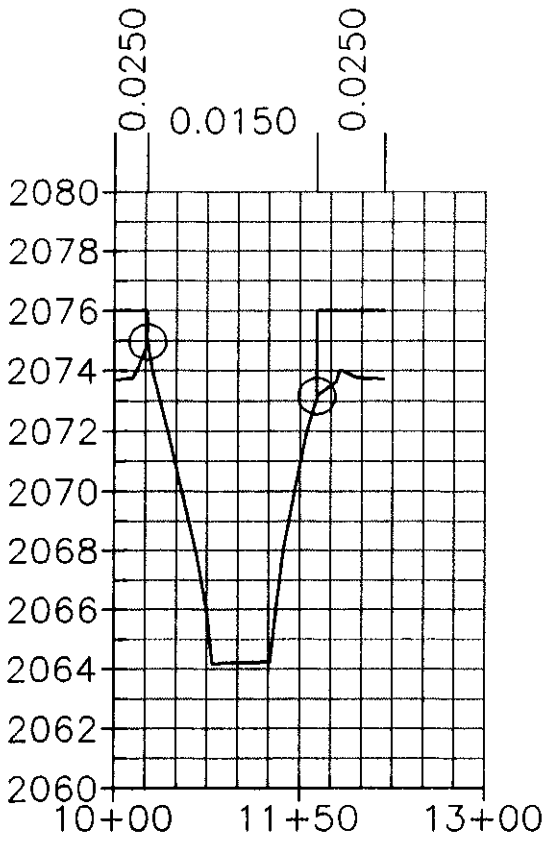
1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY
CCRFCD

CROSS SECTION NO. 470

DRAWING FL2.DWG

G.C. WALLACE, INC.
Engineering/Architecture 1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102

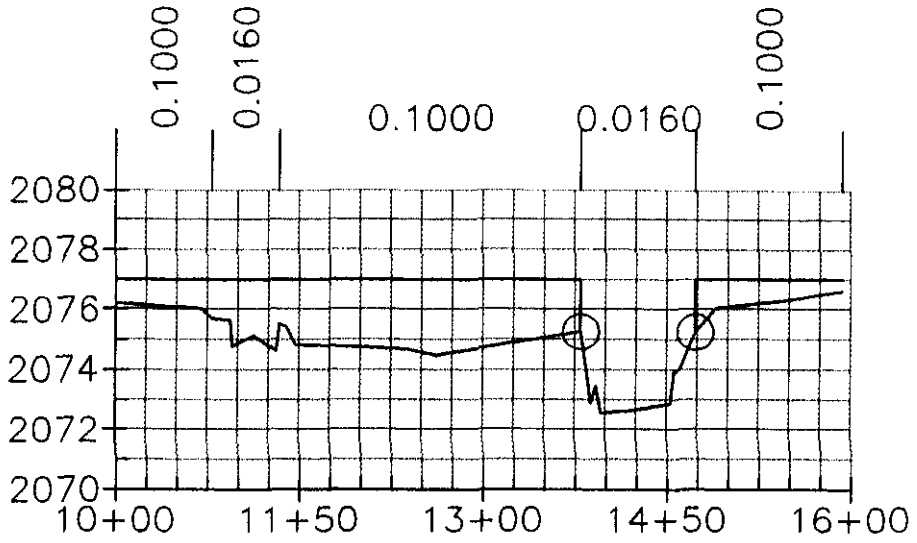


NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 480
DRAWING FL2.DWG

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102

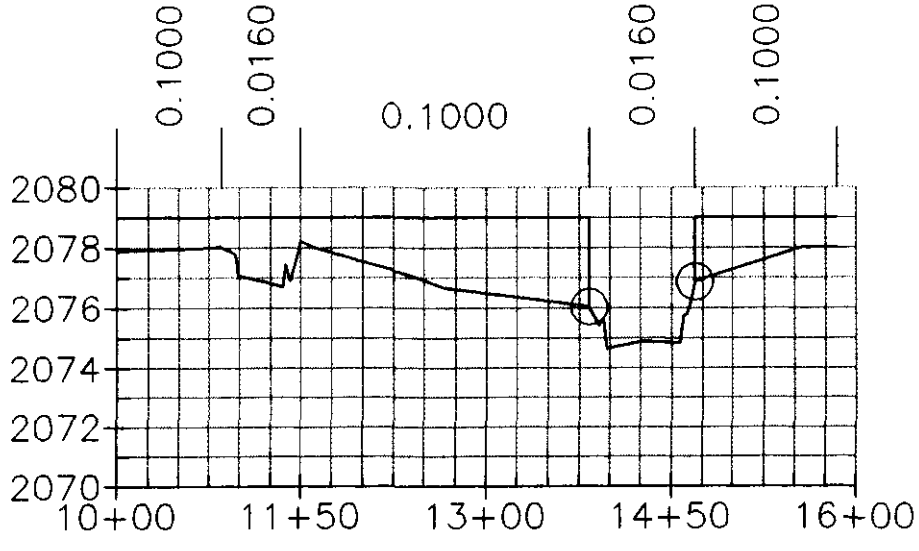


NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 490
DRAWING FL2.DWG

G.C. WALLACE, INC.
Engineering/Architecture 1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102

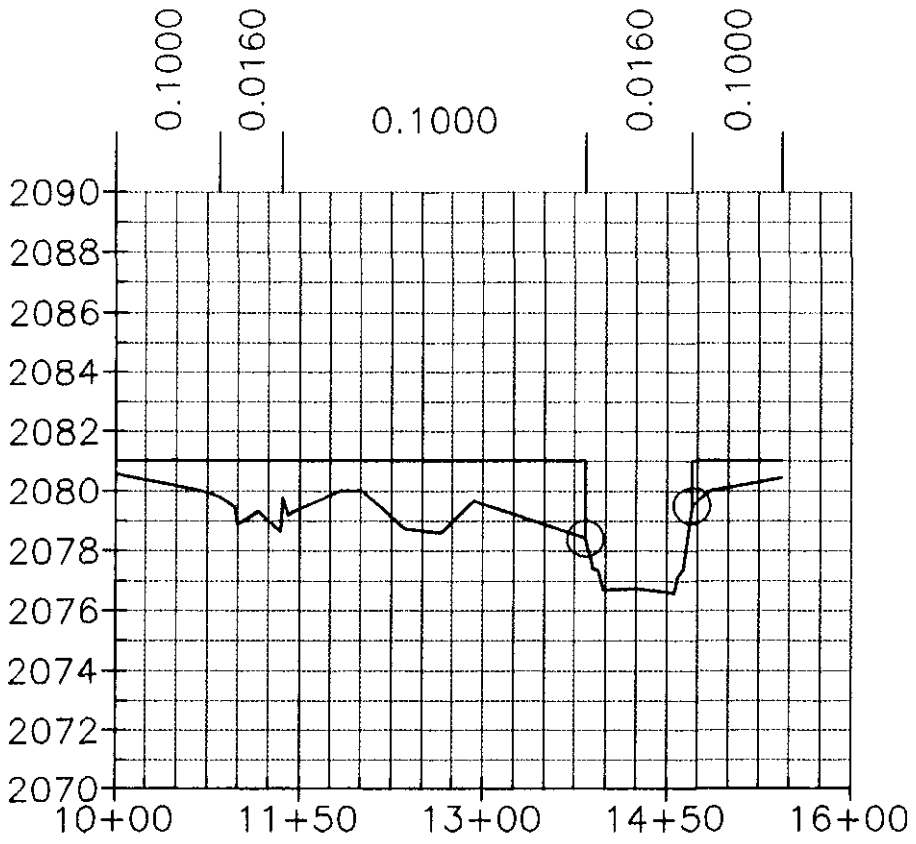


NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 500
DRAWING FL2.DWG

G.C. WALLACE, INC.
Engineering/Architecture 1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102



NOTE:

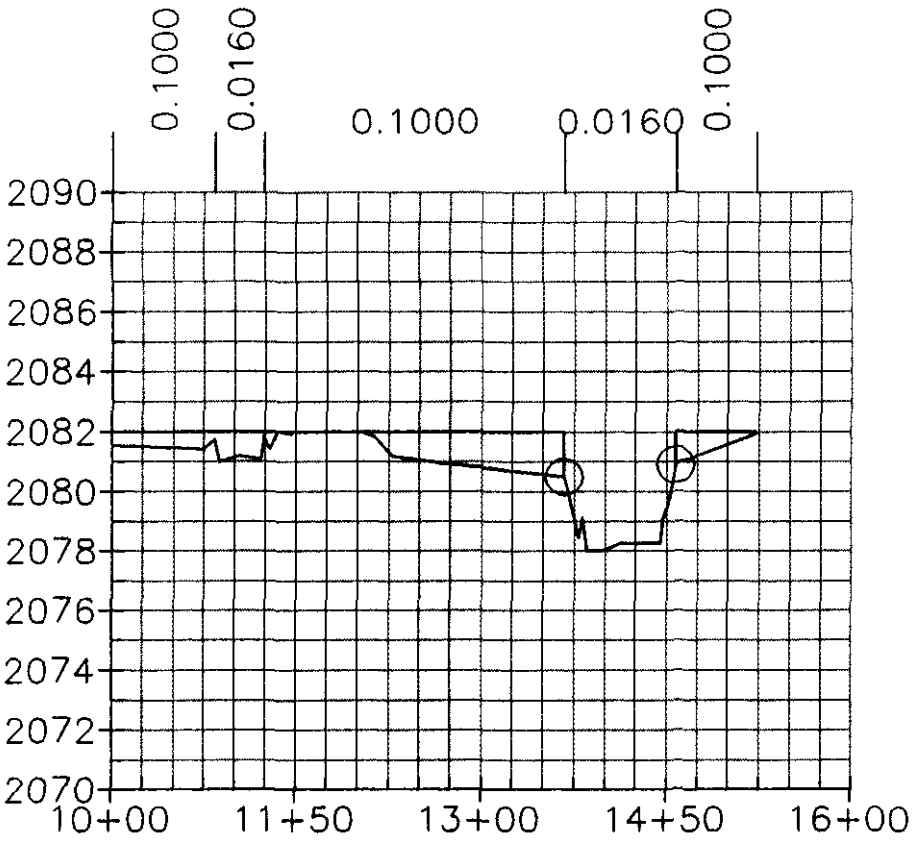
1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY
CCRFCD

CROSS SECTION NO. 510

DRAWING FL2.DWG

G.C. WALLACE, INC.
Engineering/Architecture 1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102

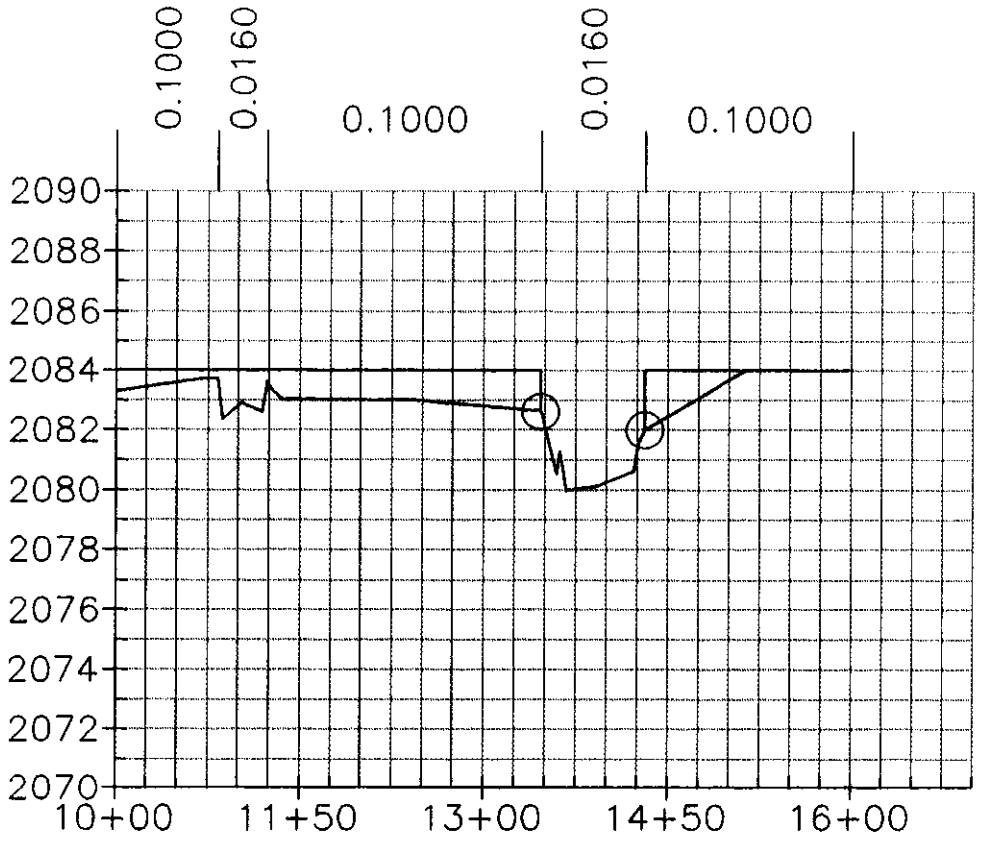


NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 520
DRAWING FL2.DWG

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102

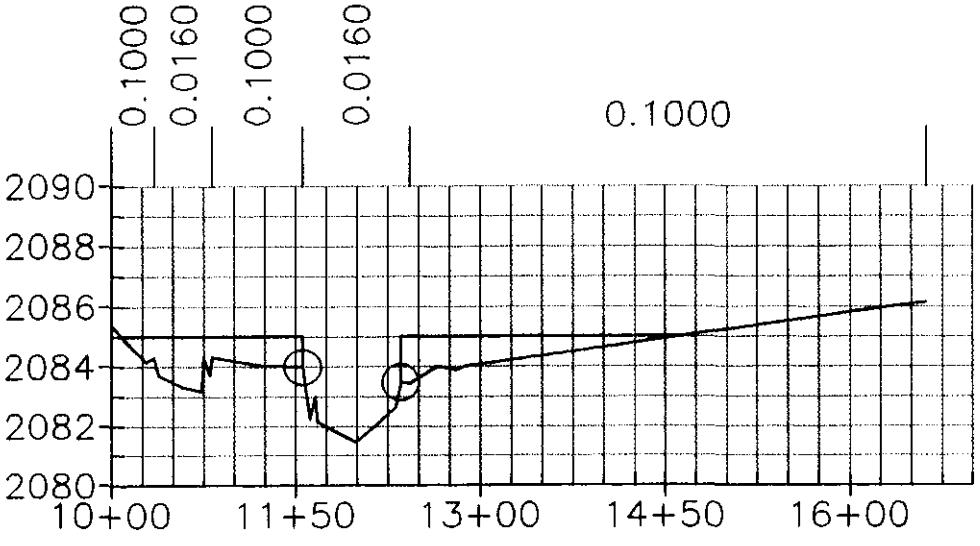


NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 530
DRAWING FL2.DWG

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102

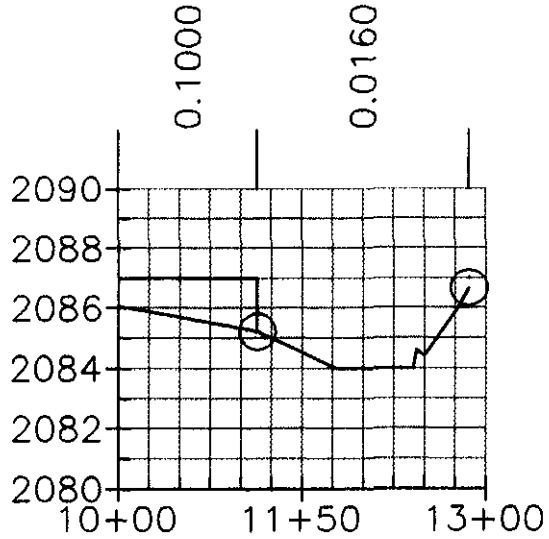


NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 540
DRAWING FL2.DWG

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102



NOTE:

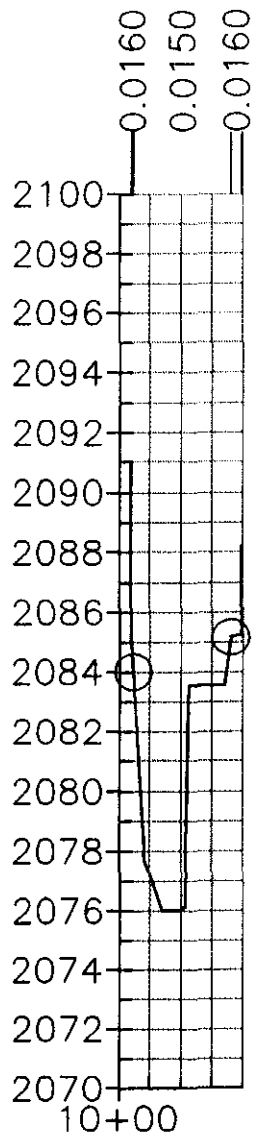
1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY
CCRFCD

CROSS SECTION NO. 550

DRAWING FL2.DWG

G.C. WALLACE, INC.
Engineering/Architecture 1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102



NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY
CCRFCD

CROSS SECTION NO. 560

DRAWING FL2.DWG

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102

2.3.4 EASTERN AVE. TO LAS VEGAS WASH REACH

MANNING'S NUMBER ("n")

PROJECT: FLAMINGO WASH FIS RESTUDY
DRAWING: FL3.DWG

HEC-2 STATION	$n_{channel}$	$n_{left\ overbank}$	$n_{right\ overbank}$	ROLL#/PICTURE#	PAGE# CALC. SHEET
350	0.020	0.020	0.020	5 / 17-25	35 of 37
360	0.020	0.020	0.020	4 / 17	BRIDGE
370	0.020	0.020	0.020	4 / 16	BRIDGE
380	0.020	0.030	0.030	5 / 15-16	33 & 34 of 37
390	0.020	0.030	0.030	5 / 15-16	33 & 34 of 37
400	0.020	0.030	0.030	5 / 15-16	33 & 34 of 37
410	0.020	0.030	0.030	5 / 15-16	33 & 34 of 37
420	0.020	0.030	0.030	5 / 15-16	33 & 34 of 37
430	0.015	0.030	0.030	5 / 11	BRIDGE
440	0.015	0.030	0.030	5 / 10	BRIDGE
450	0.040	0.025	0.025	5 / 1-14	31 & 32 of 37
460	0.040	0.025	0.025	5 / 1-14	31 & 32 of 37
470	0.040	0.025	0.025	5 / 5	BRIDGE
480	0.040	0.025	0.025	5 / 4	BRIDGE
490	0.040	0.025	0.025	5 / 1-14	31 & 32 of 37
500	0.040	0.025	0.025	5 / 1-14	31 & 32 of 37
510	0.030	0.020	0.020	4 / 24-25	29 & 30 of 37
520	0.030	0.020	0.020	4 / 24-25	29 & 30 of 37
530	0.030	0.020	0.020	4 / 24-25	29 & 30 of 37
540	0.030	0.020	0.020	4 / 24-25	29 & 30 of 37
550	0.030	0.020	0.020	4 / 24-25	29 & 30 of 37
560	0.030	0.020	0.020	4 / 24-25	29 & 30 of 37
570	0.030	0.020	0.020	4 / 24-25	29 & 30 of 37
580	0.015	0.020	0.020	4 / 19-23	27 & 28 of 37
590	0.015	0.020	0.020	4 / 23	BRIDGE
600	0.015	0.020	0.020	4 / 21	BRIDGE
610	0.015	0.020	0.020	4 / 19-23	27 & 28 of 37
620	0.015	0.020	0.020	4 / 19-23	27 & 28 of 37
630	0.015	0.020	0.020	4 / 19-23	27 & 28 of 37
640	0.015	0.020	0.020	4 / 19-23	27 & 28 of 37
650	0.015	0.020	0.020	4 / 18	BRIDGE
660	0.015	0.020	0.020	4 / 17	BRIDGE
670	0.025	0.025	0.025	4 / 9-18	25 & 26 of 37
680	0.025	0.025	0.025	4 / 9-18	25 & 26 of 37
690	0.025	0.025	0.025	4 / 14	BRIDGE
700	0.025	0.025	0.025	4 / 12	BRIDGE
710	0.025	0.025	0.025	4 / 9-18	25 & 26 of 37
720	0.025	0.025	0.025	4 / 9-18	25 & 26 of 37
730	0.025	0.025	0.025	4 / 9-18	25 & 26 of 37
740	0.025	0.025	0.025	4 / 9-18	25 & 26 of 37
750	0.025	0.025	0.025	4 / 9-18	25 & 26 of 37
760	0.025	0.025	0.025	4 / 9-18	25 & 26 of 37
770	0.025	0.025	0.025	4 / 9-18	25 & 26 of 37
780	0.015	0.025	0.025	4 / 8	BRIDGE
790	0.015	0.025	0.025	4 / 7	BRIDGE

800	0.030	0.035	0.035	3 / 36-37 & 4 / 1-8	23 & 24 of 37
810	0.030	0.035	0.035	3 / 36-37 & 4 / 1-8	23 & 24 of 37

MANNING'S NUMBER ("n")

PROJECT: FLAMINGO WASH FIS RESTUDY
DRAWING: FL4.DWG

HEC-2 STATION	$n_{channel}$	$n_{left\ overbank}$	$n_{right\ overbank}$	ROLL#/PICTURE#	PAGE# CALC. SHEET
10	0.030	0.030	0.030	6 / 1-3	36 & 37 of 37
20	0.030	0.030	0.030	6 / 1-3	36 & 37 of 37
30	0.030	0.030	0.030	6 / 1-3	36 & 37 of 37
40	0.030	0.030	0.030	6 / 1-3	36 & 37 of 37
50	0.030	0.030	0.030	6 / 1-3	36 & 37 of 37
60	0.030	0.030	0.030	6 / 1-3	36 & 37 of 37
70	0.030	0.030	0.030	6 / 1-3	36 & 37 of 37
80	0.030	0.030	0.030	6 / 1-3	36 & 37 of 37
90	0.030	0.030	0.030	6 / 1-3	36 & 37 of 37
100	0.030	0.030	0.030	6 / 1-3	36 & 37 of 37
110	0.015	0.030	0.030	6 / 1-3	36 & 37 of 37
120	0.015	0.030	0.030	5 / 25	BRIDGE
130	0.015	0.020	0.020	5 / 24	BRIDGE
140	0.015	0.020	0.020	5 / 17-25	35 of 37
150	0.020	0.020	0.020	5 / 17-25	35 of 37
160	0.020	0.020	0.020	5 / 17-25	35 of 37
170	0.020	0.020	0.020	5 / 17-25	35 of 37
180	0.020	0.020	0.020	5 / 17-25	35 of 37
190	0.020	0.020	0.020	5 / 17-25	35 of 37
200	0.020	0.020	0.020	5 / 17-25	35 of 37
210	0.020	0.020	0.020	5 / 17-25	35 of 37
220	0.020	0.020	0.020	5 / 17-25	35 of 37
230	0.020	0.020	0.020	5 / 17-25	35 of 37
240	0.020	0.020	0.020	5 / 17-25	35 of 37
250	0.015	0.020	0.020	5 / 17-25	35 of 37
260	0.015	0.020	0.020	5 / 17-25	35 of 37
270	0.015	0.020	0.020	5 / 17-25	35 of 37
280	0.015	0.020	0.020	5 / 17-25	35 of 37
290	0.015	0.020	0.020	5 / 17-25	35 of 37
300	0.015	0.020	0.020	5 / 17-25	35 of 37
310	0.015	0.020	0.020	5 / 17-25	35 of 37
320	0.020	0.020	0.020	5 / 17-25	35 of 37
330	0.020	0.020	0.020	5 / 17-25	35 of 37
340	0.020	0.020	0.020	5 / 17-25	35 of 37

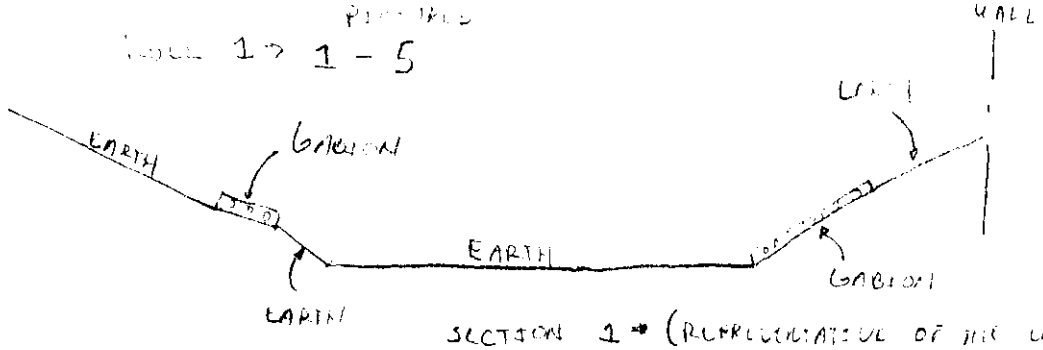
DATE 6/ /

CLIENT [illegible] JOB NO 550.032 C CALC BY

DESCRIPTION CHANNEL MANNING'S 'n' CHECKED BY

$n = (n_0 + n_1 + n_2 + n_3 + n_4) m_5$

PICTURE ROLL 1 → 1 - 5



SECTION 1 = (REPRESENTATIVE OF THE WHOLE REACH)

MATERIALS

EARTH = 0.020 GABION = 0.030

12% CONSIST OF GABIONS, 88% CONSIST OF EARTH

$n_0 = 12\%\,(.030) + 88\%\,(0.020) = .021$

IRREGULARITY:

SMOOTH

$n_1 = 0.000$

VARIATIONS:

GRADUAL

$n_2 = 0.000$

OBSTRUCTIONS:

NEGLIBLE

$n_3 = 0.000$

VEGETATION:

LOW

$n_4 = 0.005$

DEGREE OF MEANDERING

MINOR

$m_5 = 1.000$

$n_{CHANNEL} = 0.0262$ ROUND TO

$n_{CHANNEL} = 0.025$

PICTURE ROLL 1 → 1 - 5

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD / LAS VEGAS, NEVADA 89102

DATE

CLIENT CCRFCD JOB NO 550.02 CALC BY

DESCRIPTION Overbank Manning's n CHECKED BY

Manning's n

Lateral Boundary

30% Channel of Concrete 70% Channel of Earth

n_0 = 30% (.030) + 70% (0.020) = .023

IRREGULARITY:

SMOOTH

n_1 = 0.000

VARIATIONS:

GRADUAL

n_2 = 0.010

OBSTRUCTIONS:

NEGLIGIBLE

n_3 = 0.000

VEGETATION

LOW

n_4 = 0.005

DEGREE OF MEANDERING

MINOR

n_5 = 1.000

$n_{LEFT, RIGHT\ OVERBANK}$ = .028 ROUND TO

$n_{OVERBANK}$ = 0.03

PICTURE

ROLL 1 => 1-5

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD / LAS VEGAS, NEVADA 89102

DATE 6/

CLIENT CCRFCD JOB NO 550.052C CALC BY

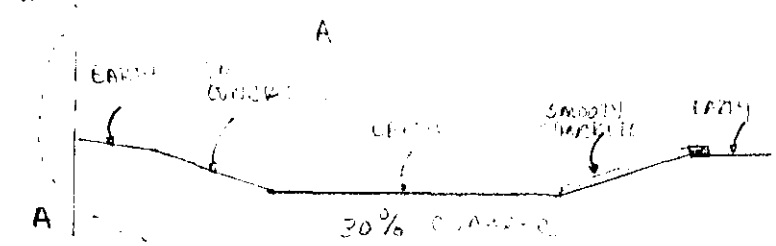
DESCRIPTION [illegible] MANNING'S "n" CHECKED BY

REACH

ROLL 1 TO 6-15

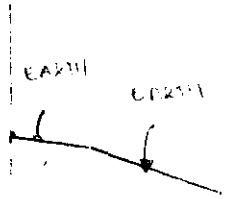
WALL

A



30% CONCRETE
90% EARTH
SECTION 1

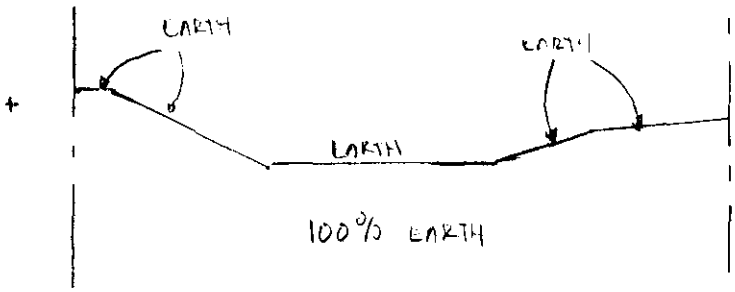
+



=> SAME AS SECTION 1

15% CONCRETE
85% EARTH
SECTION 1A

+



100% EARTH

SECTION 2

15% OF THE REACH IS COMPRISED OF SECTION 1A

30% OF THE REACH IS COMPRISED OF SECTION 2

55% OF THE REACH IS COMPRISED OF SECTION 1

MATERIAL:

EARTH = 0.020 CONCRETE = 0.015

$$n_0 = 55\%\left[30\%(.015) + 70\%(.020)\right] + 15\%\left[15\%(.015) + 85\%(.020)\right] + 30\%(.020)\Big] = .019$$

IRREGULARITY:

SMOOTH

$n_1 = 0.000$

VARIATION:

GRADUAL

$n_2 = 0.000$

OBSTRUCTION:

NEGLIBLE

$n_3 = 0.000$

VEGETATION:

NONE

$n_4 = 0.000$

DEGREE OF MEANDERING

MINOR

$m_5 = 1.000$

$n_{CHANNEL} = 0.019$ ROUND TO

$n_{CHANNEL} = 0.02$

ROLL 1 PROFILE L-15

EN-3-N
3/86

SHEET 3 OF 37

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD. / LAS VEGAS, NEVADA 89102

DATE 8/.../9

CLIENT CCRFCD JOB NO 550.032C CALC BY

DESCRIPTION OVERBANK MANNINGS 'n' CHECKED BY

SECTION 1-2

80% CONCRETE

20% EARTH

SECTION 1A-3

55% EARTH

45% CONCRETE

SECTION 3-4

100% EARTH

MATERIAL:

EARTH: 0.020 CONCRETE: 0.015

$$n_o = 55\%\left[80\%(.015) + 20\%(0.020)\right] + 15\%\left[55\%(0.020) + 45\%(.015)\right]$$

$$+ 30\%(0.020)\Big] = 0.017$$

IRREGULARITY	VARIATIONS	OBSTRUCTION
SMOOTH	GRADUAL	NEGLIBLE
$n_1 = 0.000$	$n_2 = 0.000$	$n_3 = 0.000$

VEGETATION	DEGREE OF MEANDERING
NONE	MINOR
$n_4 = 0.000$	$m_5 = 1.000$

$n_{LEFT, RIGHT\ OVERBANK} = 0.017$ ROUND TO

$n_{OVERBANK} = 0.02$

PICK: ROLL 1 => 6-15

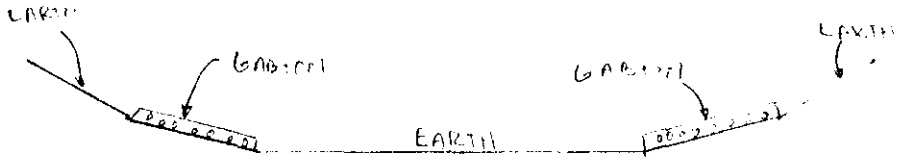
G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD. / LAS VEGAS, NEVADA 89102

DATE

CLIENT CCRFCD JOB NO 550.032.C CALC BY

DESCRIPTION CHANNEL MANNING'S n CHECKED BY

ROLL 1 / 16-20



SECTION 1 ⇒ (REPRESENTATIVE OF THE MIDDLE REACH)

MATERIALS

EARTH: 0.020 GABION: 0.030

20% CONSIST OF GABION, 80% CONSIST OF EARTH

n_o = 20% (0.030) + 80% (0.020) = 0.022

IRREGULARITY	VARIATIONS	OBSTRUCTION
SMOOTH	GRADUAL	NEGLIBLE
n_1 = 0.000	n_2 = 0.000	n_3 = 0.000

VEGETATION	DEGREE OF MEANDERING
LOW	MINOR
n_4 = 0.005 (MAINTENANCE AGREEMENT)	m_5 = 1.000

$n_{CHANNEL}$ = 0.027 ROUND TO

$n_{CHANNEL}$ = 0.030

ROLL 1 ⇒ PICTURE 16-20

EN-3-N
3/66

SHEET 5 OF 37

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102

DATE 6/

CLIENT CCRFCD JOB NO 550.032.6 CALC BY

DESCRIPTION [illegible] CHECKED BY

Mixed No. 3

[illegible] GAIN = 0.030

70% [illegible] 30% [illegible]

MATERIAL:

n_0 = 70% (0.030) + 30% (0.030) = 0.023

IRREGULARITY:	VARIATIONS:	OBSTRUCTIONS:
SMOOTH	GRADUAL	NEGLIGIBLE
$n_1 = 0.000$	$n_2 = 0.000$	$n_3 = 0.000$

VEGETATION:	DEGREE OF MEANDERING:
NONE	MINOR
$n_4 = 0.000$	$m_5 = 1.000$

$n_{LEFT, RIGHT\ OVERBANK}$ = 0.023 ROUND TO

$n_{OVERBANK} = 0.025$ ROLL 1 => 16-20 PIPE

EN-3-N
3/66

SHEET 6 OF 37

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102

DATE 6/

CLIENT CCRFCD JOB NO 550.032 CALC BY

DESCRIPTION CHANNEL MANNING'S "n" CHECKED BY

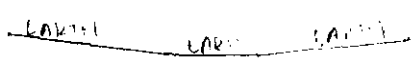
ROLL 1 => 21 - 27



90% EARTH 10% CONCRETE

SECTION 1

+



100% EARTH

SECTION 2

30% OF THE REACH IS COMPRISED OF SECTION 1

70% OF THE REACH IS COMPRISED OF SECTION 2

MATERIAL:

EARTH = 0.020 CONCRETE = 0.015

$$n_0 = 30\%\left[90\%(0.020) + 10\%(0.015)\right] + 70\%(0.020) = 0.020$$

IRREGULARITY:

MINOR

$n_1 = 0.005$

VARIATIONS:

ALTERNATING OCCASIONALLY

$n_2 = 0.005$

OBSTRUCTION:

NEGLIGIBLE

$n_3 = 0.000$

VEGETATION

LOW

$n_4 = 0.005$

DEGREE OF MEANDERING

MINOR

$m_5 = 1.000$

PICTURE ROLL 1 => 21-27

$n_{CHANNEL} = 0.035$

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD / LAS VEGAS, NEVADA 89102

DATE 6/[illegible]/97

CLIENT CCRFCD JOB NO 550.032 C CALC BY

DESCRIPTION OVERBANK MANNING'S "n" CHECKED BY

SECTION 1 %

15% CONCRETE

85% EARTH

SECTION 2 %

100% EARTH

MATERIALS

EARTH = 0.020 CONCRETE = 0.015

n_0 = 30% [15% (0.015) + 85% (0.020)] + 70% (0.020) = 0.020

IRREGULARITY:

MINOR

n_1 = 0.005

VARIATIONS:

ALTERNATING OCCASSIONALLY

n_2 = 0.005

OBSTRUCTIONS:

NEGLIGIBLE

n_3 = 0.000

VEGETATION:

LOW

n_4 = 0.005

DEGREE OF MEANDERING

MINOR

m_5 = 1.000

$n_{LEFT, RIGHT\ OVERBANK}$ = 0.035

PICTURE

ROLL 1 => 21-27

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102

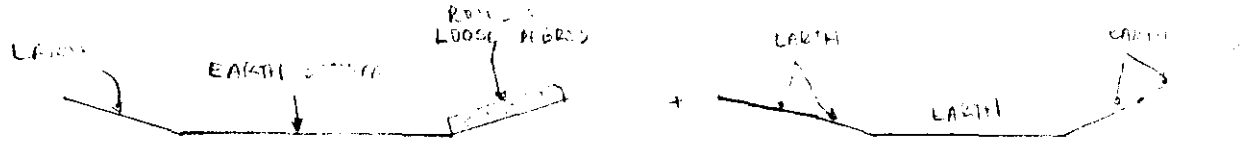
DATE

CLIENT CCDTCD JOB NO 550.022 CALC BY

DESCRIPTION CHANNEL & ENGINEERING CHECKED BY

PICTURE

ROLL 1 => 28-37



90% EARTH BOTTOM AND RUBBLE SIDES

10% EARTH

SECTION 1

100% EARTH

SECTION 2

60% OF THE REACH IS COMPRISED OF SECTION 1

40% OF THE REACH IS COMPRISED OF SECTION 2

MATERIALS

EARTH BOTTOM & RUBBLE SIDES = 0.030 EARTH = 0.020

$$n_0 = 60\%\left[90\%(0.030) + 10\%(0.020)\right] + 40\%(0.020) = 0.025$$

IRREGULARITY %	VARIATION %	OBSTRUCTION %
SMOOTH	GRADUAL	NEGLIBLE
$n_1 = 0.000$	$n_2 = 0.000$	$n_3 = 0.000$

VEGETATION %	DEGREE OF MEANDERING
NONE	MINOR
$n_4 = 0.000$	$m_5 = 1.000$

$n_{CHANNEL} = 0.025$

PICTURE

ROLL 1 => 28-37

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DATE 1/

CLIENT CRFCD JOB NO 550.032.C CALC BY

DESCRIPTION OVERBANK MANNING'S "n" CHECKED BY

SECTION 1 — SECTION 6

50% RUBBLE SIDES — 10% EARTH

50% EARTH

MATERIALS

RUBBLE SIDES: 0.030 EARTH: 0.020

$n_0 = 60\%\left[50\%(0.030) + 50\%(0.020)\right] + 40\%(0.000) = 0.023$

IRREGULARITY	VARIATIONS	OBSTRUCTIONS
SMOOTH	GRADUAL	NEGLIGIBLE
$n_1 = 0.000$	$n_2 = 0.000$	$n_3 = 0.000$

VEGETATION	DEGREE OF MEANDERING
LOW	MINOR
$n_4 = 0.005$	$n_5 = 1.000$

$n_{LEFT,\ RIGHT\ OVERBANK} = 0.028$ ROUND TO

$n_{OVERBANK} = 0.03$

PICTURE ROLL 1 => 28-37

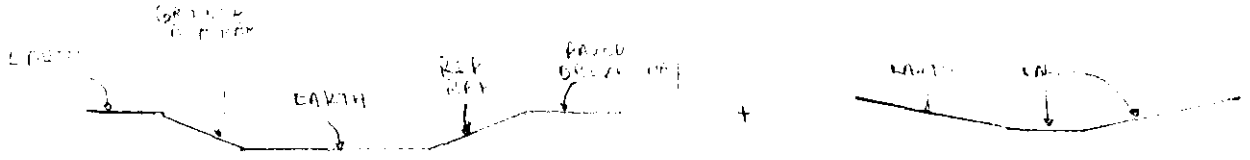
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DATE

CLIENT CCRFCD JOB NO 550.032 CALC BY

DESCRIPTION CHANNEL MANNING'S 'n' CHECKED BY

PICTURE 1 - 6



≈10" ⇒ 8% RIP-RAP 7% GROUTED RIP RAP

85% EARTH

SECTION 1 20% OF THE FLOW IS CONVEYED IN SECTION 1

80% OF THE FLOW IS CONVEYED IN SECTION 2

MATERIALS

$n_{RIP\text{-}RAP} = 0.0395 (d_{50})^{1/6} = 0.038$ $n_{GROUTED\ RIP\text{-}RAP} = 0.030$ $n_{EARTH} = 0.020$

$$n_0 = 20\% \left[8\%(0.038) + 7\%(0.030) + 85\%(0.020) \right] + 80\%(0.020) = 0.020$$

IRREGULARITY	VARIATION	OBSTRUCTION
SMOOTH	GRADUAL	NEGLIBLE
$n_1 = 0.00$	$n_2 = 0.000$	$n_3 = 0.000$

VEGETATION	DEGREE OF MEANDERING
LOW	MINOR
$n_4 = 0.005$	$m_5 = 1.000$

$n_{CHANNEL} = 0.025$

PICTURE ROLL 2 = 1 - 6

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DATE 6/[illegible]/11

CLIENT CCRFCD JOB NO 550.[illegible] CALC BY

DESCRIPTION OVERBANK [illegible] CHECKED BY

SLOPE [illegible]

50% RIP RAP

50% GROUTED RIP RAP

[illegible]

[illegible]

MATERIALS

$n_{RIP-RAP} = 0.0395\ (d_{50})^{1/6} = 0.038$ (for $d_{50} \approx 10''$)

$n_{GROUTED\ RIP\ RAP} = 0.020$

$n_{BARE} = 0.020$

$n_0 = 20\%\left[50\%(0.038) + 50\%(0.030)\right] + 80\%(0.020) = 0.023$

IRREGULARITY

SMOOTH

$n_1 = 0.000$

VARIATIONS

GRADUAL

$n_2 = 0.000$

OBSTRUCTIONS

NEGLIBLE

$n_3 = 0.000$

VEGETATION

LOW

$n_4 = 0.005$

DEGREE OF MEANDERING

MINOR

$n_5 = 1.000$

$n_{LEFT,\ RIGHT\ OVERBANK} = 0.028$ ROUND TO

$n_{OVERBANK} = 0.03$

ROLL 2 = PICTURE 1-6

EN-3-N
3/66

SHEET 11 OF 37

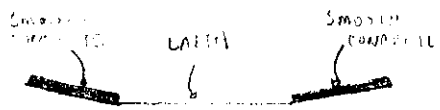
G.C. WALLACE, INC.
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DATE 6/7

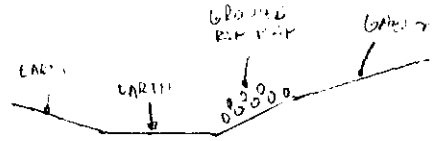
CLIENT CCRFCD JOB NO 550.038 CALC BY

DESCRIPTION CHANNEL MEANDERING "A" CHECKED BY

$r_{100} \Rightarrow$ 7/-16



+

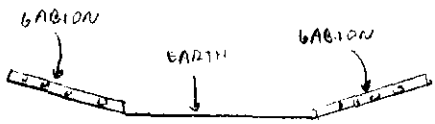


80% EARTH
20% CONCRETE

SECTION 1

90% EARTH
10% GROUTED RIP-RAP

SECTION 2



80% EARTH
20% GABION

SECTION 3

70% OF THE REACH IS COMPRISED OF SECTION 1

5% OF THE REACH IS COMPRISED OF SECTION 2

25% OF THE REACH IS COMPRISED OF SECTION 3

MATERIAL:

$n_{EARTH} = 0.020$ $n_{CONCRETE} = 0.015$ $n_{GROUTED\ RIP\text{-}RAP} = 0.030$ $n_{GABION} = 0.030$

$$n_0 = 70\%\left[80\%(0.020) + 20\%(0.015)\right] + 5\%\left[90\%(0.020) + 10\%(0.030)\right] + 25\%\left[80\%(0.020) + 20\%(0.030)\right] = 0.020$$

IRREGULARITY:
SMOOTH
$n_1 = 0.000$

VARIATION:
GRADUAL
$n_2 = 0.000$

OBSTRUCTION:
NEGLIBLE
$n_3 = 0.000$

VEGETATION:
LOW
$n_4 = 0.005$

DEGREE OF MEANDERING:
MINOR
$m_5 = 1.000$

$n_{CHANNEL} = 0.025$

PICTURE ROLL 2 - 17-16

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DATE

CLIENT CORPS JOB NO 550.23 CALC BY

DESCRIPTION OVERBANK CHECKED BY

25% (illegible)

25% (illegible)

MATERIALS

n_{BARE} = 0.040 $n_{CONCRETE}$ = 0.015 $n_{GRASS\ OVER\ RIP\ RAP}$ = 0.030

n_b = 70%(0.015) + 5%[50%(0.040) + 25%(illegible) + 25%(0.030)]

+ 25%(0.030) = 0.019

IRREGULARITY %

SMOOTH

n_1 0.000

VARIATIONS %

GRADUAL

n_2 0.000

OBSTRUCTIONS

NEGLIGIBLE

n_3 0.000

VEGETATION %

NONE

n_4 = 0.000

DEGREE OF MEANDERING %

MINOR

m_5 = 1.000

$n_{LEFT,\ RIGHT\ OVERBANK}$ = 0.019 ROUND TO

$n_{OVERBANK}$ = 0.02

PICTURE ROLL 2 ⇒ 7-16

EN-3-N
3/66

SHEET 13 OF 37

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DATE

CLIENT JUNO JOB NO CALC BY

DESCRIPTION CHANNEL MANNINGS 'n' / OVERBANK CHECKED BY

PICTURE

ROLL 2 @ 17-25

MATERIALS

$n_{CONCRETE} = 0.016$

$n_0 = 0.016$

IRREGULARITY

SMOOTH

$n_1 = 0.000$

VARIATIONS

GRADUAL

$n_2 = 0.000$

OBSTRUCTIONS

NEGLIGIBLE

$n_3 = 0.000$

VEGETATION

NONE

$n_4 = 0.000$

DEGREE OF MEANDERINGS

MINOR

$m_5 = 1.000$

$n_{CHANNEL} = 0.016$

PICTURE

ROLL 2 @ 17-25

$n_{OVERBANK} = 0.100$
LEFT, RIGHT

REDUCE IN CONVEYANCE DUE TO DEVELOPMENT

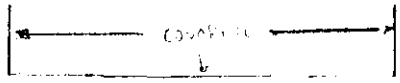
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DATE

CLIENT CCRFCD JOB NO 550.128.C CALC BY

DESCRIPTION SPREADSHEET MANNING'S n CHECKED BY

[illegible] => 1-6



SECTION [illegible]

MANNING'S

$n_{Concrete}$ 0.015

n_2 = 0.015

IRREGULARITIES

SMOOTH

n_1 = 0.000

OBSTRUCTIONS

NEGLIGIBLE

n_3 = 0.000

VEGETATION

NONE

n_4 = 0.000

DEGREE OF MEANDERING

MINOR

m_5 = 1.000

$n_{CHANNEL} = 0.015$

PICTURE ROLL 3 => 1-6

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DATE

CLIENT JOB NO CALC. BY

DESCRIPTION OVERBANK CHECKED BY

ROLL 3 => 1 - 5

MATERIALS

n_1 = 0.000

n_0 = 0.000

VARIATION

GRADUAL

n_2 = 0.000

OBSTRUCTIONS

NEGLIGIBLE

n_3 = 0.000

VEGETATION %

LOW

n_4 = 0.005

DEGREE OF MEANDERING

MINOR

m_5 = 1.000

$n_{LOB, ROB}$ = 0.025

OVERBANK

ROLL 3 => 1 - 6

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DATE _____

CLIENT CCRFCD JOB NO _____ CALC BY _____

DESCRIPTION CHANNEL MANNING'S "n" CHECKED BY _____

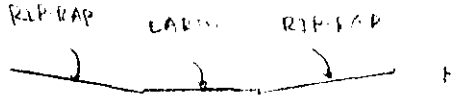
ROLL 3 => 7 - 14



95% EARTH
5% RIP-RAP

SECTION 1

+



60% EARTH
40% RIP-RAP

SECTION 2



100% EARTH

SECTION 3

77% OF THE REACH IS COMPRISED OF SECTION 1

8% OF THE REACH IS COMPRISED OF SECTION 2

15% OF THE REACH IS COMPRISED OF SECTION 3

MATERIAL:

$n_{EARTH} = 0.020$ $n_{RIP\text{-}RAP} = 0.035 (d_{50})^{1/6} = 0.037$

$$n_0 = 77\% \left[95\%(0.020) + 5\%(0.037) \right] + 8\% \left[60\%(0.020) + 40\%(0.037) \right]$$

$$+ 15\%(0.020) = .021$$

DEGREE OF IRREGULARITY: SMOOTH
$n_1 = 0.000$

VARIATIONS: ALTERNATING OCCASIONALLY
$n_2 = 0.005$

OBSTRUCTION: NEGLIBLE
$n_3 = 0.000$

VEGETATION: NONE
$n_4 = 0.000$

MEANDERING: MINOR
$m_5 = 1.000$

$n_{CHANNEL} = 0.026$ ROUND TO

$n_{CHANNEL} = 0.03$

PICTURE ROLL 3 => 7 - 14

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DATE 7/12/95

CLIENT CCRFCD JOB NO 550-93-2 CALC BY

DESCRIPTION OVERBANK MANNING'S "n" CHECKED BY

SECTION 1 & 2
50% RIP-RAP
50% EARTH

SECTION 2 & 3
100% RIP-RAP

SECTION 3
100% EARTH

MATERIAL:

n_{EARTH} 0.020 $n_{RIP\text{-}RAP}$ $0.035\,(d_{50})^{1/6} = 0.037$

$$n_0 = 77\%\left[50\%(0.037) + 50\%(0.020)\right] + 8\%(0.037) + 15\%(0.020)$$

$n_0 = 0.028$

DEGREE OF IRREGULARITY:
SMOOTH
$n_1 = 0.000$

VARIATIONS:
ALTERNATING OCCASSIONALLY
$n_2 = 0.005$

OBSTRUCTIONS:
NEGLIGIBLE
$n_3 = 0.000$

VEGETATION:
NONE
$n_4 = 0.000$

MEANDERING:
MINOR
$m_5 = 1.000$

$n_{LEFT,\ RIGHT\ OVERBANK} = 0.033$ ROUND TO

$n_{OVERBANK} = 0.035$

PICTURE
ROLL 3 => 7-14

EN-3-N
3/66

SHEET 17 OF 37

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DATE 7/7[illegible]

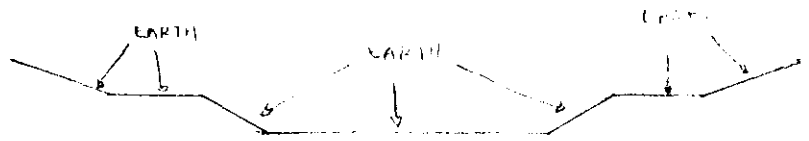
CLIENT [illegible] JOB NO [illegible] CALC BY

DESCRIPTION CHANNEL [illegible] CHECKED BY

& OVERBANK

PICTURES

ROLL 3 @ 15 - 24



REPRESENTATIVE OF THE [illegible] REACH

MATERIALS

EARTH 0.020

$n_0 = 0.020$

IRREGULARITY'S

SMOOTH

$n_1 = 0.000$

VARIATIONS

GRADUAL

$n_2 = 0.000$

OBST. [illegible]

NEGLIGIBLE

$n_3 = 0.000$

VEGETATIONS

LOW

$n_4 = 0.005$

MEANDERING

MINOR

$m_5 = 1.000$

$n_{CHANNEL} = .025$
& OVERBANK

PICTURE

ROLL 3 @ 15-24

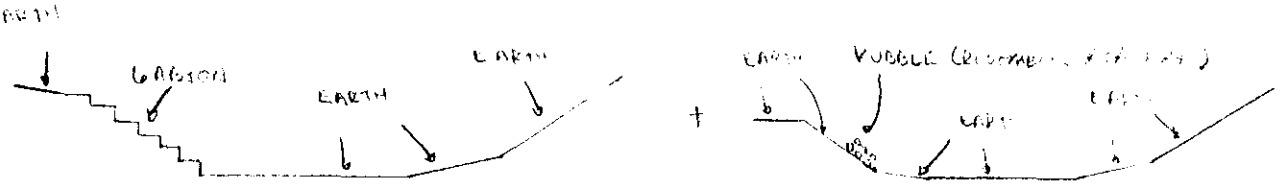
G.C. WALLACE, INC.
Engineering/Architecture
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DATE 7/11/11

CLIENT [illegible] JOB NO [illegible] CALC BY

DESCRIPTION CHANNEL [illegible] "n" CHECKED BY

ROLL 3 => 25-31



95% EARTH
5% GABION

SECTION 1

95% EARTH
5% RUBBLE

SECTION 2

25% OF THE REACH IS COMPRISED OF SECTION 1

75% OF THE REACH IS COMPRISED OF SECTION 2

MATERIAL:

$n_{EARTH} = 0.020$ $n_{RUBBLE} = 0.035$ $n_{GABION} = 0.030$

$$n_0 = 25\%\left[95\%(0.020) + 5\%(0.030)\right] + 75\%\left[95\%(0.020) + 5\%(0.035)\right]$$

$$n_0 = 0.021$$

IRREGULARITY:
MINOR
$n_1 = 0.005$

VARIATION:
GRADUAL
$n_2 = 0.000$

OBSTRUCTION:
NEGLIGIBLE
$n_3 = 0.000$

VEGETATION:
NONE
$n_4 = 0.000$

MEANDERING:
MINOR
$m_5 = 1.000$

$n_{CHANNEL} = 0.025$

PICTURE
ROLL 3 => 25-29

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DATE

CLIENT JOB NO CALC BY

DESCRIPTION CHECKED BY

SURFACES

50% GRASS

50% EARTH

SURFACE

25% IRREG

75% SMOOTH

MATERIALS

$n_{EARTH} = 0.028$ $n_{GRASS} = 0.025$ $n_{GRAVEL} = 0.030$

$n_0 = 25\%\left[50\%(0.030) + 50\%(0.000)\right] + 75\%\left[25\%(0.025) + 75\%(\quad)\right]$

$n_0 = 0.024$

IRREGULARITY %	VARIATION %	OBSTRUCTIONS
MINOR	GRADUAL	NEGLIGIBLE
$n_1 = 0.005$	$n_2 = 0.000$	$n_3 = 0.000$

VEGETATION %	MEANDERING %
NONE	MINOR
$n_4 = 0.000$	$m_5 = 1.000$

$n_{LEFT, RIGHT\ OVERBANK} = 0.029$ ROUND TO

$n_{OVERBANK} = 0.03$

PICTURE

ROLL 3 ⇒ 25-28

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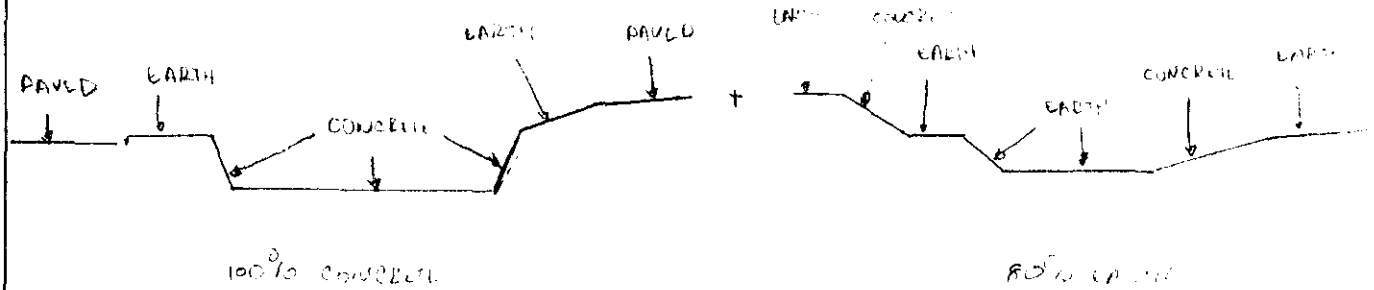
DATE

CLIENT JOB NO CALC BY

DESCRIPTION CHECKED BY

PLOT #1

ROLL 3 => 32-35



100% CONCRETE

80% EARTH
20% CONCRETE

SECTION 1

SECTION 2

75 % of THE REACH IS COMPRISED OF SECTION 1

25% OF THE REACH IS COMPRISED OF SECTION 2

MATERIALS

$n_{EARTH} = 0.020$ $n_{CONCRETE} = 0.015$

$$n_0 = 75\%(0.015) + 25\%\left[80\%(0.020) + 20\%(0.015)\right] = 0.016$$

IRREGULARITY%	VARIATION%	OBSTRUCTION%
SMOOTH	GRADUAL	NEGLIBLE
$n_1 = 0.000$	$n_2 = 0.000$	$n_3 = 0.000$

VEGETATION%	MEANDERING	
NONE	MINOR	
$n_4 = 0.000$	$m_5 = 1.000$	

$n_{CHANNEL} = 0.016$ ROUND TO

$n_{CHANNEL} = 0.015$

PLOT #1
ROLL 3 => 29-35

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DATE

CLIENT CCE JOB NO CALC BY

DESCRIPTION CHANNEL MANNING'S n CHECKED BY

SLOPE

SLOPE

100-YR CHANNEL

100-YR

OVERBANK

OVERBANK

MATERIALS

$n_{CHANNEL} = 0.030$ $n_{OVERBANK} = 0.015$

$n_0 = 75\%\left[25\%(0.020) + 75\%(0.015)\right] + 25\%\left[20\%(0.030) + 70\%(0.015)\right]$

$n_0 = 0.02$

IRREGULARITY

SMOOTH

$n_1 = 0.000$

VARIATION

GRADUAL

$n_2 = 0.000$

OBSTRUCTIONS

NEGLIBLE

$n_3 = 0.000$

VEGETATION

LOW

$n_4 = 0.005$

MEANDERING

MINOR

$m_5 = 1.000$

$n_{LEFT,\ RIGHT\ OVERBANK} = 0.025$ ROUND TO

PICTURE

$n_{OVERBANK} = 0.025$

ROLL 3 ⇒ 29-35

EN-3-N
3/66

SHEET 22 OF 37

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1555 SOUTH RAINBOW BLVD / LAS VEGAS, NEVADA 89102

DATE 7/

CLIENT [illegible] JOB NO [illegible] CALC BY

DESCRIPTION CHANNEL MANNING'S n CHECKED BY

PICTURE
ROLL 3 => 36-37 & PICTURE ROLL 4 => 1-8



100% EARTH

SECTION 1

+

80% EARTH
20% GRASS

SECTION 2

10% OF THE REACH IS COMPRISED OF SECTION 1.

90% OF THE REACH IS COMPRISED OF SECTION 2

MATERIALS

$n_{EARTH} = 0.020$ $n_{GRASS} = 0.030$

$$n_b = 10\%(0.020) + 90\%\left[80\%(0.020) + 20\%(0.030)\right] = 0.022$$

IRREGULARITY'S	VARIATIONS	OBSTRUCTIONS
SMOOTH	GRADUAL	NEGLIBLE
$n_1 = 0.000$	$n_2 = 0.000$	$n_3 = 0.000$

VEGETATION'S	MEANDERINGS	
MEDIUM	MINOR	$n_{CHANNEL} = 0.032$ ROUND TO
$n_4 = 0.010$	$m_5 = 1.000$	$n_{CHANNEL} = 0.03$

PICTURE
ROLL 3 => 36-37
&
ROLL 4 => 1-8

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DATE 4/[illegible]

CLIENT [illegible] JOB NO [illegible] CALC BY

DESCRIPTION UV[illegible] MANNING'S 'n' CHECKED BY

SECTION 3 ⁵

100% EARTH

SECTION 2 ⁵

100% [illegible]

MATERIALS

n_{EARTH} = 0.040 n_{GRASS} = 0.030

n_0 = 10%(0.040) + 90%(0.030) = 0.031

IRREGULARITY ⁵	VARIATIONS ⁵	OBSTRUCTIONS ⁵
SMOOTH	GRADUAL	NEGLIBLE
n_1 = 0.000	n_2 = 0.000	n_3 = 0.000

VEGETATION	MEANDERING
LOW	MINOR
n_4 = 0.005	m_5 = 1.000

$n_{LEFT, RIGHT\ OVERBANK}$ = 0.036 ROUND TO

$n_{OVERBANK}$ = 0.035

PICTURE

ROLL 3 => 36-37

&

ROLL 4 => 1-8

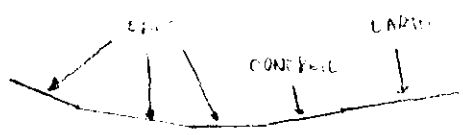
G.C. WALLACE, INC.
Engineering/Architecture
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DATE 7/[illegible]

CLIENT [illegible] JOB NO [illegible] CALC BY

DESCRIPTION [illegible] CHECKED BY

[illegible] 9-18

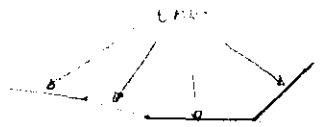


95% [illegible]

5% CONCRETE

SECTION 1

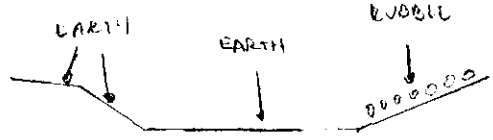
+



100% [illegible]

SECTION 2

+



95% EARTH

5% RUBBLE

SECTION 3

5% OF THE REACH IS COMPRISED OF SECTION 1

75% OF THE REACH IS COMPRISED OF SECTION 2

20% OF THE REACH IS COMPRISED OF SECTION 3

MATERIAL%

$n_{EARTH} = 0.020$ $n_{CONCRETE} = 0.015$ $n_{RUBBLE} = 0.035$

$n_0 = 5\%\left[95\%(0.020) + 5\%(0.015)\right] + 75\%(0.020) + 20\%\left[95\%(0.020) + 5\%(.03$

$n_0 = 0.020$

IRREGULARITY%

SMOOTH

$n_1 = 0.000$

VARIATION%

ALTERNATING OCCASIONALLY

$n_2 = 0.005$

OBSTRUCTION%

NEGLIGIBLE

$n_3 = 0.000$

VEGETATION%

NONE

$n_4 = 0.000$

MEANDERING

MINOR

$m_5 = 1.000$

$n_{CHANNEL} = 0.025$

PICTURE

ROLL 4 => 9-18

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD. / LAS VEGAS, NEVADA 89102

DATE

CLIENT JOB NO CALC BY

DESCRIPTION CHECKED BY

SECTION 1	SECTION 2	SECTION 3
20% [illegible]	100% EARTH	50% EARTH
80% [illegible]		50% [illegible]

MATERIALS

$n_{EARTH} = 0.030$ $n_{CONCRETE} = 0.013$ $n_{GRAVEL} = 0.035$

$n_0 = 5\%[20\%(0.015) + 80\%(0.030)] + 70\%(0.030) + 25\%[50\%(0.030) + 50\%(0.035)]$

$n_0 = 0.020$

IRREGULARITY	VARIATIONS	OBSTRUCTIONS
SMOOTH	GRADUAL	NEGLIGIBLE
$n_1 = 0.000$	$n_2 = 0.000$	$n_3 = 0.000$

VEGETATION	MEANDERINGS
LOW	MINOR
$n_4 = 0.005$	$m_5 = 1.000$

$n_{LEFT, RIGHT} = 0.025$
OVERBANK

RECTORC
ROLL 4 ⇒ 9 - 18

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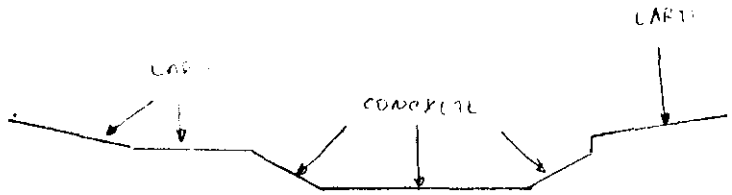
DATE 7/1/

CLIENT [illegible] JOB NO [illegible] CALC BY

DESCRIPTION CHANNEL MANNING'S 'n' CHECKED BY

PICTURE

ROLL 4 => 19-23



100% CONCRETE

REPRESENTATIVE OF THE CHANNEL REACH

SECTION 1

MATERIALS

n_{LAND} = 0.030 $n_{CONCRETE}$ = 0.015

n_0 = 0.015

IRREGULARITY:

SMOOTH

n_1 = 0.000

VARIATIONS:

GRADUAL

n_2 = 0.000

OBSTRUCTIONS:

NEGLIBLE

n_3 = 0.000

VEGETATION:

NONE

n_4 = 0.000

MEANDERING:

APPRECIABLE

n_5 = 1.15

$n_{CHANNEL}$ = 0.017 ROUND TO

$n_{CHANNEL}$ = 0.015

PICTURE

ROLL 4 => 19-23

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DATE

CLIENT [illegible] JOB NO 55[illegible] CALC BY

DESCRIPTION [illegible] CHECKED BY

SECTION 1

40% [illegible]

60% [illegible]

MATERIALS

[illegible] .015 [illegible] .040

$n_0 = 40\%(0.015) + 60\%(0.040) = 0.018$

IRREGULARITY

SMOOTH

$n_1 = 0.000$

VARIATION:

GRADUAL

n_2 0.000

OBSTRUCTIONS

NEGLIGIBLE

$n_3 = 0.000$

VEGETATION

NONE

$n_4 = 0.000$

ADJUSTMENTS

APPRECIABLE

$m_5 = 1.15$

$n_{LEFT,\ RIGHT\ OVERBANK}$ 0.021 ROUND TO

$n_{OVERBANK} = 0.02$

PICTURE ROLL 4 => 19-23

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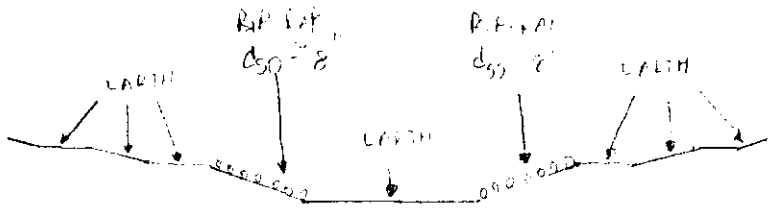
DATE

CLIENT _____ JOB NO _____ CALC BY _____

DESCRIPTION CHANNEL Manning's n CHECKED BY _____

PICTURE

ROLL 4 => 24-25



SECTION 1 (REPRESENTATIVE OF THE UPPER REACH)

40% EARTH

60% RIP-RAP

MATERIALS:

$n_{EARTH} = 0.020$ $n_{RIP-RAP} = 0.0395 d_{50}^{1/6} = 0.037$

d_{50} = 8"

$n_0 = 40\%(0.020) + 60\%(0.037) = 0.030$

IRREGULARITY:	VARIATIONS:	OBSTRUCTIONS:
SMOOTH	GRADUAL	NEGLIGIBLE
$n_1 = 0.000$	$n_2 = 0.000$	$n_3 = 0.000$

VEGETATION:	MEANDERINGS
NONE	MINOR
$n_4 = 0.000$	$m_5 = 1.000$

$n_{CHANNEL} = 0.030$

PICTURE
ROLL 4 => 24-25

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DATE 4/[illegible]

CLIENT [illegible] JOB NO [illegible] CALC BY

DESCRIPTION [illegible] CHECKED BY

SECTION 19

100% EARTH

MATERIALS

$n_{EARTH} = 0.040$

$n_0 = 0.020$

IRREGULARITIES

SMOOTH

$n_1 = 0.000$

VARIATIONS

GRADUAL

$n_2 = 0.000$

OBSTRUCTIONS

NEGLIGIBLE

$n_3 = 0.000$

VEGETATION

NONE

$n_4 = 0.000$

MEANDERING

MINOR

$m_5 = 1.000$

$n_{LEFT, RIGHT\ OVERBANK} = 0.040$

PICTURE
ROLL 4 ⇒ 24-25

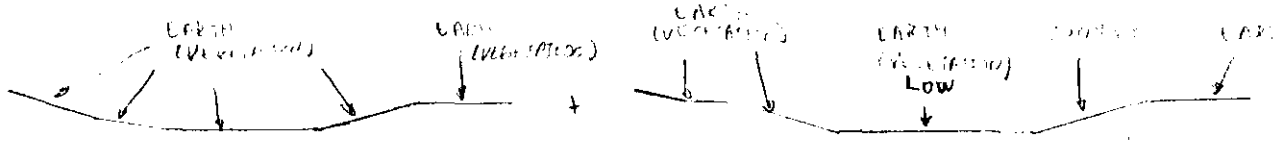
G.C. WALLACE, INC.
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DATE 9/[illegible]

CLIENT CORPS JOB NO [illegible] CALC BY

DESCRIPTION CHANNEL ROUGHNESS CHECKED BY

ROLL 5 ⇒ 1 - 14



100% EARTH

95% EARTH

5% BRUSH

SECTION 1

SECTION 2

95% OF THE REACH IS COMPRISED OF SECTION 1

5% OF THE REACH IS COMPARABLE OF SECTION 2

MATERIALS

$n_{earth} = 0.020$ $n_{brush} = 0.015$

IRREGULARITY

SMOOTH

VARIATIONS

GRADUAL

$n_D = 95\%(0.020) + 5\%[95\%(0.020) + 5\%(0.015)]$ $n_1 = 0.000$

$n_2 = 0.000$

$n_D = 0.020$

OBSTRUCTIONS

NEGLIBLE

$n_3 = 0.000$

VEGETATION

MEDIUM

$n_4 = 0.02$

MEANDERING

MINOR

$m_5 = 1.000$

$n_{CHANNEL} = .04$ ROUND TO

$n_{CHANNEL} = 0.04$

ROLL 5 = 7 PICTURE 1 - 14

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DATE 9/1/2

CLIENT CITY JOB NO CALC BY

DESCRIPTION OVERBANK MANNING'S n CHECKED BY

SECTION 1 SECTION 2

30% [illegible]

70% EARTH

MATERIALS

$n_{earth} = 0.035$ $n_{concrete} = 0.015$

$n_0 = 95\%\ (0.035) + 5\%\left[30\%\ (0.015) + 70\%\ (0.035)\right]$

$n_0 = 0.020$

IRREGULARITY'S	VARIATIONS	OBSTRUCTIONS
SMOOTH	GRADUAL	NEGLIGIBLE
$n_1 = 0.000$	$n_2 = 0.000$	$n_3 = 0.000$

VEGETATION'S	MEANDERINGS
LOW	MINOR
$n_4 = 0.005$	$m_5 = 1.000$

$n_{LEFT, RIGHT} = 0.025$
OVERBANK

PICTURE
ROLL 5 ⇒ 1 - 14

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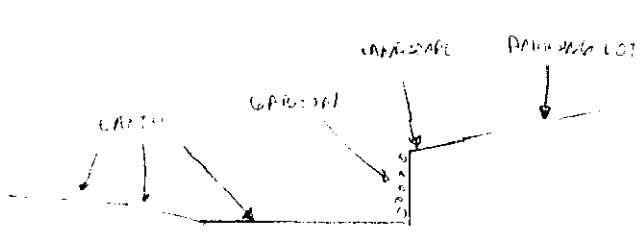
DATE 11/2[illegible]

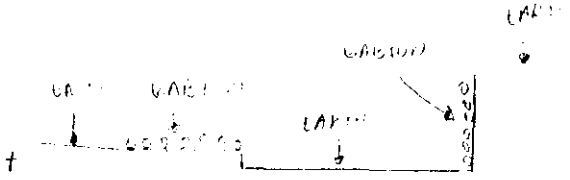
CLIENT [illegible] JOB NO 550[illegible] CALC BY

DESCRIPTION [illegible] CHECKED BY

PICTURE

ROLL 5 OF 15 - 16





95% [illegible]

5% [illegible]

SECTION 1

90% [illegible]

10% [illegible]

SECTION 2

30% OF THE REACH IS COMPRISED OF SECTION 1

70% OF THE REACH IS COMPRISED OF SECTION 2

MATERIALS

n_{BANK} 0.030 $n_{CHANNEL}$ 0.020

$n_0 = 30\%\left[95\%(0.030) + 5\%(0.050)\right] + 70\%\left[90\%(0.030) + 10\%(0.050)\right]$

$n_0 = 0.031$

IRREGULARITY

SMOOTH

$n_1 = 0.000$

VARIATIONS

GRADUAL

$n_2 = 0.000$

OBSTRUCTIONS

NEGLIGIBLE

n_3 0.000

VEGETATION

NONE

$n_4 = 0.000$

MEANDERING

MINOR

$n_5 = 1.000$

$n_{CHANNEL}$ 0.021 ROUND TO

$n_{CHANNEL}$ 0.00

PICTURE ROLL 5 OF 15 - 16

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DATE

CLIENT CCRLC JOB NO CALC BY

DESCRIPTION CHECKED BY

SURFACE 1: 75% CONCRETE

SURFACE 2: 75% CONCRETE

MATERIALS:

$n_{CONC.} = 0.020$ $n_{METAL} = 0.030$

$n_0 = 30\%[75\%(0.020) + 25\%(0.030)] + 70\%[75\%(0.020) + 25\%(0.030)]$

$n_0 = 0.026$

IRREGULARITIES: SMOOTH

$n_1 = 0.000$

VARIATIONS: GRADUAL

$n_2 = 0.000$

OBSTRUCTIONS: NEGLIGIBLE

$n_3 = 0.000$

VEGETATION: LOW

$n_4 = 0.005$

MEANDERING: MINOR

$m_5 = 1.000$

$n_{LEFT, RIGHT\ OVERBANK} = 0.031$ ROUND TO

$n_{OVERBANK} = 0.03$

PICTURE ROLL 5 ⇒ 15-16

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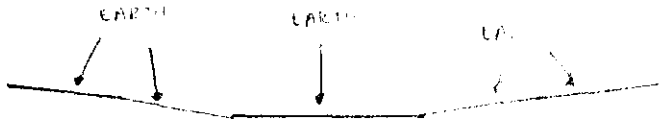
DATE 7/6/94

CLIENT [illegible] JOB NO [illegible] CALC. BY

DESCRIPTION CHANNEL MANNING'S 'n' CHECKED BY

& OVERBANK

ROLL 5 ⇒ 19-25



100% [illegible]

[illegible] OF THE [illegible] REACH

SECTION 1

MATERIALS	IRREGULARITY	VARIATION
n_{EARTH} 0.000	SMOOTH	GRADUAL
n_0 0.000	n_1 = 0.000	n_2 = 0.000

OBSTRUCTIONS	VEGETATION	MEANDERING
NEGLIGIBLE	NONE	MINOR
n_3 = 0.000	n_4 = 0.000	m_5 = 1.000

$n_{CHANNEL}$ = 0.00
& OVERBANK

PICTURE

ROLL 5 ⇒ 19-25

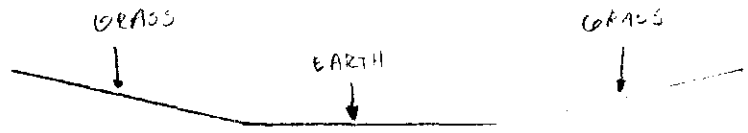
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DATE 7/2/97

CLIENT CCDFCD JOB NO 550.03 CALC BY

DESCRIPTION CHANNEL MANNING'S "n" CHECKED BY

PICTURE
ROLL 6 => 1-3



10% EARTH
90% GRASS

SECTION 1

MATERIAL:

$n_{GRASS} = 0.030$ $n_{EARTH} = 0.020$

$n_0 = 10\%(0.020) + 90\%(0.030)$

$n_0 = 0.029$

IRREGULARITY:

SMOOTH

$n_1 = 0.000$

VARIATIONS:

GRADUAL

$n_2 = 0.000$

OBSTRUCTIONS:

NEGLIGIBLE

$n_3 = 0.000$

VEGETATION:

NONE

$n_4 = 0.000$

MEANDERING:

MINOR

$m_5 = 1.000$

$n_{CHANNEL} = 0.029$ ROUND TO

$n_{CHANNEL} = 0.03$

PICTURE
ROLL 6 => 1-3

EN-3-N
3/66

SHEET 36 OF 37

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DATE 7/6/--

CLIENT CCRFCD JOB NO [illegible] CALC BY

DESCRIPTION OVERBANK MANNING'S 'n' CHECKED BY

SECTION 1-2

100% GRASS

MATERIAL:

$n_{GRASS} = 0.030$

IRREGULARITY:

SMOOTH

$n_1 = 0.000$

VARIATIONS:

GRADUAL

$n_2 = 0.000$

$n_0 = 0.030$

OBSTRUCTIONS:

NEGLIGIBLE

$n_3 = 0.000$

VEGETATION:

NONE

$n_4 = 0.000$

MEANDERING:

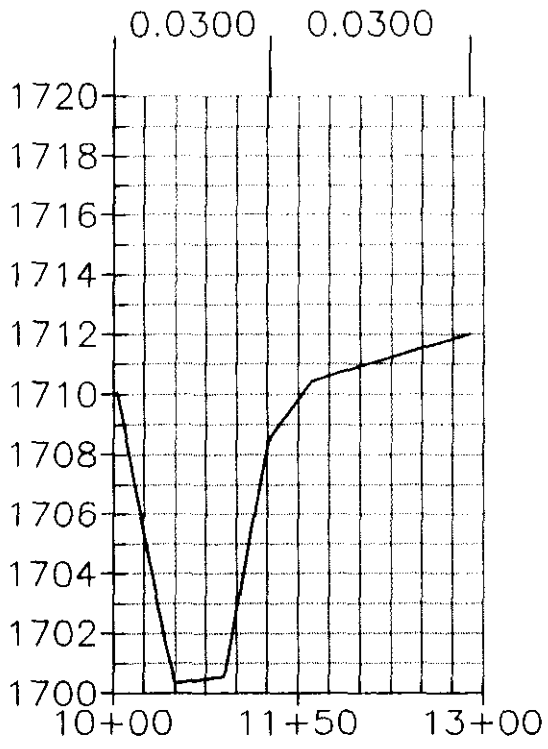
MINOR

$n_5 = 1.000$

$n_{LEFT, RIGHT} = 0.03$
OVERBANK

PICTURE
ROLL 6 => 1 - 3

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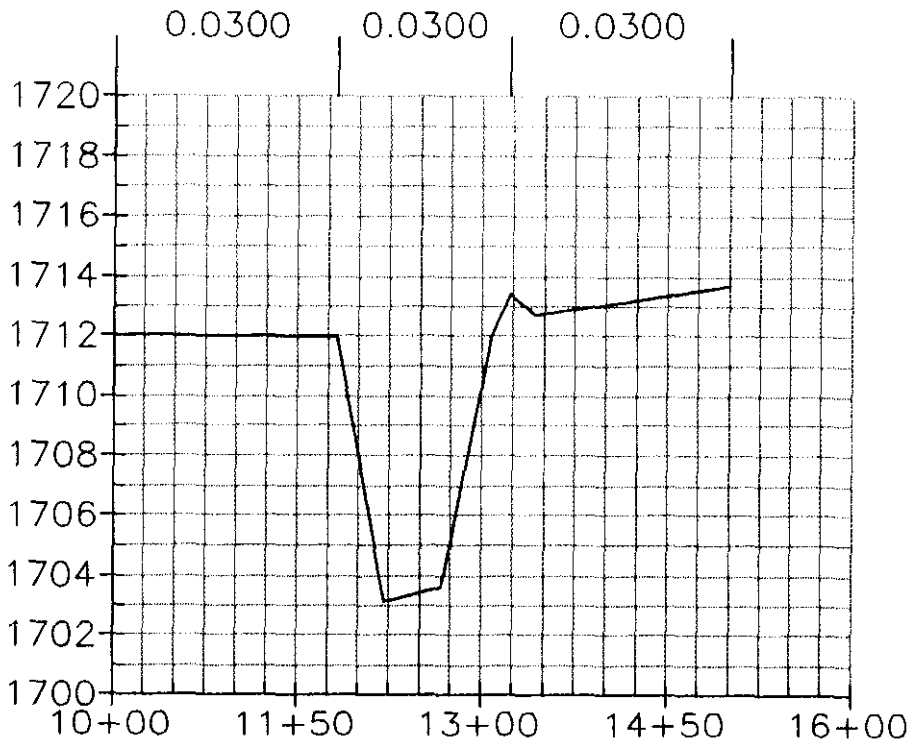


NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 10
DRAWING FL4.DWG

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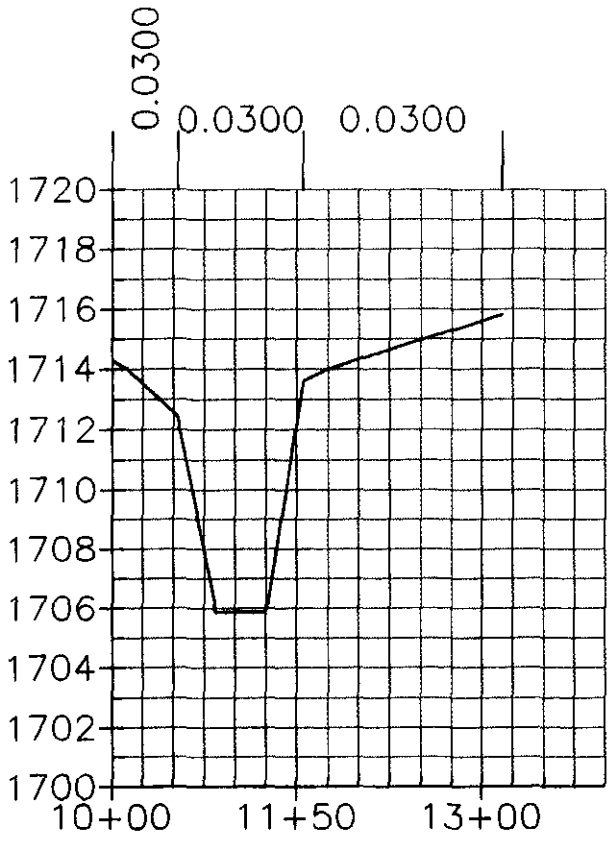


NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 20
DRAWING FL4.DWG

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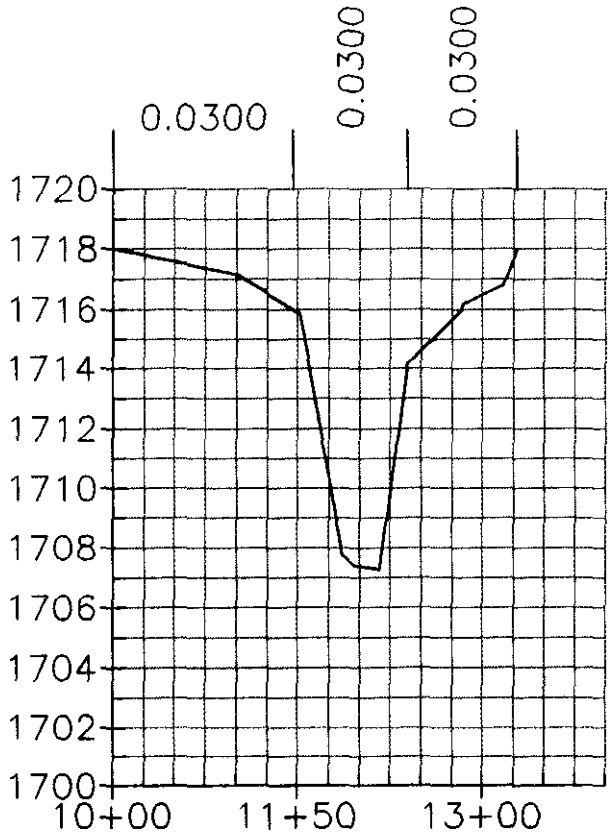


NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 30
DRAWING FL4.DWG

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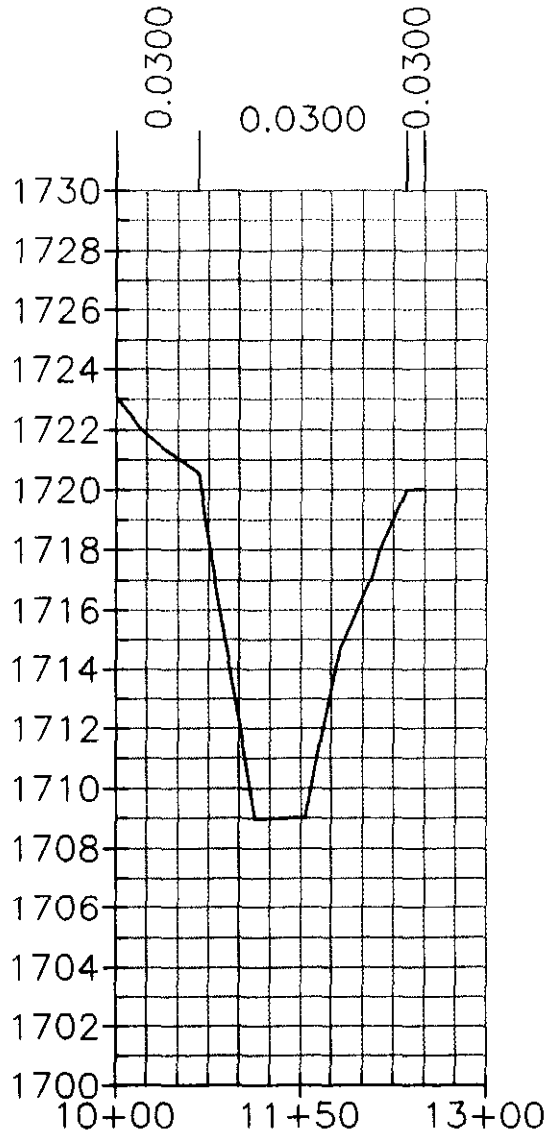


NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 40
DRAWING FL4.DWG

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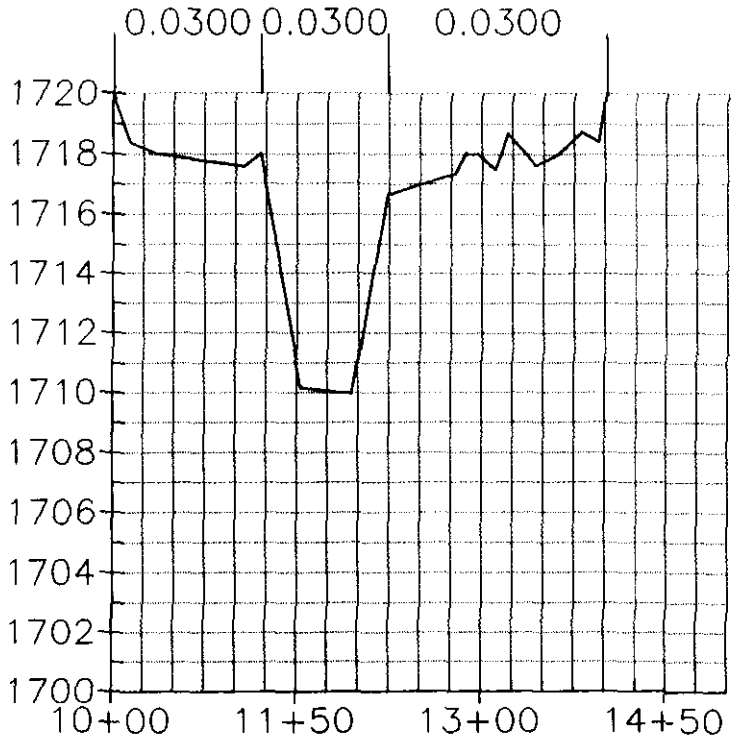


NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 50
DRAWING FL4.DWG

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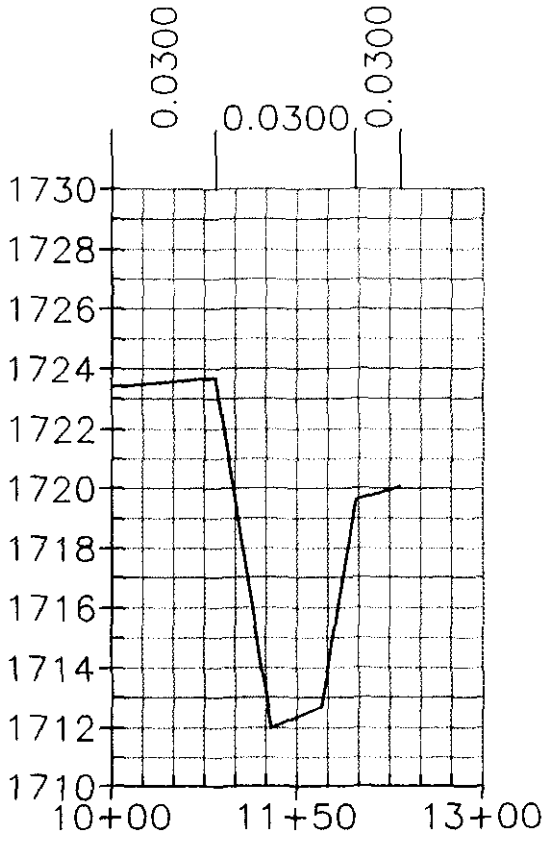


NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 60
DRAWING FL4.DWG

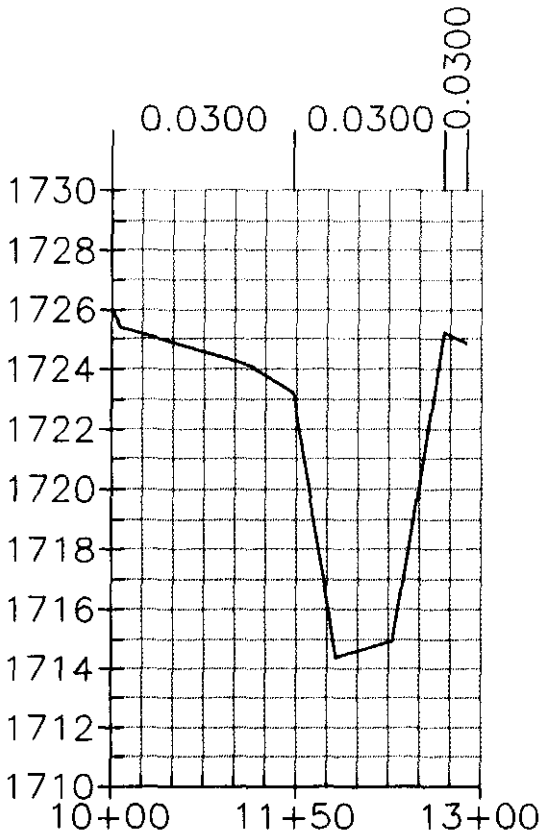
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NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 70
DRAWING FL4.DWG
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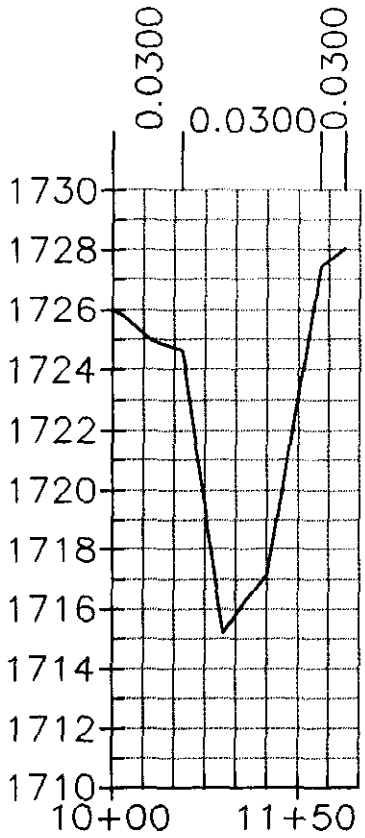


NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 80
DRAWING FL4.DWG

G.C. WALLACE, INC.
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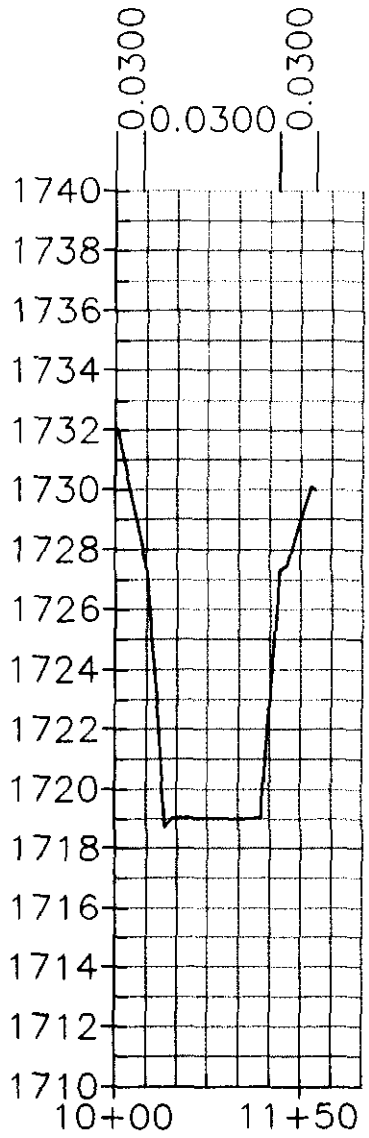


NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 90
DRAWING FL4.DWG

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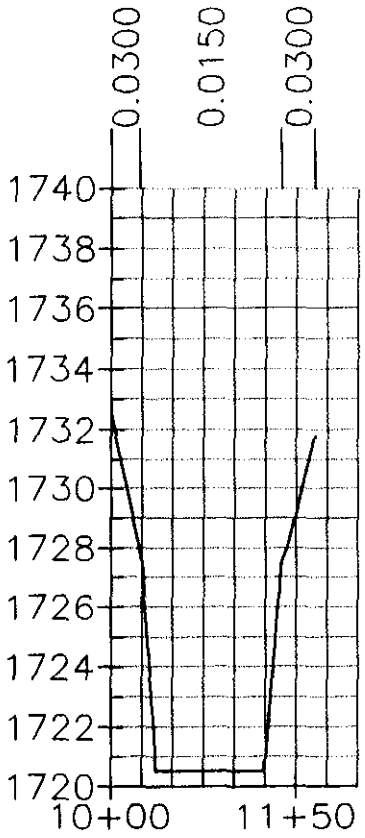


NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 100
DRAWING FL4.DWG

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NOTE:

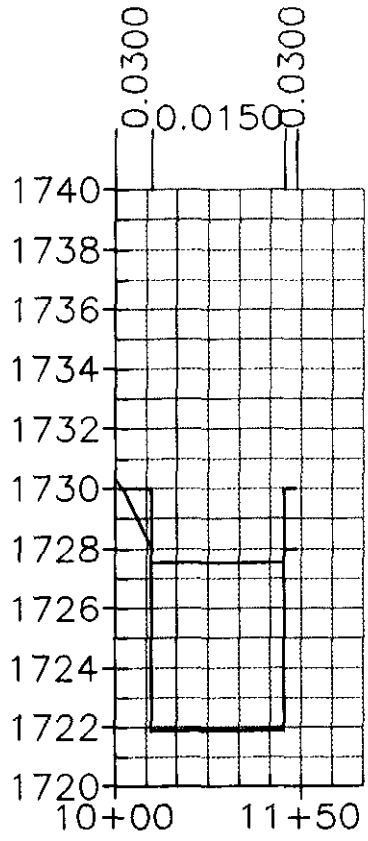
1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY
CCRFCD

CROSS SECTION NO. 110

DRAWING FL4.DWG

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NOTE:

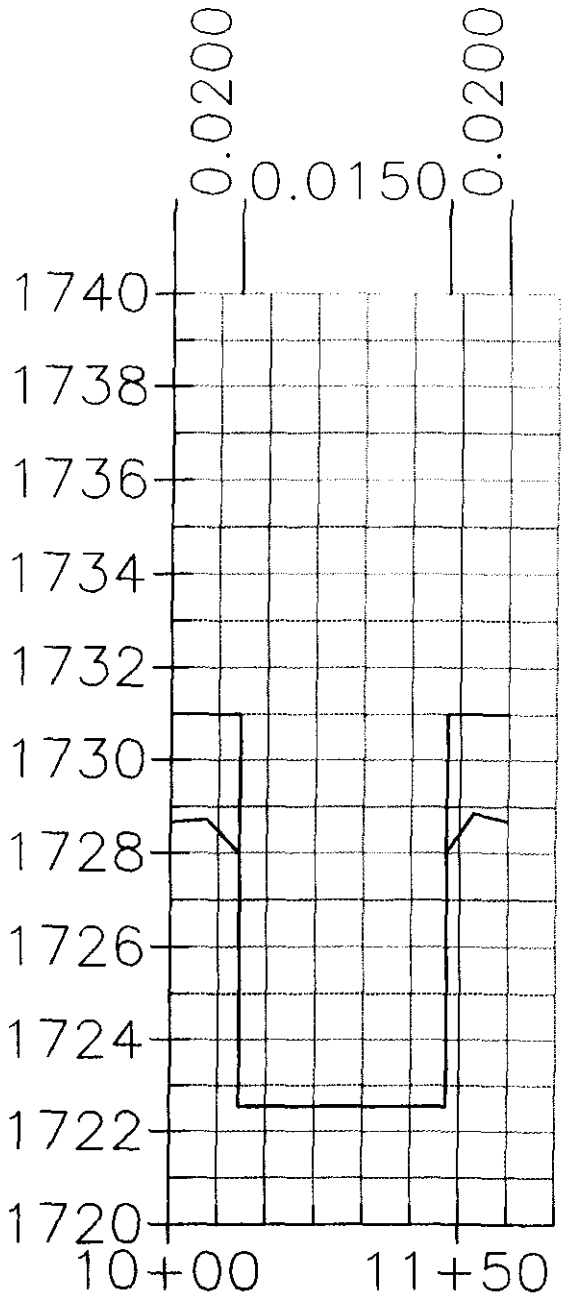
1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY
CCRFCD

CROSS SECTION NO. 120

DRAWING FL4.DWG

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Engineering/Architecture 1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102

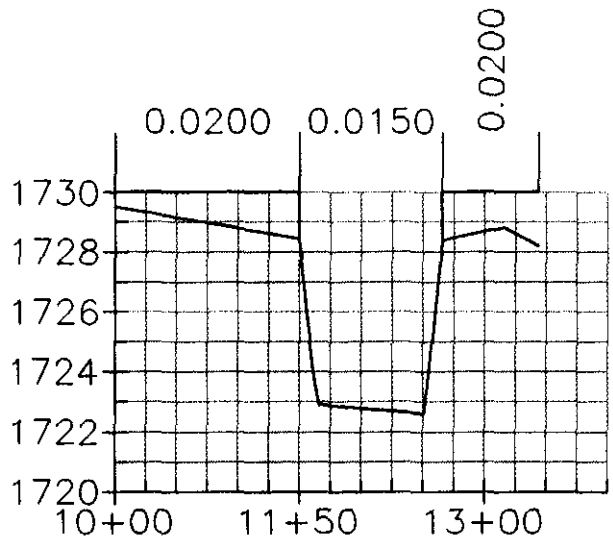


NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 130
DRAWING FL4.DWG

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102



NOTE:

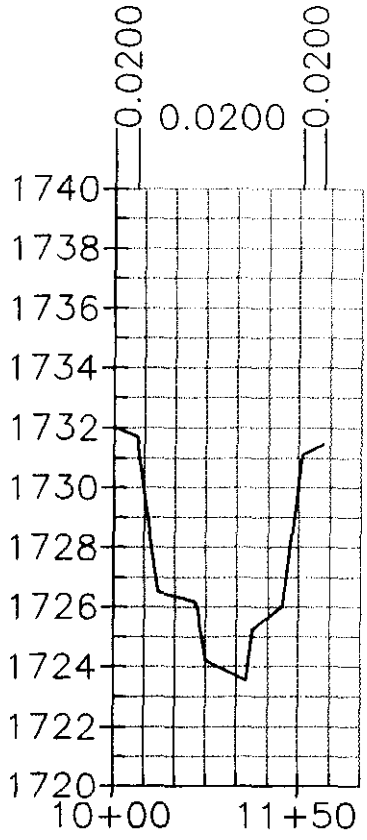
1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY
CCRFCD

CROSS SECTION NO. 140

DRAWING FL4.DWG

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD, LAS VEGAS, NEVADA 89102

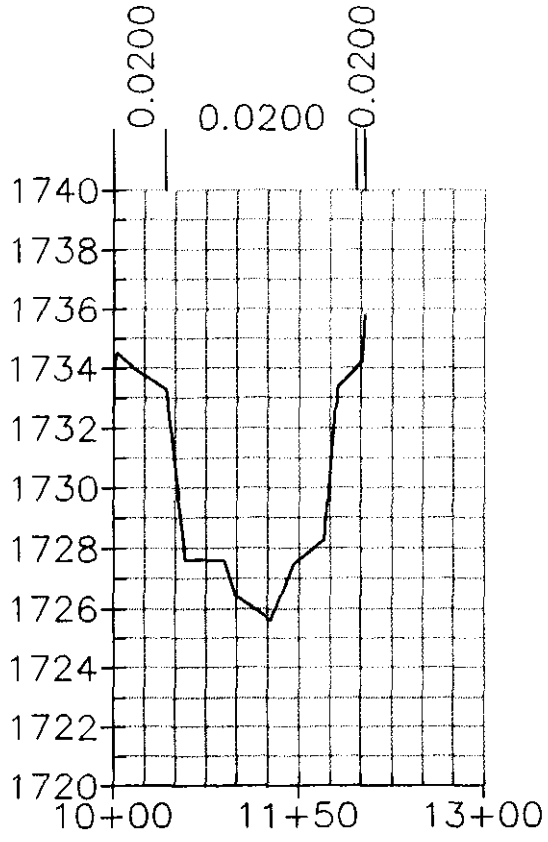


NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 150
DRAWING FL4.DWG

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102

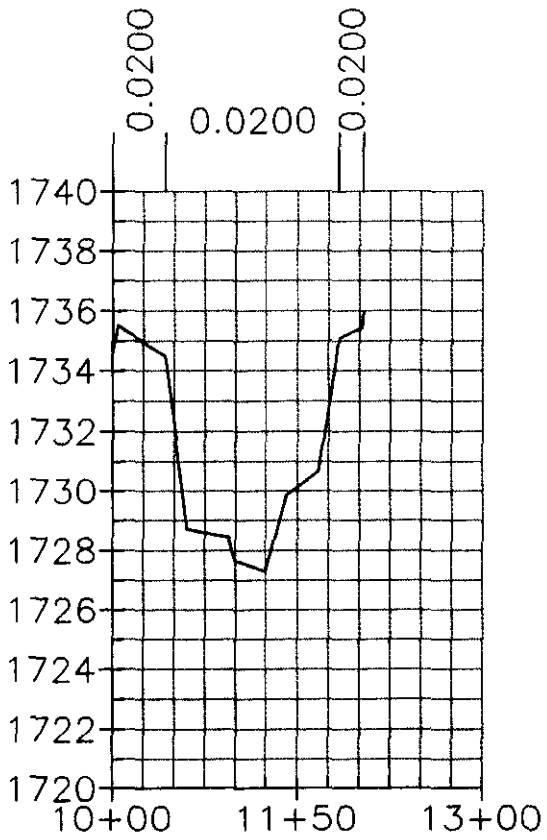


NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 160
DRAWING FL4.DWG

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102

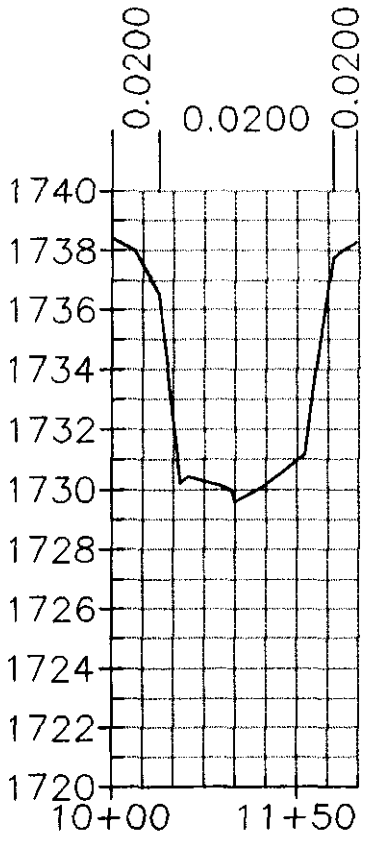


NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 170
DRAWING FL4.DWG

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102



NOTE:

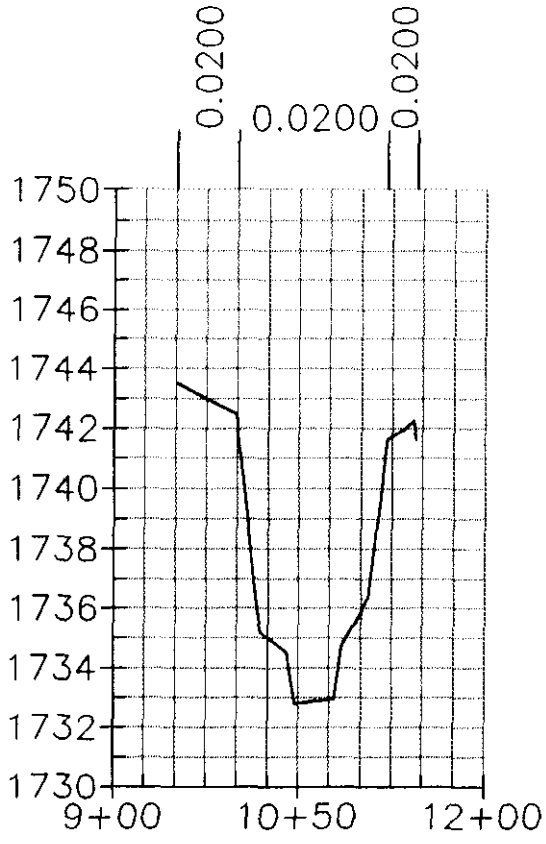
1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY
CCRFCD

CROSS SECTION NO. 180

DRAWING FL4.DWG

G.C. WALLACE, INC.
Engineering/Architecture 1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102



NOTE:

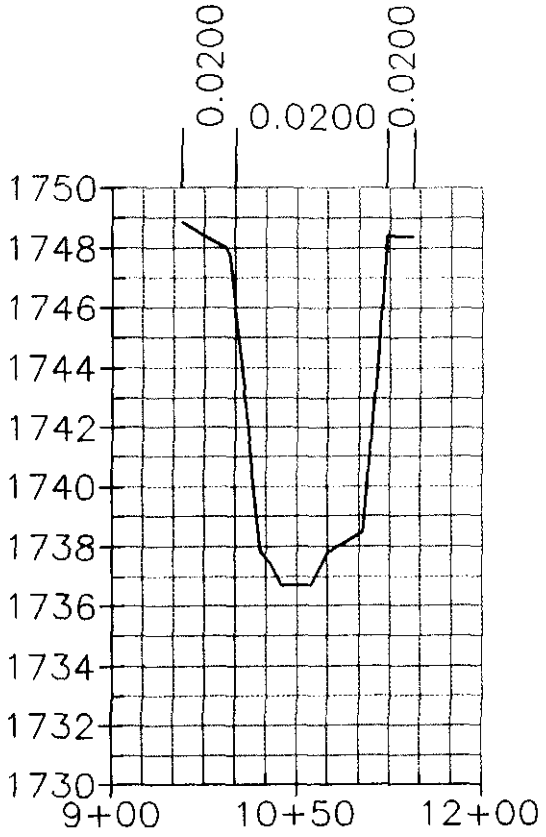
1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY
CCRFCD

CROSS SECTION NO. 190

DRAWING FL4.DWG

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102



NOTE:

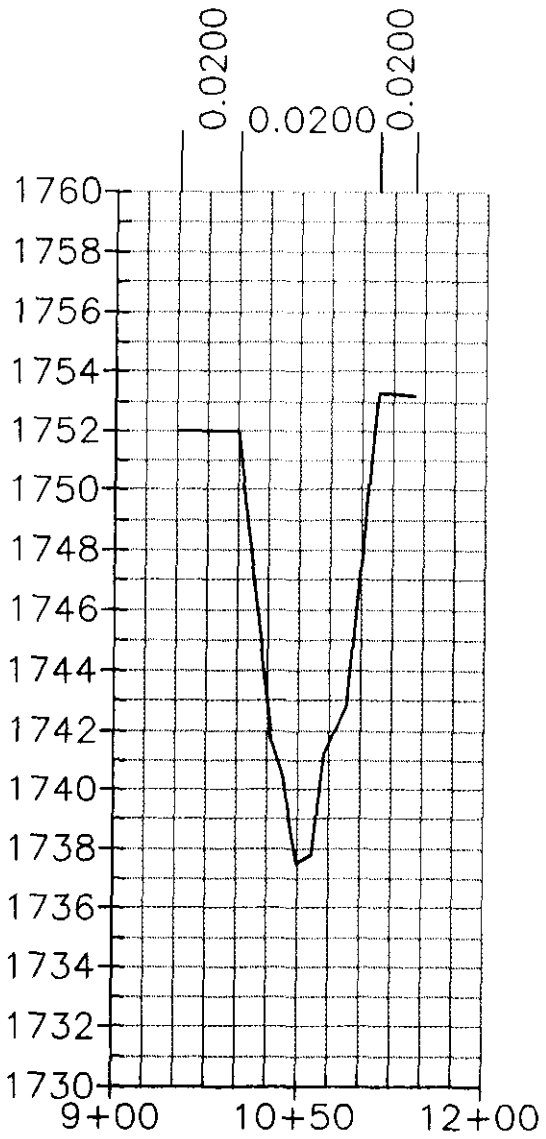
1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY
CCRFCD

CROSS SECTION NO. 200

DRAWING FL4.DWG

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD, LAS VEGAS, NEVADA 89102

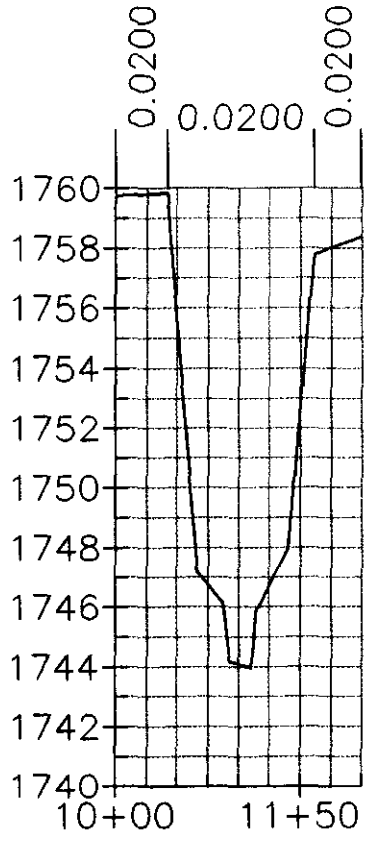


NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 210
DRAWING FL4.DWG

G.C. WALLACE, INC.
Engineering/Architecture 1555 SOUTH RAINBOW BLVD., LAS VEGAS, NEVADA 89102



NOTE:

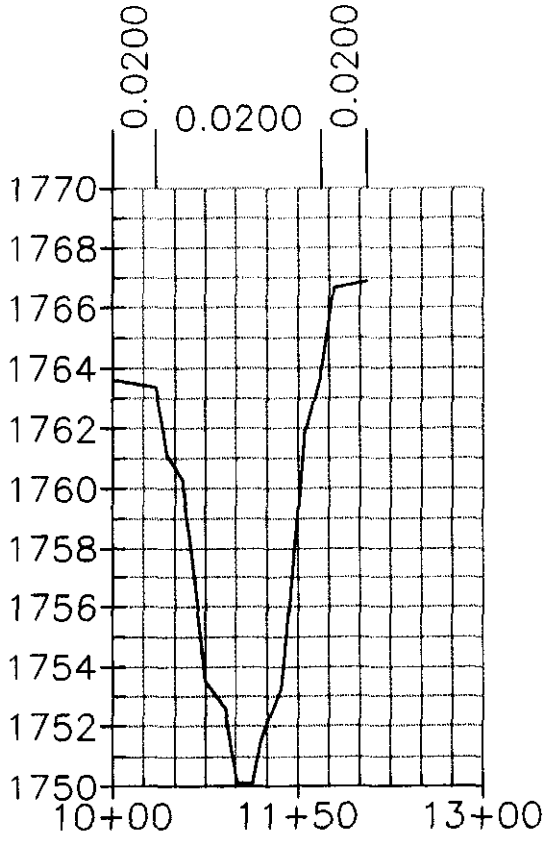
1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY
CCRFCD

CROSS SECTION NO. 220

DRAWING FL4.DWG

G.C. WALLACE, INC.
Engineering/Architecture 1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102



NOTE:

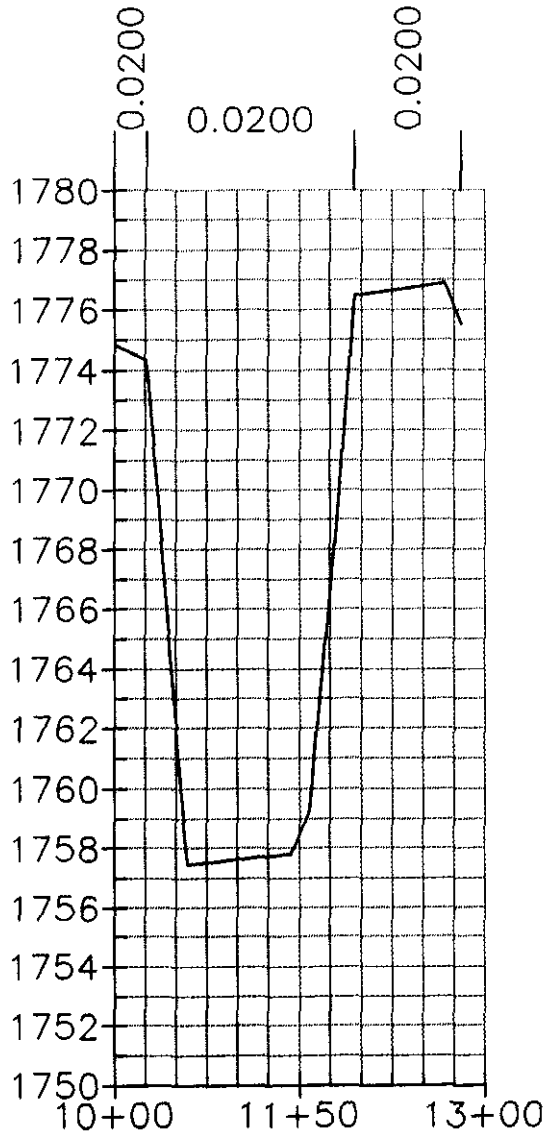
1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY
CCRFCD

CROSS SECTION NO. 230

DRAWING FL4.DWG

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102

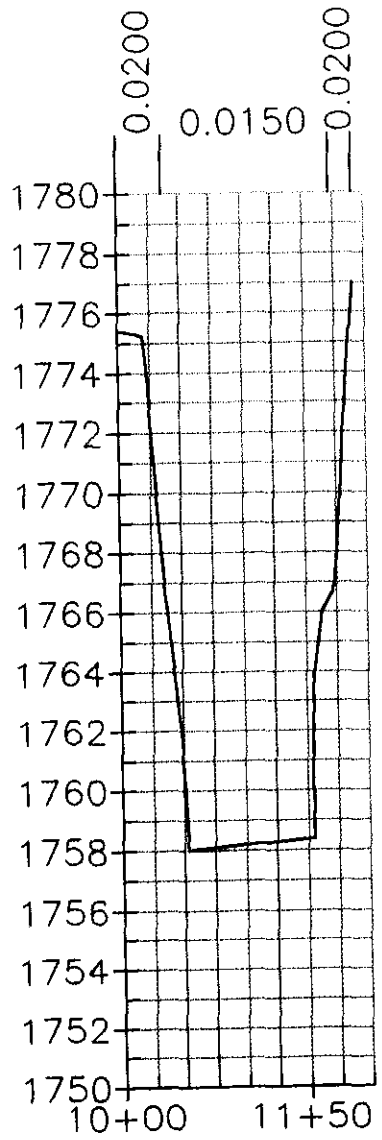


NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 240
DRAWING FL4.DWG

G.C. WALLACE, INC.
Engineering/Architecture
1556 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102



NOTE:

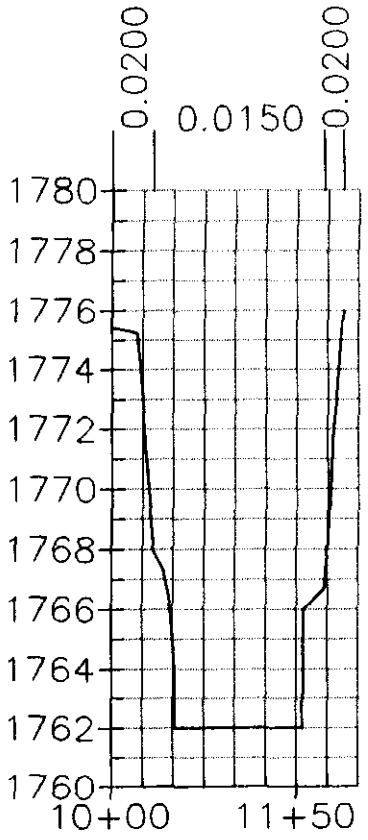
1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY
CCRFCD

CROSS SESCTION NO. 250

DRAWING FL4.DWG

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102

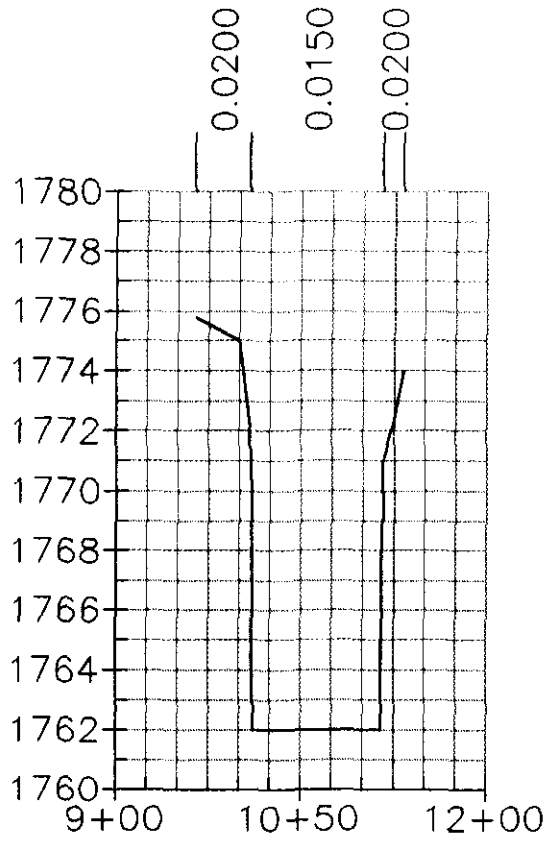


NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 260
DRAWING FL4.DWG

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD, LAS VEGAS, NEVADA 89102

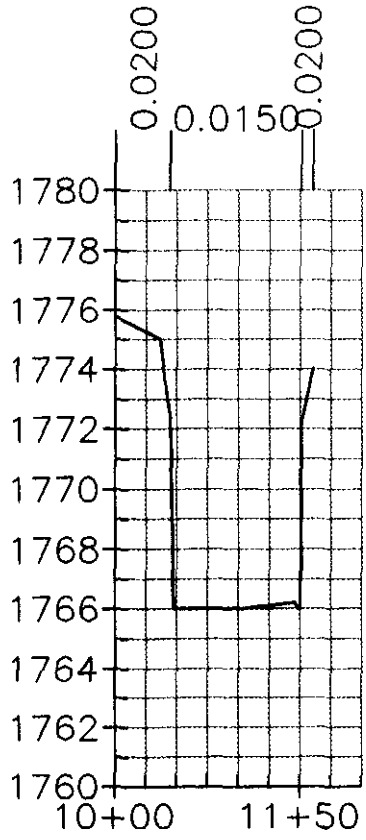


NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 270
DRAWING FL4.DWG

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102

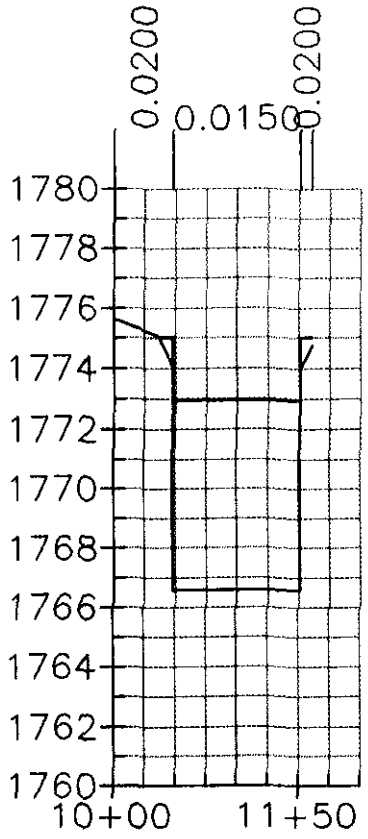


NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 280
DRAWING FL4.DWG

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102

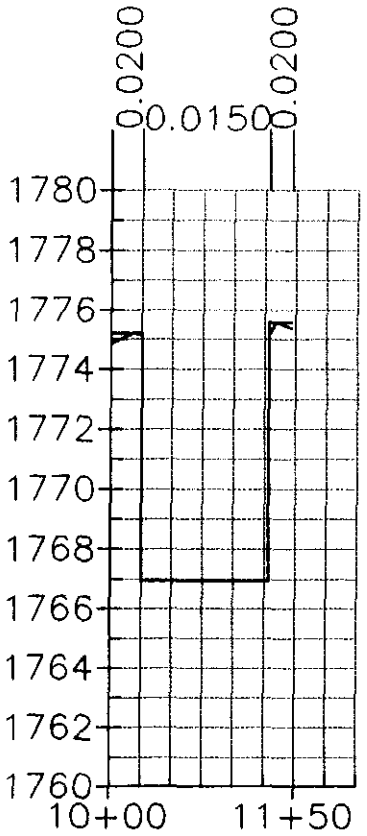


NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 290
DRAWING FL4.DWG

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102

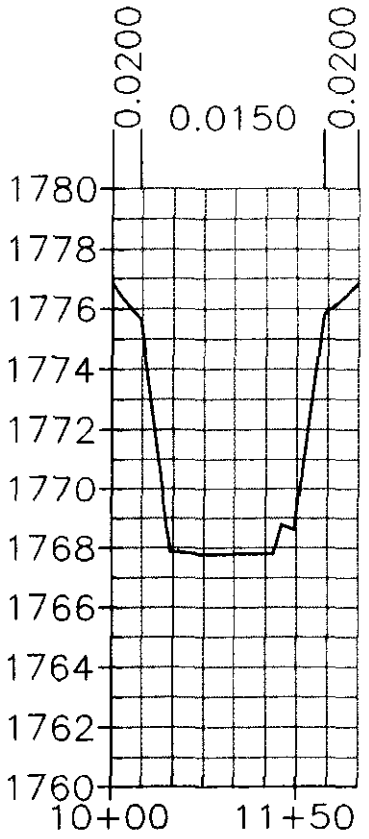


NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 300
DRAWING FL4.DWG

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102

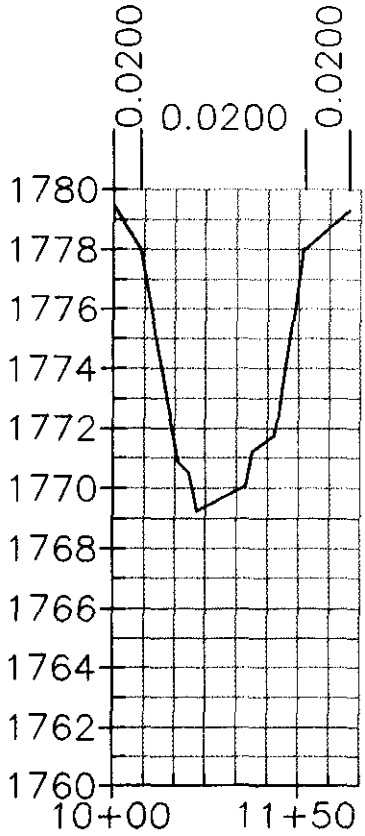


NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 310
DRAWING FL4.DWG

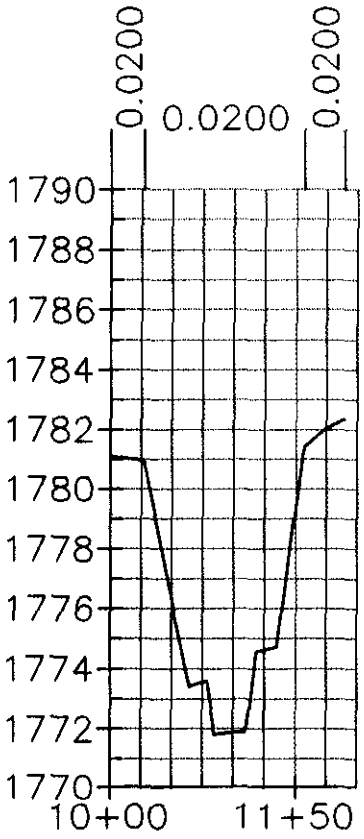
G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102



NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 320
DRAWING FL4.DWG
G.C. WALLACE, INC. Engineering/Architecture 1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102

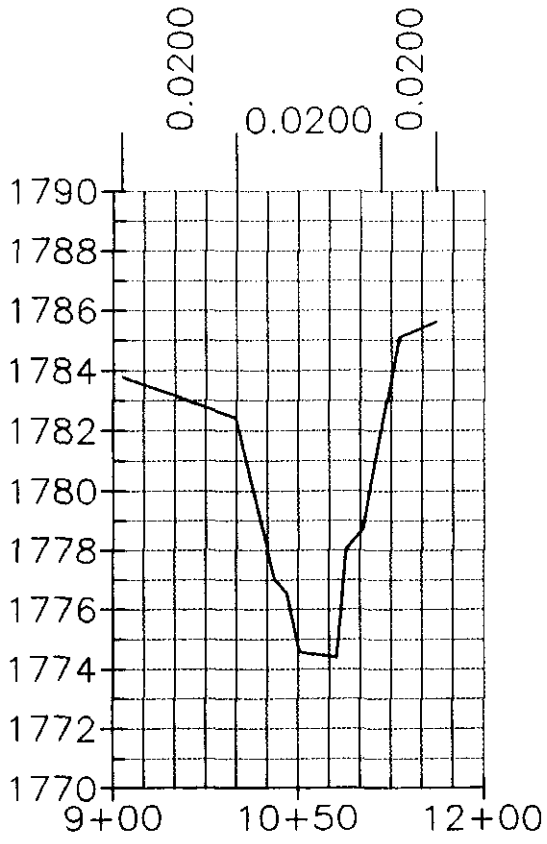


NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 330
DRAWING FL4.DWG

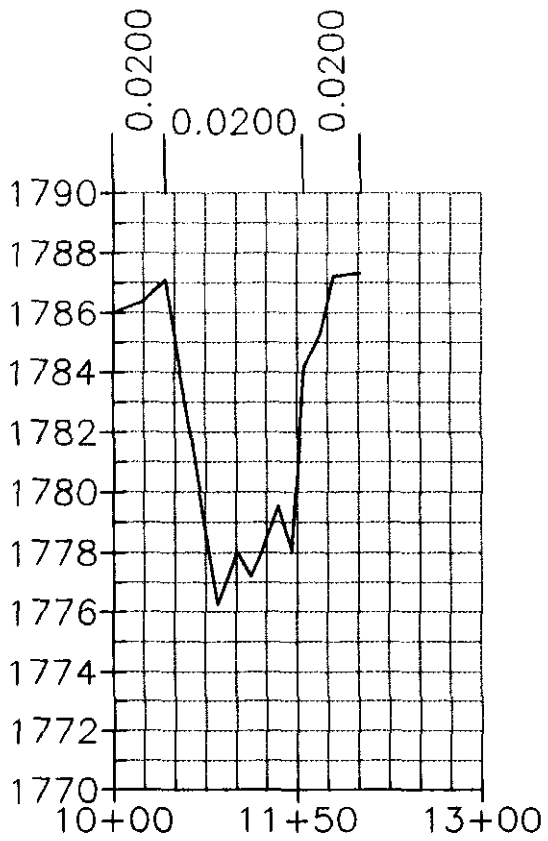
G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102



NOTE:

1. NOT TO SCALE

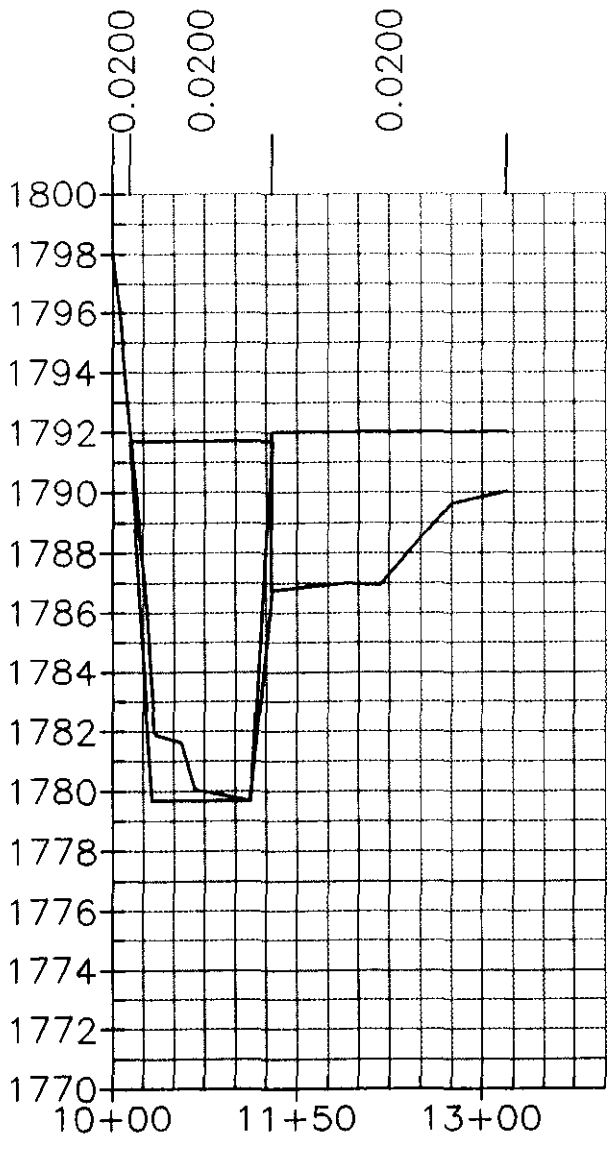
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CROSS SECTION NO. 340
DRAWING FL4.DWG
G.C. WALLACE, INC. Engineering/Architecture 1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102



NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 350
DRAWING FL3.DWG
G.C. WALLACE, INC. Engineering/Architecture 1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102



NOTE:

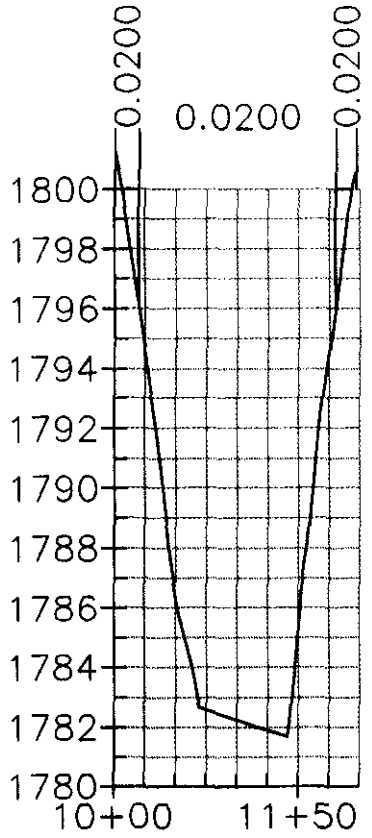
1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY
CCRFCD

CROSS SECTION NO. 360

DRAWING FL3.DWG

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102



NOTE:

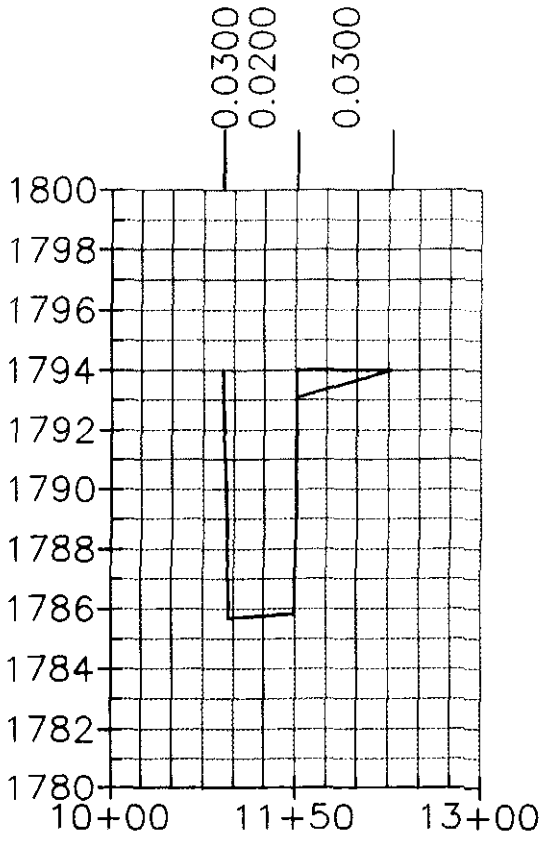
1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY
CCRFCD

CORSS SECTION NO. 370

DRAWING FL3.DWG

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102

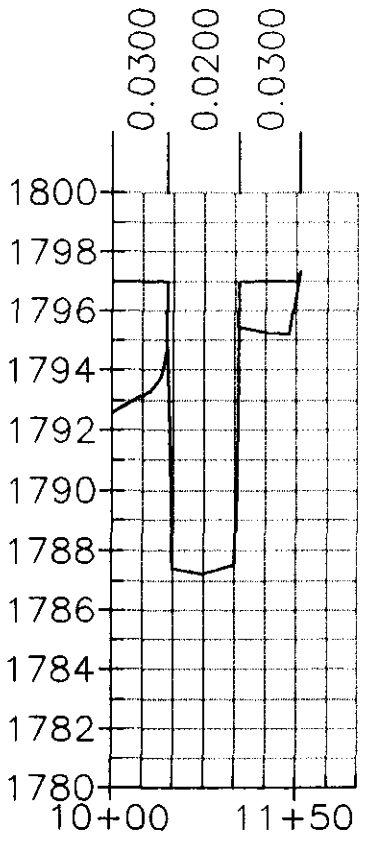


NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 380
DRAWING FL3.DWG

G.C. WALLACE, INC.
Engineering/Architecture 1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102

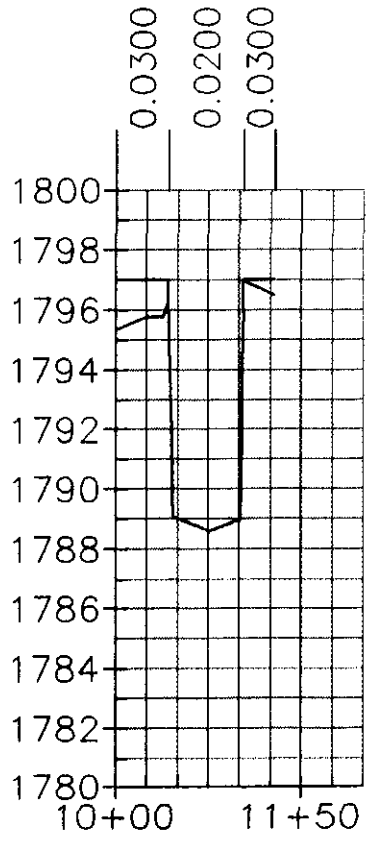


NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 390
DRAWING FL3.DWG

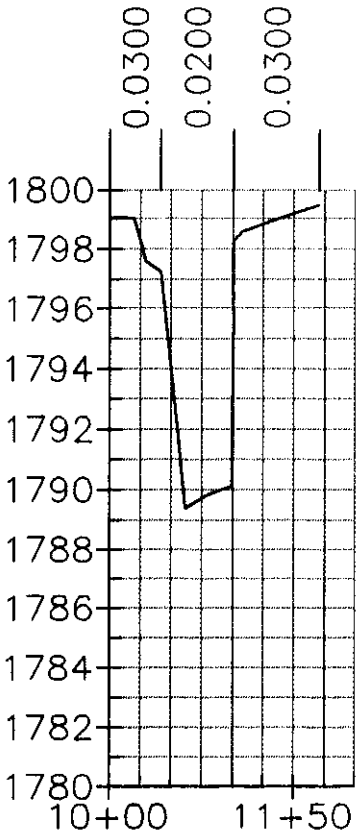
G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102



NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 400
DRAWING FL3.DWG
G.C. WALLACE, INC. Engineering/Architecture 1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102

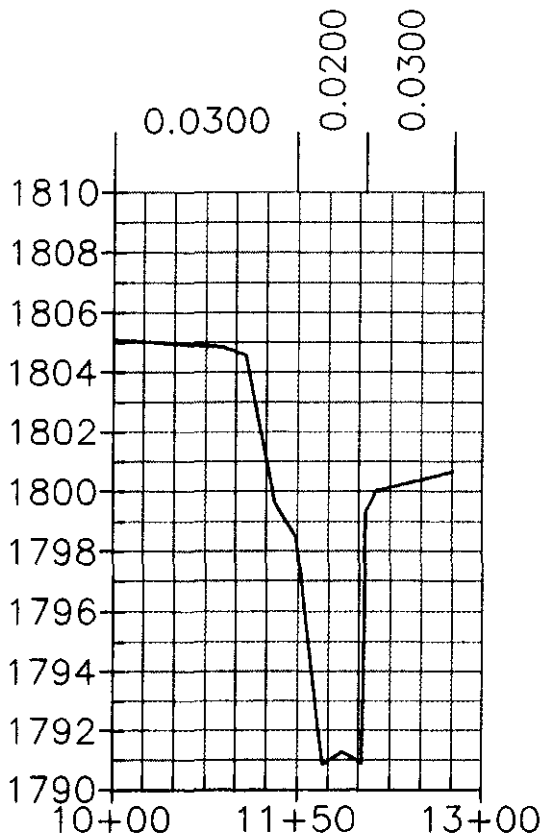


NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 410
DRAWING FL3.DWG

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102

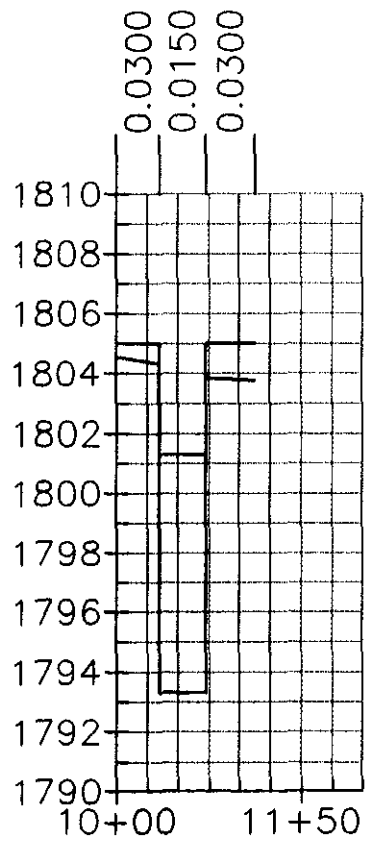


NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 420
DRAWING FL3.DWG

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD, LAS VEGAS, NEVADA 89102

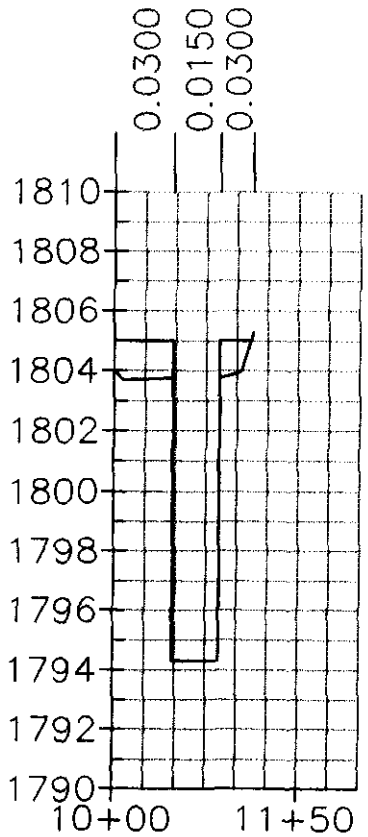


NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 430
DRAWING FL3.DWG

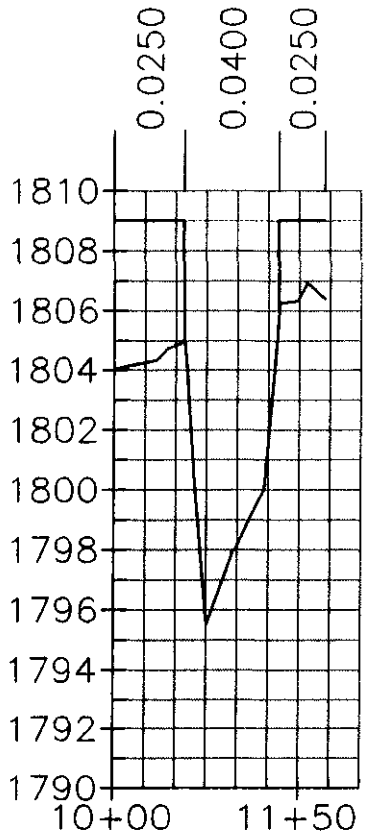
G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102



NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 440
DRAWING FL3.DWG
G.C. WALLACE, INC. Engineering/Architecture 1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102

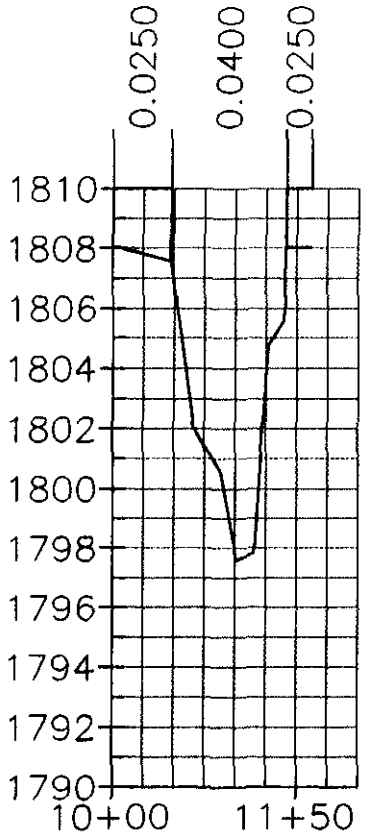


NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 450
DRAWING FL3.DWG

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102

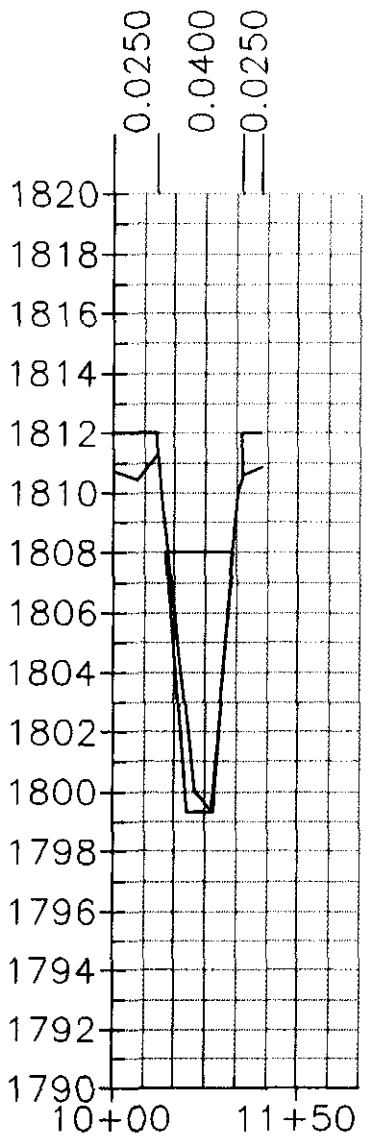


NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 460
DRAWING FL3.DWG

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102



NOTE:

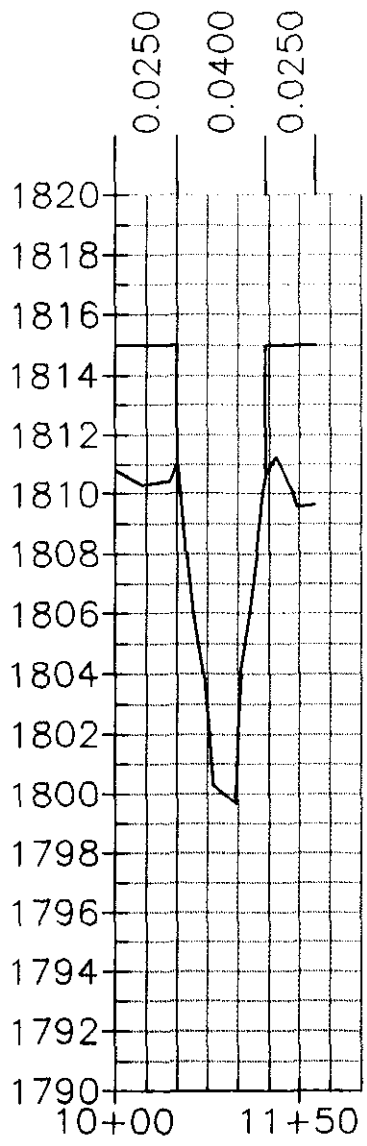
1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY
CCRFCD

CROSS SECTION NO. 470

DRAWING FL3.DWG

G.C. WALLACE, INC.
Engineering/Architecture 1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102

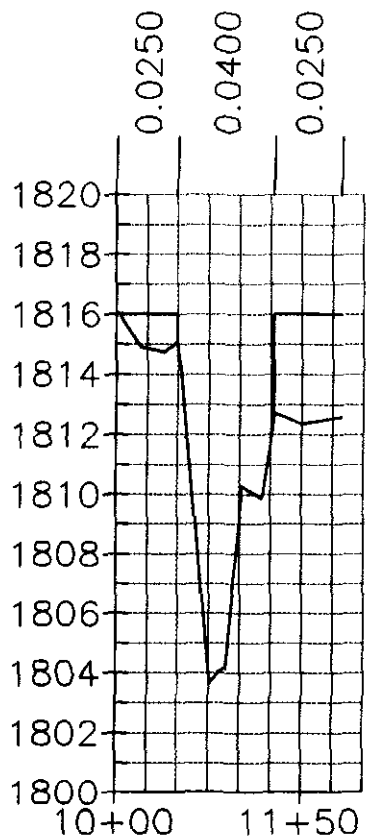


NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 480
DRAWING FL3.DWG

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102



NOTE:

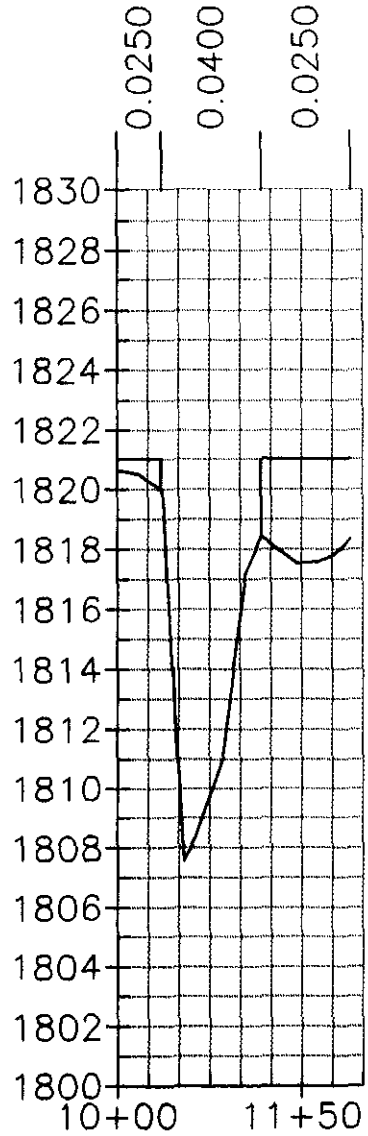
1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY
CCRFCD

CROSS SECTION NO. 490

DRAWING FL3.DWG

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102

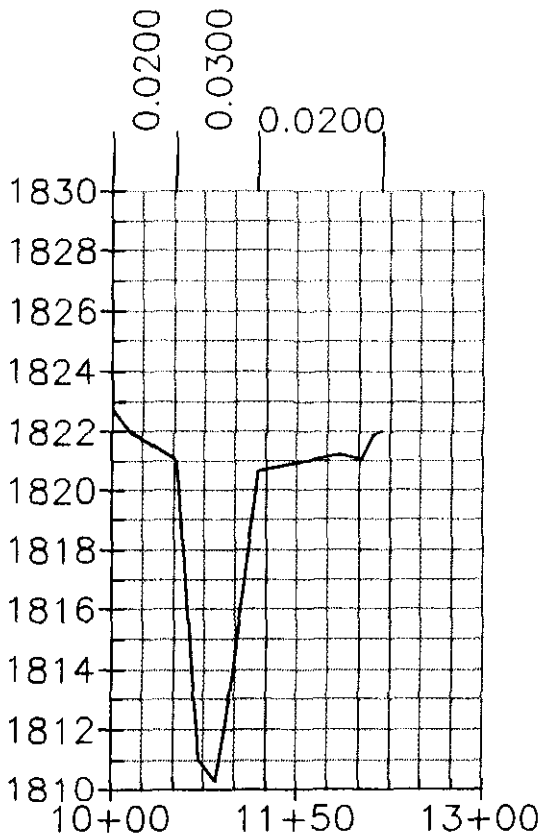


NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 500
DRAWING FL3.DWG

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102

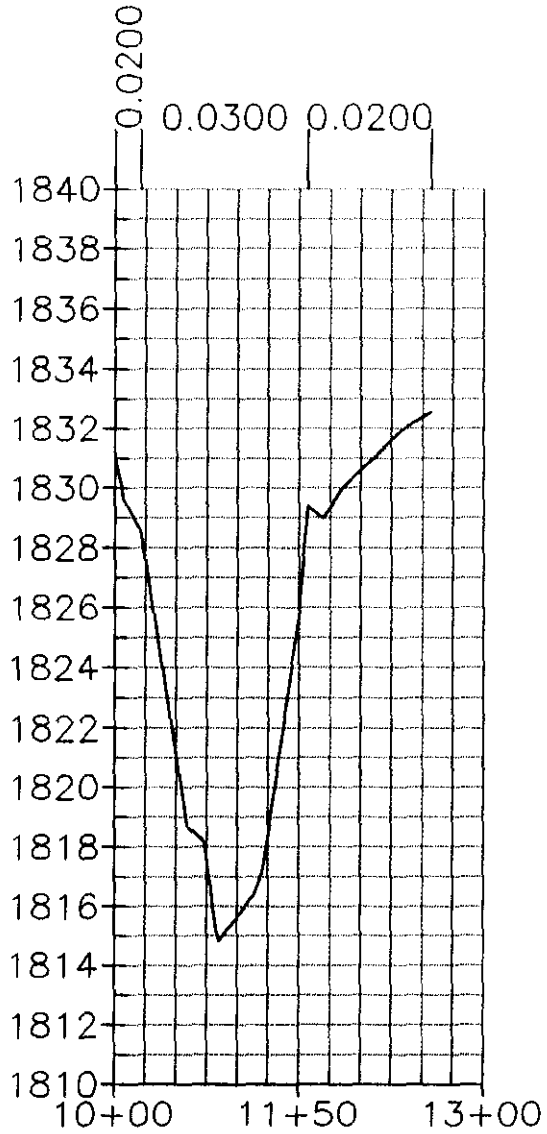


NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 510
DRAWING FL3.DWG

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102

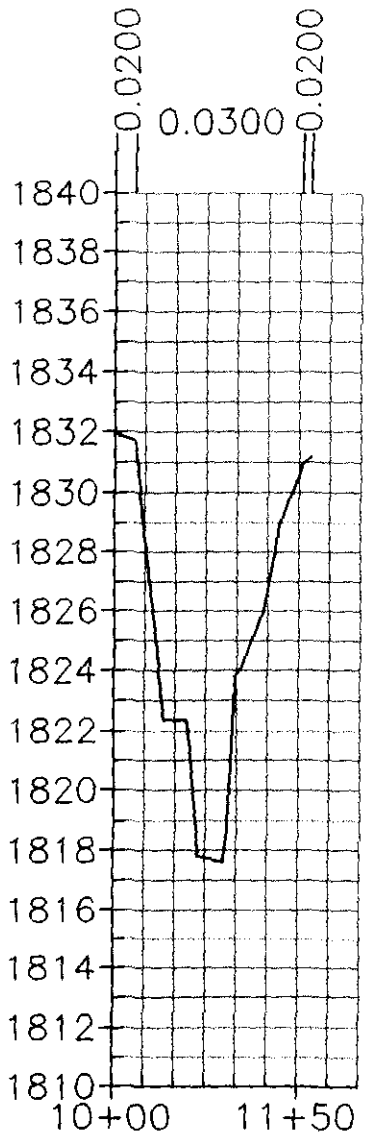


NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 520
DRAWING FL3.DWG

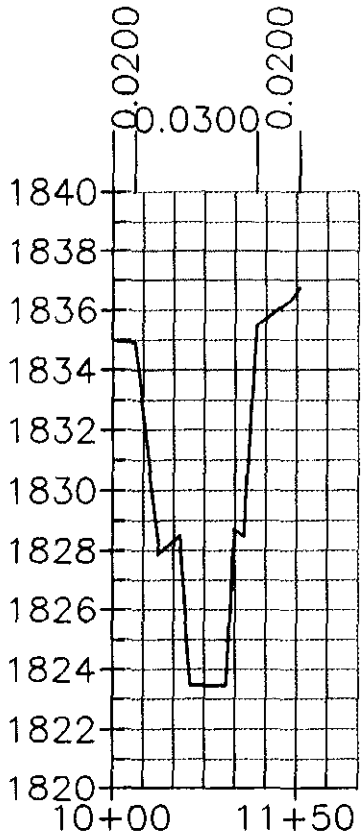
G.C. WALLACE, INC.
Engineering/Architecture 1555 SOUTH RAINBOW BLVD.,LAS VEGAS, NEVADA 89102



NOTE:

1. NOT TO SCALE

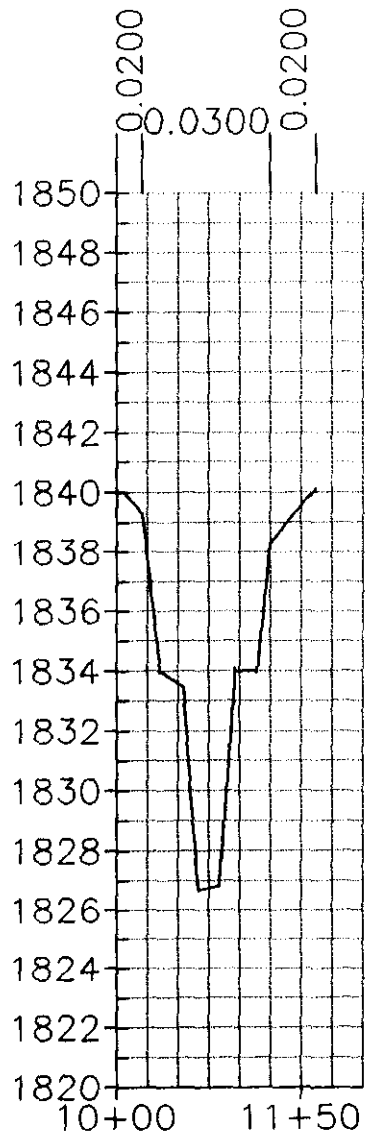
FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 530
DRAWING FL3.DWG
G.C. WALLACE, INC. Engineering/Architecture 1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102



NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 540
DRAWING FL3.DWG
G.C. WALLACE, INC. Engineering/Architecture 1555 SOUTH RAINBOW BLVD.,LAS VEGAS, NEVADA 89102

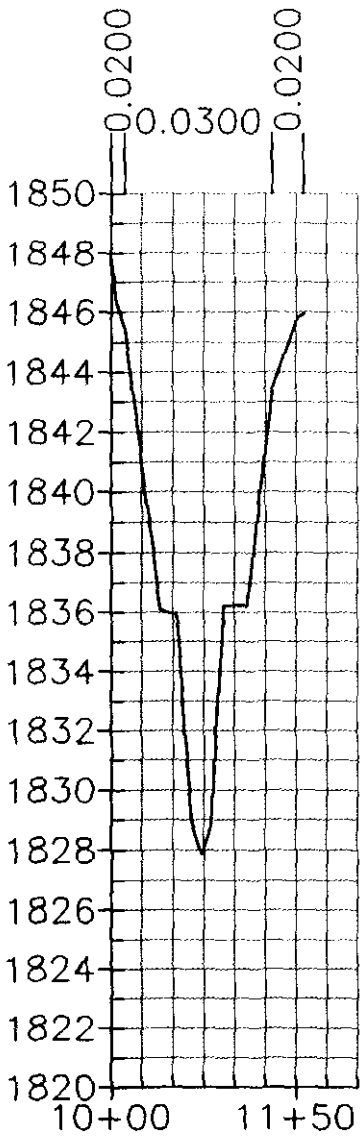


NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 550
DRAWING FL3.DWG

G.C. WALLACE, INC.
Engineering/Architecture 1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102

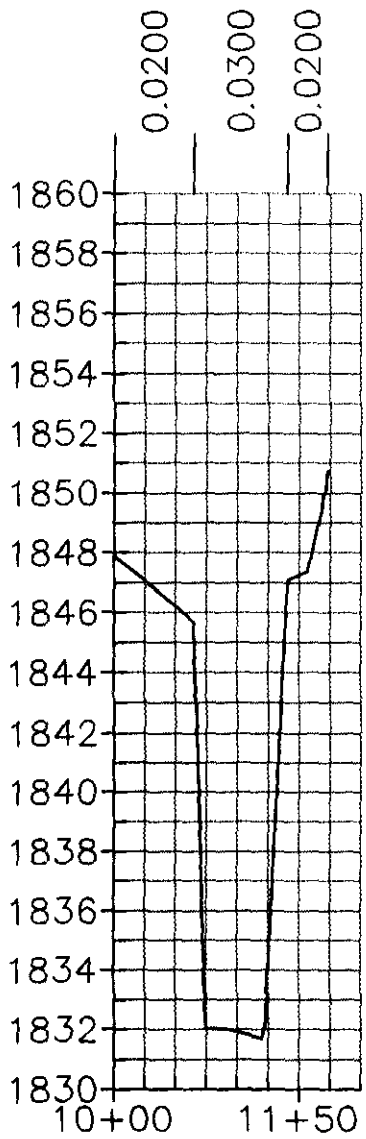


NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 560
DRAWING FL3.DWG

G.C. WALLACE, INC.
Engineering/Architecture 1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102

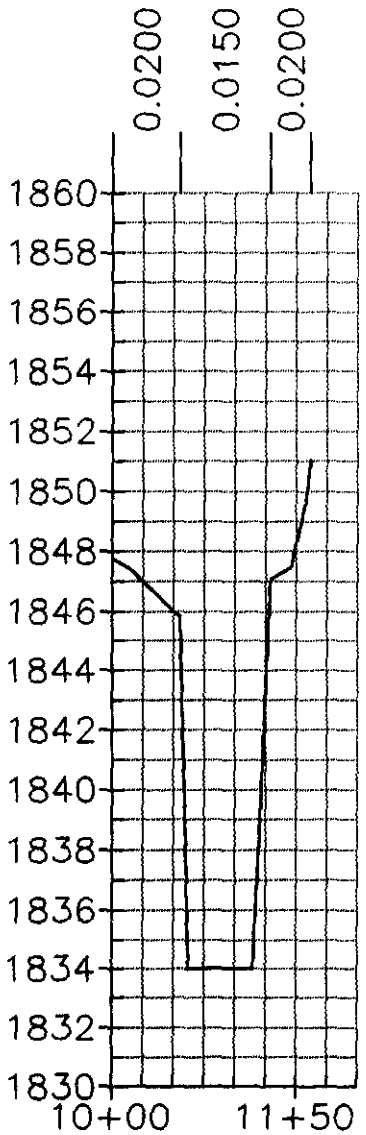


NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 570
DRAWING FL3.DWG

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102



NOTE:

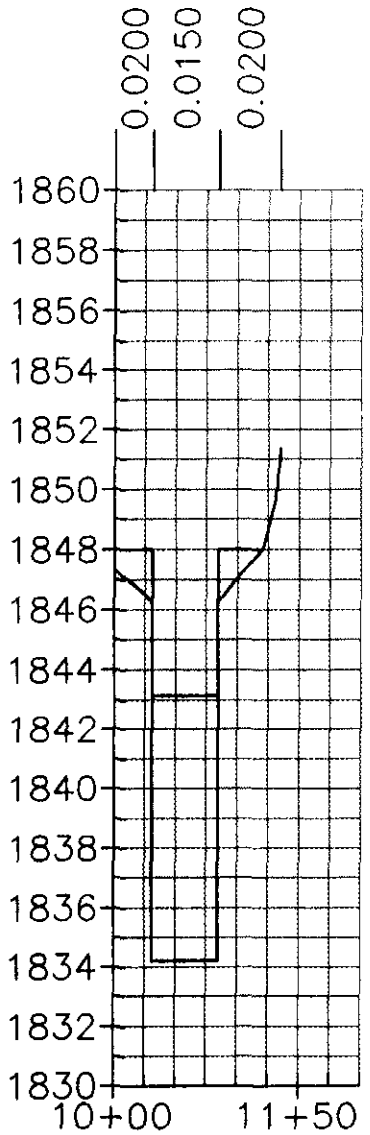
1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY
CCRFCD

CROSS SECTION NO. 580

DRAWING FL3.DWG

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102

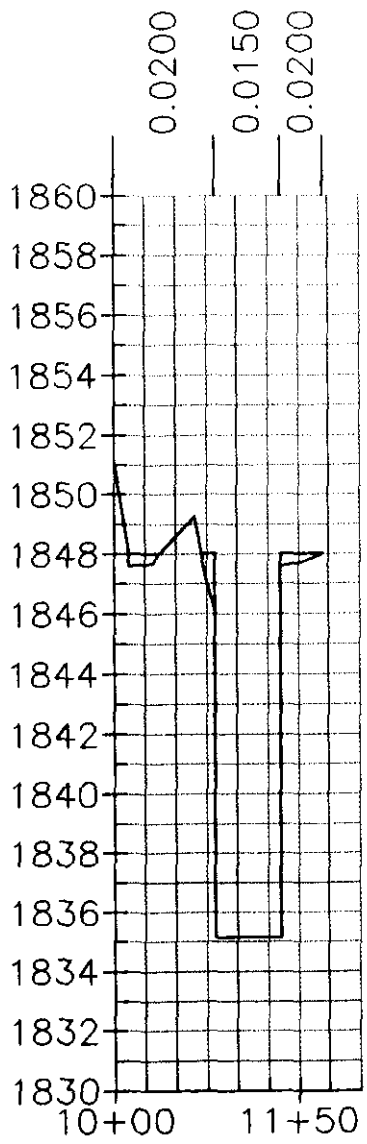


NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 590
DRAWING FL3.DWG

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102



NOTE:

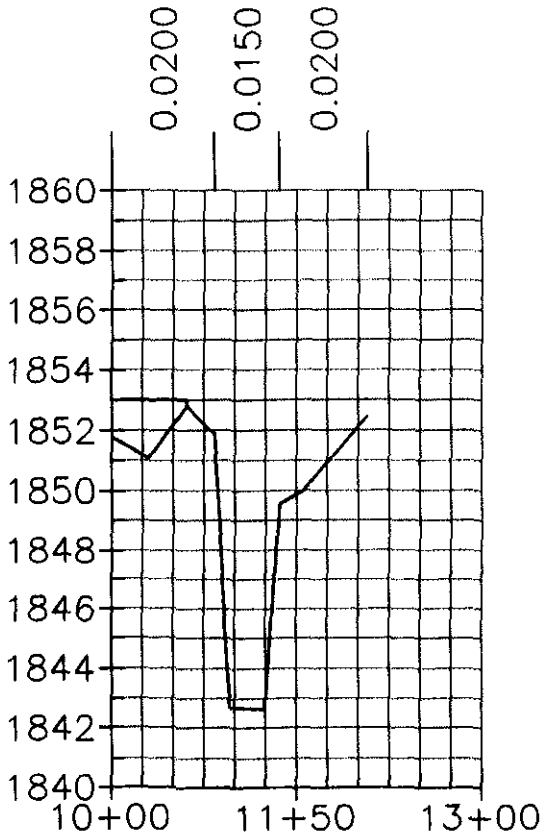
1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY
CCRFCD

CROSS SECTION NO. 600

DRAWING FL3.DWG

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102

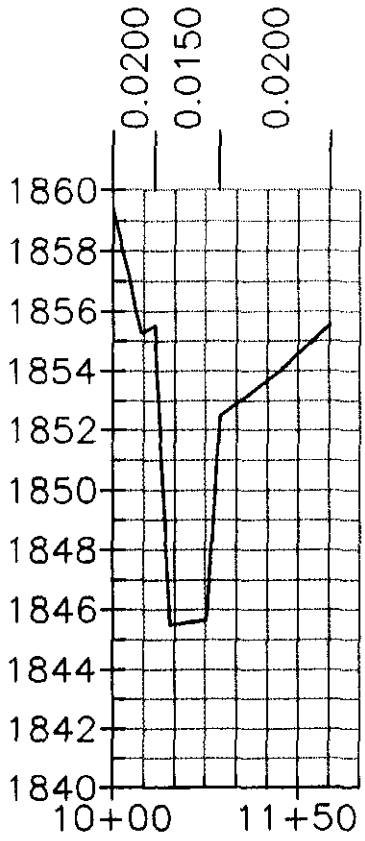


NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 610
DRAWING FL3.DWG

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102

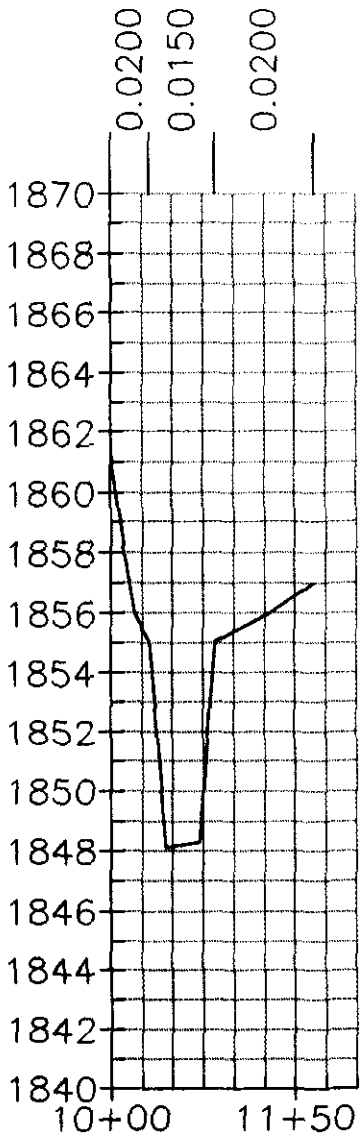


NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 620
DRAWING FL3.DWG

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102

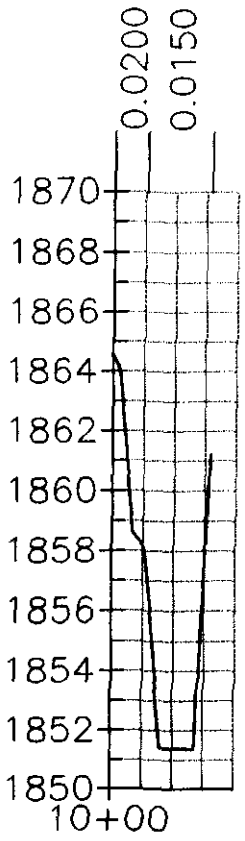


NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 630
DRAWING FL3.DWG

G.C. WALLACE, INC.
Engineering/Architecture 1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102

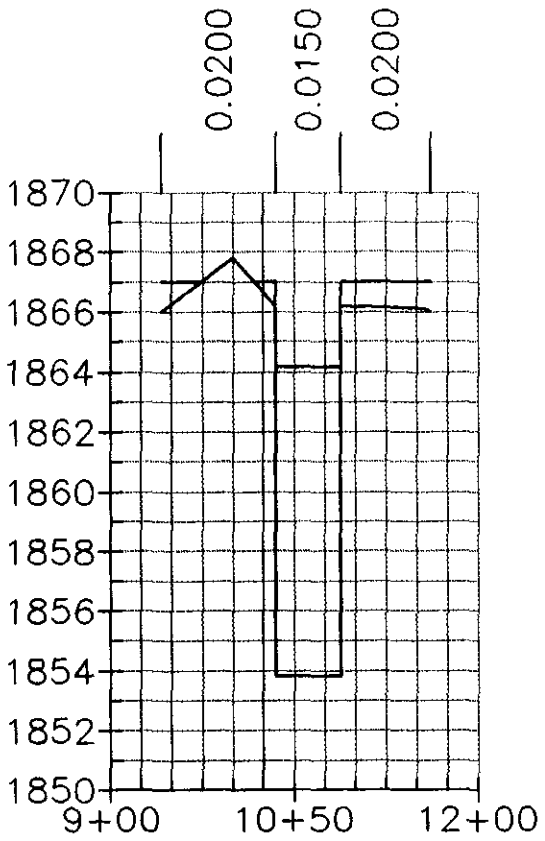


NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 640
DRAWING FL3.DWG

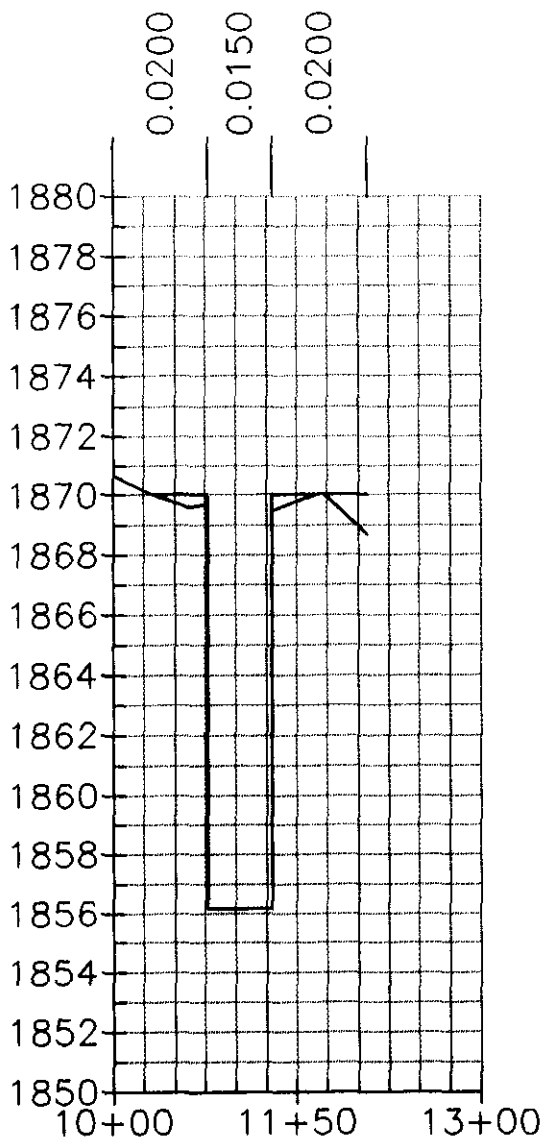
G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102



NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 650
DRAWING FL3.DWG
G.C. WALLACE, INC. Engineering/Architecture 1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102

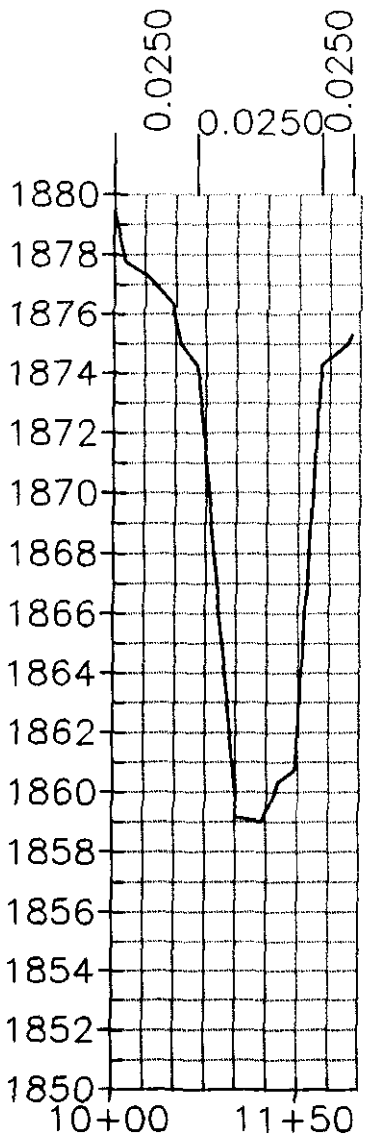


NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 660
DRAWING FL3.DWG

G.C. WALLACE, INC.
Engineering/Architecture 1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102

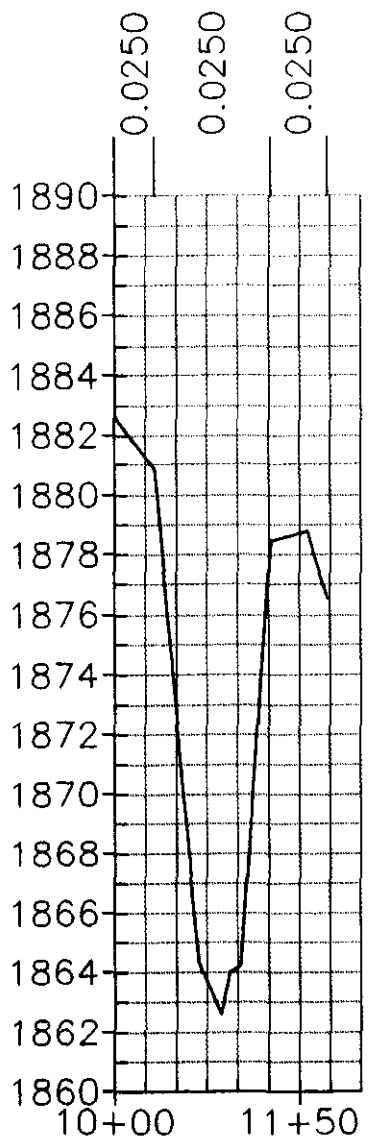


NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 670
DRAWING FL3.DWG

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102



NOTE:

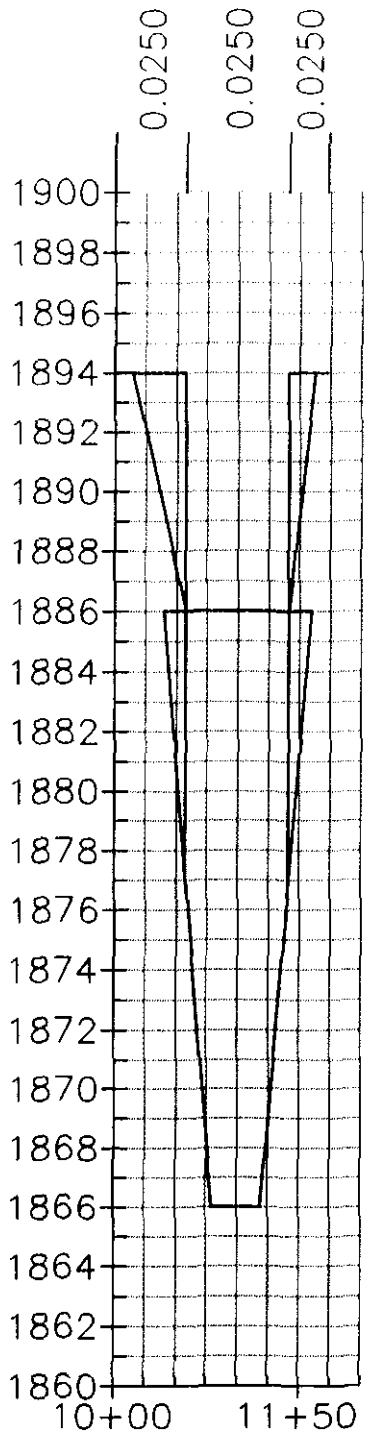
1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY
CCRFCD

CROSS SECTION NO. 680

DRAWING FL3.DWG

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102



NOTE:

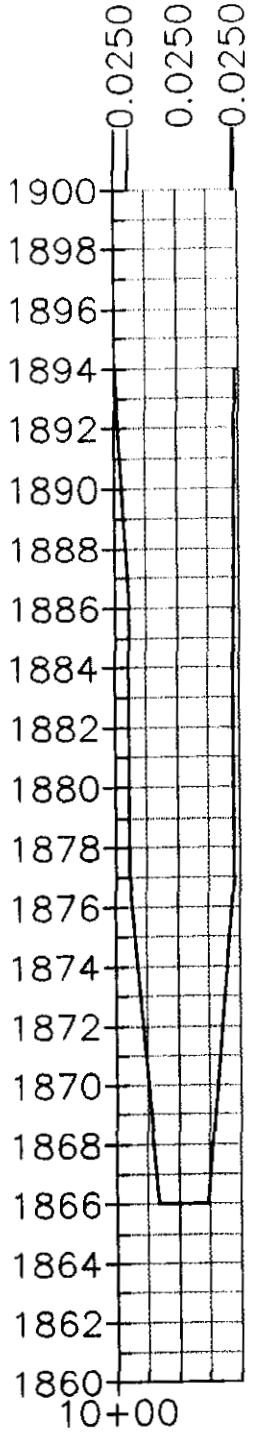
1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY
CCRFCD

CROSS SECTION NO. 690

DRAWING FL3.DWG

G.C. WALLACE, INC.
Engineering/Architecture 1555 SOUTH RAINBOW BLVD, LAS VEGAS, NEVADA 89102



NOTE:

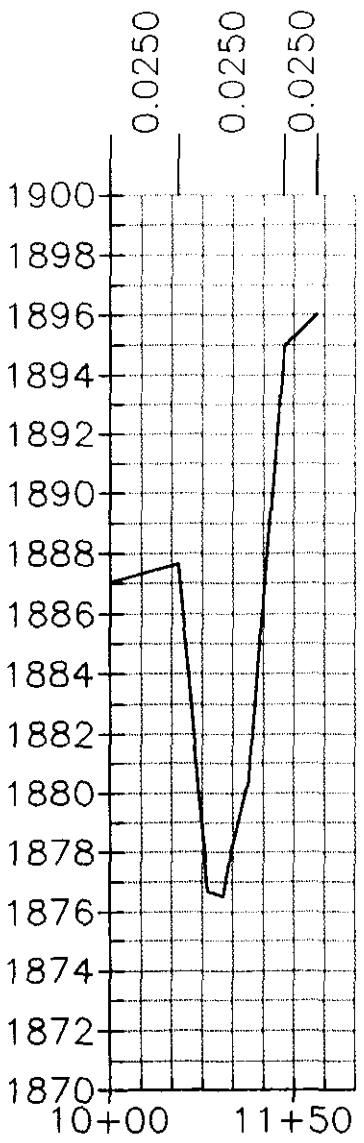
1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY
CCRFCD

CROSS SECTION NO. 700

DRAWING FL3.DWG

G.C. WALLACE, INC.
Engineering/Architecture 1555 SOUTH RAINBOW BLVD.,LAS VEGAS, NEVADA 89102

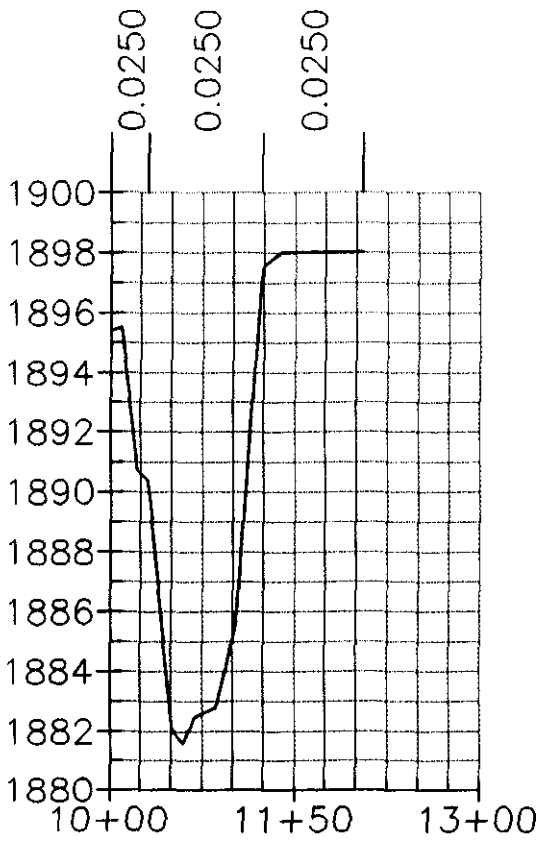


NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 710
DRAWING FL3.DWG

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102



NOTE:

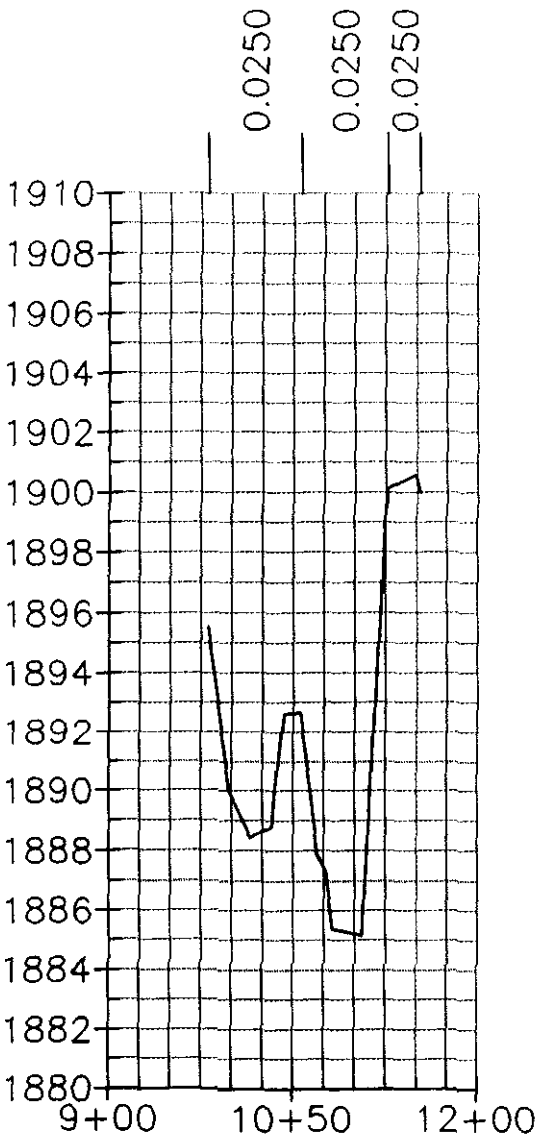
1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY
CCRFCD

CROSS SECTION NO. 720

DRAWING FL3.DWG

G.C. WALLACE, INC.
Engineering/Architecture 1555 SOUTH RAINBOW BLVD.,LAS VEGAS, NEVADA 89102

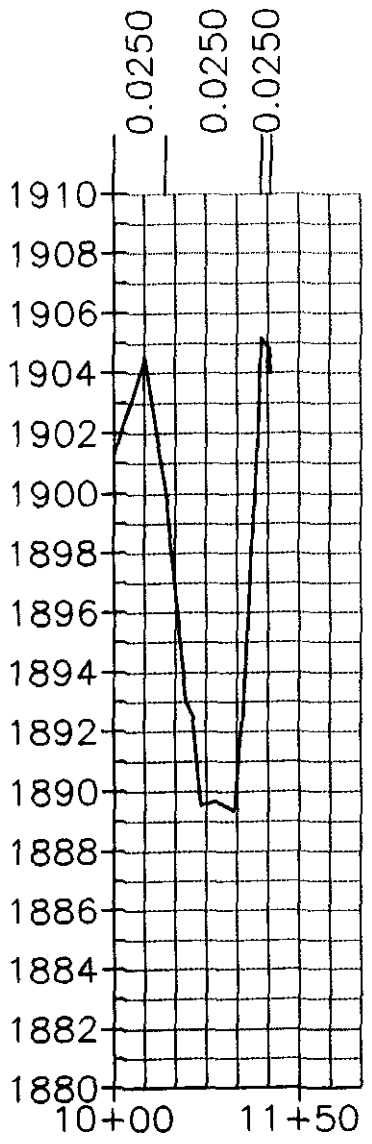


NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 730
DRAWING FL3.DWG

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102



NOTE:

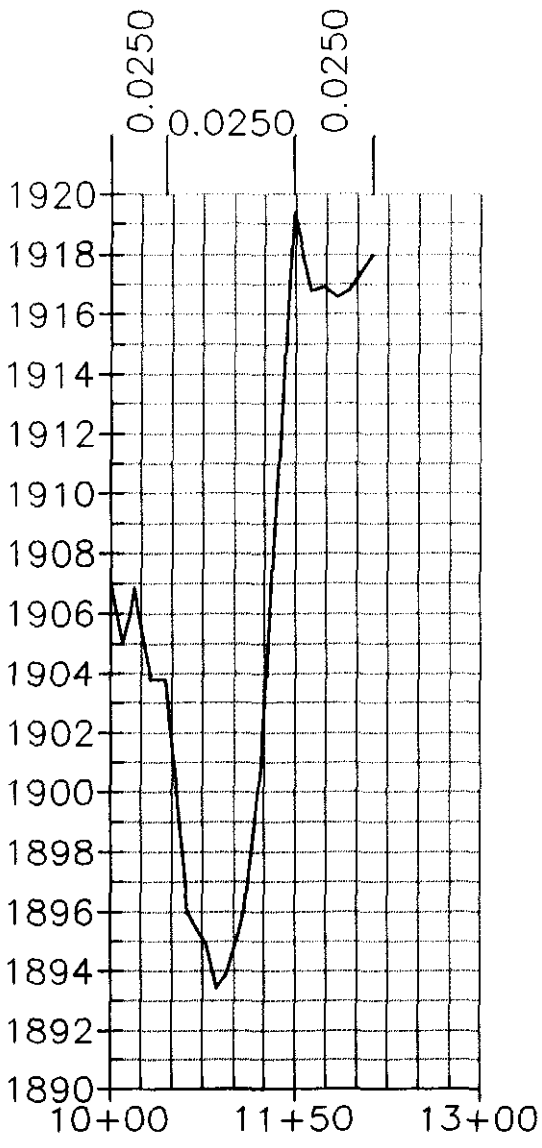
1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY
CCRFCD

CROSS SECTION NO. 740

DRAWING FL3.DWG

G.C. WALLACE, INC.
Engineering/Architecture 1555 SOUTH RAINBOW BLVD, LAS VEGAS, NEVADA 89102

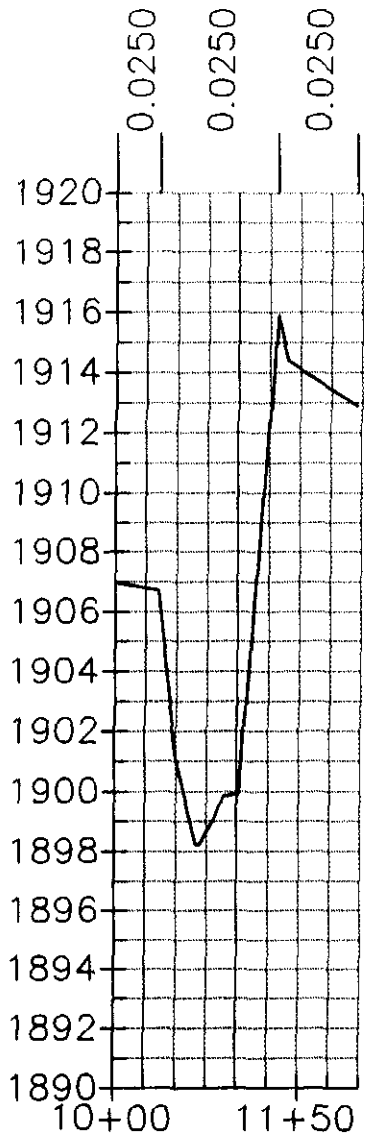


NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 750
DRAWING FL3.DWG

G.C. WALLACE, INC.
Engineering/Architecture 1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102

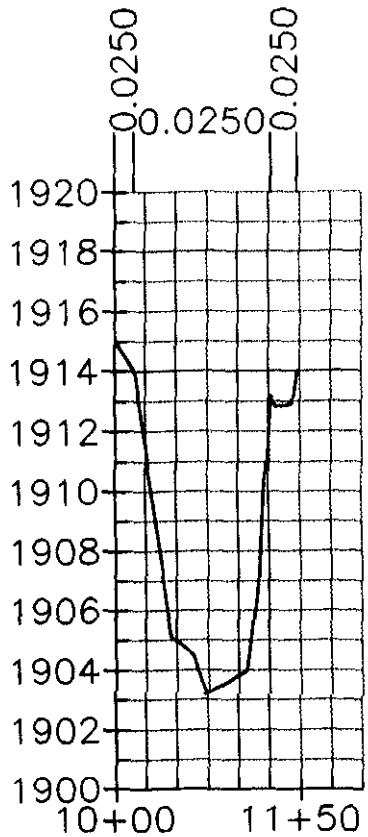


NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 760
DRAWING FL3.DWG

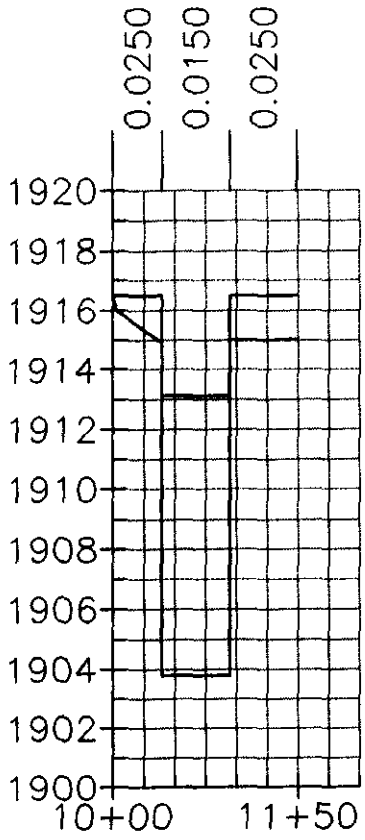
G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102



NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 770
DRAWING FL3.DWG
G.C. WALLACE, INC. Engineering/Architecture 1555 SOUTH RAINBOW BLVD.,LAS VEGAS, NEVADA 89102

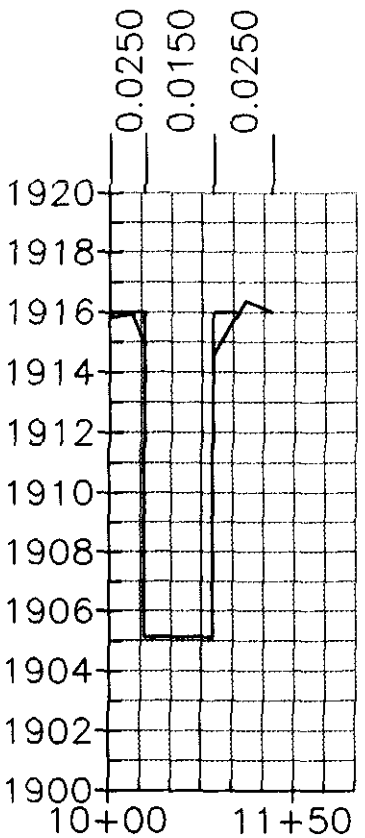


NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 780
DRAWING FL3.DWG

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102

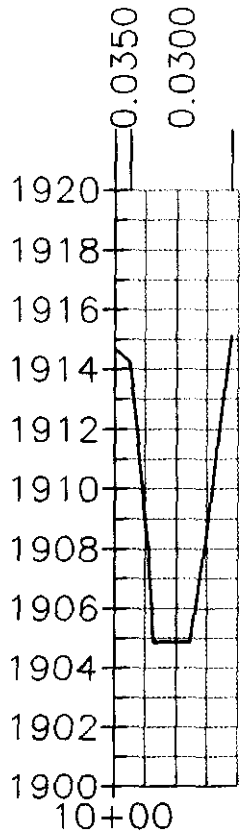


NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 790
DRAWING FL3.DWG

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102



NOTE:

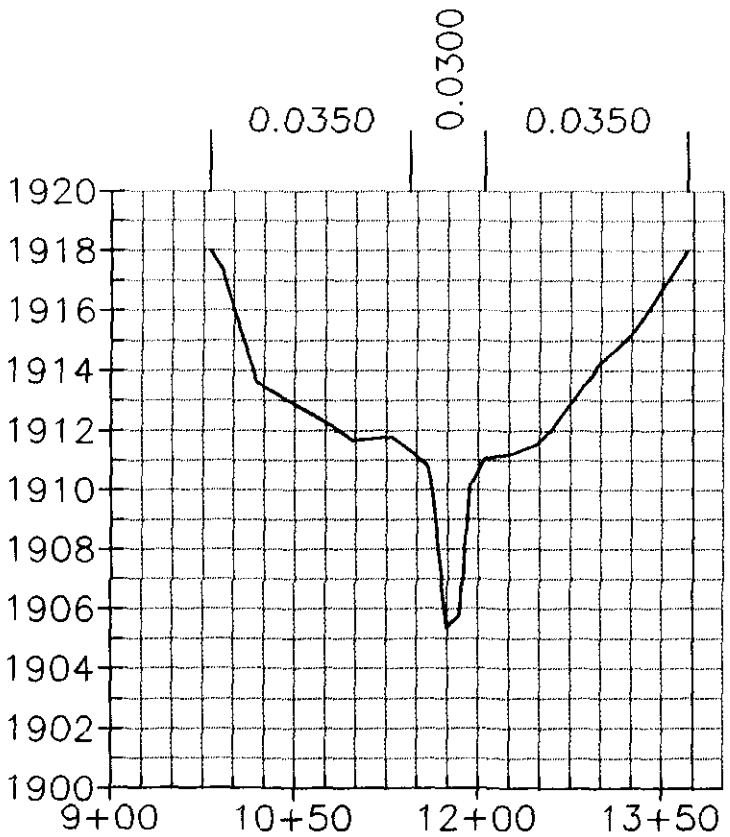
1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY
CCRFCD

CROSS SECTION NO. 800

DRAWING FL3.DWG

G.C. WALLACE, INC.
Engineering/Architecture 1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102



NOTE:

1. NOT TO SCALE

FLAMINGO WASH FIS RESTUDY CCRFCD
CROSS SECTION NO. 810
DRAWING FL3.DWG

G.C. WALLACE, INC.
Engineering/Architecture

2.4.1 RAINBOW BLVD. TO JONES BLVD. REACH

KEY TO CROSS-SECTION (XS) LABELING

PREPARED BY:
SC: G. C. Wallace, Inc.
TEC:

DATE PREPARED:
SC: OCTOBER 13, 1997
TEC:

COMMUNITY NAME Clark County
STATE Nevada
FEMA CID NO.

STREAM NAME Flamingo Wash
RUN DATE OCTOBER 6, 1997

BASE0.D1

STUDY CONTRACTOR			TECHNICAL EVALUATION CONTRACTOR	
FIELD SURVEY SECTION NO.	XS LETTER DRAFT FIS	COMPUTER STATIONING	EPA REACH FILE NO.	XS LETTER FINAL FIS
	470	470		
	480	480		
	490	490		
	500	500		
	510	510		
	520	520		
530	530	530		
540	540	540		
550	550	550		
560	560	560		
570	570	570		
580	580	580		
590	590	590		
600	600	600		
610	610	610		

KEY TO CROSS SECTION (XS) LABELING

PREPARED BY:
SC: G. C. Wallace, Inc.
TEC:

DATE PREPARED:
SC:
TEC:

COMMUNITY NAME Clark County
STATE Nevada
FEMA CID NO.

STREAM NAME Flamingo Wash
RUN DATE

BASED.D1

STUDY CONTRACTOR			TECHNICAL EVALUATION CONTRACTOR	
FIELD SURVEY SECTION NO.	XS LETTER DRAFT FIS	COMPUTER STATIONING	EPA REACH FILE NO.	XS LETTER FINAL FIS
620	620	620		
630	630	630		
640	640	640		
650	650	650		
660	660	660		
670	670	670		
680	680	680		
690	690	690		
700	700	700		
710	710	710		

2.4.2 JONES BLVD. TO INDUSTRIAL RD. REACH

KEY TO CROSS-SECTION (XS) LABELING

PREPARED BY:
SC: G. C. Wallace, Inc.
TEC:

DATE PREPARED:
SC: October 13, 1997
TEC:

COMMUNITY NAME Clark County
STATE Nevada
FEMA CID NO.

STREAM NAME Flamingo Wash
RUN DATE October 6, 1997

BASE1.D1

STUDY CONTRACTOR			TECHNICAL EVALUATION CONTRACTOR	
FIELD SURVEY SECTION NO.	XS LETTER DRAFT FIS	COMPUTER STATIONING	EPA REACH FILE NO.	XS LETTER FINAL FIS
10	10	10		
20	20	20		
30	30	30		
	40	40		
	50	50		
60	60	60		
70	70	70		
80	80	80		
90	90	90		
100	100	100		
110	110	110		
120	120	120		
130	130	130		
140	140	140		
	150	150		

KEY TO CROSS-SECTION (XS) LABELING

PREPARED BY:
SC: G. C. Wallace, Inc.
TEC:

DATE PREPARED:
SC:
TEC:

COMMUNITY NAME Clark County
STATE Nevada
FEMA CID NO.

STREAM NAME Flamingo Wash
RUN DATE

BASE1.D1

STUDY CONTRACTOR			TECHNICAL EVALUATION CONTRACTOR	
FIELD SURVEY SECTION NO.	XS LETTER DRAFT FIS	COMPUTER STATIONING	EPA REACH FILE NO.	XS LETTER FINAL FIS
	160	160		
170	170	170		
180	180	180		
	190	190		
	200	200		
	210	210		
	220	220		
	230	230		
	240	240		
	250	250		
260	260	260		
270	270	270		
	280	280		
	290	290		
300	300	300		

KEY TO CROSS-SECTION (XS) LABELING

PREPARED BY:
SC: G. C. Wallace, Inc.
TEC:

DATE PREPARED:
SC:
TEC:

COMMUNITY NAME Clark County
STATE Nevada
FEMA CID NO.

STREAM NAME Flamingo Wash
RUN DATE

BASE1.D1

STUDY CONTRACTOR			TECHNICAL EVALUATION CONTRACTOR	
FIELD SURVEY SECTION NO.	XS LETTER DRAFT FIS	COMPUTER STATIONING	EPA REACH FILE NO.	XS LETTER FINAL FIS
	310	310		
	320	320		
330	330	330		
	340	340		
	350	350		
360	360	360		
370	370	370		
	380	380		
	390	390		
	400	400		
	410	410		
	420	420		
	430	430		
	440	440		
	450	450		

KEY TO CROSS-SECTION (XS) LABELING

PREPARED BY:
SC: G. C. Wallace, Inc.
TEC:

DATE PREPARED:
SC:
TEC:

COMMUNITY NAME Clark County
STATE Nevada
FEMA CID NO.

STREAM NAME Flamingo Wash
RUN DATE

BASE1.D1

STUDY CONTRACTOR			TECHNICAL EVALUATION CONTRACTOR	
FIELD SURVEY SECTION NO.	XS LETTER DRAFT FIS	COMPUTER STATIONING	EPA REACH FILE NO.	XS LETTER FINAL FIS
	460	460		
	470	470		
480	480	480		
490	490	490		
500	500	500		
510	510	510		
520	520	520		

KEY TO CROSS SECTION (XS) LABELING

PREPARED BY:
SC: G. C. Wallace, Inc.
TEC:

DATE PREPARED:
SC: OCTOBER 13, 1997
TEC:

COMMUNITY NAME Clark County
STATE Nevada
FEMA CID NO.

STREAM NAME Flamingo Wash
RUN DATE OCTOBER 12, 1997

BASE1.DZ

STUDY CONTRACTOR			TECHNICAL EVALUATION CONTRACTOR	
FIELD SURVEY SECTION NO.	XS LETTER DRAFT FIS	COMPUTER STATIONING	EPA REACH FILE NO.	XS LETTER FINAL FIS
	1001	1001		
	1002	1002		
	1003	1003		
	1004	1004		
	1005	1005		
	1006	1006		
	1007	1007		
	1008	1008		
	1009	1009		

2.4.3 IMPERIAL PALACE TO SPENCER ST. REACH

KEY TO CROSS-SECTION (XS) LABELING

PREPARED BY:
SC: G. C. Wallace, Inc.
TEC: _____

DATE PREPARED:
SC: OCTOBER 13, 1997
TEC: _____

COMMUNITY NAME Clark County
STATE Nevada
FEMA CID NO. _____

STREAM NAME Flamingo Wash
RUN DATE OCTOBER 6, 1997

BASE2.D1

STUDY CONTRACTOR			TECHNICAL EVALUATION CONTRACTOR	
FIELD SURVEY SECTION NO.	XS LETTER DRAFT FIS	COMPUTER STATIONING	EPA REACH FILE NO.	XS LETTER FINAL FIS
	10	10		
	20	20		
30	30	30		
40	40	40		
50	50	50		
	60	60		
	70	70		
	80	80		
	90	90		
	100	100		
	110	110		
	120	120		
	130	130		
	140	140		
	150	150		

KEY TO CROSS-SECTION (XS) LABELING

PREPARED BY:
SC: G. C. Wallace, Inc.
TEC:

DATE PREPARED:
SC:
TEC:

COMMUNITY NAME Clark County
STATE Nevada
FEMA CID NO.

STREAM NAME Flamingo Wash
RUN DATE

BASE2.01

STUDY CONTRACTOR		TECHNICAL EVALUATION CONTRACTOR		
FIELD SURVEY SECTION NO.	XS LETTER DRAFT FIS	COMPUTER STATIONING	EPA REACH FILE NO.	XS LETTER FINAL FIS
	160	160		
	170	170		
	180	180		
	190	190		
	200	200		
210	210	210		
220	220	220		
230	230	230		
240	240	240		
	250	250		
	260	260		
270	270	270		
280	280	280		
	290	290		
	300	300		

KEY TO CROSS-SECTION (XS) LABELING

PREPARED BY:
SC: G. C. Wallace, Inc.
TEC:

DATE PREPARED:
SC:
TEC:

COMMUNITY NAME Clark County
STATE Nevada
FEMA CID NO.

STREAM NAME Flamingo Wash
RUN DATE

BASE2.D1

STUDY CONTRACTOR			TECHNICAL EVALUATION CONTRACTOR	
FIELD SURVEY SECTION NO.	XS LETTER DRAFT FIS	COMPUTER STATIONING	EPA REACH FILE NO.	XS LETTER FINAL FIS
310	310	310		
320	320	320		
	330	330		
	340	340		
350	350	350		
360	360	360		
370	370	370		
	380	380		
	390	390		
	400	400		
	410	410		
	420	420		
430	430	430		
440	440	440		
	450	450		

KEY TO CROSS-SECTION (XS) LABELING

PREPARED BY:
SC: G. C. Wallace, Inc.
TEC:

DATE PREPARED:
SC:
TEC:

COMMUNITY NAME Clark County
STATE Nevada
FEMA CID NO.

STREAM NAME Flamingo Wash
RUN DATE

BASE2.D1

STUDY CONTRACTOR			TECHNICAL EVALUATION CONTRACTOR	
FIELD SURVEY SECTION NO.	XS LETTER DRAFT FIS	COMPUTER STATIONING	EPA REACH FILE NO.	XS LETTER FINAL FIS
	460	460		
	470	470		
480	480	480		
	490	490		
	500	500		
	510	510		
	520	520		
	530	530		
	540	540		
550	550	550		
560	560	560		

2.4.4 EASTERN AVE. TO LAS VEGAS WASH REACH

APPROXIMATE METHOD
HEC-2 MODEL ANALYSIS
EASTERN AVE. TO LAS VEGAS WASH REACH

This reach from Eastern Avenue to Las Vegas Wash was flown as part of this project. Therefore, topography was generated. The starting water surface elevation was computed using normal depth. The subcritial run was used to determine the floodplain delineation for this reach.

A supplemental HEC-2 model analysis was performed to estimate the limits of flooding between Desert Inn Road and Mojave Road using a supercritical run. This reach is completely concrete lined as demonstrated by the photographs. The starting water surface elevation was computed using critical depth.

```
*****************************************
*  HEC-2 WATER SURFACE PROFILES         *
*                                       *
*  Version  4.6.2;  May 1991            *
*                                       *
*  RUN DATE    06OCT97    TIME   11:11:00 *
*****************************************
```


```
*****************************************
*  U.S. ARMY CORPS OF ENGINEERS         *
*  HYDROLOGIC ENGINEERING CENTER        *
*  609 SECOND STREET, SUITE D           *
*  DAVIS, CALIFORNIA 95616-4687         *
*          (916) 756-1104               *
*****************************************
```


```
X     X  XXXXXXX   XXXXX             XXXXX
X     X  X        X     X           X     X
X     X  X        X                       X
XXXXXXX  XXXX     X          XXXXX    XXXXX
X     X  X        X                  X
X     X  X        X     X            X
X     X  XXXXXXX  XXXXX              XXXXXXX
```

THIS RUN EXECUTED 06OCT97 11:11:01

****
HEC-2 WATER SURFACE PROFILES

Version 4.6.2; May 1991
****

T1 550.032
T2 FLAMINGO WASH FIS RESTUDY
T3 FLOODPLAIN DELINEATION
T4 FILES: BASE3-4.DWG, BASE3-4.01
T4 STARTING WSE = NORMAL DEPTH
T4 SUBCRITICAL RUN

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
		2			0.004			6400	1705	

J2	NPROF	IPLOT	PRFVS	XSECV	XSECH	FN	ALLDC	IBW	CHNIM	ITRACE
	-1		-1				-2	-6		

ARIABLE CODES FOR SUMMARY PRINTOUT

100 150

NC	0.03	0.03	0.03	0.1	0.3					
X1	10	18	1000	1126.64						
GR	1710	1000	1710.07	1002.71	1710	1003.06	1708	1012.39	1706	1021.7
GR	1704	1031.01	1702	1040.32	1701.54	1042.48	1700.33	1049.9	1700.55	1089.4
GR	1702	1095.84	1704	1104.89	1706	1114.24	1708	1123.66	1708.6	1126.64
GR	1710	1152.79	1710.41	1160.64	1712	1288.04				
NC	0.03	0.03	0.03							
X1	20	17	1182.02	1322.04	483.22	497.54	488.53			
GR	1712	1000	1711.97	1182.02	1710	1190.86	1708	1199.75	1706	1208.56
GR	1704	1217.31	1703.12	1221.12	1703.59	1267.53	1704	1269.51	1706	1279.06
GR	1708	1288.6	1710	1298.12	1711.95	1307.42	1712	1307.8	1713.45	1322.04
GR	1712.7	1343.21	1713.7	1500.75						
NC	0.03	0.03	0.03							
X1	30	16	1053.23	1154.72	494.86	503.84	498.03			
GR	1714.3	1000	1714	1012.26	1712.41	1053.23	1712	1055.19	1710	1064.74
GR	1708	1074.25	1706	1083.68	1705.86	1084.33	1705.85	1124.71	1706	1125.31
GR	1708	1133.14	1710	1140.87	1712	1148.55	1713.61	1154.72	1714	1175.89
GR	1715.8	1316.21								
NC	0.03	0.03	0.03							
X1	40	20	1146.2	1238.76	500.14	481.13	491.57			
GR	1718	1000	1717.12	1101.53	1716	1146.2	1715.85	1152.03	1714	1159.77
GR	1712	1168.18	1710	1176.59	1708	1185.01	1707.75	1186.07	1707.38	1196.73
GR	1707.2	1216.01	1708	1218.57	1710	1225.27	1712	1231.97	1714	1238.76

GR	1714.1	1239.39	1716	1283.03	1716.17	1284.32	1716.77	1316.26	1718	1327.96

[redacted]	0.03	0.03	0.03							
C1	50	21	1066.67	1235.55	334.29	277.63	305.6			
GR	1723	1000	1722	1020.92	1721.42	1037.11	1720.56	1066.67	1720	1068.75
GR	1718	1076.4	1716	1084.26	1714	1092.32	1712	1100.45	1710	1108.62
GR	1708.9	1112.98	1709	1152.91	1710	1158.04	1712	1168.25	1714	1178.41
GR	1714.6	1181.82	1716	1195.46	1717.14	1207.5	1718	1214.02	1720	1235.55
GR	1720	1249.78								
NC	0.03	0.03	0.03							
C1	60	31	1120.14	1223.41	499.62	502.1	499.27			
GR	1720	1000	1718.36	1013.98	1718	1035.26	1717.58	1105.92	1718	1119.77
GR	1718	1120.01	1718.01	1120.14	1716	1128.57	1714	1136.9	1712	1145.29
GR	1710.1	1153.14	1710	1183.08	1709.94	1194.72	1710	1194.99	1712	1203.55
GR	1714	1212.13	1716	1220.71	1716.63	1223.41	1717.35	1277.47	1718.05	1286.74
GR	1718	1287.48	1718	1296.95	1717.48	1310.09	1718	1314.87	1718.69	1321.04
GR	1718	1336.07	1717.62	1343.02	1718	1362.12	1718.73	1381.28	1718.4	1394.59
GR	1720	1400.91								
NC	0.03	0.03	0.03							
C1	70	17	1084.1	1197.56	493.27	498.08	497.95			
GR	1723.3	1000	1723.69	1084.1	1722	1090.63	1720	1098.35	1718	1106.05
GR	1716	1113.75	1714	1121.45	1712	1129.17	1712	1129.24	1712	1129.36
GR	1712.6	1169.17	1714	1174.59	1716	1182.8	1718	1191.03	1719.59	1197.56
GR	1720	1230.27	1720.07	1233.61						
N [redacted]	0.03	0.03	0.03							
C1	80	18	1147.29	1269.91	455.76	481.96	470.68			
GR	1726	1000	1725.4	1007.66	1724.07	1115.85	1724	1116.84	1723.19	1147.29
GR	1722	1152.02	1720	1159.92	1718	1167.78	1716	1175.62	1714.38	1181.94
GR	1714.9	1227.68	1716	1232.07	1718	1240.31	1720	1248.54	1722	1256.76
GR	1724	1264.99	1725.21	1269.91	1724.85	1287.78				
NC	0.03	0.03	0.03							
C1	90	20	1056.45	1168.18	495.14	465.14	482.19			
GR	1726	1000	1725.75	1009.38	1724.96	1031.29	1724.64	1056.45	1724	1058.67
GR	1722	1065.64	1720	1072.62	1718	1079.6	1716	1086.6	1715.19	1089.42
GR	1716	1103.03	1717.15	1124.51	1718	1128.2	1720	1136.83	1722	1145.32
GR	1724	1153.73	1726	1162.18	1727.42	1168.18	1728	1186.62	1728.02	1187.5
NC	0.03	0.03	0.03							
C1	100	25	1022.27	1132.68	289.86	299.75	295.13			
GR	1732	1000	1732	1001	1732.08	1001.22	1730	1011.88	1728	1022.27
GR	1727.6	1024.44	1726	1027.45	1724	1031.2	1722	1034.85	1720	1038.4
GR	1718.7	1040.93	1719.04	1047.62	1718.99	1102.02	1719.04	1118.34	1720	1119.65
GR	1722	1123	1724	1126.5	1726	1130.15	1727.26	1132.68	1727.45	1139.16
GR	1728	1142.93	1728.68	1147.57	1730	1157.98	1730.09	1158.86	1730	1162.48
NC	0.03	0.03	0.015							
C1	110	21	1022.67	1137.41	25.99	26.18	25.69			
GR	1732.5	1000	1732	1002.64	1730	1012.69	1728	1022.67	1727.56	1024.87
GP	1726	1027.45	1724	1030.85	1722	1034.42	1720.5	1036.37	1720.5	1099.9
[redacted]	20.5	1122.88	1720.5	1123.19	1720.5	1123.29	1722	1126.96	1724	1130.74
GR	1726	1134.53	1727.52	1137.41	1728	1142.14	1729.05	1148.68	1730	1154.29

GP	1731.7	1164.66								
[illegible]	0.03	0.03	0.015							
X1	120	7	1029.49	1136.49	88.77	93.13	90.11			
X3	10			1029.49	1730	1136.49	1730			
GR	1730.3	1000	1730	1006.09	1728	1029.49	1721.9	1029.49	1721.9	1136.49
GR	1728	1136.49	1728	1146.34						
NC	0.02	0.02	0.015							
SB	0.9	1.56	2.6	145	107	7	500	0	1722.53	1721.9
X1	130	8	1035.81	1142.81	120.77	117.86	119.69			
X2			1	1727.53	1731.43			1.33		
X3	10			1035.81	1731	1142.81	1731			
GR	1728.6	1000	1728.71	1018.83	1728	1035.81	1722.53	1035.81	1722.53	1142.81
GR	1728	1142.81	1728.87	1157.29	1728.69	1174.35				
NC	0.02	0.02	0.015							
X1	140	13	1149.72	1265.63	64.74	64.09	64.14			
X3	10			1149.72	1730	1265.63	1730			
GR	1729.5	1000	1728.41	1149.72	1728	1150.76	1726	1155.81	1724	1161.07
GR	1722.8	1165.81	1722.6	1250.59	1724	1254.37	1726	1259.66	1728	1264.74
GR	1728.3	1265.63	1728.8	1316.23	1728.18	1343.83				
NC	0.02	0.02	0.02							
QT	1	6300								
X1	150	18	1018.39	1152.46	491.39	488.88	489.94			
G	1732	1000	1731.69	1018.39	1730	1024.12	1728	1030.88	1726.48	1035.9
G	1726.1	1066.83	1726	1067.43	1724.2	1074.87	1724	1083.96	1723.53	1107.26
GR	1724	1108.86	1725.23	1113.02	1726	1135.88	1725.99	1136.31	1728	1142.71
GR	1730	1149.03	1731.09	1152.46	1731.43	1169.72				
NC	0.02	0.02	0.02							
X1	160	22	1042.38	1195.86	501.43	502.7	501.51			
GR	1734	1000	1734.52	1002.52	1734	1015.73	1733.26	1042.38	1732	1045.87
GR	1730	1051.46	1728	1057.16	1727.61	1058.29	1727.59	1089.49	1726.47	1097.9
GR	1726	1115.47	1725.61	1127.39	1726	1131.14	1727.46	1145.07	1728	1162.54
GR	1728.2	1169.98	1730	1173.77	1732	1178.13	1733.38	1181.15	1734	1195.86
GR	1734.2	1200.57	1735.81	1203.67						
NC	0.02	0.02	0.02							
X1	170	20	1042.95	1183.42	486.67	487.82	487.26			
GR	1734.6	1000	1735.53	1003.78	1734.5	1042.95	1734	1044.42	1732	1050.31
GR	1730	1056.26	1728.7	1060.18	1728.42	1095.07	1728	1097.52	1727.66	1099.65
GR	1727.3	1123.92	1728	1128.46	1729.82	1140.57	1730	1146.01	1730.66	1167.12
GR	1732	1172.19	1734	1179.55	1735.09	1183.42	1735.4	1201.5	1736	1203.33
NC	0.02	0.02	0.02							
X1	180	19	1037.9	1178.31	490.6	492.37	491.83			
GR	1738.4	1000	1738	1017.86	1736.58	1037.9	1736	1039.45	1734	1044.91
GR	1732	1050.47	1730.22	1055.47	1730.42	1062.62	1730	1097.25	1729.6	1099.77
GR	1730	1119.42	1730.04	1121.41	1731.15	1155.75	1732	1158.51	1734	1165.22
GR	1736	1172.22	1737.72	1178.31	1738	1187.42	1738.27	1197.86		

[redacted]	0.02	0.02	0.02							
X1	190	22	1000	1121.49	499.18	497.1	497.74			
GR	1743.5	950.33	1742.46	998.69	1742	1000	1740	1005.6	1738	1011
GR	1736	1016.29	1735.23	1018.97	1734.5	1040.24	1734	1042.17	1732.79	1046.61
GR	1732.9	1078.44	1734	1082	1734.71	1084.43	1736	1101.82	1736.3	1105.68
GR	1738	1110.9	1740	1116.85	1741.63	1121.49	1742	1135.5	1742.24	1142.58
GR	1742	1143.57	1741.64	1144.92						
NC	0.02	0.02	0.02							
X1	200	22	1000	1122.87	494.16	496.56	495.37			
GR	1748.8	956.38	1748	992.25	1747.84	995.39	1746	1000	1744	1004.98
GR	1742	1009.94	1740	1014.87	1738	1019.77	1737.9	1020.02	1737.52	1027.73
GR	1736.7	1037.66	1736.7	1061.55	1737.76	1074.9	1738	1083.37	1738.49	1103
GR	1740	1106.13	1742	1110.31	1744	1114.5	1746	1118.68	1748	1122.87
GR	1748.4	1123.7	1748.36	1144.3						
NC	0.02	0.02	0.02							
X1	210	25	1000	1113.22	499.74	500.05	500.38			
GR	1752	951.7	1752	1000	1750	1005.42	1748	1010.97	1746	1016.52
GR	1744	1022.03	1742	1027.65	1741.66	1028.59	1740.5	1037.62	1740	1039.36
GR	1738	1047.1	1737.52	1048.91	1737.8	1061.69	1738	1062.13	1740	1067.4
GR	1741.2	1071.1	1742	1079.44	1742.89	1088.66	1744	1091.26	1746	1095.98
GR	1748	1100.7	1750	1105.41	1752	1110.13	1753.31	1113.22	1753.21	1141.88
NC	0.02	0.02	0.02							
X1	220	26	1041.51	1160.79	464.69	489.34	476.72			
GR	1759.7	1000	1759.83	1041.51	1758	1045.1	1756	1049.03	1754	1052.95
GR	1752	1056.86	1750	1060.75	1748	1064.59	1747.25	1066.03	1746.15	1087.16
GR	1746	1087.54	1744.18	1092.6	1744	1106.98	1744	1109.94	1743.96	1110.03
GR	1745.8	1113.56	1746	1116.26	1748	1139.68	1747.99	1139.83	1750	1144.13
GR	1752	1148.41	1754	1152.7	1756	1156.99	1757.77	1160.79	1758	1173.7
GR	1758.3	1199.32								
NC	0.02	0.02	0.02							
X1	230	28	1034.85	1169.03	490.46	498.91	494.76			
GR	1763.6	1000	1763.36	1034.85	1762	1040.25	1761.13	1043.65	1760.31	1056.95
GR	1760	1057.18	1758	1062.98	1756	1068.2	1754	1073.41	1753.53	1074.65
GR	1752.6	1090.81	1752	1093.04	1750.12	1100.45	1750.12	1113.46	1751.49	1119.83
GR	1752	1124.28	1753.26	1136.24	1754	1137.93	1756	1142.51	1758	1147.1
GR	1760	1151.69	1761.94	1156.15	1762	1156.82	1763.75	1168.26	1764	1169.03
GR	1766	1176.57	1766.64	1178.93	1766.86	1205.52				
NC	0.02	0.02	0.02							
X1	240	29	1026.08	1194.47	496.31	488.69	492			
GR	1774.8	1000	1774.34	1026.08	1774	1026.81	1772	1030.67	1770	1034.53
GR	1768	1038.38	1766	1042.19	1764	1045.88	1762	1049.77	1760	1053.67
GR	1758	1057.57	1757.43	1059.06	1757.79	1143.57	1758	1145.62	1758.74	1152.68
GR	1759.2	1157.83	1760	1159.46	1762	1163.99	1764	1168.57	1766	1173.21
GR	1768	1177.84	1770	1181.98	1772	1185.85	1774	1189.72	1776	1193.59
GR	1776.4	1194.47	1776.87	1267.84	1776	1276.18	1775.49	1280.88		

[redacted]

	0.02	0.02	0.015							
	250	24	1036.04	1171.85	57.45	58.44	58.6			
R	1775.4	1000	1775.23	1020.11	1774	1022.51	1772	1025.97	1770	1029.5
R	1768	1033.08	1766.5	1036.04	1766	1037.59	1764	1043.3	1762	1047.58
R	1760	1050.92	1758	1053.04	1758.34	1154.39	1760	1154.67	1762	1155.12
R	1764	1155.69	1766	1162.7	1766.67	1171.85	1768	1174.97	1770	1178.13
R	1772	1180.86	1774	1183.9	1776	1187.8	1776.99	1190.22		
C	0.02	0.02	0.015							
1	260	20	1033.31	1171.52	1	1	1			
R	1775.4	1000	1775.24	1020.49	1774	1022.9	1772	1026.35	1770	1029.81
R	1768	1033.31	1767.3	1042.07	1766	1048.18	1764	1050.85	1762	1051.85
R	1762	1154.61	1764	1155.13	1766	1155.64	1766.66	1171.52	1767.82	1173.98
R	1768	1174.12	1770	1176.75	1772	1179.4	1774	1183.08	1776	1187.74
C	0.02	0.02	0.015							
1	270	20	1008.92	1116.05	33.84	8.99	21.92			
R	1775.8	964	1775	1000	1774	1003.1	1772	1008.92	1772.04	1008.94
R	1770	1009.59	1768	1010.24	1766	1010.83	1764	1011.18	1762	1011.54
R	1762	1113.08	1762	1114.49	1762	1114.56	1764	1114.95	1766	1115.24
R	1768	1115.55	1770	1115.92	1771.04	1116.05	1772	1122.67	1774	1132.66
C	0.02	0.02	0.015							
1	280	18	1044.87	1151.21	1	1	1			
R	1775.8	1000	1775.02	1036.1	1774	1039.28	1772.37	1044.87	1772	1044.99
	1770	1045.65	1768	1046.31	1766	1047.17	1766	1103.57	1766.18	1146.5
R	1766	1148.22	1766	1149.86	1768	1150.4	1770	1150.81	1772	1151.16
R	1772.2	1151.21	1774.03	1160.57	1774	1160.65				
C	0.02	0.02	0.015							
1	290	7	1047.98	1151	14.68	12.7	14.95			
3	10			1047.98	1775	1150.91	1775			
R	1775.6	1000	1775.05	1036.02	1774	1047.98	1766.55	1047.98	1766.55	1151
R	1774	1151	1774.77	1160.59						
C	0.02	0.02	0.015							
B	0.9	1.56	2.6	106	103.02	5.02	588	0	1766.92	1766.55
1	300	8	1025.54	1128.56	102.54	98.55	102.75			
2			1	1772.92	1776.92			1.33		
3	10			1025.54	1775.19	1128.56	1775.56			
R	1774.8	1000	1775.19	1017.87	1775.12	1025.54	1766.92	1025.54	1766.92	1128.56
R	1775.1	1128.56	1775.56	1133.94	1775.35	1147.13				
C	0.02	0.02	0.015							
1	310	20	1022.98	1171.53	102.64	105.7	100.28			
R	1776.8	1000	1776	1016.17	1775.68	1022.98	1774	1028.26	1772	1034.5
R	1770	1040.77	1768.95	1044.12	1768	1047.77	1767.87	1048.18	1767.78	1072.14
R	1767.8	1131.12	1768	1132.45	1768.79	1137.38	1768.62	1147.75	1770	1152.28
R	1772	1158.91	1774	1165.6	1775.77	1171.53	1776	1177.59	1776.8	1198.8

	0.02	0.02	0.02							
	320	20	1022.11	1155.09	489.89	487.69	489.1			
R	1779.4	1000	1778.04	1022.01	1778	1022.11	1776	1030.73	1774	1039.26
R	1772	1047.79	1770.85	1052.67	1770.51	1061.45	1770	1063.83	1769.24	1067.59
R	1770	1104.76	1770.04	1107.08	1771.21	1112.55	1771.76	1130.75	1772	1131.67
R	1774	1139.29	1776	1146.67	1777.98	1153.84	1778	1155.09	1779.33	1191.2
C	0.02	0.02	0.02							
1	330	21	1027.28	1156.48	500.62	500.93	500.1			
R	1781	1000	1780.94	1027.28	1780	1031.83	1778	1041.53	1776	1051.25
R	1774	1060.96	1773.4	1063.9	1773.58	1078.46	1772	1084.27	1771.79	1085.02
R	1771.8	1109.74	1772	1110.11	1774	1116.37	1774.53	1118.12	1774.72	1134.82
R	1776	1138.9	1778	1145.34	1780	1151.87	1781.4	1156.48	1782	1173.24
R	1782.3	1189.26								
C	0.02	0.02	0.02							
1	340	19	1000	1116.66	496.19	495.64	496.21			
R	1783.7	907.67	1782.39	1000	1782	1002.25	1780	1013.68	1778	1025.11
R	1777	1030.73	1776.57	1040.34	1776	1043.31	1774.53	1051.15	1774.37	1080.76
R	1776	1084.3	1778	1088.43	1778.07	1088.55	1778.69	1101.43	1780	1107.4
R	1782	1116.66	1784	1125.98	1785.09	1131.04	1785.6	1161.06		
C	0.02	0.02	0.02							
1	350	22	1042.74	1155.28	460.23	420.27	436.71			
R	1786	1000	1786.37	1024.16	1787.1	1042.74	1786	1046.9	1784	1054.53
	1782	1062.22	1780	1069.93	1778	1077.61	1776.25	1084.32	1778.03	1100.93
	77.2	1111.98	1778	1120.32	1779.54	1134.41	1778.08	1145.13	1780	1148.5
R	1782	1151.93	1784	1155.28	1784.22	1155.66	1785.25	1168.43	1786	1172.75
R	1787.2	1179.81	1787.3	1201.99						
C	0.02	0.02	0.02							
1	360	26	1014.07	1129.57	341.79	294.05	314.29			
3	10			1014.07	1792	1129.57	1792			
R	1798	1000	1796	1005.44	1794	1009.82	1792	1014.07	1790	1018.52
R	1788	1023.42	1787.25	1025.48	1786	1027.93	1784	1030.77	1782	1033.57
R	1781.8	1036.36	1781.62	1056.13	1780.02	1067.23	1780	1073	1779.67	1111.44
R	1780	1112.32	1782	1117.65	1784	1122.81	1786	1127.74	1786.74	1129.57
R	1786.9	1190.42	1786.92	1217.35	1788	1239.83	1788.97	1260.98	1789.6	1274.74
R	1790	1319.61								
C	0.02	0.02	0.02							
B		1.56	2.6	150	80		943	1.5	1781.68	1779.67
1	370	26	1019.93	1180.43	188.4	272.56	232.15			
2			1	1791.68	1803.16					
3	10			1019.93	1800	1180.43	1800			
R	1801.2	1000	1800	1006.14	1798	1012.48	1796	1019.93	1794	1026.84
R	1792	1033.63	1790	1039.5	1788	1044.33	1787.04	1047.52	1786	1050.99
R	1784	1063.28	1782.66	1069.39	1782	1116.66	1781.68	1141.49	1782	1142.19
R	1784	1147.19	1786	1151.46	1787.43	1154.02	1788	1156.17	1790	1161.17
R	1792	1166.33	1794	1173	1796	1180.43	1798	1186.39	1800	1192.83
R	1800.7	1196.96								

[redacted]	0.03	0.03	0.02							
	380	14	1091.25	1151.34	174.12	176.08	170.96			
X3	10			1091.25	1794	1151.34	1794			
GR	1792	1090.66	1792.75	1091.25	1792	1091.78	1790	1093.21	1788	1094.63
GR	1786	1096.06	1785.68	1096.29	1785.8	1149.56	1786	1149.61	1788	1150.11
GR	1790	1150.6	1792	1151.08	1793.07	1151.34	1794	1227.86		
NC	0.03	0.03	0.02							
X1	390	21	1045.15	1103.45	420.9	420.21	420.9			
X3	10			1045.15	1797	1103.45	1797			
GR	1792.6	1000	1793.3	1031.19	1793.78	1040.57	1794	1041.52	1794.81	1045.15
GR	1794	1045.61	1792	1046.74	1790	1047.86	1788	1049.03	1787.41	1049.38
GR	1787.2	1074.16	1787.54	1100.36	1788	1100.54	1790	1101.34	1792	1102.12
GR	1794	1102.9	1795.44	1103.45	1795.23	1128.39	1795.21	1144.16	1796	1147.04
GR	1797.3	1153.05								
NC	0.03	0.03	0.02							
X1	400	18	1042.29	1103.68	216.05	217.6	216.12			
X3	10			1042.29	1797	1103.68	1797			
GR	1795.3	1000	1795.77	1024.49	1795.76	1038.23	1796	1040.26	1796.25	1042.29
GR	1796	1042.47	1794	1043.62	1792	1044.73	1790	1045.83	1789.06	1046.34
GR	1788.6	1075.55	1788.96	1100.77	1790	1101.12	1792	1101.81	1794	1102.54
GR	1796	1103.31	1796.96	1103.68	1796.49	1128.41				
NC	0.03	0.03	0.02							
[redacted]	410	21	1041.49	1100.98	236.79	212.87	222.64			
[redacted]	1799	1000	1799.04	1002.09	1799.01	1019.84	1798	1026.7	1797.57	1029.5
GR	1797.2	1041.49	1796	1044.75	1794	1049.87	1792	1054.82	1790	1059.57
GR	1789.3	1061.07	1789.8	1078.69	1790	1092.24	1790.1	1099.54	1792	1099.88
GR	1794	1100.24	1796	1100.6	1798	1100.94	1798.24	1100.98	1798.57	1108.1
GR	1799.4	1170.81								
NC	0.03	0.03	0.02							
X1	420	24	1148.62	1204.8	228.48	213.43	218.15			
GR	1805.1	1000	1804.85	1087.59	1804.56	1107.49	1804	1110.27	1802	1120.11
GR	1800	1129.91	1799.62	1132.29	1798.49	1148.62	1798	1150.2	1796	1155.64
GR	1794	1161.15	1792	1166.99	1790.86	1170.59	1791.29	1186.61	1790.88	1202.56
GR	1792	1202.83	1794	1203.37	1796	1203.9	1798	1204.44	1799.34	1204.8
GR	1800	1213.14	1800	1213.21	1800.65	1276.28	1800.8	1276.28		
NC	0.03	0.03	0.015							
X1	430	6	1034.79	1072.54	228.08	218.61	221.27			
X3	10			1034.79	1805	1072.54	1805			
GR	1804.5	1000	1804.31	1034.79	1793.29	1034.79	1793.29	1072.54	1803.82	1072.54
GR	1803.7	1113.05								
NC	0.03	0.03	0.015							
SB	0.9	1.56	2.6	78	37.75	1.75	246	0	1794.3	1793.29
X1	440	9	1048.13	1085.88	183.21	206.01	197.38			
X2			1	1801.3	1802.38			1.33		
X3	10			1048.13	1805	1085.88	1805			
[redacted]	1804	1000	1803.68	1007.43	1803.75	1048.13	1794.3	1048.13	1794.3	1085.88
[redacted]	1803.7	1085.88	1803.91	1101.01	1804	1103.62	1805.3	1113.11		

	.025	0.025	0.04							
	1	5800								
1	450	23	1056.87	1133.42	163.22	162.13	163.47			
3	10			1056.87	1809	1133.42	1809			
R	1804	1000	1804.07	1006.32	1804.32	1034.41	1804.73	1043.05	1804.96	1056.87
R	1804	1058.72	1802	1062.07	1800	1065.72	1798	1069.89	1796	1074.12
R	1795.5	1075.14	1796	1079.17	1797.92	1096.15	1798	1097.82	1799.19	1110.76
R	1800	1121.55	1802	1125.68	1804	1129.41	1806	1133.42	1806.22	1133.91
R	1806.3	1148.02	1806.93	1155.61	1806.39	1170.62				
C	0.025	0.025	0.04							
1	460	23	1048.18	1141.84	281.81	289.57	285.08			
3	10			1048.18	1810	1141.84	1810			
R	1808	1000	1808.02	1003.22	1808	1005.04	1807.55	1048.18	1806	1052.89
R	1804	1059.32	1802.11	1065.59	1802	1067.54	1800.57	1088.15	1800	1090.66
R	1798	1099.31	1797.57	1101.27	1797.83	1115.39	1798	1115.66	1800	1118.79
R	1802	1121.96	1804	1125.23	1804.77	1126.62	1805.59	1139.81	1806	1140.19
R	1808.4	1141.84	1808	1142.64	1808	1161.75				
C	0.025	0.025	0.04							
1	470	20	1035.45	1104.62	277.36	272.97	275.07			
3	10			1035.45	1812	1104.62	1812			
R	1810.7	1000	1810.44	1019.05	1811.3	1035.45	1810	1039.08	1808	1044.69
R	1806	1050.13	1804	1055.32	1802	1061.49	1800.02	1066.39	1800	1067.21
R	1799.3	1081.38	1800	1082.49	1802	1085.74	1804	1089.17	1806	1092.65
	806.1	1092.79	1808	1096.72	1810	1100.89	1810.59	1104.62	1810.87	1120.75
C	0.025	0.025	0.04							
B		1.56	2.6	100	20		288	2	1799.67	1799.29
1	480	23	1049.96	1121.92	29.43	28.85	29.16			
2			1	1808	1811.3					
3	10			1049.96	1815	1121.92	1815			
R	1810.8	1000	1810.29	1022.32	1810.42	1043.96	1811.06	1049.96	1810	1052.71
R	1808	1057.64	1806	1063.42	1804	1071.44	1802	1076.07	1800.34	1079.25
R	1800	1088.82	1799.67	1097.89	1800	1098.19	1802	1100.01	1804	1101.93
R	1806	1109.03	1808	1115.05	1810	1119.54	1810.67	1121.92	1811.24	1130.7
R	1810	1145.14	1809.57	1148.54	1809.64	1162.76				
C	0.025	0.025	0.04							
1	490	27	1050.08	1127.64	421.17	376.41	404.91			
3	10			1050	1816	1127.64	1816			
R	1816	1000	1816.02	1001.56	1814.9	1019.89	1814.74	1038.47	1815.04	1050.08
R	1814	1052.5	1812	1057.09	1810	1061.66	1808	1066.16	1806	1070.64
R	1804	1075.1	1803.66	1075.85	1804	1083.12	1804.15	1088.63	1806	1092.46
R	1808	1096.8	1810	1101.52	1810.26	1101.82	1810	1113.29	1809.88	1118.54
R	1810	1119.08	1812	1125.39	1812.71	1127.64	1812.65	1132.54	1812.36	1149.58
R	1812.4	1162.71	1812.58	1182.47						

	0.025	0.025	0.04							
	500	27	1035.57	1117.1	475.67	455.34	467.9			
3	10			1035.57	1821	1117.1	1821			
R	1820.6	1000	1820.49	1017.79	1820	1035.57	1820.01	1036.35	1818	1038.99
R	1816	1041.72	1814	1044.53	1812	1047.45	1810	1050.47	1808	1053.53
R	1807.5	1054.17	1808	1059.53	1808.27	1062.4	1810	1077.16	1811.11	1085.69
R	1812	1088.38	1814	1094.42	1816	1100.48	1817.15	1103.98	1818	1112.84
R	1818.4	1117.1	1818	1130.34	1817.52	1146.76	1817.56	1162.65	1817.78	1176.1
R	1818	1181.93	1818.33	1189.71						
C	0.02	0.02	0.03							
1	510	21	1051.63	1118	410.79	403.61	413.47			
R	1822.7	1000	1822	1014.17	1821.1	1051.63	1820	1053.73	1818	1057.54
R	1816	1061.35	1814	1065.16	1812	1068.96	1811.08	1070.77	1810.29	1084.94
R	1812	1091.3	1814	1098.08	1816	1104.27	1818	1110.29	1820	1116.14
R	1820.6	1118	1821.24	1184.8	1821.07	1201.95	1821.84	1211.83	1822	1218.61
R	1822.5	1218.61								
C	0.02	0.02	0.03							
1	520	29	1020.76	1156.45	494.67	471.93	477.37			
R	1830.9	1000	1830	1005.42	1829.57	1007.86	1828.53	1020.76	1828	1022.81
R	1826	1030.61	1824	1038.4	1822	1046.19	1820	1053.98	1818.67	1059.18
R	1818.1	1072.9	1818	1073.42	1816	1079.92	1814.82	1084.01	1816	1106.79
R	1816.3	1112.44	1817.17	1120.26	1818	1123.13	1820	1130.03	1822	1136.92
R	1824	1143.81	1825.52	1149.11	1826	1150.07	1828	1153.82	1829.41	1156.45
	1828	1169.03	1830	1185.2	1832	1235.46	1832.56	1257.15		
C	0.02	0.02	0.03							
1	530	25	1016.88	1152.68	371.54	424.3	399.2			
R	1832	1000	1831.88	1004.01	1831.69	1016.88	1830	1021.18	1828	1026.26
R	1826	1031.34	1824	1036.37	1822.35	1040.5	1822.35	1059.95	1822	1060.65
R	1820	1064.77	1818	1068.85	1817.83	1069.21	1817.62	1090.03	1818	1090.71
R	1820	1093.58	1822	1096.4	1823.81	1099.05	1824	1102.34	1826	1121.49
R	1828	1130.45	1828.88	1133.79	1830	1143.91	1830.93	1152.68	1831.19	1159.85
C	0.02	0.02	0.03							
1	540	26	1018.16	1117.46	460.35	522.62	489.72			
R	1834.9	1000	1834.9	1018.16	1834	1020.8	1832	1026.45	1830	1031.95
R	1828	1037.42	1827.86	1037.75	1828	1041.19	1828.5	1054.97	1828	1055.74
R	1826	1058.87	1824	1062.02	1823.45	1062.88	1823.47	1092.33	1824	1093.02
R	1826	1095.58	1828	1098.1	1828.7	1098.97	1828.48	1106.52	1830	1108.88
R	1832	1111.99	1834	1115.1	1835.51	1117.46	1836	1133.36	1836.3	1144.44
R	1836.7	1152.23								
C	0.02	0.02	0.03							
1	550	28	1021.09	1124.94	438.1	474.94	456.26			
R	1840.1	1000	1840	1001.92	1839.99	1006.32	1839.32	1021.09	1838	1024.57
R	1836	1029.84	1833.93	1035.32	1834	1035.34	1833.46	1054.03	1832	1056.65
R	1830	1060.26	1828	1063.9	1826.66	1066.34	1826.79	1083.14	1828	1085.42
R	1830	1089.19	1832	1092.91	1834.1	1096.67	1834	1097.34	1834	1105.63
R	1834	1111.84	1833.95	1114.36	1836	1119.24	1838	1124.12	1838.31	1124.94
	839.6	1150.68	1840	1160.26	1840.11	1162.86				

	0.02	0.02	0.03							
C1	560	32	1011.15	1130.99	332.03	327.26	330.24			
GR	1847.8	1000	1846.27	1003.9	1846	1006.41	1845.43	1011.15	1844	1015.37
GR	1842	1021.39	1840	1027.57	1838	1033.9	1836.1	1039.95	1836	1045.57
GR	1835.9	1053.25	1834	1056.42	1832	1059.77	1830	1063.2	1829.01	1064.93
GR	1828	1072.16	1827.85	1073.13	1828	1074.51	1828.64	1080.27	1830	1082.3
GR	1832	1085.3	1834	1088.32	1836	1091.45	1836.23	1091.7	1836.22	1110.34
GR	1838	1115.46	1840	1121.18	1842	1126.85	1843.5	1130.99	1844	1135.55
GR	1845.8	1151.17	1845.91	1156.17						
WC	0.02	0.02	0.03							
C1	570	31	1064.51	1140.01	229.29	230.35	228.38			
GR	1847.9	1000	1846	1056.21	1845.65	1064.51	1844	1065.7	1842	1067.16
GR	1840	1068.62	1838	1070.08	1836	1071.54	1834	1072.98	1832	1073.78
GR	1832	1074.63	1832	1075.05	1832	1084.35	1832	1091.24	1831.69	1120.28
GR	1832	1120.51	1832	1120.78	1832	1121.95	1834	1124.47	1836	1126.81
GR	1838	1129.15	1840	1131.49	1842	1133.85	1844	1136.23	1846	1138.69
GR	1847	1140.01	1847.35	1156.32	1848	1159.82	1849.6	1168.44	1850	1170.12
GR	1850.7	1172.42								
WC	0.02	0.02	0.015							
C1	580	30	1055.05	1128.8	1	1	1			
GR	1847.7	1000	1847.49	1012.37	1846	1049.98	1845.83	1055.05	1844	1056.21
GR	1842	1057.48	1840	1058.71	1838	1059.87	1836	1060.93	1834	1061.78
GR	1834	1062.46	1834	1063.07	1834	1063.47	1834	1064.19	1834	1080.22
G	1834	1109.26	1834	1109.31	1834	1114.45	1836	1116.75	1838	1119.03
GR	1840	1121.3	1842	1123.52	1844	1125.65	1846	1127.71	1847.09	1128.8
GR	1847.5	1145.88	1848	1148.67	1849.67	1157.77	1850	1158.89	1851.05	1161.45
WC	0.02	0.02	0.015							
C1	590	11	1031.2	1085.04	16.02	16.7	15.77			
C3	10			1031.2	1848	1085.04	1848			
GR	1847.3	1000	1847.01	1010.93	1846.27	1031.2	1834.21	1031.2	1834.21	1085.04
GR	1846.2	1085.04	1847.07	1099.88	1848	1120.18	1849.73	1131.49	1850	1132.09
GR	1851.3	1134.18								
WC	0.02	0.02	0.015							
SB	0.9	1.56	2.6	60	53.84	3.84	400	0	1835.13	1834.21
C1	600	15	1081.85	1135.69	93.41	94.92	93.51			
C2			1	1843.13	1846.5			1.33		
C3	10			1081.85	1848	1135.69	1848			
GR	1851	1000	1850	1003.75	1848	1011.09	1847.6	1012.57	1847.64	1032.47
GR	1848	1035.82	1849.27	1065.44	1848	1070.71	1847.2	1074.22	1846	1081.85
GR	1835.1	1081.85	1835.13	1135.69	1847.56	1135.69	1847.68	1152.6	1848	1170.43
WC	0.02	0.02	0.015							
C1	610	20	1083.2	1136.14	230.78	201.73	215.38			
C3	10			1061.48	1853	1207.54	1853			
GR	1851.7	1000	1851.08	1029.96	1852	1046.46	1852.83	1061.48	1852.52	1068.39
GR	1852	1080.06	1851.91	1083.2	1850	1085.83	1848	1088.59	1846	1091.36
GR	1844	1094.17	1842.71	1095.99	1842.62	1124.12	1844	1126.53	1846	1130
	1848	1133.45	1849.56	1136.14	1850	1155.27	1852	1197.8	1852.45	1207.54

	0.02	0.02	0.015							
X1	620	20	1033.45	1086.27	223.64	202.43	212.31			
GR	1859.3	1000	1858	1007.7	1857.16	1012.48	1856	1018.28	1855.25	1022.06
GR	1855.4	1033.45	1854	1035.35	1852	1037.9	1850	1040.44	1848	1042.97
GR	1846	1045.49	1845.48	1046.14	1845.66	1075.97	1846	1076.49	1848	1079.51
GR	1850	1082.53	1852	1085.57	1852.46	1086.27	1854	1135.67	1855.53	1176.03
NC	0.02	0.02	0.015							
X1	630	18	1031	1084.55	229.09	213.86	221.03			
GR	1861.2	1000	1860	1004.03	1858.27	1009.63	1858	1010.62	1856	1018.67
GR	1855.9	1018.82	1855.06	1031	1854	1032.96	1852	1036.68	1850	1040.45
GR	1848.1	1044.02	1848.28	1071.6	1850	1074.89	1852	1078.71	1854	1082.53
GR	1855	1084.55	1856	1129.14	1857	1165.99				
NC	0.02	0.02	0.015	0.1	0.3					
X1	640	19	1026.88	1079.43	251.59	262.14	258.21			
GR	1864.5	1000	1864.16	1004.77	1864	1005.12	1862	1009.4	1860	1013.41
GR	1858.6	1016.12	1858.09	1026.88	1858	1027.05	1856	1030.75	1854	1034.43
GR	1852	1038.12	1851.39	1039.25	1851.37	1067.22	1852	1068.01	1854	1070.51
GR	1856	1073	1858	1075.48	1860	1077.94	1861.23	1079.43		
NC	0.02	0.02	0.015							
X1	650	8	1035.35	1088.02	196.87	225.93	211.31			
X3	10			1035.35	1867	1088.02	1867			
GP	1866	941.77	1867.8	1000	1866.17	1035.35	1853.8	1035.35	1853.8	1088.02
	1866.1	1088.02	1866.1	1156.84	1866	1161.59				
NC	0.02	0.02	0.015							
SB	0.9	1.56	2.6	150	52.67	2.67	400	0	1856.17	1853.8
X1	660	11	1077.26	1129.93	191.11	191.17	191.78			
X2			1	1864.17	1869.17			1.33		
X3	10			1077.26	1870	1129.93	1870			
GR	1870.6	1000	1870	1032.33	1869.6	1060.4	1869.67	1077.26	1856.17	1077.26
GR	1856.1	1129.93	1869.5	1129.93	1870.02	1166.85	1870	1168.76	1870	1172.88
GR	1868.6	1207.45								
NC	0.025	0.025	0.025							
QT	1	5500								
X1	670	31	1067.82	1168.26	476.18	438.91	452.82			
GR	1879.4	1000	1878	1007.84	1877.77	1009.03	1877.27	1027.56	1876.26	1048.09
GR	1876	1049.44	1875	1054.05	1874.27	1067.82	1874	1068.59	1872	1072.93
GR	1870	1077.28	1868	1081.62	1866	1085.96	1864	1090.29	1862	1094.57
GR	1860	1098.77	1859.16	1100.51	1859	1121.06	1860	1131.32	1860.34	1134.65
GR	1860.7	1147.65	1862	1149.57	1864	1152.62	1866	1155.67	1868	1158.72
GR	1870	1161.77	1872	1164.82	1874	1167.84	1874.29	1168.26	1875	1189.7
GR	1875.3	1193.35								
NC	0.025	0.025	0.025							
X1	680	28	1032.41	1126.45	478.66	448	461.54			
GR	1882.6	1000	1882	1011.76	1880.87	1032.41	1880	1034.16	1878	1038.48
GR	1876	1042.78	1874	1047.09	1872	1051.41	1870	1055.75	1868	1060.1
	1866	1064.48	1864.4	1067.99	1864	1071.62	1862.6	1085.72	1864.01	1092.79
GR	1864	1093.89	1864.2	1101.75	1866	1104.88	1868	1108.34	1870	1111.81

C	1872	1115.28	1874	1118.74	1876	1122.22	1878	1125.69	1878.44	1126.45
	1878.7	1156.41	1878	1161.77	1876.53	1173.07				
NC	0.025	0.025	0.025							
X1	690	10	1057.3	1141.3	408.17	434.4	422.9			
X3	10			1057.3	1894	1141.3	1894			
GR	1894	1000	1894	1014.18	1886	1057.29	1877	1057.3	1866	1079.3
GR	1866	1119.3	1877	1141.3	1886	1141.31	1894	1162.81	1894	1172.96
NC	0.025	0.025	0.025							
SB		1.56	2.6	90	40		1240	2	1866	1866
X1	700	8	1011.47	1095.49	132.78	172.81	153.08			
X2			1	1886	1894					
GR	1894	1000	1886	1011.47	1877	1011.48	1866	1033.48	1866	1073.48
GR	1877	1095.48	1886	1095.49	1894	1097.52				
NC	0.025	0.025	0.025							
X1	710	22	1055.32	1141.88	416	467.23	424.6			
GR	1887	1000	1887.65	1055.32	1886	1058.98	1884	1063.38	1882	1067.76
GR	1880	1072.17	1878	1076.59	1876.67	1079.53	1876.5	1091.93	1878	1098.6
GR	1878.2	1099.74	1880	1110.14	1880.28	1112.24	1882	1115.7	1884	1119.72
GR	1886	1123.75	1888	1127.78	1890	1131.82	1892	1135.86	1894	1139.91
GR	1894.9	1141.88	1896	1168.62						
NC	0.025	0.025	0.025							
X1	720	28	1031.02	1123.52	499.28	495.17	498.02			
[illegible]	1895.4	1000	1895.51	1008.85	1894	1013.03	1892	1018.46	1890.74	1021.86
GR	1890.3	1031.02	1890	1031.86	1888	1036.41	1886	1041.01	1884	1045.63
GR	1882	1050.25	1882	1050.99	1881.59	1059.51	1882	1063.99	1882.46	1068.23
GR	1882.7	1085.75	1884	1093.67	1884.05	1094.02	1885.72	1102.19	1886	1102.68
GR	1888	1106.25	1890	1109.82	1892	1113.4	1894	1117.01	1896	1120.66
GR	1897.5	1123.52	1898	1138.24	1898	1204.99				
NC	0.025	0.025	0.025							
X1	730	27	1056.08	1126.41	484.5	472.89	480.56			
GR	1895.5	980.55	1890	997.92	1888.44	1014.84	1888.81	1032	1890	1034.91
GR	1892	1040.78	1892.61	1042.69	1892.66	1056.08	1892	1058.03	1890	1063.82
GR	1888	1069.32	1887.87	1069.57	1887.34	1076.5	1886	1080.07	1885.41	1081.64
GR	1885.1	1105.73	1886	1106.9	1888	1109.69	1890	1112.46	1892	1115.21
GR	1894	1117.97	1896	1120.72	1898	1123.48	1900	1126.26	1900.12	1126.41
GR	1900.5	1149.64	1900	1152.55						
NC	0.025	0.025	0.025							
X1	740	30	1042.02	1119.91	502.08	483.58	492.38			
GR	1901.2	1000	1902	1005.26	1904	1021.59	1904.51	1025.97	1904	1027.47
GR	1902	1034.42	1900	1042.02	1900.03	1042.1	1898	1046.77	1896	1051.39
GR	1894	1056.04	1893.01	1058.37	1892.51	1063.92	1892	1064.96	1890	1068.86
GR	1889.5	1069.72	1889.67	1082.45	1889.35	1096.82	1890	1098.41	1892	1103.02
GR	1892.5	1104.29	1894	1106.26	1896	1108.92	1898	1111.43	1900	1113.86
GR	1902	1116.25	1904	1118.59	1905.14	1119.91	1904.81	1126.67	1904	1127.41

[illegible]	.025	0.025	0.025							
X1	750	40	1044.53	1148.05	361.65	431.03	391.69			
GR	1906.9	1000	1906	1004.65	1905.04	1009.47	1906	1015.43	1906.84	1019.12
GR	1906	1021.92	1904	1031.78	1903.79	1032.81	1903.79	1044.53	1902	1048.63
GR	1900	1053.26	1898	1057.91	1895.97	1062.64	1896	1063.05	1894.93	1077.63
GR	1894	1083.07	1893.44	1086.12	1893.85	1093.82	1894	1094.65	1895.88	1107.68
GR	1896	1108	1898	1113.7	1900	1119.39	1900.96	1122.14	1902	1123.57
GR	1904	1126.35	1906	1129.15	1908	1131.96	1910	1134.78	1912	1137.6
GR	1914	1140.41	1916	1143.23	1918	1146.05	1919.42	1148.05	1918	1155.65
GR	1916.8	1161.99	1916.93	1173.3	1916.59	1183.77	1916.83	1193	1918	1211.96
NC	0.025	0.025	0.025							
X1	760	24	1035.23	1131.59	409.52	457.63	428.24			
GR	1906.9	1000	1906.7	1035.23	1906	1036.91	1904	1042.08	1902	1047.23
GR	1901.2	1049.24	1900	1056.11	1898.24	1065.72	1898.23	1068.7	1899.02	1080.49
GR	1899.8	1088.61	1899.92	1101.11	1900	1101.27	1902	1105.14	1904	1109.01
GR	1906	1112.87	1908	1116.71	1910	1120.52	1912	1124.3	1914	1128.06
GR	1915.9	1131.59	1914.4	1139.1	1914	1153.98	1912.9	1195.72		
NC	0.025	0.025	0.025							
X1	770	24	1015.76	1126.99	456.52	419.22	434.78			
GR	1915	1000	1914	1015.76	1913.93	1016.79	1912	1022.95	1910	1029.33
GR	1908	1035.7	1906	1042.07	1905.12	1044.87	1904.51	1063.27	1904	1066.58
GR	1903.2	1072.95	1903.42	1081.93	1903.73	1095.61	1903.96	1105.84	1904	1105.97
GR	1906	1113.03	1906.63	1115.29	1908	1117.4	1910	1120.69	1912	1124.57
G	[illegible]913.1	1126.99	1912.81	1130.93	1912.89	1143.7	1914	1148.24		
NC	0.025	0.025	0.015							
X1	780	8	1058.72	1114.05	52.99	49.44	49.44			
X3	10			1058.72	1916.5	1114.05	1916.5			
GR	1916.4	1000	1916	1003.3	1914.9	1058.72	1903.78	1058.72	1903.78	1114.05
GR	1914	1114.05	1914	1121.8	1915.01	1149.26				
NC	0.025	0.025	0.015							
SB	1.25	1.56	2.6	80	55.33	5.33	400	0	1905.12	1903.78
X1	790	10	1028.58	1083.91	108.42	108.26	108.02			
X2			1	1913.12	1917.12			2		
X3	10			1028.58	1916	1083.91	1916			
GR	1916	1000	1915.8	1001.42	1915.93	1017.77	1914.87	1028.58	1905.12	1028.58
GR	1905.1	1083.91	1914.59	1083.91	1916	1104.86	1916.37	1109.9	1916	1131.78
NC	0.035	0.035	0.03							
X1	800	14	1012.48	1094.47	100.8	88.06	95.8			
X3	10			1000	1915.5	1094.47	1915.5			
GR	1914.6	1000	1914.21	1012.48	1914	1012.99	1912	1017.82	1910	1022.59
GR	1908	1027.3	1904.86	1031.73	1904.86	1053.16	1904.86	1061.2	1908	1072.68
GR	1910	1078.88	1912	1084.82	1914	1090.67	1915.12	1094.47		

	.035	0.035	0.03	0.1	0.3					
1	810	28	1144.23	1205.12	221.84	144.84	185.09			
R	1918	980.65	1917.34	990.58	1916	1000	1914	1016.18	1913.61	1019.48
R	1912	1086.58	1911.68	1097.61	1911.77	1130.03	1911.33	1144.23	1910.82	1158.38
R	1910	1162.77	1908	1167.25	1906	1172.16	1905.36	1173.67	1905.8	1185.18
R	1906	1185.5	1908	1188.52	1910	1192.61	1910.28	1194.53	1911.05	1205.12
R	1911.2	1228.44	1911.5	1247.06	1912	1258.22	1914	1295.39	1914.12	1296.38
R	1915.1	1324.03	1916	1338.5	1918	1370.57				

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	QLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	FLMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*PROF 1

CRITICAL DEPTH TO BE CALCULATED AT ALL CROSS SECTIONS
ALLOWABLE ERROR FOR CRITICAL DEPTH DETERMINATION (ALLDC) = 2.000 PERCENT OF THE DEPTH

CHV= .100 CEHV= .300

*SECNO 10.000									
10.000	8.37	1708.70	1707.40	1705.00	1710.19	1.48	.00	.00	1710.00
6400.0	.0	6400.0	.0	.0	654.9	.1	.0	.0	1708.60
.00	.00	9.77	.03	.000	.030	.030	.000	1700.33	1009.11
.004017	0.	0.	0.	0	14	5	.00	119.45	1128.56
*SECNO 20.000									
20.000	7.61	1710.73	1710.04	.00	1712.55	1.82	2.27	.10	1711.97
6400.0	.0	6400.0	.0	.0	591.5	.0	7.0	1.3	1713.45
.01	.00	10.82	.00	.000	.030	.000	.000	1703.12	1187.56
.005416	483.	489.	498.	2	12	0	.00	114.06	1301.62
*SECNO 30.000									
30.000	7.51	1713.36	1712.99	.00	1715.48	2.12	2.84	.09	1712.41
6400.0	27.4	6372.6	.0	11.7	544.1	.0	13.5	2.7	1713.61
.02	2.34	11.71	.00	.030	.030	.000	.000	1705.85	1028.67
.006014	495.	498.	504.	2	12	0	.00	125.10	1153.77
*SECNO 40.000									
40.000	9.07	1716.27	1715.79	.00	1718.18	1.91	2.67	.02	1716.00
6400.0	1.4	6177.9	220.7	1.5	548.8	55.2	20.1	4.3	1714.00
.04	.92	11.26	4.00	.030	.030	.030	.000	1707.20	1135.37
.004947	500.	492.	481.	2	8	0	.00	154.35	1289.72

*SECNO 50.000

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.40

50.000	9.46	1718.36	1716.06	.00	1719.32	.96	1.04	.10	1720.56
6400.0	.0	6400.0	.0	.0	815.2	.0	25.1	5.3	1720.00
.05	.00	7.85	.00	.000	.030	.000	.000	1708.90	1075.00
.002510	334.	306.	278.	2	15	0	.00	142.96	1217.96

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
ME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 60.000

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.45

60.000	9.73	1719.67	1717.29	.00	1720.20	.53	.84	.04	1718.01
6400.0	498.6	4971.7	929.7	199.2	769.7	335.3	37.2	8.4	1716.63
.07	2.50	6.46	2.77	.030	.030	.030	.000	1709.94	1002.76
.001193	500.	499.	502.	2	12	0	.00	396.87	1399.63

*SECNO 70.000

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

70.000	7.53	1719.53	1719.53	.00	1722.12	2.59	1.23	.62	1723.69
6400.0	.0	6400.0	.0	.0	495.4	.0	47.5	11.2	1719.59
.08	.00	12.92	.00	.000	.030	.000	.000	1712.00	1100.15
.007946	493.	498.	498.	0	12	0	.00	97.17	1197.32

*SECNO 80.000

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.54

80.000	8.83	1723.21	1721.50	.00	1724.56	1.35	2.31	.12	1723.19
6400.0	.0	6400.0	.0	.0	686.0	.0	53.9	12.3	1725.21
.10	.03	9.33	.00	.030	.030	.000	.000	1714.38	1146.51
.003339	456.	471.	482.	2	11	0	.00	115.23	1261.74

*SECNO 90.000

3301 HV CHANGED MORE THAN HVINS

90.000	9.58	1724.77	1723.80	.00	1726.63	1.85	1.91	.15	1724.64
6400.0	.4	6399.6	.0	.7	585.5	.0	60.9	13.6	1727.42
.11	.55	10.93	.00	.030	.030	.000	.000	1715.19	1046.26
.004785	495.	482.	465.	3	8	0	.00	110.73	1156.98

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
[illegible]	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
[illegible]IME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST
*SECNO 100.000									
100.000	7.72	1726.42	1724.67	.00	1727.81	1.40	1.14	.05	1728.00
6400.0	.0	6400.0	.0	.0	674.4	.0	65.2	14.3	1727.26
.12	.00	9.49	.00	.000	.030	.000	.000	1718.70	1026.65
.003204	290.	295.	300.	2	14	0	.00	104.36	1131.01
*SECNO 110.000									
3301 HV CHANGED MORE THAN HVINS									
7185 MINIMUM SPECIFIC ENERGY									
3720 CRITICAL DEPTH ASSUMED									
110.000	5.29	1725.79	1725.79	.00	1728.22	2.43	.06	.31	1728.00
6400.0	.0	6400.0	.0	.0	512.0	.0	65.5	14.4	1727.52
.12	.00	12.50	.00	.000	.015	.000	.000	1720.50	1027.80
.002026	26.	26.	26.	0	14	0	.00	106.34	1134.14
*SECNO 120.000									
7 [illegible]INIMUM SPECIFIC ENERGY									
3. [illegible]RITICAL DEPTH ASSUMED									
3470 ENCROACHMENT STATIONS= 1029.5 1136.5 TYPE= 1 TARGET= 107.000									
ELENCL= 1730.00 ELENCR= 1730.00									
3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1728.00 ELREA= 1730.00									
120.000	4.79	1726.69	1726.69	.00	1729.11	2.42	.19	.00	1728.00
6400.0	.0	6400.0	.0	.0	512.5	.0	66.6	14.6	1730.00
.12	.00	12.49	.00	.000	.015	.000	.000	1721.90	1029.49
.002207	89.	90.	93.	0	11	0	.00	107.00	1136.49
SPECIAL BRIDGE									
5227 DOWNSTREAM ELEV IS 1725.83 , NOT 1726.69 HYDRAULIC JUMP OCCURS DOWNSTREAM (IF LOW FLOW CONTROLS)									

38 XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
.90	1.56	2.60	145.00	107.00	7.00	500.00	.00	1722.53	1721.90

'SECNO 130.000
5280 CROSS SECTION 130.00 EXTENDED .83 FEET

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.85

PRESSURE FLOW

EGPRS	EGLWC	K3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
1730.66	1730.30	.00	0.	6400.	500.	500.	1727.53	1731.43	0.

3470 ENCROACHMENT STATIONS= 1035.8 1142.8 TYPE= 1 TARGET= 107.000
ELENCL= 1731.00 ELENCR= 1731.00

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1728.00 ELREA= 1731.00

0.000	6.99	1729.52	.00	.00	1730.66	1.14	1.55	.00	1728.00
00.0	.0	6400.0	.0	.0	748.4	.0	68.3	14.9	1731.00
.12	.00	8.55	.00	.000	.015	.000	.000	1722.53	1035.81
.000645	121.	120.	118.	3	0	0	.00	107.00	1142.81

*SECNO 140.000
3280 CROSS SECTION 140.00 EXTENDED 1.27 FEET

3470 ENCROACHMENT STATIONS= 1149.7 1265.6 TYPE= 1 TARGET= 115.910
ELENCL= 1730.00 ELENCR= 1730.00

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1728.41 ELREA= 1730.00

140.000	6.85	1729.45	1727.93	.00	1730.75	1.30	.05	.05	1728.41
6400.0	.0	6400.0	.0	.0	698.7	.0	69.4	15.1	1730.00
.13	.00	9.16	.00	.000	.015	.000	.000	1722.60	1149.72
.000808	65.	64.	64.	2	15	0	.00	115.91	1265.63

SECNO 150.000

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
[redacted]ME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

150.000	6.46	1729.99	1729.99	.00	1732.17	2.18	.73	.26	1731.69
6300.0	.0	6300.0	.0	.0	532.2	.0	76.3	16.4	1731.09
.14	.00	11.84	.00	.000	.020	.000	.000	1723.53	1024.14
.003737	491.	490.	489.	0	11	0	.00	124.87	1149.01

*SECNO 160.000

3301 HV CHANGED MORE THAN HVINS

160.000	6.50	1732.11	1731.56	.00	1733.75	1.64	1.53	.05	1733.26
6300.0	.0	6300.0	.0	.0	613.0	.0	82.9	17.9	1734.00
.15	.00	10.28	.00	.000	.020	.000	.000	1725.61	1045.54
.002537	501.	502.	503.	2	11	0	.00	132.85	1178.39

*[redacted]170.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

170.000	6.04	1733.34	1733.34	.00	1735.45	2.11	1.49	.14	1734.50
6300.0	.0	6300.0	.0	.0	540.6	.0	89.4	19.4	1735.09
.16	.00	11.65	.00	.000	.020	.000	.000	1727.30	1046.37
.003759	487.	487.	488.	0	11	0	.00	130.75	1177.12

*SECNO 180.000

180.000	5.61	1735.21	1735.03	.00	1737.18	1.97	1.72	.01	1736.58
6300.0	.0	6300.0	.0	.0	559.5	.0	95.6	20.8	1737.72
.18	.00	11.26	.00	.000	.020	.000	.000	1729.60	1041.60
.003261	491.	492.	492.	2	11	0	.00	127.87	1169.47

*SECNO 190.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

190.000	6.70	1739.49	1739.49	.00	1741.88	2.39	1.71	.13	1742.00
6300.0	.0	6300.0	.0	.0	508.1	.0	101.7	22.2	1741.63
.19	.00	12.40	.00	.000	.020	.000	.000	1732.79	1006.97
.003627	499.	498.	497.	0	11	0	.00	108.37	1115.34

[redacted]

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 200.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

200.000	6.16	1742.86	1742.86	.00	1745.31	2.45	1.79	.02	1746.00
6300.0	.0	6300.0	.0	.0	502.0	.0	107.4	23.4	1748.00
.20	.00	12.55	.00	.000	.020	.000	.000	1736.70	1007.81
.003603	494.	495.	497.	0	11	0	.00	104.30	1112.11

*SECNO 210.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

210.000	9.31	1746.83	1746.83	.00	1749.68	2.85	1.78	.12	1752.00
6300.0	.0	6300.0	.0	.0	465.2	.0	113.0	24.5	1753.31
.21	.00	13.54	.00	.000	.020	.000	.000	1737.52	1014.22
.003528	500.	500.	500.	0	14	0	.00	83.71	1097.93

*SECNO 220.000
7185 MINIMUM SPECIFIC ENERGY
[illegible]RITICAL DEPTH ASSUMED

[illegible]000	7.97	1751.93	1751.93	.00	1754.61	2.68	1.69	.02	1759.83
6300.0	.0	6300.0	.0	.0	479.2	.0	118.1	25.4	1757.77
.22	.00	13.15	.00	.000	.020	.000	.000	1743.96	1056.99
.003578	465.	477.	489.	0	15	0	.00	91.27	1148.26

*SECNO 230.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

230.000	8.28	1758.40	1758.40	.00	1761.19	2.78	1.75	.03	1763.36
6300.0	.0	6300.0	.0	.0	470.5	.0	123.5	26.4	1764.00
.23	.00	13.39	.00	.000	.020	.000	.000	1750.12	1061.81
.003514	490.	495.	499.	0	8	0	.00	86.22	1148.03

*SECNO 240.000

301 HV CHANGED MORE THAN HVINS

185 MINIMUM SPECIFIC ENERGY
720 CRITICAL DEPTH ASSUMED

240.000	5.18	1762.61	1762.61	.00	1764.88	2.26	1.77	.05	1774.34
6300.0	.0	6300.0	.0	.0	522.0	.0	129.1	27.6	1776.40
.24	.00	12.07	.00	.000	.020	.000	.000	1757.43	1048.58
.003668	496.	492.	489.	0	14	0	.00	116.82	1165.40

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 250.000
*185 MINIMUM SPECIFIC ENERGY
5720 CRITICAL DEPTH ASSUMED

250.000	5.05	1763.05	1763.05	.00	1765.39	2.34	.16	.02	1766.50
6300.0	.0	6300.0	.0	.0	513.2	.0	129.8	27.7	1766.67
.24	.00	12.28	.00	.000	.015	.000	.000	1758.00	1045.34
.002101	57.	59.	58.	0	8	0	.00	110.08	1155.42

*SECNO 260.000
*185 MINIMUM SPECIFIC ENERGY
5720 CRITICAL DEPTH ASSUMED

260.000	4.97	1766.97	1766.97	.00	1769.12	2.15	.00	.02	1768.00
6300.0	.0	6299.9	.1	.0	536.0	.1	129.8	27.7	1766.66
.24	.00	11.75	.95	.000	.015	.020	.000	1762.00	1043.60
.002196	1.	1.	1.	0	5	0	.00	128.59	1172.19

*SECNO 270.000
*185 MINIMUM SPECIFIC ENERGY
[illegible]ITICAL DEPTH ASSUMED

[illegible]000	4.86	1766.86	1766.86	.00	1769.28	2.42	.05	.08	1772.00
6300.0	.0	6300.0	.0	.0	504.7	.0	130.1	27.8	1771.04
.24	.00	12.48	.00	.000	.015	.000	.000	1762.00	1010.58
.002156	34.	22.	9.	0	8	0	.00	104.80	1115.37

SECNO 280.000
*185 MINIMUM SPECIFIC ENERGY
5720 CRITICAL DEPTH ASSUMED

280.000	4.89	1770.89	1770.89	.00	1773.30	2.41	.00	.00	1772.37
6300.0	.0	6300.0	.0	.0	505.9	.0	130.1	27.8	1772.20
.24	.00	12.45	.00	.000	.015	.000	.000	1766.00	1045.36
.002139	1.	1.	1.	0	5	0	.00	105.61	1150.97

SECNO 290.000
*185 MINIMUM SPECIFIC ENERGY
5720 CRITICAL DEPTH ASSUMED

470 ENCROACHMENT STATIONS= 1048.0 1150.9 TYPE= 1 TARGET= 102.930
ELENCL= 1775.00 ELENCR= 1775.00

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	RL	QLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1774.00 ELREA= 1775.00

290.000	4.86	1771.41	1771.41	.00	1773.87	2.46	.03	.02	1774.00
6300.0	.0	6300.0	.0	.0	500.6	.0	130.3	27.8	1775.00
.24	.00	12.58	.00	.000	.015	.000	.000	1766.55	1047.98
.002208	15.	15.	13.	0	5	0	.00	102.93	1150.91

SPECIAL BRIDGE

5227 DOWNSTREAM ELEV IS 1770.65 , NOT 1771.41 HYDRAULIC JUMP OCCURS DOWNSTREAM (IF LOW FLOW CONTROLS)

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	.90	1.56	2.60	106.00	103.02	5.02	588.00	.00	1766.92	1766.55

*SECNO 300.000

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.46

CLASS B LOW FLOW

3420 BRIDGE W.S.= 1771.78 BRIDGE VELOCITY= 12.74 CALCULATED CHANNEL AREA= 476.

EGPRS	EGLWC	H3	QWEIR	QLOW	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
1774.19	1774.61	.00	0.	6300.	588.	588.	1772.92	1776.92	0.

3470 ENCROACHMENT STATIONS= 1025.5 1128.6 TYPE= 1 TARGET= 103.020
ELENCL= 1775.19 ELENCR= 1775.56

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1775.12 ELREA= 1775.56

300.000	6.16	1773.08	.00	.00	1774.61	1.53	.74	.00	1775.12
6300.0	.0	6300.0	.0	.0	634.9	.0	131.6	28.1	1775.56
.24	.00	9.92	.00	.000	.015	.000	.000	1766.92	1025.54
.001032	103.	103.	99.	0	0	0	.00	103.02	1128.56

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST
*SECNO 310.000									
310.000	5.24	1773.02	1772.67	.00	1774.82	1.80	.13	.08	1775.68
6300.0	.0	6300.0	.0	.0	584.9	.0	133.0	28.4	1775.77
.25	.00	10.77	.00	.000	.015	.000	.000	1767.78	1031.30
.001633	103.	100.	106.	2	15	0	.00	131.04	1162.34
*SECNO 320.000									
*7185 MINIMUM SPECIFIC ENERGY									
5720 CRITICAL DEPTH ASSUMED									
320.000	6.59	1775.83	1775.83	.00	1778.13	2.30	1.15	.15	1778.00
6300.0	.0	6300.0	.0	.0	517.7	.0	139.2	29.7	1778.00
.26	.00	12.17	.00	.000	.020	.000	.000	1769.24	1031.46
.003649	490.	489.	488.	0	11	0	.00	114.58	1146.04
*SECNO 330.000									
*7185 MINIMUM SPECIFIC ENERGY									
5720 CRITICAL DEPTH ASSUMED									
330.000	7.07	1778.86	1778.86	.00	1781.22	2.35	1.82	.02	1780.94
[illegible]0.0	.0	6300.0	.0	.0	511.8	.0	145.1	31.0	1781.40
[illegible].27	.00	12.31	.00	.000	.020	.000	.000	1771.79	1037.34
.003649	501.	500.	501.	0	8	0	.00	110.82	1148.16
*SECNO 340.000									
*7185 MINIMUM SPECIFIC ENERGY									
5720 CRITICAL DEPTH ASSUMED									
340.000	7.48	1781.85	1781.85	.00	1784.18	2.33	1.82	.00	1782.39
6300.0	.0	6300.0	.0	.0	514.5	.0	151.0	32.3	1782.00
.28	.00	12.24	.00	.000	.020	.000	.000	1774.37	1003.10
.003670	496.	496.	496.	0	8	0	.00	112.87	1115.97
*SECNO 350.000									
*7185 MINIMUM SPECIFIC ENERGY									
5720 CRITICAL DEPTH ASSUMED									
350.000	7.59	1783.84	1783.84	.00	1786.34	2.50	1.58	.05	1787.10
6300.0	.0	6300.0	.0	.0	496.9	.0	156.1	33.4	1784.00
.29	.00	12.68	.00	.000	.020	.000	.000	1776.25	1055.14
.003560	460.	437.	420.	0	5	0	.00	99.87	1155.01

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 360.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 1014.1 1129.6 TYPE= 1 TARGET= 115.500
ELENCL= 1792.00 ELENCR= 1792.00

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1792.00 ELREA= 1792.00

360.000	6.39	1786.06	1786.06	.00	1788.58	2.51	1.13	.01	1792.00
6300.0	.0	6300.0	.0	.0	495.1	.0	159.6	34.1	1792.00
.30	.00	12.72	.00	.000	.020	.000	.000	1779.67	1027.81
.003601	342.	314.	294.	0	15	0	.00	100.08	1127.89

SPECIAL BRIDGE

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	.00	1.56	2.60	150.00	80.00	.00	943.00	1.50	1781.68	1779.67

*SECNO 370.000

6070,LOW FLOW BY NORMAL BRIDGE

EGPRS= .000 EGLWC= 1790.131 ELLC= 1791.680 PCWSE= 1786.061 ELTRD= 1803.160

3370 NORMAL BRIDGE, NRD= 0 MIN ELTRD= 1803.16 MAX ELLC= 1791.68

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 1019.9 1180.4 TYPE= 1 TARGET= 160.500
ELENCL= 1800.00 ELENCR= 1800.00

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1796.00 ELREA= 1800.00

370.000	6.08	1787.76	1787.76	.00	1790.11	2.35	.84	.02	1796.00
6300.0	.0	6300.0	.0	.0	512.6	.0	162.3	34.6	1800.00
.30	.00	12.29	.00	.000	.020	.000	.000	1781.68	1045.12
.003601	188.	232.	273.	0	15	0	.00	110.15	1155.27

*SECNO 380.000

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	OLOB	OCH	OROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 1091.3 1151.3 TYPE= 1 TARGET= 60.090
ELENCL= 1794.00 ELENCR= 1794.00

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1792.75 ELREA= 1794.00

380.000	7.42	1793.10	1793.10	.00	1796.62	3.52	.63	.35	1792.75
6300.0	.0	6300.0	.0	.0	418.2	.0	164.1	35.0	1794.00
.31	.00	15.06	.00	.000	.020	.000	.000	1785.68	1091.25
.003753	174.	171.	176.	0	11	0	.00	60.09	1151.34

*SECNO 390.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 1045.2 1103.4 TYPE= 1 TARGET= 58.300
ELENCL= 1797.00 ELENCR= 1797.00

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1794.81 ELREA= 1797.00

390.000	7.72	1794.92	1794.92	.00	1798.52	3.60	1.58	.02	1794.81
6300.0	.0	6300.0	.0	.0	413.7	.0	168.2	35.6	1797.00
.31	.00	15.23	.00	.000	.020	.000	.000	1787.20	1045.15
.003749	421.	421.	420.	0	8	0	.00	58.10	1103.25

*SECNO 400.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 1042.3 1103.7 TYPE= 1 TARGET= 61.390
ELENCL= 1797.00 ELENCR= 1797.00

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1796.25 ELREA= 1797.00

400.000	7.54	1796.14	1796.14	.00	1799.60	3.46	.80	.01	1796.25
6300.0	.0	6300.0	.0	.0	421.9	.0	170.2	35.8	1797.00
.32	.00	14.93	.00	.000	.020	.000	.000	1788.60	1042.37
.003696	216.	216.	218.	0	8	0	.00	60.99	1103.36

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	OLOB	OCH	OROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 410.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

410.000	8.94	1798.24	1798.24	.00	1801.57	3.33	.78	.01	1797.20
6300.0	28.9	6271.1	.0	11.7	427.1	.0	172.4	36.2	1798.24
.32	2.46	14.68	.00	.030	.020	.000	.000	1789.30	1025.06
.003361	237.	223.	213.	0	12	0	.00	75.96	1101.01

*SECNO 420.000

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

420.000	9.85	1800.71	1800.71	.00	1803.49	2.78	.62	.06	1798.49
6300.0	98.3	6149.1	52.6	30.3	454.1	32.8	174.8	36.8	1799.34
.33	3.24	13.54	1.60	.030	.020	.030	.000	1790.86	1126.45
.002436	228.	218.	213.	0	8	0	.00	149.83	1276.28

*SECNO 430.000

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 1034.8 1072.5 TYPE= 1 TARGET= 37.750
ELENCL= 1805.00 ELENCR= 1805.00

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1804.31 ELREA= 1805.00

430.000	9.52	1802.81	1802.81	.00	1807.58	4.77	.56	.60	1804.31
6300.0	.0	6300.0	.0	.0	359.3	.0	177.1	37.2	1805.00
.33	.00	17.53	.00	.000	.015	.000	.000	1793.29	1034.79
.002676	228.	221.	219.	0	8	0	.00	37.75	1072.54

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

PECIAL BRIDGE

227 DOWNSTREAM ELEV IS 1801.33 , NOT 1802.81 HYDRAULIC JUMP OCCURS DOWNSTREAM (IF LOW FLOW CONTROLS)

B	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	.90	1.56	2.60	78.00	37.75	1.75	246.00	.00	1794.30	1793.29

SECNO 440.000
RESSURE AND WEIR FLOW, Weir Submergence Based on TRAPEZOIDAL Shape

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
1818.70	1811.23	.00	2706.	3603.	246.	252.	1801.30	1802.38	78.

6685 20 TRIALS ATTEMPTED WSEL,CWSEL
6710 WSEL ASSUMED BASED ON MIN DIFF
6693 PROBABLE MINIMUM SPECIFIC ENERGY

6470 ENCROACHMENT STATIONS= 1048.1 1085.9 TYPE= 1 TARGET= 37.750
ELENCL= 1805.00 ELENCR= 1805.00

6495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1803.75 ELREA= 1805.00

440.000	9.55	1803.85	1803.80	.00	1808.59	4.74	.53	-.10	1803.75
6300.0	.0	6300.0	.0	.0	360.4	.0	178.7	37.4	1805.00
.33	.00	17.48	.00	.000	.015	.000	.000	1794.30	1048.13
.002647	183.	197.	206.	20	5	3	.00	37.75	1085.88

SECNO 450.000
6280 CROSS SECTION 450.00 EXTENDED 1.94 FEET

6301 HV CHANGED MORE THAN HVINS

6470 ENCROACHMENT STATIONS= 1056.9 1133.4 TYPE= 1 TARGET= 76.550
ELENCL= 1809.00 ELENCR= 1809.00

6495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1804.96 ELREA= 1809.00

450.000	12.84	1808.34	1804.77	.00	1809.41	1.08	.46	.37	1804.96
5800.0	.0	5800.0	.0	.0	696.1	.0	180.7	37.6	1809.00
.34	.00	8.33	.00	.000	.040	.000	.000	1795.50	1056.87
.002944	163.	163.	162.	4	8	0	.00	76.55	1133.42

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	RV	HL	OLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

SECNO 460.000
280 CROSS SECTION 460.00 EXTENDED 1.28 FEET

470 ENCROACHMENT STATIONS= 1048.2 1141.8 TYPE= 1 TARGET= 93.660
ELENCL= 1810.00 ELENCR= 1810.00

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1807.55 ELREA= 1810.00

460.000	11.72	1809.29	1806.55	.00	1810.35	1.06	.93	.00	1807.55
5800.0	.0	5800.0	.0	.0	702.3	.0	185.2	38.2	1810.00
.35	.00	8.26	.00	.000	.040	.000	.000	1797.57	1048.18
.003634	282.	285.	290.	2	19	0	.00	93.66	1141.84

*SECNO 470.000

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
[redacted]ITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 1035.4 1104.6 TYPE= 1 TARGET= 69.170
ELENCL= 1812.00 ELENCR= 1812.00

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1811.30 ELREA= 1812.00

470.000	10.99	1810.29	1810.29	.00	1813.45	3.16	1.75	.63	1811.30
5800.0	.0	5800.0	.0	.0	406.6	.0	188.7	38.7	1812.00
.35	.00	14.27	.00	.000	.040	.000	.000	1799.30	1038.28
.013868	277.	275.	273.	0	11	0	.00	64.43	1102.71

SPECIAL BRIDGE

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	.00	1.56	2.60	100.00	20.00	.00	288.00	2.00	1799.67	1799.29

*SECNO 480.000
3280 CROSS SECTION 480.00 EXTENDED 4.18 FEET

3301 HV CHANGED MORE THAN HVINS

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 2.10

RESSURE AND WEIR FLOW, Weir Submergence Based on TRAPEZOIDAL Shape

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
1820.11	1813.45	.00	1830.	4005.	288.	305.	1808.00	1811.30	100.

470 ENCROACHMENT STATIONS= 1050.0 1121.9 TYPE= 1 TARGET= 71.960
ELENCL= 1815.00 ELENCR= 1815.00

495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1811.06 ELREA= 1815.00

480.000	14.15	1813.82	.00	.00	1814.97	1.15	1.53	.00	1811.06
5800.0	.0	5800.0	.0	.0	672.6	.0	189.1	38.7	1815.00
.35	.00	8.62	.00	.000	.040	.000	.000	1799.67	1049.96
.157	29.	29.	29.	3	0	2	.00	71.96	1121.92

SECNO 490.000
280 CROSS SECTION 490.00 EXTENDED 2.62 FEET

301 HV CHANGED MORE THAN HVINS

302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .63

470 ENCROACHMENT STATIONS= 1050.0 1127.6 TYPE= 1 TARGET= 77.640
ELENCL= 1816.00 ELENCR= 1816.00

495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1815.04 ELREA= 1816.00

490.000	11.54	1815.20	1813.93	.00	1817.13	1.93	1.93	.23	1815.04
5800.0	.0	5800.0	.0	.0	519.9	.0	194.7	39.4	1816.00
.36	.05	11.16	.00	.025	.040	.000	.000	1803.66	1050.00
.007968	421.	405.	376.	3	19	0	.00	77.64	1127.64

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

SECNO 500.000
080 CROSS SECTION 500.00 EXTENDED .67 FEET

070 ENCROACHMENT STATIONS= 1035.6 1117.1 TYPE= 1 TARGET= 81.530
ELENCL= 1821.00 ELENCR= 1821.00

095 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1820.00 ELREA= 1821.00

500.000	11.50	1819.00	1817.86	.00	1821.00	2.00	3.85	.02	1820.00
5800.0	.0	5800.0	.0	.0	511.4	.0	200.2	40.3	1821.00
.38	.00	11.34	.00	.000	.040	.000	.000	1807.50	1037.67
.008504	476.	468.	455.	3	11	0	.00	79.43	1117.10

SECNO 510.000
185 MINIMUM SPECIFIC ENERGY
720 CRITICAL DEPTH ASSUMED

510.000	11.75	1822.04	1822.04	.00	1823.68	1.64	2.10	.04	1821.10
5800.0	48.7	5326.1	425.2	18.2	500.3	96.3	205.5	41.6	1820.60
.39	2.67	10.65	4.42	.020	.030	.020	.000	1810.29	1013.43
.05383	411.	413.	404.	0	8	0	.00	205.18	1218.61

SECNO 520.000

520.000	9.13	1823.95	1822.70	.00	1825.46	1.51	1.77	.01	1828.53
5800.0	.0	5800.0	.0	.0	588.5	.0	212.1	43.3	1829.41
.40	.00	9.86	.00	.000	.030	.000	.000	1814.82	1038.59
.004091	495.	477.	472.	3	14	0	.00	105.06	1143.65

SECNO 530.000

301 HV CHANGED MORE THAN HVINS

185 MINIMUM SPECIFIC ENERGY
720 CRITICAL DEPTH ASSUMED

530.000	9.16	1826.78	1826.78	.00	1829.24	2.45	2.26	.28	1831.69
5800.0	.0	5800.0	.0	.0	461.5	.0	216.9	44.2	1830.93
.41	.00	12.57	.00	.000	.030	.000	.000	1817.62	1029.35
.008341	372.	399.	424.	0	5	0	.00	95.65	1125.00

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	*QCH*	*QROB*	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

SECNO 540.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

540.000	8.31	1831.76	1831.76	.00	1834.43	2.67	4.08	.07	1834.90
5800.0	.0	5800.0	.0	.0	442.1	.0	222.0	45.2	1835.51
.42	.00	13.12	.00	.000	.030	.000	.000	1823.45	1027.12
.008330	460.	490.	523.	0	11	0	.00	84.49	1111.61

*SECNO 550.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

550.000	10.00	1836.66	1836.66	.00	1839.20	2.54	3.86	.01	1839.32
5800.0	.0	5800.0	.0	.0	453.2	.0	226.7	46.2	1838.31
.43	.00	12.80	.00	.000	.030	.000	.000	1826.66	1028.11
.008600	438.	456.	475.	0	11	0	.00	92.74	1120.84

*SECNO 560.000

560.000	11.65	1839.50	1839.24	.00	1841.81	2.31	2.59	.02	1845.43
5800.0	.0	5800.0	.0	.0	475.4	.0	230.2	46.9	1843.50
.44	.00	12.20	.00	.000	.030	.000	.000	1827.85	1029.17
.007179	332.	330.	327.	0	8	0	.00	90.56	1119.73

*SECNO 570.000

570.000	9.35	1841.04	1839.22	.00	1843.02	1.98	1.17	.03	1845.65
5800.0	.0	5800.0	.0	.0	514.1	.0	232.8	47.3	1847.00
.44	.00	11.28	.00	.000	.030	.000	.000	1831.69	1067.86
.003860	229.	228.	230.	2	14	0	.00	64.87	1132.73

*SECNO 580.000

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

580.000	6.94	1840.94	1840.94	.00	1844.13	3.18	.00	.36	1845.83
5800.0	.0	5800.0	.0	.0	405.1	.0	232.8	47.3	1847.09
.44	.00	14.32	.00	.000	.015	.000	.000	1834.00	1058.13
.002051	1.	1.	1.	0	15	0	.00	64.22	1122.35

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

SECNO 590.000
185 MINIMUM SPECIFIC ENERGY
720 CRITICAL DEPTH ASSUMED

470 ENCROACHMENT STATIONS= 1031.2 1085.0 TYPE= 1 TARGET= 53.840
ELENCL= 1848.00 ELENCR= 1848.00

495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1846.27 ELREA= 1848.00

590.000	7.09	1841.30	1841.30	.00	1844.88	3.58	.03	.12	1846.27
5800.0	.0	5800.0	.0	.0	381.8	.0	233.0	47.3	1848.00
.44	.00	15.19	.00	.000	.015	.000	.000	1834.21	1031.20
.002356	16.	16.	17.	0	8	0	.00	53.84	1085.04

SPECIAL BRIDGE

5227 DOWNSTREAM ELEV IS 1839.99 , NOT 1841.30 HYDRAULIC JUMP OCCURS DOWNSTREAM (IF LOW FLOW CONTROLS)

	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
.90	1.56	2.60	60.00	53.84	3.84	400.00	.00	1835.13	1834.21

*SECNO 600.000
5840, FLOW IS BY WEIR AND LOW FLOW

5301 HV CHANGED MORE THAN HVINS

5302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.51

5420 BRIDGE W.S.= 1844.25 BRIDGE VELOCITY= 12.07 CALCULATED CHANNEL AREA= 456.

EGPRS	EGLWC	H3	QWEIR	QLOW	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
1846.40	1846.51	2.94	0.	5781.	400.	400.	1843.13	1846.50	60.

5470 ENCROACHMENT STATIONS= 1081.8 1135.7 TYPE= 1 TARGET= 53.840
ELENCL= 1848.00 ELENCR= 1848.00

5495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1846.00 ELREA= 1848.00

600.000	9.34	1844.44	.00	.00	1846.51	2.07	1.63	.00	1846.00
5800.0	.0	5800.0	.0	.0	501.8	.0	233.9	47.4	1848.00
.44	.00	11.56	.00	.000	.015	.000	.000	1835.10	1081.85
.001031	93.	94.	95.	4	0	0	.00	53.84	1135.69

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

CNO 610.000
35 MINIMUM SPECIFIC ENERGY
20 CRITICAL DEPTH ASSUMED

70 ENCROACHMENT STATIONS= 1061.5 1207.5 TYPE= 1 TARGET= 146.060
LENCL= 1853.00 ELENCR= 1853.00

610.000	9.68	1852.30	1852.30	.00	1854.80	2.50	.25	.13	1851.91
5800.0	2.2	5382.6	415.1	2.1	410.1	104.7	236.4	47.9	1849.56
.45	1.05	13.13	3.97	.020	.015	.020	.000	1842.62	1073.26
.001287	231.	215.	202.	0	8	0	.00	131.09	1204.36

SECNO 620.000

265 DIVIDED FLOW

185 MINIMUM SPECIFIC ENERGY
720 CRITICAL DEPTH ASSUMED

620.000	9.83	1855.31	1855.31	.00	1857.66	2.35	.26	.02	1855.40
5800.0	.0	5322.5	477.4	.2	416.2	125.6	239.0	48.5	1852.46
[redacted]45	.24	12.79	3.80	.020	.015	.020	.000	1845.48	1021.74
.001208	224.	212.	202.	0	5	0	.00	141.80	1170.30

SECNO 630.000
280 CROSS SECTION 630.00 EXTENDED .66 FEET

185 MINIMUM SPECIFIC ENERGY
720 CRITICAL DEPTH ASSUMED

630.000	9.56	1857.66	1857.66	.00	1859.80	2.14	.25	.02	1855.06
5800.0	121.6	5170.6	507.8	32.3	417.9	138.7	241.8	49.2	1855.00
.46	3.77	12.37	3.66	.020	.015	.020	.000	1848.10	1012.01
.001093	229.	221.	214.	0	8	0	.00	153.98	1165.99

CHV= .100 CEHV= .300
*SECNO 640.000

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

640.000	9.28	1860.65	1860.65	.00	1863.91	3.25	.35	.33	1858.09
5800.0	146.1	5653.9	.0	29.0	386.3	.0	244.8	49.9	1861.23
.46	5.04	14.64	.00	.020	.015	.000	.000	1851.37	1012.10
[redacted]1695	252.	258.	262.	0	8	0	.00	66.64	1078.73

*SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 650.000
*185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 1035.3 1088.0 TYPE= 1 TARGET= 52.670
ELENCL= 1867.00 ELENCR= 1867.00

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1866.17 ELREA= 1867.00

650.000	7.20	1861.00	1861.00	.00	1864.63	3.64	.42	.12	1866.17
5800.0	.0	5800.0	.0	.0	379.0	.0	246.7	50.2	1867.00
.47	.00	15.30	.00	.000	.015	.000	.000	1853.80	1035.35
.002370	197.	211.	226.	0	15	0	.00	52.67	1088.02

SPECIAL BRIDGE

3227 DOWNSTREAM ELEV IS 1859.85 , NOT 1861.00 HYDRAULIC JUMP OCCURS DOWNSTREAM (IF LOW FLOW CONTROLS)

	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
.90	1.56	2.60	150.00	52.67	2.67	400.00	.00	1856.17	1853.80

*SECNO 660.000

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.45

CLASS B LOW FLOW

3420 BRIDGE W.S.= 1862.46 BRIDGE VELOCITY= 15.52 CALCULATED CHANNEL AREA= 314.

EGPRS	EGLWC	H3	QWEIR	QLOW	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
1866.09	1867.56	.00	0.	5800.	400.	400.	1864.17	1869.17	0.

3470 ENCROACHMENT STATIONS= 1077.3 1129.9 TYPE= 1 TARGET= 52.670
ELENCL= 1870.00 ELENCR= 1870.00

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1869.67 ELREA= 1870.00

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IOC	ICONT	CORAR	TOPWID	ENDST
660.000	9.24	1865.34	.00	.00	1867.56	2.22	2.93	.00	1869.67
5800.0	.0	5800.0	.0	.0	484.6	.0	248.6	50.4	1870.00
.47	.00	11.97	.00	.000	.015	.000	.000	1856.10	1077.26
.001128	191.	192.	191.	0	0	0	.00	52.67	1129.93

*SECNO 670.000

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

670.000	7.49	1866.49	1866.49	.00	1869.36	2.87	.95	.19	1874.27
5500.0	.0	5500.0	.0	.0	404.4	.0	253.2	51.1	1874.29
.48	.00	13.60	.00	.000	.025	.000	.000	1859.00	1084.90
.005530	476.	453.	439.	0	15	0	.00	71.51	1156.41

*SECNO 680.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

680.000	9.22	1871.82	1871.82	.00	1874.94	3.13	2.54	.08	1880.87
5500.0	.0	5500.0	.0	.0	387.6	.0	257.4	51.8	1878.44
.49	.00	14.19	.00	.000	.025	.000	.000	1862.60	1051.81
.005493	479.	462.	448.	0	11	0	.00	63.15	1114.96

*SECNO 690.000

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.42

3470 ENCROACHMENT STATIONS= 1057.3 1141.3 TYPE= 1 TARGET= 84.000
ELENCL= 1894.00 ELENCR= 1894.00

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1877.00 ELREA= 1894.00

690.000	8.87	1874.87	1873.33	.00	1876.66	1.79	1.59	.13	1877.00
5500.0	.0	5500.0	.0	.0	512.4	.0	261.8	52.5	1894.00
.50	.00	10.73	.00	.000	.025	.000	.000	1866.00	1061.55
.002727	408.	423.	434.	3	15	0	.00	75.49	1137.05

[redacted]NO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

ECIAL BRIDGE

XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
.00	1.56	2.60	90.00	40.00	.00	1240.00	2.00	1866.00	1866.00

SECNO 700.000

370,LOW FLOW BY NORMAL BRIDGE

GPRS= .000 EGLWC= 1876.664 ELLC= 1886.000 PCWSE= 1874.875 ELTRD= 1894.000

370 NORMAL BRIDGE, NRD= 0 MIN ELTRD= 1894.00 MAX ELLC= 1886.00

700.000	9.60	1875.60	1873.33	.00	1877.06	1.45	.36	.03	1886.00
5500.0	.0	5500.0	.0	.0	568.2	.0	263.7	52.7	1886.00
.51	.00	9.68	.00	.000	.025	.000	.000	1866.00	1014.28
.002037	133.	153.	173.	3	19	0	.00	78.39	1092.68

[redacted]710.000

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

710.000	9.42	1885.92	1885.92	.00	1888.98	3.06	1.33	.48	1887.65
5500.0	.0	5500.0	.0	.0	391.6	.0	268.4	53.4	1894.90
.52	.00	14.04	.00	.000	.025	.000	.000	1876.50	1059.17
.005417	416.	425.	467.	0	8	0	.00	64.41	1123.58

*SECNO 720.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

720.000	7.74	1889.33	1889.33	.00	1892.11	2.78	2.73	.03	1890.30
5500.0	.0	5500.0	.0	.0	411.0	.0	273.0	54.2	1897.50
.53	.00	13.38	.00	.000	.025	.000	.000	1881.59	1033.38
.005533	499.	498.	495.	0	15	0	.00	75.25	1108.63

*SECNO 730.000

3301 HV CHANGED MORE THAN HVINS

[redacted]

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
[redacted]	OLOB	OCH	OROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
[redacted]ME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

730.000	7.69	1892.79	1892.79	.00	1894.82	2.02	2.47	.08	1892.66
5500.0	1557.3	3942.7	.0	167.8	324.5	.0	278.0	55.3	1900.12
.54	9.28	12.15	.00	.025	.025	.000	.000	1885.10	989.10
.004791	485.	481.	473.	0	5	0	.00	127.21	1116.31

*SECNO 740.000

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

740.000	8.50	1897.85	1897.85	.00	1900.93	3.08	2.53	.32	1900.00
5500.0	.0	5500.0	.0	.0	390.7	.0	283.0	56.4	1905.14
.55	.00	14.08	.00	.000	.025	.000	.000	1889.35	1047.11
.005489	502.	492.	484.	0	8	0	.00	64.13	1111.24

[redacted] 750.000
7[redacted]NIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

750.000	8.37	1901.81	1901.81	.00	1904.64	2.83	2.17	.02	1903.79
5500.0	.0	5500.0	.0	.0	407.5	.0	286.6	57.0	1919.42
.56	.00	13.50	.00	.000	.025	.000	.000	1893.44	1049.07
.005581	362.	392.	431.	0	5	0	.00	74.23	1123.31

*SECNO 760.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

760.000	7.79	1906.02	1906.02	.00	1908.81	2.79	2.40	.00	1906.70
5500.0	.0	5500.0	.0	.0	410.3	.0	290.6	57.8	1915.90
.56	.00	13.40	.00	.000	.025	.000	.000	1898.23	1036.86
.005630	410.	428.	458.	0	9	0	.00	76.05	1112.91

*SECNO 770.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

770.000	6.57	1909.77	1909.77	.00	1912.24	2.46	2.45	.03	1914.00
5500.0	.0	5500.0	.0	.0	436.8	.0	294.8	58.6	1913.10
.57	.00	12.59	.00	.000	.025	.000	.000	1903.20	1030.05
.005652	457.	435.	419.	0	15	0	.00	90.26	1120.32

[redacted]

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 780.000

5301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

5470 ENCROACHMENT STATIONS= 1058.7 1114.1 TYPE= 1 TARGET= 55.330
ELENCL= 1916.50 ELENCR= 1916.50

5495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1914.90 ELREA= 1916.50

780.000	6.72	1910.50	1910.50	.00	1913.90	3.40	.17	.28	1914.90
5500.0	.0	5500.0	.0	.0	371.9	.0	295.3	58.7	1916.50
.57	.00	14.79	.00	.000	.015	.000	.000	1903.78	1058.72
.002347	53.	49.	49.	0	8	0	.00	55.33	1114.05

SPECIAL BRIDGE

5220 DOWNSTREAM ELEV IS 1909.08 , NOT 1910.50 HYDRAULIC JUMP OCCURS DOWNSTREAM (IF LOW FLOW CONTROLS)

SB XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
1.25	1.56	2.60	80.00	55.33	5.33	400.00	.00	1905.12	1903.78

*SECNO 790.000

5301 HV CHANGED MORE THAN HVINS

5302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.72

CLASS B LOW FLOW

5420 BRIDGE W.S.= 1911.67 BRIDGE VELOCITY= 15.25 CALCULATED CHANNEL AREA= 327.

EGPRS	EGLWC	H3	QWEIR	QLOW	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
1915.08	1916.39	.00	0.	5500.	400.	400.	1913.12	1917.12	0.

5470 ENCROACHMENT STATIONS= 1028.6 1083.9 TYPE= 1 TARGET= 55.330
ELENCL= 1916.00 ELENCR= 1916.00

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1914.87 ELREA= 1916.00

790.000	9.63	1914.73	.00	.00	1916.39	1.66	2.49	.00	1914.87
5500.0	.0	5500.0	.0	.0	532.3	.0	296.4	58.8	1916.00
.58	.00	10.33	.00	.000	.015	.000	.000	1905.10	1028.58
.000791	108.	108.	108.	0	0	0	.00	55.33	1083.91

*SECNO 800.000
3280 CROSS SECTION 800.00 EXTENDED .05 FEET

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .53

3470 ENCROACHMENT STATIONS= 1000.0 1094.5 TYPE= 1 TARGET= 94.470
ELENCL= 1915.50 ELENCR= 1915.50

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1914.21 ELREA= 1915.50

.000	10.31	1915.17	1912.90	.00	1916.55	1.38	.13	.03	1914.21
5500.0	17.7	5482.3	.0	9.6	581.3	.0	297.6	59.0	1915.50
.58	1.84	9.43	.00	.035	.030	.000	.000	1904.86	1000.00
.002830	101.	96.	88.	2	15	0	.00	94.47	1094.47

CCHV= .100 CEHV= .300
*SECNO 810.000

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 2.02

810.000	11.29	1916.65	1914.06	.00	1916.89	.24	.23	.11	1911.33
5500.0	1697.2	2353.7	1449.1	580.4	471.5	495.9	302.2	60.0	1911.05
.59	2.92	4.99	2.92	.035	.030	.035	.000	1905.36	995.44
.000695	222.	185.	145.	3	9	0	.00	353.45	1348.89

THIS RUN EXECUTED 06OCT97 11:16:13

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HEC-2 WATER SURFACE PROFILES

Version 4.6.2; May 1991
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NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

FLOODPLAIN DELINEATION

SUMMARY PRINTOUT TABLE 100

	SECNO	EGLWC	ELLC	EGPRS	ELTRD	QPR	QWEIR	CLASS	H3	DEPTH	CWSEL	VCH	EG
*	130.000	1730.30	1727.53	1730.66	1731.43	6400.00	.00	10.00	.00	6.99	1729.52	8.55	1730.66
*	300.000	1774.61	1772.92	1774.19	1776.92	6300.00	.00	2.00	.00	6.16	1773.08	9.92	1774.61
*	370.000	1790.13	1791.68	.00	1803.16	6300.00	.00	59.00	.00	6.08	1787.76	12.29	1790.11
*	440.000	1811.23	1801.30	1818.70	1802.38	3603.15	2705.88	30.00	.00	9.55	1803.85	17.48	1808.59
*	480.000	1813.45	1808.00	1820.11	1811.30	4005.47	1830.21	30.00	.00	14.15	1813.82	8.62	1814.97
*	600.000	1846.51	1843.13	1846.40	1846.50	5780.91	.16	15.00	2.94	9.34	1844.44	11.56	1846.51
*	660.000	1867.56	1864.17	1866.09	1869.17	5800.00	.00	2.00	.00	9.24	1865.34	11.97	1867.56
	700.000	1876.66	1886.00	.00	1894.00	5500.00	.00	59.00	.00	9.60	1875.60	9.68	1877.06
*	790.000	1916.39	1913.12	1915.08	1917.12	5500.00	.00	2.00	.00	9.63	1914.73	10.33	1916.39

)PLAIN DELINEATION

SUMMARY PRINTOUT TABLE 150

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH	AREA	.01K
	10.000	.00	.00	.00	1700.33	6400.00	1708.70	1707.40	1710.19	40.17	9.77	654.99	1009.81
	20.000	488.53	.00	.00	1703.12	6400.00	1710.73	1710.04	1712.55	54.16	10.82	591.46	869.66
	30.000	498.03	.00	.00	1705.85	6400.00	1713.36	1712.99	1715.48	60.14	11.71	555.76	825.31
	40.000	491.57	.00	.00	1707.20	6400.00	1716.27	1715.79	1718.18	49.47	11.26	605.53	909.92
*	50.000	305.60	.00	.00	1708.90	6400.00	1718.36	1716.06	1719.32	25.10	7.85	815.17	1277.56
*	60.000	499.27	.00	.00	1709.94	6400.00	1719.67	1717.29	1720.20	11.93	6.46	1304.23	1852.60
*	70.000	497.95	.00	.00	1712.00	6400.00	1719.53	1719.53	1722.12	79.46	12.92	495.38	717.97
*	80.000	470.68	.00	.00	1714.38	6400.00	1723.21	1721.50	1724.56	33.39	9.33	685.96	1107.62
	90.000	482.19	.00	.00	1715.19	6400.00	1724.77	1723.80	1726.63	47.85	10.93	586.21	925.18
	100.000	295.13	.00	.00	1718.70	6400.00	1726.42	1724.67	1727.81	32.04	9.49	674.45	1130.66
*	110.000	25.69	.00	.00	1720.50	6400.00	1725.79	1725.79	1728.22	20.26	12.50	512.01	1421.91
*	120.000	90.11	.00	.00	1721.90	6400.00	1726.69	1726.69	1729.11	22.07	12.49	512.45	1362.37
*	130.000	119.69	1731.43	1727.53	1722.53	6400.00	1729.52	.00	1730.66	6.45	8.55	748.45	2519.99
	140.000	64.14	.00	.00	1722.60	6400.00	1729.45	1727.93	1730.75	8.08	9.16	698.74	2252.04
*	150.000	489.94	.00	.00	1723.53	6300.00	1729.99	1729.99	1732.17	37.37	11.84	532.17	1030.53
	160.000	501.51	.00	.00	1725.61	6300.00	1732.11	1731.56	1733.75	25.37	10.28	612.98	1250.86
•	170.000	487.26	.00	.00	1727.30	6300.00	1733.34	1733.34	1735.45	37.59	11.65	540.60	1027.52
	180.000	491.83	.00	.00	1729.60	6300.00	1735.21	1735.03	1737.18	32.61	11.26	559.45	1103.29
*	190.000	497.74	.00	.00	1732.79	6300.00	1739.49	1739.49	1741.88	36.27	12.40	508.15	1046.09
•	200.000	495.37	.00	.00	1736.70	6300.00	1742.86	1742.86	1745.31	36.03	12.55	501.99	1049.50
•	210.000	500.38	.00	.00	1737.52	6300.00	1746.83	1746.83	1749.68	35.28	13.54	465.25	1060.72
*	220.000	476.72	.00	.00	1743.96	6300.00	1751.93	1751.93	1754.61	35.78	13.15	479.23	1053.22
•	230.000	494.76	.00	.00	1750.12	6300.00	1758.40	1758.40	1761.19	35.14	13.39	470.48	1062.73
•	240.000	492.00	.00	.00	1757.43	6300.00	1762.61	1762.61	1764.88	36.68	12.07	521.97	1040.16

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH	AREA	.01K
*	250.000	58.60	.00	.00	1758.00	6300.00	1763.05	1763.05	1765.39	21.01	12.28	513.16	1374.32
*	260.000	1.00	.00	.00	1762.00	6300.00	1766.97	1766.97	1769.12	21.96	11.75	536.10	1344.52
*	270.000	21.92	.00	.00	1762.00	6300.00	1766.86	1766.86	1769.28	21.56	12.48	504.71	1356.90
*	280.000	1.00	.00	.00	1766.00	6300.00	1770.89	1770.89	1773.30	21.39	12.45	505.92	1362.04
*	290.000	14.95	.00	.00	1766.55	6300.00	1771.41	1771.41	1773.87	22.08	12.58	500.64	1340.65
*	300.000	102.75	1776.92	1772.92	1766.92	6300.00	1773.08	.00	1774.61	10.32	9.92	634.90	1960.95
	310.000	100.28	.00	.00	1767.78	6300.00	1773.02	1772.67	1774.82	16.33	10.77	584.86	1558.77
*	320.000	489.10	.00	.00	1769.24	6300.00	1775.83	1775.83	1778.13	36.49	12.17	517.70	1042.95
*	330.000	500.10	.00	.00	1771.79	6300.00	1778.86	1778.86	1781.22	36.49	12.31	511.82	1042.99
*	340.000	496.21	.00	.00	1774.37	6300.00	1781.85	1781.85	1784.18	36.70	12.24	514.52	1039.97
*	350.000	436.71	.00	.00	1776.25	6300.00	1783.84	1783.84	1786.34	35.60	12.68	496.89	1055.87
*	360.000	314.29	.00	.00	1779.67	6300.00	1786.06	1786.06	1788.58	36.01	12.72	495.11	1049.91
*	370.000	232.15	1803.16	1791.68	1781.68	6300.00	1787.76	1787.76	1790.11	36.01	12.29	512.65	1049.85
*	380.000	170.96	.00	.00	1785.68	6300.00	1793.10	1793.10	1796.62	37.53	15.06	418.21	1028.38
*	390.000	420.90	.00	.00	1787.20	6300.00	1794.92	1794.92	1798.52	37.49	15.23	413.68	1028.90
*	400.000	216.12	.00	.00	1788.60	6300.00	1796.14	1796.14	1799.60	36.96	14.93	421.85	1036.24
*	410.000	222.64	.00	.00	1789.30	6300.00	1798.24	1798.24	1801.57	33.61	14.68	438.82	1086.66
*	420.000	218.15	.00	.00	1790.86	6300.00	1800.71	1800.71	1803.49	24.36	13.54	517.22	1276.55
*	430.000	221.27	.00	.00	1793.29	6300.00	1802.81	1802.81	1807.58	26.76	17.53	359.32	1217.88
*	440.000	197.38	1802.38	1801.30	1794.30	6300.00	1803.85	1803.80	1808.59	26.47	17.48	360.40	1224.55
	450.000	163.47	.00	.00	1795.50	5800.00	1808.34	1804.77	1809.41	29.44	8.33	696.14	1068.91
	460.000	285.08	.00	.00	1797.57	5800.00	1809.29	1806.55	1810.35	36.34	8.26	702.34	962.09
	470.000	275.07	.00	.00	1799.30	5800.00	1810.29	1810.29	1813.45	138.68	14.27	406.58	492.51
	480.000	29.16	1811.30	1808.00	1799.67	5800.00	1813.82	.00	1814.97	31.57	8.62	672.62	1032.30
	490.000	404.91	.00	.00	1803.66	5800.00	1815.20	1813.93	1817.13	79.68	11.16	519.90	649.77
	500.000	467.90	.00	.00	1807.50	5800.00	1819.00	1817.86	1821.00	85.04	11.34	511.37	628.96

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH	ARLA	.01K
*	510.000	413.47	.00	.00	1810.29	5800.00	1822.04	1822.04	1823.68	33.83	10.65	614.81	997.24
	520.000	477.37	.00	.00	1814.82	5800.00	1823.95	1822.70	1825.46	40.91	9.86	588.48	906.77
*	530.000	399.20	.00	.00	1817.62	5800.00	1826.78	1826.78	1829.24	83.41	12.57	461.47	635.06
*	540.000	489.72	.00	.00	1823.45	5800.00	1831.76	1831.76	1834.43	83.30	13.12	442.12	635.50
*	550.000	456.26	.00	.00	1826.66	5800.00	1836.66	1836.66	1839.20	86.00	12.80	453.18	625.44
	560.000	330.24	.00	.00	1827.85	5800.00	1839.50	1839.24	1841.81	71.79	12.20	475.41	684.51
	570.000	228.38	.00	.00	1831.69	5800.00	1841.04	1839.22	1843.02	38.60	11.28	514.15	933.54
*	580.000	1.00	.00	.00	1834.00	5800.00	1840.94	1840.94	1844.13	20.51	14.32	405.06	1280.79
*	590.000	15.77	.00	.00	1834.21	5800.00	1841.30	1841.30	1844.88	23.56	15.19	381.84	1194.84
*	600.000	93.51	1846.50	1843.13	1835.10	5800.00	1844.44	.00	1846.51	10.31	11.56	501.84	1806.12
*	610.000	215.38	.00	.00	1842.62	5800.00	1852.30	1852.30	1854.80	12.87	13.13	516.84	1616.89
*	620.000	212.31	.00	.00	1845.48	5800.00	1855.31	1855.31	1857.66	12.08	12.79	541.92	1668.78
	630.000	221.03	.00	.00	1848.10	5800.00	1857.66	1857.66	1859.80	10.93	12.37	588.88	1754.17
*	640.000	258.21	.00	.00	1851.37	5800.00	1860.65	1860.65	1863.91	16.95	14.64	415.21	1408.60
*	650.000	211.31	.00	.00	1853.80	5800.00	1861.00	1861.00	1864.63	23.70	15.30	378.99	1191.31
*	660.000	191.78	1869.17	1864.17	1856.10	5800.00	1865.34	.00	1867.56	11.28	11.97	484.63	1726.55
*	670.000	452.82	.00	.00	1859.00	5500.00	1866.49	1866.49	1869.36	55.30	13.60	404.44	739.57
*	680.000	461.54	.00	.00	1862.60	5500.00	1871.82	1871.82	1874.94	54.93	14.19	387.58	742.12
*	690.000	422.90	.00	.00	1866.00	5500.00	1874.87	1873.33	1876.66	27.27	10.73	512.41	1053.31
	700.000	153.08	1894.00	1886.00	1866.00	5500.00	1875.60	1873.33	1877.06	20.37	9.68	568.21	1218.51
*	710.000	424.60	.00	.00	1876.50	5500.00	1885.92	1885.92	1888.98	54.17	14.04	391.63	747.29
	720.000	498.02	.00	.00	1881.59	5500.00	1889.33	1889.33	1892.11	55.33	13.38	410.97	739.40
	730.000	480.56	.00	.00	1885.10	5500.00	1892.79	1892.79	1894.82	47.91	12.15	492.26	794.59
	740.000	492.38	.00	.00	1889.35	5500.00	1897.85	1897.85	1900.93	54.89	14.08	390.66	742.38
	750.000	391.69	.00	.00	1893.44	5500.00	1901.81	1901.81	1904.64	55.81	13.50	407.50	736.20
	760.000	428.24	.00	.00	1898.23	5500.00	1906.02	1906.02	1908.81	56.30	13.40	410.34	733.03

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH	AREA	.01K
*	770.000	434.78	.00	.00	1903.20	5500.00	1909.77	1909.77	1912.24	56.52	12.59	436.79	731.56
*	780.000	49.44	.00	.00	1903.78	5500.00	1910.50	1910.50	1913.90	23.47	14.79	371.91	1135.21
*	790.000	108.02	1917.12	1913.12	1905.10	5500.00	1914.75	.00	1916.39	7.91	10.33	532.29	1955.06
*	800.000	95.80	.00	.00	1904.86	5500.00	1915.17	1912.90	1916.55	28.30	9.43	590.89	1033.90
*	810.000	185.09	.00	.00	1905.36	5500.00	1916.65	1914.06	1916.89	6.95	4.99	1547.86	2086.34

FLOODPLAIN DELINEATION

SUMMARY PRINTOUT TABLE 150

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
	10.000	6400.00	1708.70	.00	.00	3.70	119.45	.00
	20.000	6400.00	1710.73	.00	2.03	.00	114.06	488.53
	30.000	6400.00	1713.36	.00	2.63	.00	125.10	498.03
	40.000	6400.00	1716.27	.00	2.91	.00	154.35	491.57
*	50.000	6400.00	1718.36	.00	2.09	.00	142.96	305.60
*	60.000	6400.00	1719.67	.00	1.31	.00	396.87	499.27
*	70.000	6400.00	1719.53	.00	-.14	.00	97.17	497.95
*	80.000	6400.00	1723.21	.00	3.68	.00	115.23	470.68
	90.000	6400.00	1724.77	.00	1.56	.00	110.73	482.19
	100.000	6400.00	1726.42	.00	1.65	.00	104.36	295.13
	110.000	6400.00	1725.79	.00	-.62	.00	106.34	25.69
*	120.000	6400.00	1726.69	.00	.90	.00	107.00	90.11
*	130.000	6400.00	1729.52	.00	2.83	.00	107.00	119.69
	140.000	6400.00	1729.45	.00	-.07	.00	115.91	64.14
*	150.000	6300.00	1729.99	.00	.54	.00	124.87	489.94
	160.000	6300.00	1732.11	.00	2.12	.00	132.85	501.51
*	170.000	6300.00	1733.34	.00	1.23	.00	130.75	487.26
	180.000	6300.00	1735.21	.00	1.87	.00	127.87	491.83
*	190.000	6300.00	1739.49	.00	4.28	.00	108.37	497.74
*	200.000	6300.00	1742.86	.00	3.37	.00	104.30	495.37
*	210.000	6300.00	1746.83	.00	3.97	.00	83.71	500.38
*	220.000	6300.00	1751.93	.00	5.10	.00	91.27	476.72
*	230.000	6300.00	1758.40	.00	6.47	.00	86.22	494.76
	240.000	6300.00	1762.61	.00	4.21	.00	116.82	492.00

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
*	250.000	6300.00	1763.05	.00	.43	.00	110.08	58.60
*	260.000	6300.00	1766.97	.00	3.93	.00	128.59	1.00
*	270.000	6300.00	1766.86	.00	-.12	.00	104.80	21.92
*	280.000	6300.00	1770.89	.00	4.03	.00	105.61	1.00
*	290.000	6300.00	1771.41	.00	.52	.00	102.93	14.95
*	300.000	6300.00	1773.08	.00	1.67	.00	103.02	102.75
	310.000	6300.00	1773.02	.00	-.06	.00	131.04	100.28
*	320.000	6300.00	1775.83	.00	2.81	.00	114.58	489.10
*	330.000	6300.00	1778.86	.00	3.04	.00	110.82	500.10
*	340.000	6300.00	1781.85	.00	2.99	.00	112.87	496.21
*	350.000	6300.00	1783.84	.00	1.99	.00	99.87	436.71
*	360.000	6300.00	1786.06	.00	2.22	.00	100.08	314.29
*	370.000	6300.00	1787.76	.00	1.70	.00	110.15	232.15
*	380.000	6300.00	1793.10	.00	5.34	.00	60.09	170.96
*	390.000	6300.00	1794.92	.00	1.82	.00	58.10	420.90
*	400.000	6300.00	1796.14	.00	1.21	.00	60.99	216.12
*	410.000	6300.00	1798.24	.00	2.10	.00	75.96	222.64
*	420.000	6300.00	1800.71	.00	2.47	.00	149.83	218.15
*	430.000	6300.00	1802.81	.00	2.10	.00	37.75	221.27
*	440.000	6300.00	1803.85	.00	1.04	.00	37.75	197.38
	450.000	5800.00	1808.34	.00	4.49	.00	76.55	163.47
	460.000	5800.00	1809.29	.00	.95	.00	93.66	285.08
*	470.000	5800.00	1810.29	.00	1.00	.00	64.43	275.07
*	480.000	5800.00	1813.82	.00	3.53	.00	71.96	29.16
*	490.000	5800.00	1815.20	.00	1.38	.00	77.64	404.91
	500.000	5800.00	1819.00	.00	3.81	.00	79.43	467.90

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCh
*	510.000	5800.00	1822.04	.00	3.03	.00	205.18	413.47
	520.000	5800.00	1823.95	.00	1.92	.00	105.06	477.37
*	530.000	5800.00	1826.78	.00	2.83	.00	95.65	399.20
*	540.000	5800.00	1831.76	.00	4.97	.00	84.49	489.72
*	550.000	5800.00	1836.66	.00	4.90	.00	92.74	456.26
	560.000	5800.00	1839.50	.00	2.85	.00	90.56	330.24
	570.000	5800.00	1841.04	.00	1.54	.00	64.87	228.38
*	580.000	5800.00	1840.94	.00	-.10	.00	64.22	1.00
*	590.000	5800.00	1841.30	.00	.36	.00	53.84	15.77
*	600.000	5800.00	1844.44	.00	3.13	.00	53.84	93.51
*	610.000	5800.00	1852.30	.00	7.87	.00	131.09	215.38
*	620.000	5800.00	1855.31	.00	3.01	.00	141.80	212.31
*	630.000	5800.00	1857.66	.00	2.34	.00	153.98	221.03
*	640.000	5800.00	1860.65	.00	3.00	.00	66.64	258.21
*	650.000	5800.00	1861.00	.00	.34	.00	52.67	211.31
*	660.000	5800.00	1865.34	.00	4.34	.00	52.67	191.78
*	670.000	5500.00	1866.49	.00	1.15	.00	71.51	452.82
*	680.000	5500.00	1871.82	.00	5.33	.00	63.15	461.54
*	690.000	5500.00	1874.87	.00	3.06	.00	75.49	422.90
	700.000	5500.00	1875.60	.00	.73	.00	78.39	153.08
*	710.000	5500.00	1885.92	.00	10.31	.00	64.41	424.60
*	720.000	5500.00	1889.33	.00	3.42	.00	75.25	498.02
*	730.000	5500.00	1892.79	.00	3.46	.00	127.21	480.56
*	740.000	5500.00	1897.85	.00	5.06	.00	64.13	492.38
*	750.000	5500.00	1901.81	.00	3.96	.00	74.23	391.69
	760.000	5500.00	1906.02	.00	4.21	.00	76.05	428.24

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
*	770.000	5500.00	1909.77	.00	3.75	.00	90.26	434.78
*	780.000	5500.00	1910.50	.00	.73	.00	55.33	49.44
*	790.000	5500.00	1914.73	.00	4.23	.00	55.33	108.02
*	800.000	5500.00	1915.17	.00	.44	.00	94.47	95.80
*	810.000	5500.00	1916.65	.00	1.48	.00	353.45	185.09

SUMMARY OF ERRORS AND SPECIAL NOTES

WARNING SECNO= 50.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 60.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO= 70.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 70.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

WARNING SECNO= 80.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO= 110.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 110.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 120.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 120.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 130.000 PROFILE= 1 HYDRAULIC JUMP D.S.
WARNING SECNO= 130.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO= 150.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 150.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 170.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
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CAUTION SECNO= 190.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
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CAUTION SECNO= 290.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
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CAUTION SECNO= 300.000 PROFILE= 1 HYDRAULIC JUMP D.S.
WARNING SECNO= 300.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO= 320.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
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CAUTION SECNO= 420.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
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CAUTION SECNO= 430.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 430.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 440.000 PROFILE= 1 PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 440.000 PROFILE= 1 WSEL ASSUMED BASED ON MIN DIFF
CAUTION SECNO= 440.000 PROFILE= 1 20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO= 440.000 PROFILE= 1 HYDRAULIC JUMP D.S.

[redacted] SECNO= 470.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
[redacted] SECNO= 470.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

WARNING SECNO= 480.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

[redacted]G SECNO= 490.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO= 510.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 510.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 530.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
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CAUTION SECNO= 630.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 640.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 640.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 650.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 650.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 660.000 PROFILE= 1 HYDRAULIC JUMP D.S.
WARNING SECNO= 660.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO= 670.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 670.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 680.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 680.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

WARNING SECNO= 690.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO= 710.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
[redacted]TION SECNO= 710.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

[redacted]TION SECNO= 720.000 PROFILE= 1 CRITICAL DEPTH ASSUMED

ON SECNO= 720.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

AUTION SECNO= 730.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
AUTION SECNO= 730.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

AUTION SECNO= 740.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
AUTION SECNO= 740.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

AUTION SECNO= 750.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
AUTION SECNO= 750.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

AUTION SECNO= 760.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
AUTION SECNO= 760.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

AUTION SECNO= 770.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
AUTION SECNO= 770.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

AUTION SECNO= 780.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
AUTION SECNO= 780.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

AUTION SECNO= 790.000 PROFILE= 1 HYDRAULIC JUMP D.S.
ARNING SECNO= 790.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

ARNING SECNO= 800.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

ARNING SECNO= 810.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

BASE3-4.02

```
*******************************************
*  HEC-2 WATER SURFACE PROFILES           *
*                                         *
*  Version  4.6.2;  May 1991              *
*                                         *
*  DATE     06OCT97     TIME   11:18:07   *
*******************************************
```


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*******************************************
*  U.S. ARMY CORPS OF ENGINEERS           *
*  HYDROLOGIC ENGINEERING CENTER          *
*  609 SECOND STREET, SUITE D             *
*  DAVIS, CALIFORNIA 95616-4687           *
*          (916) 756-1104                 *
*******************************************
```


```
X     X  XXXXXXX   XXXXX             XXXXX
X     X  X        X     X           X     X
X     X  X        X                       X
XXXXXXX  XXXX     X          XXXXX    XXXXX
X     X  X        X                  X
X     X  X        X     X            X
X     X  XXXXXXX  XXXXX              XXXXXXX
```

THIS RUN EXECUTED 06OCT97 11:18:09

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**********************************
HEC-2 WATER SURFACE PROFILES

Version  4.6.2;  May 1991
**********************************


T1     550.032
T2     FLAMINGO WASH FIS RESTUDY
T3     FLOODPLAIN DELINEATION
T4     FILES: BASE3-4.DWG, BASE3-4.D2
 4     STARTING WSE = CRITICAL DEPTH
T4     SUPERCRITICAL RUN
T4     CONCRETE CHANNEL LINING BETWEEN O.I. ROAD & MOJAVE ROAD

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

                2                   1        -1                            5800   1860.44

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

    -1                  -1                                      -2        -6

J3  VARIABLE CODES FOR SUMMARY PRINTOUT

    150                 100

NC    0.02      0.02      0.015     0.1       0.3
X1     640        19   1026.88   1079.43    251.59    262.14    258.21
GR  1864.5      1000   1864.16   1004.77      1864   1005.12      1862    1009.4      1860   1013.41
GR  1858.6   1016.12   1858.09   1026.88      1858   1027.05      1856   1030.75      1854   1034.43
GR    1852   1038.12   1851.39   1039.25   1851.37   1067.22      1852   1068.01      1854   1070.51
GR    1856      1073      1858   1075.48      1860   1077.94   1861.23   1079.43

NC    0.02      0.02      0.015
X1     630        18      1031   1084.55    229.09    213.86    221.03
GR  1861.2      1000      1860   1004.03   1858.27   1009.63      1858   1010.62      1856   1018.67
GR  1855.9   1018.82   1855.06      1031      1854   1032.96      1852   1036.68      1850   1040.45
GR  1848.1   1044.02   1848.28    1071.6      1850   1074.89      1852   1078.71      1854   1082.53
GR    1855   1084.55      1856   1129.14      1857   1165.99

NC    0.02      0.02      0.015
X1     620        20   1033.45   1086.27    223.64    202.43    212.31
GR  1859.3      1000      1858    1007.7   1857.16   1012.48      1856   1018.28   1855.25   1022.06
GR  1855.4   1033.45      1854   1035.35      1852    1037.9      1850   1040.44      1848   1042.97
GR    1846   1045.49   1845.48   1046.14   1845.66   1075.97      1846   1076.49      1848   1079.51
GR    1850   1082.53      1852   1085.57   1852.46   1086.27      1854   1135.67   1855.53   1176.03
```

	0.02	0.02	0.015							
1	610	20	1083.2	1136.14	230.78	201.73	215.38			
3	10			1061.48	1853	1207.54	1853			
R	1851.7	1000	1851.08	1029.96	1852	1046.46	1852.83	1061.48	1852.52	1068.39
R	1852	1080.06	1851.91	1083.2	1850	1085.83	1848	1088.59	1846	1091.36
R	1844	1094.17	1842.71	1095.99	1842.62	1124.12	1844	1126.53	1846	1130
R	1848	1133.45	1849.56	1136.14	1850	1155.27	1852	1197.8	1852.45	1207.54
C	0.02	0.02	0.015							
1	600	15	1081.85	1135.69						
3	10			1081.85	1848	1135.69	1848			
R	1851	1000	1850	1003.75	1848	1011.09	1847.6	1012.57	1847.64	1032.47
R	1848	1035.82	1849.27	1065.44	1848	1070.71	1847.2	1074.22	1846	1081.85
R	1835.1	1081.85	1835.1	1135.69	1847.56	1135.69	1847.68	1152.6	1848	1170.43

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	OLOB	OCH	OROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	JDC	ICONT	CORAR	TOPWID	ENDST

PROF 1

RITICAL DEPTH TO BE CALCULATED AT ALL CROSS SECTIONS
LLOWABLE ERROR FOR CRITICAL DEPTH DETERMINATION (ALLDC) = 2.000 PERCENT OF THE DEPTH

CHV= .100 CEHV= .300
SECNO 640.000
720 CRITICAL DEPTH ASSUMED

640.000	9.27	1860.64	1860.64	1860.44	1863.91	3.27	.00	.00	1858.09
5800.0	144.5	5655.5	.0	28.7	385.3	.0	.0	.0	1861.23
.00	5.04	14.68	.00	.020	.015	.000	.000	1851.37	1012.14
.001710	0.	0.	0.	0	7	0	.00	66.57	1078.71

*SECNO 630.000

3301 HV CHANGED MORE THAN HVINS

3301 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 2.00

630.000	6.51	1854.61	1857.62	.00	1862.65	8.04	.78	.48	1855.06
5800.0	.0	5800.0	.0	.0	254.9	.0	2.0	.4	1855.00
.00	.00	22.75	.00	.000	.015	.000	.000	1848.10	1031.84
.006841	252.	258.	262.	9	8	0	.00	51.91	1083.75

*SECNO 620.000

3301 HV CHANGED MORE THAN HVINS

620.000	6.31	1851.79	1855.32	.00	1860.94	9.15	1.60	.11	1855.40
5800.0	.0	5800.0	.0	.0	238.9	.0	3.2	.6	1852.46
.01	.00	24.27	.00	.000	.015	.000	.000	1845.48	1038.17
.007680	229.	221.	214.	10	17	0	.00	47.08	1085.25

*SECNO 610.000

3301 HV CHANGED MORE THAN HVINS

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	*QCH*	*QROB*	*ALOB*	*ACH*	*AROB*	*VOL*	*TWA*	*R-BANK ELEV*
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	*CORAR*	*TOPWID*	*ENDST*

470 ENCROACHMENT STATIONS= 1061.5 1207.5 TYPE= 1 TARGET= 146.060
ELENCL= 1853.00 ELENCR= 1853.00

495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1851.91 ELREA= 1849.56

610.000	6.01	1848.63	1852.30	.00	1859.02	10.39	1.79	.12	1851.91
5800.0	.0	5800.0	.0	.0	224.2	.0	4.4	.8	1849.56
.01	.00	25.86	.00	.000	.015	.000	.000	1842.62	1087.71
.009304	224.	212.	202.	9	14	0	.00	46.85	1134.55

SECNO 600.000

301 HV CHANGED MORE THAN HVINS

302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.69

ENCROACHMENT STATIONS= 1081.8 1135.7 TYPE= 1 TARGET= 53.840
ELENCL= 1848.00 ELENCR= 1848.00

495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1846.00 ELREA= 1848.00

600.000	3.26	1838.36	1842.19	.00	1855.21	16.85	3.16	.65	1846.00
5800.0	.0	5800.0	.0	.0	176.1	.0	5.4	1.1	1848.00
.01	.00	32.94	.00	.000	.015	.000	.000	1835.10	1081.85
.026536	231.	215.	202.	6	11	0	.00	53.84	1135.69

THIS RUN EXECUTED 060CT97 11:18:39

****
HEC-2 WATER SURFACE PROFILES

Version 4.6.2; May 1991
****

NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

FLOODPLAIN DELINEATION

SUMMARY PRINTOUT TABLE 100

SECNO	EGLWC	ELLC	EGPRS	ELTRD	QPR	QWEIR	CLASS	H3	DEPTH	CWSEL	VCH	EG

AIN DELINEATION

UMMARY PRINTOUT TABLE 150

SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH	AREA	.01K
640.000	.00	.00	.00	1851.37	5800.00	1860.64	1860.64	1863.91	17.10	14.68	413.92	1402.59
630.000	258.21	.00	.00	1848.10	5800.00	1854.61	1857.62	1862.65	68.41	22.75	254.90	701.25
620.000	221.03	.00	.00	1845.48	5800.00	1851.79	1855.32	1860.94	76.80	24.27	238.94	661.84
610.000	212.31	.00	.00	1842.62	5800.00	1848.63	1852.30	1859.02	93.04	25.86	224.25	601.29
600.000	215.38	.00	.00	1835.10	5800.00	1838.36	1842.19	1855.21	265.36	32.94	176.07	356.05

MAIN DELINEATION

SUMMARY PRINTOUT TABLE 150

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
*	640.000	5800.00	1860.64	.00	.00	.20	66.57	.00
*	630.000	5800.00	1854.61	.00	-6.03	.00	51.91	258.21
	620.000	5800.00	1851.79	.00	-2.82	.00	47.08	221.03
	610.000	5800.00	1848.63	.00	-3.15	.00	46.85	212.31
*	600.000	5800.00	1838.36	.00	-10.27	.00	53.84	215.38

SUMMARY OF ERRORS AND SPECIAL NOTES

CAUTION SECNO= 640.000 PROFILE= 1 CRITICAL DEPTH ASSUMED

WARNING SECNO= 630.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 600.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

KEY TO CROSS-SECTION (XS) LABELING

PREPARED BY:
SC: G. C. Wallace, Inc.
TEC: _____

DATE PREPARED:
SC: October 13, 1997
TEC: _____

COMMUNITY NAME Clark County
STATE Nevada
FEMA CID NO. _____

STREAM NAME Flamingo Wash
RUN DATE October 6, 1997

BASE 3-4.01

STUDY CONTRACTOR			TECHNICAL EVALUATION CONTRACTOR	
FIELD SURVEY SECTION NO.	XS LETTER DRAFT FIS	COMPUTER STATIONING	EPA REACH FILE NO.	XS LETTER FINAL FIS
	10	10		
	20	20		
	30	30		
	40	40		
	50	50		
	60	60		
	70	70		
	80	80		
	90	90		
100	100	100		
110	110	110		
120	120	120		
130	130	130		
140	140	140		
	150	150		

KEY TO CROSS-SECTION (XS) LABELING

PREPARED BY:
SC: G. C. Wallace, Inc.
TEC: _____

DATE PREPARED:
SC: _____
TEC: _____

COMMUNITY NAME Clark County
STATE Nevada
FEMA CID NO. _____

STREAM NAME Flamingo Wash
RUN DATE _____

BASE3-4.01

STUDY CONTRACTOR			TECHNICAL EVALUATION CONTRACTOR	
FIELD SURVEY SECTION NO.	XS LETTER DRAFT FIS	COMPUTER STATIONING	EPA REACH FILE NO.	XS LETTER FINAL FIS
	160	160		
	170	170		
	180	180		
	190	190		
	200	200		
	210	210		
	220	220		
	230	230		
240	240	240		
250	250	250		
260	260	260		
270	270	270		
280	280	280		
290	290	290		
300	300	300		

KEY TO CROSS-SECTION (XS) LABELING

PREPARED BY:
SC: G. C. Wallace, Inc.
TEC: _____

DATE PREPARED:
SC: _____
TEC: _____

COMMUNITY NAME Clark County
STATE Nevada
FEMA CID NO. _____

STREAM NAME Flamingo Wash
RUN DATE _____

BASE3-4.D1

STUDY CONTRACTOR			TECHNICAL EVALUATION CONTRACTOR	
FIELD SURVEY SECTION NO.	XS LETTER DRAFT FIS	COMPUTER STATIONING	EPA REACH FILE NO.	XS LETTER FINAL FIS
	310	310		
	320	320		
	330	330		
	340	340		
	350	350		
360	360	360		
370	370	370		
	380	380		
	390	390		
	400	400		
	410	410		
	420	420		
430	430	430		
440	440	440		
	450	450		

KEY TO CROSS-SECTION (XS) LABELING

PREPARED BY:
SC: G. C. Wallace, Inc.
TEC: _____

DATE PREPARED:
SC: _____
TEC: _____

COMMUNITY NAME Clark County
STATE Nevada
FEMA CID NO. _____

STREAM NAME Flamingo Wash
RUN DATE _____

BASE3-4.D1

STUDY CONTRACTOR			TECHNICAL EVALUATION CONTRACTOR	
FIELD SURVEY SECTION NO.	XS LETTER DRAFT FIS	COMPUTER STATIONING	EPA REACH FILE NO.	XS LETTER FINAL FIS
	460	460		
470	470	470		
480	480	480		
	490	490		
	500	500		
	510	510		
	520	520		
	530	530		
	540	540		
	550	550		
	560	560		
570	570	570		
580	580	580		
590	590	590		
600	600	600		

KEY TO CROSS-SECTION (XS) LABELING

PREPARED BY:
SC: G. C. Wallace, Inc.
TEC: _____

DATE PREPARED:
SC: _____
TEC: _____

COMMUNITY NAME Clark County
STATE Nevada
FEMA CID NO. _____

STREAM NAME Flamingo Wash
RUN DATE _____

BASE3-4.01

STUDY CONTRACTOR			TECHNICAL EVALUATION CONTRACTOR	
FIELD SURVEY SECTION NO.	XS LETTER DRAFT FIS	COMPUTER STATIONING	EPA REACH FILE NO.	XS LETTER FINAL FIS
	610	610		
	620	620		
	630	630		
	640	640		
650	650	650		
660	660	660		
	670	670		
	680	680		
690	690	690		
700	700	700		
	710	710		
	720	720		
	730	730		
	740	740		
	750	750		

KEY TO CROSS-SECTION (XS) LABELING

PREPARED BY:
SC: G. C. Wallace, Inc.
TEC:

DATE PREPARED:
SC:
TEC:

COMMUNITY NAME Clark County
STATE Nevada
FEMA CID NO.

STREAM NAME Flamingo Wash
RUN DATE

BASE3-4.01

STUDY CONTRACTOR			TECHNICAL EVALUATION CONTRACTOR	
FIELD SURVEY SECTION NO.	XS LETTER DRAFT FIS	COMPUTER STATIONING	EPA REACH FILE NO.	XS LETTER FINAL FIS
	760	760		
770	770	770		
780	780	780		
790	790	790		
800	800	800		
	810	810		

KEY TO CROSS-SECTION (XS) LABELING

PREPARED BY:
SC: G. C. Wallace, Inc.
TEC:

COMMUNITY NAME Clark County
STATE Nevada
FEMA CID NO.

DATE PREPARED:
SC: October 13, 1997
TEC:

STREAM NAME Flamingo Wash
RUN DATE October 6, 1997

BASE3-4.D2

STUDY CONTRACTOR			TECHNICAL EVALUATION CONTRACTOR	
FIELD SURVEY SECTION NO.	XS LETTER DRAFT FIS	COMPUTER STATIONING	EPA REACH FILE NO.	XS LETTER FINAL FIS
600	600	600		
	610	610		
	620	620		
	630	630		
	640	640		

FLAMINGO WASH FIS RESTUDY
CERTIFICATION

This is to certify that all work accomplished in the conduct of this FIS was done in accordance with the Statement of Work and General Provisions of Contract 550.030, and all amendments thereto, together with all such modifications, either written or oral, as the Regional PO and/or the Contracting Officer or their representatives have directed, such as modifications affect this contract, and that all such work has been accomplished in accordance with sound and accepted engineering practice within the contract provisions for respective phases of work.

Calvin L. Black, P.E. - Executive Vice President
G. C. Wallace, Inc.

DRAFT

FLAMINGO WASH
FLOOD INSURANCE STUDY RESTUDY

CLARK COUNTY, NEVADA

550.032

OCTOBER 1997

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1.0 INTRODUCTION

1.1 Purpose of Study

The purpose of this study is to investigate the limits of flood hazards due to the Flamingo Wash from Rainbow Boulevard downstream to Industrial Road, from the Imperial Palace Casino downstream to Spencer Street, and from Eastern Avenue downstream to the Las Vegas Wash Confluence by approximate methods. The above reaches of the Flamingo Wash all lie within the unincorporated areas of Clark County, Nevada. The results of this flood risk study will be used to update the Flood Insurance Rate Maps (FIRM) for Clark County (Unincorporated Areas). The FIRMs are distributed by the Federal Emergency Management Agency (FEMA) to aid in the administration of the National Flood Insurance Program (NFIP). This program was established with the passage of the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973 to enable property owners to purchase insurance protection against losses from flooding.

1.2 Authority For Study

G. C. Wallace, Inc. (GCW) was authorized by the Clark County Regional Flood Control District (CCRFCD) to perform this study for these unincorporated areas of Clark County under contract, "Agreement of Professional Services for Flamingo Wash Flood Insurance Study Restudy," dated November 14, 1996.

The topographic mapping was performed by Nevada Aerial Mapping (Reference 1) for G. C. Wallace, Inc.

The work was completed October 1997.

1.3 Community Coordination and Acknowledgment

The area of approximate study was outlined by the CCRFCD and coordinated with Clark County Public Works (CCPW). The CCRFCD provided available hydrologic data including the "Technical Support Data Notebook for the Upper

Flamingo Wash Detention Basin Letter of Map Revision," January 1996 (Reference 2).

On December 3, 1996, representatives of the CCRFCD, CCPW, and GCW met for the initial coordination meeting to discuss scheduling, study methods, assumptions, and the format of deliverable items. Throughout the project, coordination meetings were held to discuss progress and preliminary study results.

All meeting minutes and written comments are included in the TSDN, Section 1 General Documentation. This study incorporates all appropriate comments.

1.4 Community Concurrence

The study members of GCW have maintained close contact with CCRFCD and CCPW throughout the project. Both CCRFCD and CCPW have had the opportunity through continued meetings and review submittals, to provide input regarding the results of the study. At the time of the submittal of this study to FEMA, both CCRFCD and CCPW concur with the results of this study. Letters of concurrence are included in the TSDN, Section 1.4 - General Correspondence.

2.0 AREAS STUDIED

2.1 Scope of Study

This study involved a review and restudy of the effective FIRMs within a portion of the unincorporated areas of Clark County, more specifically, the Flamingo Wash from Rainbow Boulevard downstream to Industrial Road, from the Imperial Palace Casino downstream to Spencer Street, and from Eastern Avenue downstream to the Las Vegas Wash Confluence. The study area is shown in Figure 1, and include delineation of those areas studied by approximate methods.

The flooding source studied by approximate methods was selected by CCRFCD and CCPW. The approximate method study areas encompass the following:

- Rainbow Boulevard to Jones Boulevard Reach
- Jones Boulevard to Industrial Road Reach
- Imperial Palace to Spencer Street Reach
- Eastern Avenue to Las Vegas Wash Reach

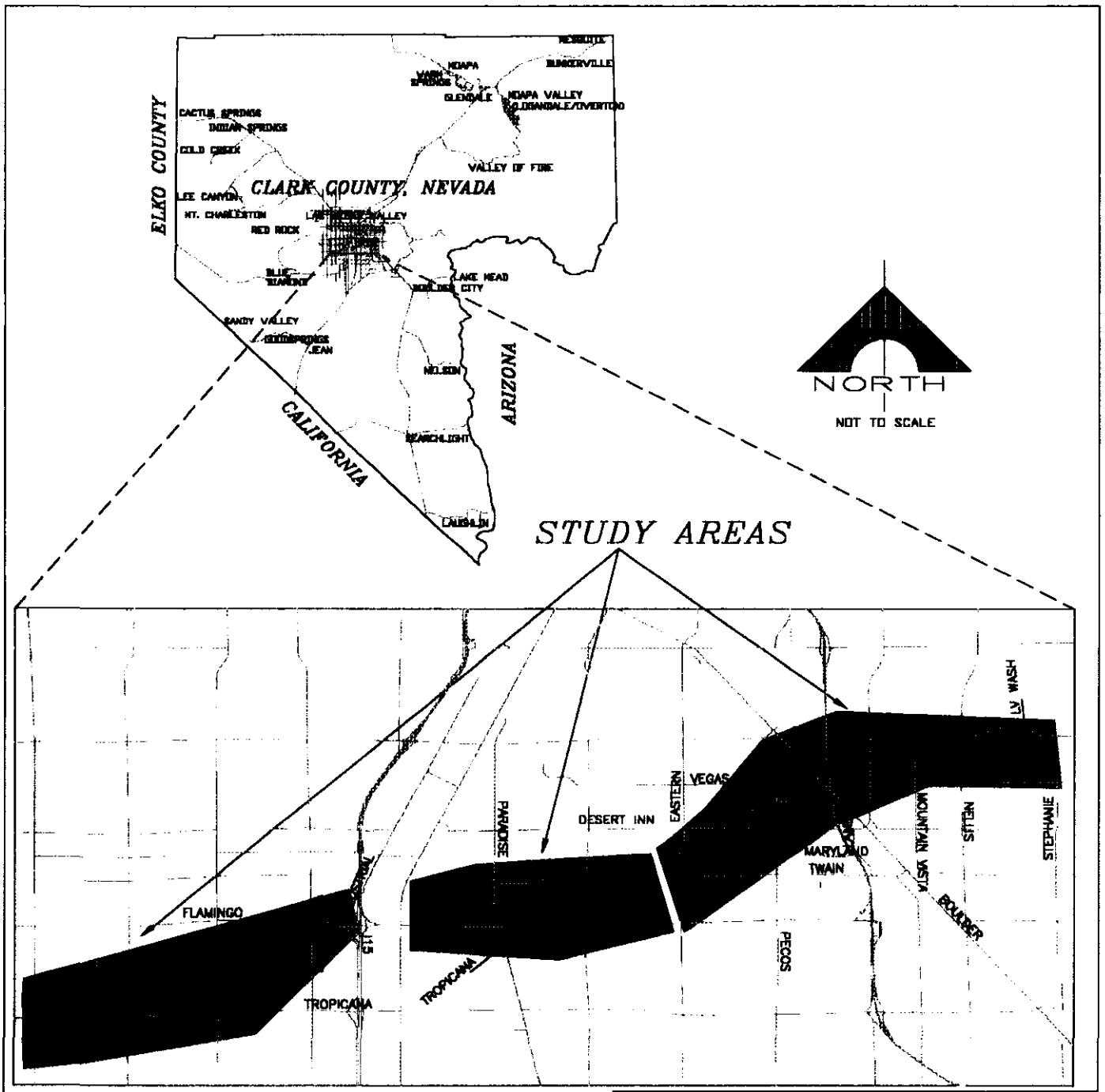
Areas excluded from study include the Tropicana Wash and Tropicana Wash Breakouts, the Las Vegas Wash, the Industrial Road to Imperial Palace Reach, and the Spencer Street to Eastern Avenue Reach.

In order to minimize the cost of this study, two (2) reaches of the Flamingo Wash were determined not to be included, thus, becoming areas of discontinuity. The first area of discontinuity is between Industrial Road and the Imperial Palace Hotel and Casino Parking Garage. The Flamingo Wash storm flows were expected and later confirmed to be intercepted and conveyed by the Industrial Road Culvert which continues under I-15, Caesars Palace Hotel and Casino, Las Vegas Boulevard, and the Imperial Palace Hotel and Casino because a significant reduction in peak flows in this area was realized due to the upstream improvements.

The second area of discontinuity is between Spencer Street and Eastern Avenue. This area is a community golf course and the previous FEMA designated Special Flood Hazard Areas are generally confined to it. Therefore, no further analyses is warranted.

2.2 Community Description

The study area is located within the central portion of Clark County in Southern Nevada as shown in Figure 1. The Flamingo Wash is situated in the middle of the Las Vegas Valley. The Las Vegas Valley is surrounded by desert mountains and slopes generally from west to east towards Lake Mead.



FLAMINGO WASH FIS RESTUDY
CCRFCD

FIGURE 1

VICINITY MAP

G.C. WALLACE, INC.
Engineering/Architecture

The Las Vegas Valley is approximately 35 miles wide (north to south) by 30 miles long (west to east). It is bounded on the north by the Sheep Range and the Las Vegas Range; on the east by Sunrise, Frenchman, and River Mountains; on the south by the Black Mountains; and on the west by the Spring Mountains. The valley is most densely populated in the center and generally decreases in density towards the fringes. Residential and commercial development are the predominant land uses within the Valley.

Rainfall is generally the result of two distinctly different meteorological events. High intensity, short-duration thunderstorms typically occurring in the late summer months of July, August, and September. These late summer storms can produce high runoff rates over small geographical areas. During the winter months, precipitation generally results from frontal and pacific storm movements with longer durations, lower intensities, and larger aerial coverages.

2.3 Principal Flood Problems

2.3.1 Rainbow Boulevard to Jones Boulevard Reach

No significant flood problems noted in this reach.

2.3.2 Jones Boulevard to Industrial Road Reach

The area surrounding the Flamingo Wash between Cameron Street and Arville Street from Harmon Avenue to Tropicana Avenue is subject to flooding during a major storm event due to the limited capacity of the Cameron Street Culvert/Orleans Culvert.

2.3.3 Imperial Palace to Spencer Street Reach

The area surrounding the Flamingo Wash between the Imperial Palace Hotel and Casino Parking Garage and Koval Lane is subjected to flooding partially due to the limited capacity of the Winnick Avenue Inlet Structure and Culverts.

The Flamingo Wash flows are outletted in the Imperial Palace Hotel and Casino Parking Garage and are conveyed to Winnick Avenue where a culvert, inlet structure, and an inverted crown street section have been constructed by Clark County Public Works to reduce the flood hazard problems in this area.

A scaled physical hydraulic model of this facility was constructed by the Bureau of Reclamation to investigate the effectiveness of this facility during the design phase of this facility (Reference 3). Conclusions of this report suggest that at least 50 percent of the storm flows will be intercepted by this facility.

The remainder of the storm flows continue down Winnick Avenue as surface flow to Koval Lane. At Koval Lane, the water spills over back into the Flamingo Wash.

Factors that may aggravate local flooding include debris clogging the Winnick Avenue grates.

2.3.4 Eastern Avenue to Las Vegas Wash Reach

The area surrounding the Flamingo Wash west of Boulder Highway is subjected to flooding partially due to the limited capacity of the Boulder Highway Culverts.

Factors that may aggravate local flooding include minimal drainage improvements and cross-sections having limited conveyance capacity.

2.4 Flood Protection Measures

The facilities listed below have been constructed by local public agencies and/or private developers over a long period of time and the majority of these facilities were constructed prior to the Las Vegas Valley Flood Insurance Study Hydrology Report by James M. Montgomery Consulting Engineers, Inc., dated

September 1991. No new construction is associated with this project. Maintenance of these facilities is provided by Clark County Public Works and funded by the Clark County Regional Flood Control District.

2.4.1 Rainbow Boulevard to Jones Boulevard Reach

Clark County Regional Flood Control District Master Plan facilities which have been constructed include the Rainbow Boulevard Bridge, Tropicana Avenue Bridge, Torrey Pines Drive Culvert.

No significant flood control facilities such as levees, dams, or detention basins have been constructed within this reach.

2.4.2 Jones Boulevard to Industrial Road Reach

Clark County Regional Flood Control District Master Plan facilities which have been constructed include the Jones Boulevard Culvert, Decatur Boulevard Culvert, Cameron Street Culvert/Orleans Culvert, Arville Street Culvert, Valley View Boulevard Culvert, Flamingo Road/Industrial Road Connector Culvert, Flamingo Road Overpass, Union Pacific Railroad Bridge, Industrial Road Culvert.

No significant flood control facilities such as levees, dams, or detention basins have been constructed within this reach.

2.4.3 Imperial Palace to Spencer Street Reach

Clark County Regional Flood Control District Master Plan facilities which have been constructed include the Winnick Avenue Culvert, Hughes Center Culvert, Palos Verdes Street Culvert, Swenson Street Culvert, Cambridge Street Culvert, Maryland Parkway Culvert, Spencer Street Culvert.

No significant flood control facilities such as levees, dams, or detention basins have been constructed within this reach.

2.4.4 Eastern Avenue to Las Vegas Wash Reach

Clark County Regional Flood Control District Master Plan facilities which have been constructed include the Eastern Avenue Culvert, Pecos-McLeod Interconnect Bridge, Desert Inn Road Culvert, Mojave Road Culvert, Trailer Park Bridge, Boulder Highway Culvert, US 95 Bridge, Lamb Boulevard Culvert, Nellis Boulevard Bridge.

No significant flood control facilities such as levees, dams, or detention basins have been constructed within this reach.

3.0 ENGINEERING METHODS

3.1 Hydrologic Analysis

3.1.1 Introduction

This section summarizes the existing conditions/existing facilities of the Flamingo Wash drainage basin conducted for the Flamingo Wash FIS Restudy. The study area covered by this analysis includes the Flamingo Wash, Tropicana Wash, and Red Rock Wash drainage areas. The purpose of this analysis was to develop acceptable discharges for use in the Flamingo Wash FIS Restudy.

The basis of the hydrologic analysis was the HEC-1 model developed by James M. Montgomery Consulting Engineers, Inc. for the Las Vegas Valley Flood Insurance Study Hydrology Report dated September 1991.

Peak discharges have been computed for proposed FIS concentration points for the 100-year return period only using the September 1990 version of the HEC-1 Flood Hydrograph Package.

Subbasins are shown on Figure S-4 of the 1991 Master Plan Update for the Las Vegas Valley included here as Figure 2.

CLARK COUNTY
REGIONAL FLOOD CONTROL DISTRICT

1991 FLOOD CONTROL MASTER PLAN UPDATE LAS VEGAS VALLEY

LEGEND

45 SUBAREA DESIGNATION

SUBAREA DELINEATION

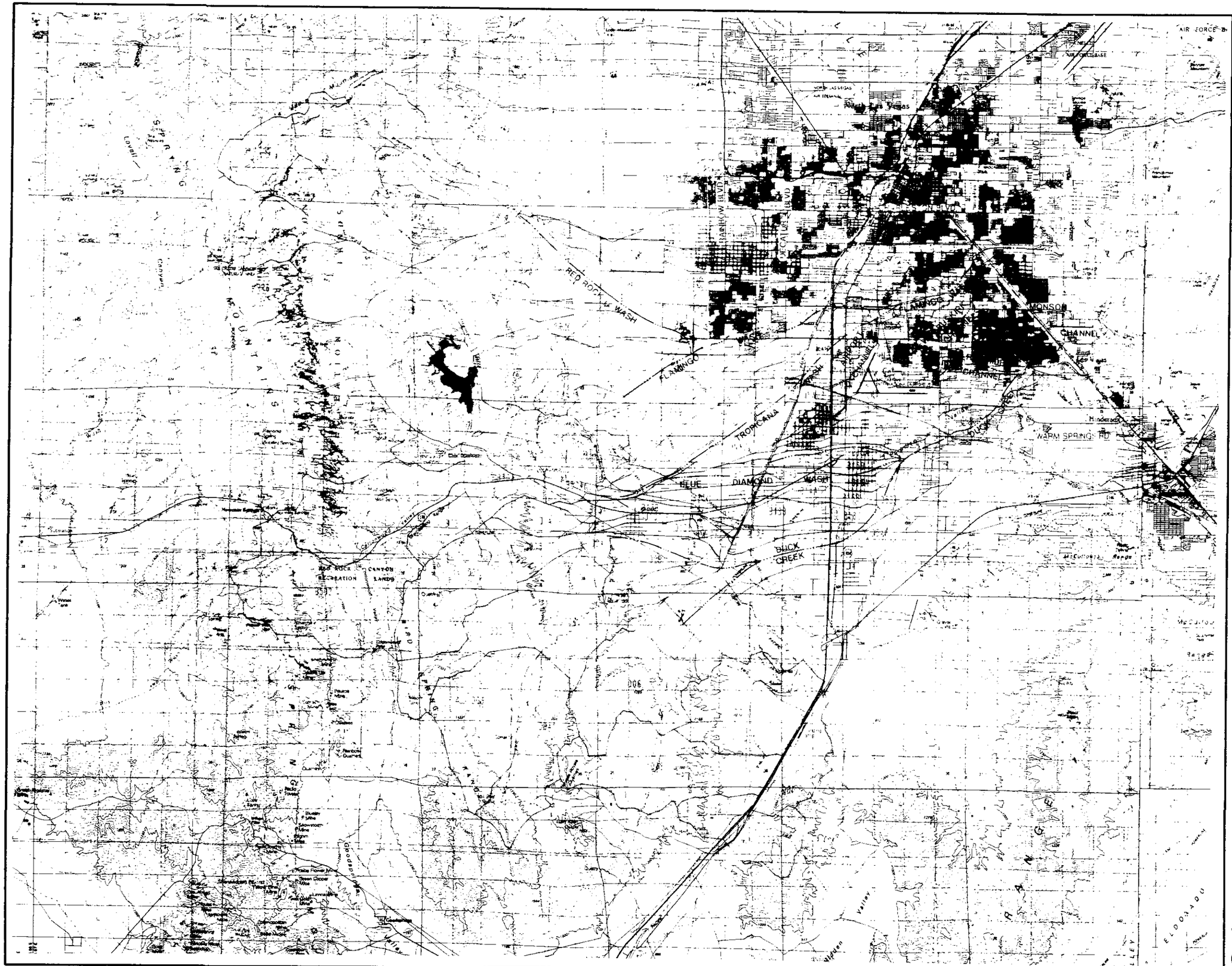


FIGURE 2

N

0 7,500 15,000 22,500

(APPROXIMATE)

SOUTHWEST BASIN
HYDROLOGIC SUBAREAS

FIGURE S-4

James M. Montgomery
Consulting Engineers, Inc.
Las Vegas, Nevada

3.1.2 Modifications to the 1991 Effective Model

The following paragraphs discuss the changes made to the Flamingo/Tropicana Wash HEC-1 model from the 1991 Las Vegas Valley FIS Hydrology Report.

3.1.2.1 Previous HEC-1 analyses in the study area were performed using the August 1988 version of the program (File: F100.DAT). This study was performed using the September 1990 version of the HEC-1 Flood Hydrograph Package.

3.1.2.2 Minor changes were made to some Kinematic Wave routings due to the inability of the September 1990 version of HEC-1 to run these routings (File: F100R.DAT).

3.1.2.3 The Red Rock Detention Basin drainage area is no longer included as a part of the Flamingo Wash watershed for the 100-year return period storm event. This is due to the negligible contribution of runoff from the detention basin during the 100-year storm event since the Red Rock Detention Basin Expansion project (LOMR Case No. 97-09-177P). The Depth Area Reduction Factors (DARF) were increased with the decrease in drainage area for this study (File: F-FL.DAT).

3.1.2.4 The Upper Flamingo Wash Detention Basin and drainage area were modified to reflect the Upper Flamingo Wash Detention Basin LOMR (LOMR Case No. 97-09-138P) except for the Red Rock Detention Basin drainage area as discussed above (File: F-FL.DAT).

3.1.2.5 Peak discharges for FIS hydrology were required at numerous concentration points in the Flamingo Wash drainage area. Appropriate peak discharges at each concentration point were determined using two (2) design storm centerings:

3.1.2.5.1 For each concentration point, a storm covering the Flamingo and Tropicana watersheds was investigated. No runoff from the Red Rock Detention Basin watershed was assumed. DARF's for this scenario were based on the total

tributary area, excluding the Red Rock Detention Basin area. This is referred to as the "Overall Storm" (File: F-FL.DAT).

3.1.2.5.2 For each concentration point, a storm covering the Flamingo and Tropicana watersheds, excluding the Red Rock and Upper Flamingo Wash Detention Basin areas, was investigated. No runoff from the Red Rock or Upper Flamingo Wash Detention Basins were assumed. DARF's for this scenario were based on the storm area upstream of each concentration point. This is referred to as the "Central Storm" (File: F-FLC.DAT). The Central Storm produces discharges which differ from the Overall Storm. The Overall Storm produces higher discharges upstream of the Flamingo/Tropicana confluence while the Central Storm produces higher discharges downstream.

3.1.3 Summary of Results

The existing conditions, 100-year HEC-1 model was executed for the two storm scenarios discharged above. Results are shown in Table 1. This table lists the tributary area, appropriate DARF, and peak discharge for each proposed FIS concentration point assuming occurrence of the Overall Storm and Central Storm.

The conclusion was made from the data presented in Table 1 that the controlling storm (i.e., the storm producing the largest peak discharge) is the Overall Storm for all Flamingo Wash locations between the Upper Flamingo Wash Detention Basin and the Tropicana Wash confluence. Downstream of the Flamingo/Tropicana Wash confluence, the Central Storm controls.

Note that for the Overall Storm, the peak discharge drops significantly with the increase in tributary area upstream of the Flamingo/Tropicana Wash confluence. This is due to differences in peak time and DARF. However, it is felt that instead of having the peak discharge go down in this reach, the highest peak discharge held through this reach would be more appropriate.

TABLE 1
COMPARISON OF ALTERNATIVE 100-YEAR STORM SIMULATIONS FOR FLAMINGO WASH WATERSHED

Concentration Point	Description	Overall Storm			Central Storm			Adopted Discharge (cfs)
		Area (sq mi)	DARF	Peak Q (cfs)	Area (sq mi)	DARF	Peak Q (cfs)	
F8	Flamingo Wash at Rainbow Blvd.	37.94	0.72	3,874	3.38	0.92	1,310	3,900
F9	Flamingo Wash at Jones Blvd.	40.35	0.71	3,646	5.79	0.90	1,517	3,900
F14	Flamingo Wast at Decatur Blvd.	50.27	0.68	2,902	15.71	0.82	2,268	3,900
F15	Flamingo Wash at UPRR	51.59	0.68	2,921	17.03	0.80	2,366	3,900
F16	Flamingo Wash at I-15/Caesars Palace	52.11	0.68	2,931	17.55	0.80	2,445	3,900
F17	Flamingo Wash at Winnick Ave./Hughes Center	52.76	0.68	2,934	18.20	0.80	2,581	3,900
F17	Flamingo Wash at Flamingo/Tropicana Confluence	73.61	0.64	4,556	39.05	0.71	4,627	4,600
F18	Flamingo Wash at Spencer St.	77.79	0.64	5,151	43.23	0.71	5,496	5,500
F20B	Flamingo Wash at D/S Desert Inn Rd.	85.45	0.62	5,650	50.89	0.68	5,832	5,800
F22	Flamingo Wash at Boulder Hwy.	90.15	0.61	5,974	55.59	0.67	6,257	6,300
F23	Flamingo Wash at Nellis Blvd./Las Vegas Wash	92.07	0.61	6,098	57.51	0.67	6,411	6,400

3.2 Hydraulic Analysis

3.2.1 Methodology

For the areas studied, the water surface elevations for 100-year flood were computed using the COE HEC-2 Water Surface Profile computer program (Reference 4) which runs inside BOSS International's BOSS RMS for AutoCAD software (Reference 5). Where otherwise unknown, the starting water surface elevations were developed using normal depth calculations. Special bridge option was employed.

The special bridge option was used to model existing bridges located in the study area. The bridge data required was developed from construction drawings, field survey data, and topographic maps. Bridges are assumed to be normalized to the river with an approximate length equaling the span width times the sine of the skew angle plus the road width divided by the cosine of the skew angle. This conservative approach allows the continuous use of the HEC-2 which is a 1-D model. Otherwise, the models would have to be discontinuous with the use of a 2-D model at the discontinuities (i.e., bridges/culverts).

Ground control surveys, check cross-sections, and establishment of elevations reference marks were completed by G. C. Wallace Inc. Vertical control is based on the National Geodetic Vertical Datum of 1929 (NGVD 1929) and horizontal control is tied into the Nevada State Plane Coordinate System (NAD 1983). Clark County survey monuments were used for control whenever possible.

Dimensions of hydraulic structures were obtained by construction plans and field surveys. Table 2 lists the hydraulic structures, brief descriptions, and their respective locations on the Flamingo Wash.

Please note that these hydraulic structures are existing and have been existing for many years. In fact, the majority of these structures were in place prior to the 1991 Las Vegas Valley Flood Insurance Study.

TABLE 2
EXISTING HYDRAULIC STRUCTURES
FLAMINGO WASH FIS RESTUDY
Clark County, Nevada

Reach	Location Description	Structures Description
Rainbow Blvd. to Jones Blvd.	Rainbow Blvd. Bridge	Trapezoidal Channel, 40' ± Bottom Width, 1.5:1 Side Slopes, 14' ± high, 2 Piers
	Tropicana Blvd. Bridge	Trapezoidal Channel, 48' ± Bottom Width, 1.5:1 Side Slopes, 8' ± high, 3 Piers
	Torrey Pines Dr. Culvert	4-10'wide by 8'high RCBs
Jones Blvd. to Industrial Rd.	Jones Blvd. Culvert	4-10'wide by 8'high RCBs
	Decatur Blvd. Culvert	3-12'wide by 10'high RCBs
	Cameron St. Culvert/ Orleans Culvert	7-10'wide by 5'high RCBs/ 3-10'wide by 8'high RCBs
	Arville St. Culvert	7-12'wide by 5'high RCBs
	Valley View Culvert	3-20'wide by 7'high Con Spans (Precast Concrete Arch Structures)
	Flamingo Rd./ Industrial Rd. Connector Culvert	4-12'wide by 10'high RCBs
	Flamingo Road Overpass	Trapezoidal Channel, 70' ± Bottom Width, 2.5:1 ± Side Slopes
	Union Pacific Railroad Bridge	Trapezoidal Channel, 97' ± Bottom Width, 0:1 Side Slopes, 6' ± high, 6 Piers
	Industrial Rd. Culvert	6-10'wide by 8'high RCBs
Imperial Palace to Spencer St.	Winnick Ave. Culvert	2-11'wide by 7'high RCBs
	Hughes Center Culvert	2-15'wide by 10'high RCBs
	Palos Verdes St. Culvert	5-12'wide by 8'high RCBs
	Swenson St. Culvert	3-10'wide by 7'high RCBs
	Cambridge St. Culvert	3-12'wide by 10'high RCBs
	Maryland Pkwy. Culvert	4-12'wide by 12'high RCBs
	Spencer St. Culvert	4-12'wide by 5'high RCBs

TABLE 2
EXISTING HYDRAULIC STRUCTURES
FLAMINGO WASH FIS RESTUDY
Clark County, Nevada

Reach	Location Description	Structures Description
Eastern Ave. to Las Vegas Wash	Eastern Ave. Culvert	5-10'wide by 8'high RCBs
	Pecos-McLeod Interconnect Bridge	Trapezoidal Channel, 40' ± Bottom Width, 2:1 Side Slopes, 20' ± high
	Desert Inn Rd. Culvert	5-10'wide by 8'high RCBs
	Mojave Rd. Culvert	5-10'wide by 8'high RCBs
	Trailer Park Bridge	Trapezoidal Channel, 20' ± Bottom Width, 2:1 Side Slopes, 8.5' ± high
	Boulder Hwy. Culvert	3-10'wide by 7'high RCBs & 1-6'wide by 6'high RCB
	US 95 Bridge	Trapezoidal Channel, 80' ± Bottom Width, 1.5:1 Side Slopes, 10' ± high
	Lamb Blvd. Culvert	4-12'wide by 6'high RCBs & 5-10'wide by 6'high RCBs
	Nellis Blvd. Bridge	Trapezoidal Channel, 100' ± Bottom Width, 0:1 Side Slopes, 5'high, 2 Piers

3.2.2 Cross-Section Description

Cross-section locations were initially taken across the Flamingo Wash at approximately 500-foot intervals positioned, generally, normal to the expected direction of flow. The cross-sections were then refined based on preliminary HEC-2 models which showed major conveyance and ineffective flow areas. In addition, some intermediate cross-sections were added to reduce cross-section to cross-section differences in top width, friction slope, and conveyance.

The cross-section data for each reach were derived from field survey and aerial mapping. The mapping was prepared specifically for this project and based on aerial photography prepared by Nevada Aerial Mapping dated January 22, 1997 (Reference 1).

3.2.3 Manning's "n" Values

Manning's roughness factors (n) were obtained through field inspection, aerial photographs, and engineering judgment. The roughness conditions were also documented with photographs and the "n" values were compared with published data (Reference 6). In addition, Cowan's procedure (Reference 7) for estimating hydraulic roughness coefficients was used to account for channel material, degree of irregularity, variations of channel cross-section, relative effect of obstructions, vegetation, and degree of meandering.

The "NC" and "NH" cards of the HEC-2 model are used to designate the proper "n" values for section areas. The HEC-2 model computes composite "n" values when "NH" cards are used.

3.2.4 Expansion and Contraction Coefficients

The expansion and contraction loss coefficients used are typical Riverine values with gradual changes (0.3 and 0.1, respectively) and with abrupt changes (0.5 and 0.3, respectively).

3.3 Modeling Results

A summary of the discharges used in the hydraulic analyses are listed in Table 3.

Results of the modeling indicate that the 100-year peak storm flows will be confined to the Flamingo Wash facilities except for seven overtopped bridge/culvert locations. Two are located in the Jones Boulevard to Industrial Road Reach. Three are located in the Imperial Palace to Spencer Street Reach. Two more are located in the Eastern Avenue to Las Vegas Wash Reach.

The overtopped culverts in the Jones Boulevard to Industrial Road Reach are Cameron Street Culvert/Orleans Culvert and the Valley View Boulevard Culvert.

Due to a lack of hydraulic capacity of the Cameron Street Culvert/Orleans Culvert, approximately 2,300 cfs will flow into Cameron Street. Cameron Street is an offset crown with the ground on the east side sloping away to the east. As a result of this section, the street capacity is limited. Therefore, the majority of the 2,300 cfs overflow into Cameron Street will spillover through the Orleans Hotel and Casino property to the east.

Approximately 150 cfs will flow into Valley View Boulevard. Valley View Boulevard is sagged in this location and will allow the overflow to spillover back into the Flamingo Wash to the east.

In support of the Industrial Road to Imperial Palace reach discontinuity discussed earlier, the HEC-2 analyses for the Jones Boulevard to Industrial Road Reach was extended to include approximately 1,100 feet of the culvert. The results indicate that the entire 100-year Flamingo Wash storm runoff will be intercepted and conveyed by the underground facility to the Imperial Palace Hotel and Casino Parking Garage.

The three (3) overtopped or by-passed culverts in the Imperial Palace to Spencer Street Reach are Winnick Avenue Culvert, Swenson Street Culvert, and Spencer Street Culvert. Approximately 1,950 cfs, 450 cfs, and 2,000 cfs will flow into Winnick Avenue, Swenson Street, and Spencer Street, respectively. Swenson Street and Spencer Street are sagged in these locations and will allow the overflow to spillover back into the Flamingo Wash to the east. Winnick Avenue has been constructed with an RCB storm drain system and an open inlet structure. The open inlet and storm drain are intended to intercept a portion of the flows eastward in Winnick Avenue to the Flamingo Wash east of Koval Lane. Winnick Avenue has been constructed with an inverted crowned street section which is intended to convey the bypass flows to Koval Avenue where it will return to the Flamingo Wash.

The two (2) overtopped bridges/culverts in the Eastern Avenue to Nellis Boulevard Reach are Trailer Park Bridge and Boulder Highway Culvert. Approximately 1,850 cfs will flow over and around the Trailer Park Bridge back into

the Flamingo Wash. Approximately 2,700 cfs will flow into Boulder Highway. Boulder Highway is sagged in this location and will allow the overflow to spillover back into the Flamingo Wash to the east. Note the revised floodplain in this area is increased.

After discussions with the CCRFCD, it was decided to designate the Special Flood Hazard Area by approximate methods (Zone A) because of the extent of existing development and the narrow width of the floodplain along the majority of the entire study area.

TABLE 3
HYDRAULIC ANALYSIS DISCHARGES
FLAMINGO WASH FIS RESTUDY
Clark County, Nevada

Reach	Section Numbers	100-Year Peak Flow Rates (cfs)
Rainbow Blvd. to Jones Blvd.	520 - 700	3,900
Jones Blvd. to Industrial Rd.	10 - 510	3,900
Imperial Palace to Spencer St.	10 - 50	5,500
	60 - 280	4,600
	290 - 560	3,900
Eastern Ave. to Las Vegas Wash	10 - 140	6,400
	150 - 440	6,300
	450 - 660	5,800
	670 - 810	5,500

4.0 FLOODPLAIN MANAGEMENT APPLICATIONS

4.1 Floodplain Boundaries

Floodplain boundaries for the approximate method areas were delineated on topographic maps with a scale of 1" = 400' and a contour interval of 4-feet. Spot elevations were plotted and used in areas requiring greater definition. The

boundaries of the 100-year flood were delineated using elevations computed at each cross-section by the HEC-2 models. The delineations were interpolated between cross-sections using engineering judgment in conjunction with the BOSS RMS software capabilities. The 500-year floodplain was not determined by this study.

4.2 Floodways

Based on discussions with the CCRFCD, floodways were not delineated due to the extent of existing development adjacent to the wash and containment of the flows.

5.0 INSURANCE APPLICATIONS

For flood insurance rating purposes, flood insurance rate zones are designated based on the results of the engineering analyses. The FEMA flood insurance rate zones are defined as follows:

Zone A

Zone A is the Flood Insurance Rate Zone that corresponds to the 100-year floodplains that are determined in the Flood Insurance Study by approximate methods. Because detailed hydraulic analyses are not performed for such areas, no BFEs or depths are shown within this zone.

Zone AE

Zone AE is the Flood Insurance Rate Zone that corresponds to the 100-year floodplains that are determined in the FIS by detailed methods. In most instances, whole-foot BFEs derived from the detailed hydraulic analyses are shown at selected intervals within this zone.

Zone AH

Zone AH is the Flood Insurance Rate Zone that corresponds to the areas of 100-year shallow flooding (usually areas of ponding) where average depths are between 1 and 3 feet. Whole-foot BFEs derived from the detailed hydraulic analyses are shown within this zone.

Zone AO

Zone AO is the Flood Insurance Rate Zone that corresponds to the areas of 100-year shallow flooding (usually sheet flow on sloping terrain) where average depths are between 1 and 3 feet. Average whole-foot depths derived from the detailed hydraulic analyses are shown within this zone.

Zone X

Zone X is the Flood Insurance Rate Zone that corresponds to areas outside the 500-year floodplain, areas within the 500-year floodplain, areas of 100-year flooding where average depths are less than 1-foot, areas of 100-year flooding where the contributing drainage area is less that 1 square mile, and areas protected by levees from the 100-year flood. No BFEs or depths are shown within this zone.

6.0 OTHER STUDIES

This study is intended to update and supersede the portion of the previous study which addressed the study area which was performed in 1991 which FEMA adopted and reprinted FIRMs effective August 16, 1995.

As discussed earlier, referenced hydrologic data for the approximate method analysis were obtained from the "Technical Support Data Notebook for the Upper Flamingo Wash Detention Basin Letter of Map Revision," January 1996 (Reference 2).

7.0 REFERENCES

1. Nevada Aerial Mapping, Topographical Mapping for the Flamingo Wash FIS Re-study, 1" = 400', 4-foot contour interval, flown January 22, 1997.

2. Black and Veatch, *Technical Support Data Notebook for the Upper Flamingo Wash Detention Basin Letter of Map Revision,* January 1996.

3. U. S. Bureau of Reclamation, *Hydraulic Model Study of the Flamingo Wash/Winnick Avenue Drop Inlet Structure,* May 1993.

4. U. S. Army Corps of Engineers, *Hydrologic Engineering Center, HEC-2 Water Surface Profiles User's Manual,* September 1990.

5. Boss International, *Boss RMS for AutoCAD,* 1997.

6. *Ven Te Chow, Open-Channel Hydraulics,* McGraw-Hill, Inc., 1959.

7. Woody L. Cowan, *Estimating Hydraulic Roughness Coefficients, Agricultural Engineering, Vol. 37, No. 7, pp. 473-475,* July 1956.

TABLE 4
ELEVATION REFERENCE MARKERS

Map	Name	Elevation	Description
FL1	CCBM 7C10 24W4	2301.58	2-inch dome head brass cap reference monument on top of curb, northeast corner of Jones Blvd. And Harmon Ave.
FL1	CCBM 7C11 19SWS	2245.10	Rivet and square aluminum plate in top of curb, northeast corner of Tropicana Ave. And Decatur Blvd. Near the pc of Tropicana Ave.
FL1	CCBM 6C11 20SWS	2175.57	Rivet and square aluminum plate in top of curb, northeast corner of Tropicana Ave. And Valley View Blvd. Near the pc of Tropicana Ave.
FL1	CCBM 7C11 19E6	2176.60	Rivet and square aluminum plate in top of curb, northeast corner of Wynn. Rd. And Harmon Ave., east of the westerly driveway going into 4050 Harmon Ave.
FL1	CCBM 7C11 18SES	2152.90	Rivet and square aluminum plate in top of curb, northwest corner of Flamingo Rd. And Valley View Blvd. Near the pc of Flamingo Rd.
FL1	USCGS BM N-366	2141.40	USC&GS brass cap, in southeast headwall of railroad bridge, 325 ft. North of Flamingo Rd. Overpass at tracks.
FL2	CCBM 6C11 15SWW6	2048.60	Rivet and square aluminum plate in top of curb, northeast corner of Paradise Rd. And driveway going into 3900 Paradise Rd. Near the pc of Paradise Rd. ¼ mile south of Sands Dr.-Twain Ave.
FL2	CCBM 6C11 15NWW6	2046.27	Rivet and square aluminum plate in top of curb, northeast corner of Paradise Rd. And Edison Ave., near the pc of Paradise Rd.
FL2	CCBM 6C11 22NWW6	2046.43	Rivet and square aluminum plate in top of curb, east side of Paradise Rd. At Tropicana Wash box, just north of south driveway into Villa De Paradise Apartments, at a light pole.

FL2	CCBM 6C11 23NWW6	2006.68	Rivet and square aluminum plate in top of curb, northeast corner of Maryland Pkwy. And Rochelle Ave. Near the pc of Maryland Pkwy.
FL2	CCBM 6C11 23NWW6	1985.51	Rivet and square aluminum plate in top of curb, northeast corner of Maryland Pkwy. And Sierra Dr. near the pc of Maryland Pkwy.
FL2	CCBM 6C11 14SWW6	1986.23	Rivet and square aluminum plate in top of curb, east side of Maryland Pkwy. At the north side of Flamingo Wash.
FL3	CCBM 6C12 7C4	1814.92	Rivet and square aluminum plate in top of curb, east side of Boulder Hwy. At north property line of 3745 Boulder Hwy., at projected centerline of Sandhill Rd.
FL3	CCBM 6C12 7NW6	1804.74	Rivet and square aluminum plate in base of fire hydrant, east of Boulder Hwy., south of Dalhart St. and north of Flamingo Wash.
FL3	CCBM 6C12 18N4	1825.38	Rivet and square aluminum plate in top of curb, southeast corner of Desert Inn. Rd. And Sandhill Rd. Just east of wheel chair ramp.
FL3	CCBM 6C11 13E6	1895.32	Rivet and square aluminum plate in top of curb, northeast corner of Twain Ave. And Pecos-McCleod interconnect., near the pc of Pecos-McCleod interconnect.
FL3	CCBM 6C11 13N6	1889.46	Rivet and square aluminum plate in top of curb, southeast corner of Pecos-McCleod interconnect and the bridge at the Flamingo Wash.
FL4	CCBM 6C12 9W4	1720.66	Rivet and square aluminum plate in top of curb, northeast corner of Nellis Blvd. And Vegas Valley Dr., near the pc of Nellis Blvd.
FL4	CCBM 6C12 4SWS	1728.73	Rivet and square aluminum plate in top of curb, northeast corner of Nellis Blvd. And Sahara Ave., near the pc of Nellis Blvd.
FL4	CCBM 7C12 9NWW6	1727.38	Rivet and square aluminum plate in top of curb, east side of Nellis Blvd. at third street light pole, at Desert Rose Golf Course.
FL4	CCBM 7C12 8NWW6	1777.46	Rivet and square aluminum plate in top of curb, northeast corner of Lamb Blvd. And Karen Ave., near the pc of Lamb Blvd.

FLAMINGO WASH FIS RE-STUDY

Project: flam Thu Sep 4 21:20:32 1997
Point statistics:
Starting point number: 1
Max point number used: 1027
Min point number used: 1002
Current point number: 1028

Current Coordinate Listing (All)

Point	Northing	Easting	Elevation	Description
1002	249887.94	63230.31	2301.58	CCBM 7C10 24W4
1003	247599.99	68310.99	2245.10	CCBM 7C11 19SWS
1004	247659.32	73607.80	2175.57	CCBM 6C11 20SWS
1005	250275.91	72238.30	2176.60	CCBM 7C11 19E6
1006	252974.07	73387.06	2152.90	CCBM 7C11 18SES
1027	252917.03	75077.08	2141.40	USCGS BM N-366

FLAMINGO WASH FIS RE-STUDY

Project: flam Thu Sep 4 21:24:53 1997
Point statistics:
Starting point number: 1
Max point number used: 1030
Min point number used: 1007
Current point number: 1031

Current Coordinate Listing (All)

Point	Northing	Easting	Elevation	Description
1007	254070.29	83879.60	2048.90	CCBM 6C11 15SWW6
1008	256428.94	83878.96	2046.27	CCBM 6C11 15NWW6
1009	251610.66	84407.45	2046.43	CCBM 6C11 22NWW6
1011	251433.84	89024.15	2006.68	CCBM 6C11 23NWW6
1012	257245.87	89166.63	1985.51	CCBM 6C11 14NWW6
1030	253796.22	89004.21	1986.23	CCBM 6C11 14SWW6

FLAMINGO WASH FIS RE-STUDY

Project: flam Thu Sep 4 21:31:28 1997

Point statistics:

Starting point number:	1
Max point number used:	1029
Min point number used:	1020
Current point number:	1030

Current Coordinate Listing (All)

Point	Northing	Easting	Elevation	Description
1020	261378.32	102145.78	1814.92	CCBM 6C12 7C4
1021	262501.70	101136.92	1804.74	CCBM 6C12 7NW6
1022	258116.17	102509.05	1825.38	CCBM 6C12 18N4
1023	255388.76	98696.47	1895.32	CCBM 6C11 13E6
1029	256854.81	97397.43	1889.46	CCBM 6C11 13N6

FLAMINGO WASH FIS RE-STUDY

Project: flam Thu Sep 4 21:51:10 1997

Point statistics:

Starting point number:	1
Max point number used:	1018
Min point number used:	1015
Current point number:	1019

Current Coordinate Listing (All)

Point	Northing	Easting	Elevation	Description
1015	260959.11	110274.40	1720.66	CCBM 6C12 9W4
1016	263634.17	110289.62	1728.73	CCBM 6C12 4SWS
1017	262549.92	110284.47	1727.38	CCBM 7C12 9NWW6
1018	262253.40	105130.20	1777.46	CCBM 7C12 8NWW6

FEDERAL EMERGENCY MANAGEMENT AGENCY
REVISION REQUESTOR AND COMMUNITY OFFICIAL FORM

O.M.B. Burden No. 3067-0148
Expires July 31, 1997

FEMA USE ONLY

PUBLIC BURDEN DISCLOSURE NOTICE

Public reporting burden for this form is estimated to average 2.25 hours per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing and reviewing the form. Send comments regarding the accuracy of the burden estimate and any suggestions for reducing this burden, to: Information Collections Management, Federal Emergency Management Agency, 500 C Street, S.W., Washington, DC 20472.

You are not required to respond to this collection of information unless a valid OMB Control Number is displayed in the upper right corner of this form.

1. OVERVIEW

1. The basis for this revision request is (are): *(check all that apply)*

- ☐ Physical change
  - ☐ Existing
  - ☐ Proposed
- ☒ Improved methodology
- ☒ Improved data
- ☐ Floodway revision
- ☐ Other _____
  Explain _____

2. Flooding Source: Flamingo Wash
3. Project Name/Identifier: Flamingo Wash FIS Restudy
4. FEMA zone designations affected: A
   (example: A, AH, AO, A1-A30, A99, AE, V, V1-30, VE, B, C, D, X)
5. The NFIP map panel(s) affected for all impacted communities is (are):

	Community No.	Community Name	County	State	Map No.	Panel No.	Effective Date
EX:	480301	Katy, City	Harris, Fort Bend	TX	480301	0005D	02/08/83
	480287	Harris County	Harris	TX	48201C	0220G	09/28/90
	32003	Clark County	Clark	NV	32003C	2551D	08/16/95
	32003	Clark County	Clark	NV	32003C	2552D	08/16/95
	32003	Clark County	Clark	NV	32003C	2556D	08/16/95
	32003	Clark County	Clark	NV	32003C	2557D	08/16/95

6. The area of revision encompasses the following types of flooding, structures, and associated disciplines: *(check all that apply)*

Types of Flooding	Structures	Disciplines*
☒ Riverine	☐ Channelization	☐ Water Resources
☐ Coastal	☐ Levee/Floodwall	☒ Hydrology
☐ Alluvial Fan	☒ Bridge/Culvert	☒ Hydraulics
☐ Shallow Flooding *(e.g. Zones AO and AH)*	☐ Dam	☐ Sediment Transport
☐ Lakes	☐ Coastal	☐ Interior Drainage
	☐ Fill	☐ Structural
Affected by wind/wave action	☐ Pump Station	☐ Geotechnical
☐ Yes	☒ None	☒ Land Surveying
☐ No	☐ Channel Relocation	☐ Other *(describe)*
	☐ Excavation	
	☐ Other *(describe)*	
☐ Other *(describe)* _____	_____	_____

* **Attach completed "Certification by Registered Professional Engineer and/or Land Surveyor" Form for each discipline checked. (Form 2)**

2. FLOODWAY INFORMATION

7. Does the affected flooding source have a floodway designated on the effective FIRM or FBFM? ☐ Yes ☒ No
   Does the revised floodway delineation differ from that shown on the effective FIRM or FBFM? ☐ Yes ☐ No
   If yes, give reason: _____

PLEASE REFER TO THE INSTRUCTIONS FOR THE APPROPRIATE MAILING ADDRESS

Attach copy of either a public notice distributed by the community stating the community's intent to revise the floodway or a statement by the community that it has notified all affected property owners and affected adjacent jurisdictions.

9. Does the State have jurisdiction over the floodway or its adoption by communities participating in the NFIP?

☐ Yes ☒ No

If yes, attach a copy of a letter notifying the appropriate State agency of the floodway revision and documentation of the approval of the revised floodway by the appropriate State agency.

3. PROPOSED ENCROACHMENTS

10. With floodways:

1A. Does the revision request involve fill, new construction, substantial improvement, or other development in the floodway?
☐ Yes ☐ No

1B. If yes, does the development cause the 100-year water surface elevation to increase at any location by more than 0.000 feet?
☐ Yes ☒ No

11. Without floodways:

2A. Does the revision request involve fill, new construction, substantial improvement, or other development in the 100-year floodplain? ☐ Yes ☐ No

2B. If yes, does the cumulative effect of all development that has occurred since the effective SFHA was originally identified cause the 100-year water surface elevation to increase at any location by more than one foot *(or other surcharge limit if community or state has adopted more stringent criteria)*? ☐ Yes ☐ No

If the answer to either Items 1B or 2B is yes, please provide documentation that all requirements of Section 65.12 of the NFIP regulations have been met, regarding evaluation of alternatives, notice to individual legal property owners, concurrence of CEO, and certification that no insurable structures are impacted.

4. REVISION REQUESTOR ACKNOWLEDGEMENT

12. Having read NFIP Regulations, 44 CFR Ch. I, parts 59, 60, 61, and 72, I believe that the proposed revision ☒ is ☐ is not in compliance with the requirements of the aforementioned NFIP Regulations.

5. COMMUNITY OFFICIAL ACKNOWLEDGEMENT

13. Was this revision request reviewed by the community for compliance with the community's adopted floodplain management ordinances? ☒ Yes ☐ No

14. Does this revision request have the endorsement of the community? ☒ Yes ☐ No

If no to either of the above questions, please explain: _____

Please note that community acknowledgement and/or notification is required for all requests as outlined in Section 65.4(b) of the NFIP Regulations.

6. OPERATION AND MAINTENANCE

15. Does the physical change involve a flood control structure (e.g. levees, floodwalls, channelization, basins, dams)?
☐ Yes ☒ No

If yes, please provide the following information for each of the new flood control structures:

A. Inspection of the flood control project will be conducted periodically by _____ (entity) _____ with a maximum interval of _____ months between inspections.

B. Based on the results of scheduled periodic inspections, appropriate maintenance of the flood control facilities will be conducted by _____ (entity) to ensure the integrity and degree of flood protection of the structure.

C. A formal plan of operation, including documentation of the flood warning system, specific actions and assignments of responsibility by individual name or title, and provisions for testing the plan at intervals not less than one year, ☐ has ☐ has not been prepared for the flood control structure.

D. The community is willing to assume responsibility for ☐ performing ☐ overseeing compliance with the maintenance and operation plans of the _____ (Name) flood control structure. If not performed promptly by an owner other than the community, the community will provide the necessary services without cost to the Federal government.

Each operation and maintenance plans

7. REQUESTED RESPONSE FROM FEMA

16. After examining the pertinent NFIP regulations and reviewing the document entitled "Appeals, Revisions, and Amendments to National Flood Insurance Program Maps, A Guide for Community Officials," dated December 1993, this request is for a:

____a. CLOMR A letter from FEMA commenting on whether a proposed project, if built as proposed, would justify a map revision *(LOMR or PMR)*, or proposed hydrology changes *(see 44 CFR Ch. I, Parts 60, 65, and 72)*.

____b. LOMR A letter from FEMA officially revising the current NFIP map to show changes to floodplains, floodways, or flood elevations. LOMRs typically depict decreased flood hazards. *(See 44 CFR Ch. 1, Parts 60 and 65.)*

__X__c. PMR A reprinted NFIP map incorporating changes to floodplains, floodways, or flood elevations. Because of the time and cost involved to change, reprint, and redistribute an NFIP map, a PMR is usually processed when a revision reflects increased flood hazards or large-scope changes. *(See 44 CFR Ch. 1, Parts 60 and 65.)*

____d. Other: Describe _____

8. FORMS INCLUDED

17. Form 2 entitled "Certification by Registered Professional Engineer And/Or Land Surveyor" must be submitted.

The following forms should be included with this request if (check the included forms):

Hydrologic analysis for flooding source differs from that used to develop FIRM	☒ Hydrologic Analysis Form (Form 3)
• Hydraulic analysis for riverine flooding differs from that used to develop FIRM	☒ Riverine Hydraulic Analysis Form (Form 4)
• The request is based on updated topographic information or a revised floodplain or floodway delineation is requested	☒ Riverine/Coastal Mapping Form (Form 5)
• The request involves any type of channel modification	☐ Channelization Form (Form 6)
• The request involves new bridge or culvert or revised analysis of an existing bridge or culvert	☒ Bridge/Culvert Form (Form 7) See Attachment
• The request involves a new revised levee/floodwall system	☐ Levee/Floodwall System Analysis Form (Form 8)
• The request involves analysis of coastal flooding	☐ Coastal Analysis Form (Form 9)
• The request involves coastal structures credited as providing protection from the 100-year flood	☐ Coastal Structures (Form 10)
• The request involves an existing, proposed, or modified dam	☐ Dam Form (Form 11)
• The request involves structures credited as providing protection from the 100-year flood on an alluvial fan	☐ Alluvial Fan Flooding Form (Form 12)

9. INITIAL REVIEW FEE

18. Has minimum initial review fee for the appropriate request category been included. ☐ Yes ☒ No

Initial fee amount: $ _____

Check or money order only. Make check or money order payable top: **National Flood Insurance Program**. If paying by Visa or Master Card please refer to the credit card information form which follows this form.

or

19. Is this request for a project that is for public benefit and is primarily intended for flood loss reduction to insurable structures in identified flood hazard areas which were in existence prior to the commencement of construction of the flood control project? ☐ Yes ☒ No

or

20. Is this request to correct map errors, to include the effects of natural changes within the areas of special flood hazards, or solely to provide more detailed data? ☒ Yes ☐ No

Note: I understand that my signature indicates that all information submitted in support of this request is correct.

Calvin L. Black

Signature of Revision Requestor

Calvin L. Black, P. E., Executive Vice President

Printed Name and Title of Revision Requestor

G. C. Wallace, Inc.

Company Name

11/13/97

Date

Note: Signature indicates that the community understands, from the revision requestor, the impacts of the revision on flooding conditions in the community.

Robert B. Thompson

Signature of Community Official

Robert B. Thompson, P.E., Civil Engineer III

Printed Name and Title of Community Official

Clark County

Community Name

11/14/97

Date

Does this request impact any other communities? ☐ Yes ☒ No

If yes, attach letters from all affected jurisdictions acknowledging revision request and approving changes to floodway, if applicable.

Note: Although a photograph of physical changes is not required, it may be helpful for FEMA's review.

ATTACHMENT TO FEMA FORM 1

5. (Con't)

Community No.	Community Name	County	State	Map No.	Panel No.	Effective Date
32003	Clark County	Clark	NV	32003	2580D	08/16/95
32003	Clark County	Clark	NV	32003	2190D	08/16/95
32003	Clark County	Clark	NV	32003	2200D	08/16/95

17. (Con't)

Due to the number of bridges/culverts, the information normally shown on the Bridge/Culvert Form (Form 7 is located in the HEC-2 models and is not reproduced on the Form in an effort to save the community time and money.

FEDERAL EMERGENCY MANAGEMENT AGENCY

CERTIFICATION BY REGISTERED PROFESSIONAL ENGINEER AND/OR LAND SURVEYOR FORM

O.M.B. Burden No. 3067-0148
Expires July 31, 1997

FEMA USE ONLY

PUBLIC BURDEN DISCLOSURE NOTICE

Public reporting burden for this form is estimated to average .23 hour per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing and reviewing the form. Send comments regarding the accuracy of the burden estimate and any suggestions for reducing this burden, to: Information Collections Management, Federal Emergency Management Agency, 500 C Street, S.W., Washington, DC 20472.

You are not required to respond to this collection of information unless a valid OMB Control Number is displayed in the upper right corner of this form.

1. This certification is in accordance with 44 CFR Ch. I, Section 65.2.
2. I am licensed with an expertise in Hydrology and Hydraulics
   [example: water resources *(hydrology, hydraulics, sediment transport, interior drainage)**, structural, geotechnical, land surveying.]
3. I have 7 years experience in the expertise listed above.
4. I have ☒ prepared ☐ reviewed the attached supporting data and analyses related to my expertise.
5. I ☒ have ☐ have not visited and physically viewed the project.
6. In my opinion, the following analyses and/or designs, is/are being certified:

   _____
7. Based upon the following review, the modifications in place have been constructed in general accordance with plans and specifications.

   Basis for above statement: (check all that apply)

   a. ☐ Viewed all phases of actual construction.

   b. ☐ Compared plans and specifications with as-built survey information.

   c. ☐ Examined plans and specifications and compared with completed projects.

   d. ☒ Other Analyses only, no construction involved
8. All information submitted in support of this request is correct to the best of my knowledge. I understand that any false statement may be punishable by fine or imprisonment under Title 18 of the United States Code, Section 1001.

Name: Jerry E. Pruitt, P.E.
(please print or type)

Title: Project Manager
(please print or type)

Registration No. 11902 Expiration Date: December 31, 1997

State Nevada

Type of License Civil

Jerry E Pruitt
Signature

10-9-97
Date

*Specify Subdiscipline

Seal
(Optional)

Note: Insert not applicable (N/A) when statement does not apply.

PLEASE REFER TO THE INSTRUCTIONS FOR THE APPROPRIATE MAILING ADDRESS

FEDERAL EMERGENCY MANAGEMENT AGENCY
CERTIFICATION BY REGISTERED PROFESSIONAL ENGINEER AND/OR LAND SURVEYOR FORM

O.M.B. Burden No. 3067-0148
Expires July 31, 1997

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1. This certification is in accordance with 44 CFR Ch. I, Section 65.2.
2. I am licensed with an expertise in Land Surveying
   [example: water resources *(hydrology, hydraulics, sediment transport, interior drainage)**, structural, geotechnical, land surveying.]
3. I have 18 years experience in the expertise listed above.
4. I have ☐ prepared ☒ reviewed the attached supporting data and analyses related to my expertise.
5. I ☒ have ☐ have not visited and physically viewed the project.
6. In my opinion, the following analyses and/or designs, is/are being certified:

   _____
7. Based upon the following review, the modifications in place have been constructed in general accordance with plans and specifications.

   Basis for above statement: (check all that apply)

   a. ☐ Viewed all phases of actual construction.
   b. ☐ Compared plans and specifications with as-built survey information.
   c. ☐ Examined plans and specifications and compared with completed projects.
   d. ☒ Other Analyses only, no construction involved
8. All information submitted in support of this request is correct to the best of my knowledge. I understand that any false statement may be punishable by fine or imprisonment under Title 18 of the United States Code, Section 1001.

Name: Paul Burn, PLS
(please print or type)

Title: Director of Survey Division
(please print or type)

Registration No. 11174 Expiration Date: December 31, 1998

State Nevada

Type of License Land Surveying

Paul Burn
Signature

10-9-97
Date

*Specify Subdiscipline

Seal
(Optional)

Note: Insert not applicable (N/A) when statement does not apply.

PLEASE REFER TO THE INSTRUCTIONS FOR THE APPROPRIATE MAILING ADDRESS

FEDERAL EMERGENCY MANAGEMENT AGENCY **HYDROLOGIC ANALYSIS FORM**	*O.M.B. Burden No. 3067-0148* *Expires July 31, 1997*	*FEMA USE ONLY*

PUBLIC BURDEN DISCLOSURE NOTICE

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Community Name: Clark County, Nevada

Flooding Source: Flamingo Wash
(One form for each flooding source)

Project Name/Identifier: Flamingo Wash FIS Restudy

1. HYDROLOGIC ANALYSIS IN FIS

- [x] Approximate study stream (Zone A)
- [ ] Detailed study stream (briefly explain methodology) _____

2. REASON FOR NEW HYDROLOGIC ANALYSIS

- [ ] No existing analysis
- [ ] Improved data *(see data revision on page 3)*
- [x] Changed physical conditions of watershed *(explain)* Facilities constructed, i.e., Red Rock Detention Basin Expansion (LOMR Case No. 97-09-177P) and Upper Flamingo Detention Basin (LOMR Case No. 97-09-138P).
- [ ] Alternative methodology *(justify why the revised model is better than model used in the effective FIS)*
- [ ] Evaluation of proposed conditions (CLOMRs only) (explain) _____
- [ ] Other _____

If a computer program/model was used in revising the hydrologic analysis, please provide a diskette with the input files for the 10-, 50-, 100- and 500-year recurrence intervals.

Only the 100-year recurrence interval need be included for SFHAs designated as Zone A.

3. APPROVAL OF ANALYSIS

- [x] Approval of the hydrologic analysis, including the resulting peak discharge value(s) has been provided by the appropriate local, state, or Federal Agency. (i.e., Clark County Regional Flood Control District, Clark County Public Works)

  Attach evidence of approval.
- [ ] Approval of the hydrologic analysis is not required by any local, State or Federal Agency.

PLEASE REFER TO THE INSTRUCTIONS FOR THE APPROPRIATE MAILING ADDRESS

4. REVIEW OF RESULTS

4. REVIEW OF RESULTS

Stream: Flamingo Wash

Comparison of 100-year Discharges

Location:	Drainage area (Sq. mi.) FIS/Revised	FIS (cfs):	Revised (cfs):
Rainbow Boulevard	92.49/37.94	4823	3874
Flamingo/Tropicana Confluence	126.65/73.61	6003	4627
Spencer Street	130.83/43.23	6383	5496
D/S Desert Inn Road	138.49/50.89	6717	5832
Boulder Highway	143.19/55.59	7013	6257
Nellis Boulevard/Las Vegas Wash	145.11/57.51	7111	6411

Note: When revised discharges are not significantly different than FIS discharges, FEMA may require a confidence limits analysis on attachment D at a later date to complete the review.

As is often the case with revision requests, only a portion of a stream may actually be revised or be affected by a revision. Therefore, transition to the unrevised portion is important to maintain the continuity of the study. NFIP regulations stipulate that such a transition must be assured. What is the transition from the proposed discharges to the effective discharges? Please explain how the transition was made *(attach separate sheet if necessary)*.

Analysis incorporates the entire reach from the Red Rock Detention Basin to the Las Vegas Wash.

ATTACH A COMPLETED "REVIEW OF RESULTS" PAGE FOR EACH FLOODING SOURCE.

Is the new hydrologic analysis being developed solely to revise the flow values presented in the FIS *(i.e. no changed hydraulic conditions)?* ☐ Yes ☒ No

If yes, does the 100-year water surface elevation change by 1.0 foot or more? N/A ☐ Yes ☐ No

Note: FEMA does not normally revise NFIP maps solely due to flow changes when changes in 100-year water surface elevation are less than 1.0 foot.

5. HISTORICAL FLOODING INFORMATION

Is historical data available for the flooding source? ☐ Yes ☒ No

If yes, provide the following:

Location along flooding source: _____

Maximum peak discharge: _____ cfs

Second highest peak discharge: _____ cfs

Source of information: _____

6. GAGE RECORD INFORMATION

Location of nearest gage to project site *(along flooding source or similar watershed; specify)*

_____

Gaging Station: N/A

Drainage area at gage: _____ mi^2

Number of years of data: _____

7. DATA REVISION

Please use the following table to list all the data and/or parameters affected by this request and identify them as new data *(New)* or as revising existing data *(Revised)*. *(If necessary, attach a separate sheet.)*

Data Parameter	New	Revised	Data Source
Red Rock Detention Basin Watershed	☐	☒	LOMR Case No. 97-09-177P
Upper Flamingo Wash Detention Basin Rating Curve and Watershed	☐	☒	LOMR Case No. 97-09-138P
Depth Area Reduction Factors	☐	☒	CCRFCD Manual
Kinematic Wave Routing	☐	☒	HEC-1 Flood Hydrograph Package
	☐	☐	

- The data source can be a Federal, State, or local government agency, or a private source. Some State and local governments may have less strict data requirements than Federal agencies, in which case the hydrologic data may not be accepted by FEMA unless it is demonstrated that the data give a better estimate of the flood discharge.
- Attach documentation corroborating each data source *(i.e., certified statement, report, bibliographical reference to a published document)*. In the case of a published document or a government report, providing copies of the cover and pertinent pages may be helpful.

8. METHODOLOGY FOR NEW ANALYSIS

☐ Statistical Analysis of Gage Records *(use Attachment A)*

☐ Regional Regression Equations *(use Attachment B)*

☒ Precipitation/Runoff Model *(use Attachment C)*

☐ Other *(specify; attach backup computations and supporting data)* _____

_____

ATTACHMENT A: STATISTICAL ANALYSIS OF GAGE RECORDS

Gaging Station: _____

Gage Location (latitude and longitude): _____

		FIS:	Revised:
1.	Number of years of data		
	Systematic		
	Historical		
2.	Homogeneous data	☐ Yes ☐ No	☐ Yes ☐ No
3.	Data adjustments	☐ Yes ☐ No	☐ Yes ☐ No
4.	Number of high outliers		
	Low outliers		
	Zero events		
5.	Generalized skew		
6.	Station skew		
7.	Adopted skew		
8.	Probability distribution used (justify if log-Pearson III was not used)		
9.	Transfer equations to ungaged sites. If yes, specify method		☐ Yes ☐ No
10.	Expected probability*		☐ Yes ☐ No
11.	Comparison of results with other analyses. If yes, describe comparison		☐ Yes ☐ No

* **FEMA** does not accept expected probability analyses for the purpose of reflecting flood hazard information in a FIS.

If any data is not available, indicate by N/A.

Attach analysis including plot of flood frequency curve.

ATTACHMENT B: REGIONAL REGRESSION EQUATIONS

1. Bibliographical Reference:

_____

_____

_____

(Attach a copy of title page, table of contents, and pertinent pages including equations.)

2. Gaged or ungaged stream: _____

3. Hydrologic region(s): _____
Attach backup map.

4. Provide parameters, values, and source of data used to define parameters.

_____

_____

_____

		FIS:		Revised:	
5.	Urbanized conditions calculations	☐ Yes	☐ No	☐ Yes	☐ No
6.	Percent of watershed urbanization	_____		_____	
	Is the watershed controlled?	☐ Yes	☐ No	☐ Yes	☐ No
8.	Comparison with other analyses	☐ Yes	☐ No	☐ Yes	☐ No

If the answer to 5, 7, or 8 is yes, explain methodology in Comments.

If data is not available, indicate by N/A.

Comments

_____

_____

_____

_____

Attach computation and supporting maps, delineating the watershed boundary and drainage area divides.

ATTACHMENT C: PRECIPITATION/RUNOFF MODEL

		FIS:	Revised:
1.	Method or model used:	HEC-1	HEC-1
	Version:	5.20	4.0
	Date:	August 1998	September 1990
2.	Source of rainfall depth:	CCRFCD Manual	CCRFCD Manual
3.	Source of rainfall distribution:	CCRFCD Manual	CCRFCD Manual
4.	Rainfall duration:	CCRFCD Manual	CCRFCD Manual
5.	Areal adjustment to precipitation (%):	.81/.68/.60/.565	.72/.71/.68/.67
6.	Maximum overland flow length:	500 Feet	500 Feet
7.	Hydrograph development method:	SCS/Kinematic Wave	SCS/Kinematic Wave
8.	Loss Rate Method:	SCS Curve No.	SCS Curve No.
	Source of soils information	SCS Soil Survey	SCS Soil Survey
	Source of land use information	N/A	N/A
9.	Channel routing method:	Muskingum/Kinematic	Muskingum/Kinematic/ Muskingum-Cunge
10.	Reservoir routing:	☒ Yes ☐ No	☒ Yes ☐ No
11.	Baseflow considerations:	☐ Yes ☒ No	☐ Yes ☒ No
	If yes, explain how baseflow was determined:		
12.	Snowmelt considerations:	☐ Yes ☒ No	☐ Yes ☒ No
13.	Model calibration:	☐ Yes ☒ No	☐ Yes ☒ No
	If yes, explain how calibration was performed		
14.	Future land use condition:		☐ Yes ☒ No
	If yes, explain why:		

Note: FEMA policy is to base flooding on existing conditions.

If data is not available, indicate by N/A.

Attach precipitation/runoff model, hydrologic model schematic, curve number calculations, time of concentration calculations, and supporting maps, delineating the watershed boundary and drainage area divides.

ATTACHMENT D: CONFIDENCE LIMITS EVALUATION

Stream: _____

Select location for Confidence Limits Evaluation *(describe location)*: _____

_____

Discharges for selected location:

Exceedance Probability	FIS		Revised	
10% (10-year)	_____	cfs	_____	cfs
2% (50-year)	_____	cfs	_____	cfs
1% (100-year)	_____	cfs	_____	cfs
0.2% (500-year)	_____	cfs	_____	cfs

1% (100-year) Flood Confidence Intervals

90% Confidence Interval: 5% limit _____ cfs
95% limit _____ cfs

50% Confidence Interval: 25% limit _____ cfs
75% limit _____ cfs

If the value of the 100-year frequency flood in the FIS is beyond the 50% confidence interval but within the 90% confidence interval, does the 100-year water surface elevation change by 1.0 foot or more?

☐ Yes ☐ No

Note: An example of confidence limits analysis can be found in Appendix 9 of Bulletin 17B.

Attach Confidence Limits Analysis.

FEDERAL EMERGENCY MANAGEMENT AGENCY **RIVERINE HYDRAULIC ANALYSIS FORM**	*O.M.B. Burden No. 3067-0148* *Expires July 31, 1997*	*FEMA USE ONLY*

PUBLIC BURDEN DISCLOSURE NOTICE

Public reporting burden for this form is estimated to average 2.25 hours per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing and reviewing the form. Send comments regarding the accuracy of the burden estimate and any suggestions for reducing this burden, to: Information Collections Management, Federal Emergency Management Agency, 500 C Street, S.W., Washington, DC 20472.

You are not required to respond to this collection of information unless a valid OMB Control Number is displayed in the upper right corner of this form.

Community Name: Clark County, Nevada

Flooding Source: Flamingo Wash
(One form for each flooding source)

Project Name/Identifier: Flamingo Wash FIS Restudy

1. REACH TO BE REVISED

Downstream limit: Rainbow Boulevard

Upstream Limit: Near Las Vegas Wash Confluence

2. EFFECTIVE FIS

☐ Not studied

☒ Studied by approximate methods

Downstream limit of study Near Las Vegas Wash Confluence

Upstream limit of study Upper Flamingo Detention Basin

☐ Studied by detailed methods

Downstream limit of detailed study

Upstream limit of detailed study

☐ Floodway delineated

Downstream limit of Floodway

Upstream limit of Floodway

3. HYDRAULIC ANALYSIS

Why is the hydraulic analysis different from that used to develop the FIRM? *(Check all that apply)*

☐ Not studied in FIS

☒ Improved hydrologic data/analysis. Explain: Effective FIS HEC-1 Model revised to reflect the Red Rock Detention Basin Expansion and the Upper Flamingo Detention Basin construction upstream of the studied reach

☒ Improved hydraulic analysis. Explain: HEC-2 models were developed.

☐ Flood control structure. Explain:

☐ Other. Explain:

PLEASE REFER TO THE INSTRUCTIONS FOR THE APPROPRIATE MAILING ADDRESS

4. Models Submitted

For areas which have detailed flooding:

Full input and output listings along with files on diskette *(if available)* for each of the models listed below (items 1, 2, 3, 4, and 5) and summary of the source of input parameters used in the models must be provided. The summary must include a complete description of any changes made from model to model *(e.g. duplicate effective model to corrected effective model)*. At a minimum, the Duplicate Effective (item 1) and the Revised or Post-Project Conditions (item 4) models must be submitted. See instructions for directions on when other models may be required.

For areas which do not have detailed flooding:

Only the 100-year flood profile is required. A hydraulic model is not required for areas which do not have detailed flooding; however, BFEs may not be added to the revised FIRM. If a hydraulic model is developed for the area, items 3 and 4 described below must be submitted.

If hydraulic models are not developed, hydraulic analyses for existing or pre-project conditions and revised or post-project conditions must be submitted. All calculations must be submitted for these analyses. (See Item 6 below.)

1. Duplicate Effective Model — Natural ☐ Floodway ☐

Copies of the hydraulic analysis used in the effective FIS, referred to as the effective models *(10-, 50-, 100-, and 500-year multi-profile runs and the floodway run)* must be obtained and then reproduced on the requestor's equipment to produce the duplicate effective model. This is required to assure that the effective model input data has been transferred correctly to the requestor's equipment and to assure that the revised data will be integrated into the effective data to provide a continuous FIS model upstream and downstream of the revised reach.

2. Corrected Effective Model — Natural ☐ Floodway ☐

The corrected effective model is the model that corrects any errors that occur in the duplicate effective model, adds any additional cross sections to the duplicate effective model, or incorporates more detailed topographic information than that used in the currently effective model. The corrected effective model must not reflect any man-made physical changes since the date of the effective model. An error could be a technical error in the modeling procedures, or any construction in the floodplain that occurred prior to the date of the effective model but was not incorporated into the effective model.

3. Existing or Pre-Project Conditions Model — Natural ☐ Floodway ☐

The duplicate effective or corrected model is modified to produce the existing or pre-project conditions model to reflect any modifications that have occurred within the floodplain since the date of the effective model but prior to the construction of the project for which the revision is being requested. If no modification has occurred since the date of the effective model, then this model would be identical to the corrected effective or duplicate effective model.

4. Revised or Post-Project Conditions Model — Natural ☐ Floodway ☐

The existing or pre-project conditions model *(or duplicate effective or corrected effective model, as appropriate)* is revised to reflect revised or post-project conditions. This model must incorporate any physical changes to the floodplain since the effective model was produced as well as the effects of the project. When the request is for proposed project this Model should reflect proposed conditions.

5. Other: Please attach a sheet describing all other models submitted. **Existing Conditions Models.** — Natural ☒ Floodway ☐

6. Hydraulic Analyses (Only if Hydraulic Models are not developed) — Natural ☐ Floodway ☐

Attach all calculations for the existing or pre-project conditions and the revised or post-project conditions. Proceed to Form 5, "Riverine/Coastal Mapping Form".

5. MODEL PARAMETERS (from model used to revise 100-year water surface elevation)

1. Discharges:

	Upstream Limit	Downstream Limit
10-year	N/A	N/A
50-year	N/A	N/A
100-year	3,900 cfs	6,400 cfs
500-year	N/A	

Attach diagram showing changes in 100-year discharge

2. Explain how the starting water surface elevations were determined Normal depth was used.

3. Give range of friction loss coefficients *(Manning's "N")* Channel . . . . . 0.015 - 0.040

Overbanks . . . 0.015 - 0.1

If friction loss coefficients are different anywhere along the revised reach from those used to develop the FIRM, give location, value used in the effective FIS, and revised values and an explanation as to how the revised values were determined.

Location	FIS	Revised
N/A		

Explain:

4. Describe how the cross section geometry data were determined *(e.g., field survey, topographic map, taken from previous study)* and list cross sections that were added.

Cross-section geometry data were determined by field survey and topographic maps developed specifically for this restudy. There were no previous cross-sections.

5. Were natural channel banks selected as the location of the left and right channel banks in the model?

☒ Yes ☐ No If no, explain why not:

6. Explain how reach lengths for channel and overbanks were determined:

The flow lengths between cross-sections were determined by measuring along expected flow paths using the natural topography, the river centerline, banks, and engineering judgement as a guide

6. RESULTS (from model used to revise 100-year water surface elevations) - N/A

1. Do the results indicate:

   a. Water surface elevations higher than end points of cross sections? ☐ Yes ☐ No

   b. Supercritical depth? ☐ Yes ☐ No

   c. Critical depth? ☐ Yes ☐ No

   d. Other unique situations? ☐ Yes ☐ No

   If yes to any of the above, attach an explanation that discusses the situation and how it is presented on the profiles, tables, and maps.

2. What is the maximum change in energy gradient between cross-sections? _____

   Specify location _____

3. What is the distance between the cross-sections in 2 above? _____

   Specify location _____

4. What is the maximum distance between cross-sections? _____

   Specify location _____

5. Floodway determination

   a. What is the maximum surcharge allowed by the community or State? _____ foot

   b. What is the maximum surcharge for the revised conditions? _____ foot

   Specify locations _____

   c. What is the maximum velocity? _____

   Specify location _____

   d. Are there any negative surcharge values at any cross-section? ☐ Yes ☐ No

   If yes, the floodway may need to widen. If it is not widened, please explain and indicate the maximum negative surcharge.

Explain: _____

6. Is the discharge value used to determine the floodway anywhere different from that used to determine the natural 100-year flood elevations? . . . . . ☐ Yes ☐ No N/A

If yes, explain:

_____

_____

_____

7. Do 100-year water surface elevations increase at any location? . . . . . ☐ Yes ☐ No N/A

If yes, please attach a list of the locations where the increases occur, state whether or not the increases are located on the requestor's property, and provide an explanation of the reason for the increases. *(For example: Stat if the increase is due to fill placed within the floodway fringe or placed within the currently adopted floodway limits)*

_____

_____

_____

Attach a completed comparison table entitled: Water Surface Elevation Check (See page 6)

7. REVISED FIRM/FBFM AND FLOOD PROFILES

8. The revised water surface elevations tie into those computed by the effective FIS Model *(10-, 50-, 100-, and 500-year)*, downstream of the project at cross-section N/A within N/A feet (*vertical*) and upstream of the project at cross section N/A within N/A feet (*vertical*).

9. The revised floodway elevations tie into those computed by the effective FIS model, downstream of the project at cross section N/A within N/A feet (*vertical*) and upstream of the project at cross section N/A within N/A feet (*vertical*).

10. Attach profiles, at the same vertical and horizontal scale as the profiles in the effective FIS report, showing stream bed and profiles of all floods studied (without encroachment). Also, label all cross sections, road crossings (including low chord and top-of-road data), culverts, tributaries, corporate limits, and study limits. If channel distance has changed, the stationing should be revised for all profile sheets. N/A

11. Attach a Floodway Data Table showing data for each cross section listed in the published Floodway Data Table in the FIS report. N/A

Proceed to Riverine/Coastal Mapping Form (Form 5).

FEDERAL EMERGENCY MANAGEMENT AGENCY

WATER SURFACE ELEVATION CHECK - N/A

COMMUNITY NAME*	FLOODING SOURCE	PROJECT NAME/IDENTIFIER

	EFFECTIVE			DUPLICATE EFFECTIVE			CORRECTED EFFECTIVE			EXISTING/PRE-PROJECT			REVISED/PROJECT		
SECNO	NCWS EL[1]	FCWS EL[2]	SURC.[3]	NCWS EL[1]	FCWS EL[2]	SURC.[3]	NCWS EL[1]	FCWS EL[2]	SURC.[3]	NCWS EL[1]	FCWS EL[2]	SURC.[3]	NCWS EL[1]	FCWS EL[2]	SURC.[3]

COMMENTS: *N/A, please see FEMA Floodway Data

1 - 100-year (natural) Water Surface Elevation 2 - Encroachment (floodway) Water Surface Elevation 3 - Surcharge Value

Include all cross sections in the models between tie-in points. Any interpolated values should be indicated in parentheses.

FEDERAL EMERGENCY MANAGEMENT AGENCY RIVERINE/COASTAL MAPPING FORM	O.M.B. Burden No. 3067-0148 Expires July 31, 1997	FEMA USE ONLY

PUBLIC BURDEN DISCLOSURE NOTICE

Public reporting burden for this form is estimated to average 1.5 hours per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing and reviewing the form. Send comments regarding the accuracy of the burden estimate and any suggestions for reducing this burden, to: Information Collections Management, Federal Emergency Management Agency, 500 C Street, S.W., Washington, DC 20472; and to the Office of Management and Budget, Paperwork Reduction Project (3067-0148), Washington, DC 20503.

You are not required to respond to this collection of information unless a valid OMB Control Number is displayed in the upper right corner of this form.

Community Name: Clark County, Nevada

Flooding Source: Flamingo Wash

Project Name/Identifier: Flamingo Wash FIS Restudy

1. MAPPING CHANGES

1. A topographic work map of suitable scale, contour interval, and planimetric definition must be submitted showing *(indicate N/A when not applicable)*:

		Included		
A.	Revised approximate 100-year floodplain boundaries (Zone A)?	[X] Yes	[ ] No	[ ] N/A
B.	Revised detailed 100- and 500-year floodplain boundaries?	[ ] Yes	[ ] No	[X] N/A
C.	Revised 100-year floodway boundaries?	[ ] Yes	[ ] No	[X] N/A
D.	Location and alignment of all cross sections used in the revised hydraulic model with stationing control indicated?	[ ] Yes	[ ] No	[X] N/A
E.	Stream alignments, road and dam alignments?	[X] Yes	[ ] No	[ ] N/A
F.	Current community boundaries?	[ ] Yes	[X] No	[ ] N/A
G.	Effective 100- and 500-year floodplain and 100-year floodway boundaries from the FIRM/FBFM reduced or enlarged to the scale of the topographic work map? **100-year floodplain only**	[X] Yes	[ ] No	[ ] N/A
H.	Tie-ins between the effective and revised 100- and 500-year floodplains and 100-year floodway boundaries? **100-year floodplain only**	[X] Yes	[ ] No	[ ] N/A
I.	The requestor's property boundaries and community easements?	[ ] Yes	[X] No	[ ] N/A
J.	The signed certification of a registered professional engineer?	[X] Yes	[ ] No	[ ] N/A
K.	Location and description of reference marks?	[X] Yes	[ ] No	[ ] N/A
L.	Vertical datum (example: NGVD, NAVD, etc.)?	[X] Yes	[ ] No	[ ] N/A
M.	*Coastal zone designations tie into adjacent areas not being revised?*	[ ] Yes	[ ] No	[X] N/A
N.	Location and alignment of all coastal transects used to revise the coastal analyses?	[ ] Yes	[ ] No	[X] N/A

If any of the items above are marked no or N/A, please explain: B., C., and D. approximate methods, F. Clark County boundaries are beyond study area, I. same as F., M. and N. not a Coastal Zone.

2. What is the source and date of the updated topographic information *(example: orthophoto maps, July 1985; field survey, May 1979, beach profiles, June 1987, etc.)*? Aerial Photography, flown January 22, 1997; Field Survey, July 1997.

3. What is the scale and contour interval of the following workmaps?

   a. Effective FIS Not Available scale Not Available Contour interval

   b. Revision Request 1' = 400' scale 4-Foot Contour interval

NOTE: Revised topographic information must be of equal or greater detail.

4. Attach an annotated FIRM and FBFM at the scale of the effective FIRM and FBFM showing the revised 100-year and 500-year floodplains and the 100-year floodway boundaries and how they tie into those shown on the effective FIRM and FBFM downstream and upstream of the revision or adjacent to the area of revision for coastal studies. Attach additional pages if needed.

PLEASE REFER TO THE INSTRUCTION FOR THE APPROPRIATE MAILING ADDRESS

5. Flood Boundaries and 100-year water surface elevations:

Has the 100-year floodplain been shifted or increased or the 100-year water surface elevation increased at any location on property other than the requestor's or community's? ☐ Yes ☒ No

If yes, please give the location of shift or increase and an explanation for the increase.

a. Have the affected property owners been notified of this shift or increase and the effect it will have on their property? . . . . . ☐ Yes ☐ No

If yes, please attach letters from these property owners stating they have no objections to the revised flood boundaries if a LOMR is being requested.

b. What is the number of insurable structures that will be impacted by this shift or increase? _____

6. Have the floodway boundaries shifted or increased at any location compared to those shown on the effective FBFM or FIRM? . . . . . ☐ Yes ☐ No N/A

If yes, explain:

7. If a V-zone has been designated, has it been delineated to extend landward to the heel of the primary frontal dune? . . . . . ☐ Yes ☐ No N/A

If no, explain:

8. Manual or digital map submission:

☐ Manual
☒ Digital

Digital map submissions may be used to update digital FIRMs (DFIRMs). For updating DFIRMs, these submissions must be coordinated with FEMA Headquarters as far in advance of submission as possible.

2. EARTH FILL PLACEMENT

1. The fill is: ☐ Existing ☐ Proposed N/A

2. Has fill been/will be placed in the regulatory floodway? . . . . . ☐ Yes ☒ No

If yes, please attach completed Riverine Hydraulic Analysis Form.

3. Has fill been/will be placed in floodway fringe *(area between the floodway and 100-year floodplain boundaries)*? . . . . . ☐ Yes ☒ No

If yes, then complete A, B, C, and D below.

A. Are fill slopes for granular materials steeper than one vertical on one-and-one-half horizontal? . . . . . ☐ Yes ☐ No

If yes, justify steeper slopes _____

_____

B. Is adequate erosion protection provided for fill slopes exposed to moving flood waters? *(Slopes exposed to flows with velocities of up to 5 feet per second (fps) during the 100-year flood must, at a minimum, be protected by a cover of grass, vines, weeds, or similar vegetation; slopes exposed to flows with velocities greater than 5 fps during the 100-year flood must, at a minimum, be protected by stone or rock riprap.)* . . . . . ☐ Yes ☐ No

If no, describe erosion protection provided _____

_____

C. Has all fill placed in revised 100-year floodplain been compacted to 95 percent of the maximum density obtainable with the Standard Proctor Test Method or acceptable equivalent method? . . . . . ☐ Yes ☐ No

D. Can structures conceivably be constructed on the fill at any time in the future? . . . . . ☐ Yes ☐ No

If yes, provide certification of fill compaction (item C. above) by the community's NFIP permit official, a registered professional engineer, or an accredited soils engineer.

4. Has fill been/will be placed in a V-zone? . . . . . ☐ Yes ☐ No N/A

If yes, is the fill protected from erosion by a flood control structure such as a revetment or seawall? . . . . . ☐ Yes ☐ No

If yes, attach the coastal structures form.

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Study Contractor: G. C. Wallace, Inc.

MAPPING INFORMATION INDEX

Clark County, Nevada
(COMMUNITY NAME, STATE)

FLOOD INSURANCE STUDY

TYPE OF MAP	MAP DATE	NO. OF SHEETS	EXHIBIT NO.
FIRM	8/16/97	1	4.1
BASE MAP	9/22/97	5	4.2
WORK MAP	10/3/97	5	4.3
CROSS SECTION	10/3/97	5	4.3
AERIAL PHOTOGRAPHS	1/22/97	35	4.4

Study Contractor: G. C. Wallace, Inc.

MAPPING INFORMATION

WORK MAP DELINEATION SUMMARY

Clark County, Nevada
(COMMUNITY NAME, STATE)

FLOOD INSURANCE STUDY

FOR THE FLAMINGO WASH, THE APPROXIMATE 100-YEAR FLOOD-PLAIN BOUNDARIES WERE DELINEATED USING THE WATER SURFACE ELEVATIONS DERIVED FROM THE HEC-2 MODELS. THE FLOODPLAIN BOUNDARIES WERE INTERPOLATED BETWEEN CROSS SECTIONS USING 1" = 400' SCALE TOPOGRAPHIC MAPS WITH A CONTOUR INTERVAL OF 4 FEET. THESE TOPOGRAPHIC MAPS WERE CREATED SPECIFICALLY FOR THIS STUDY.

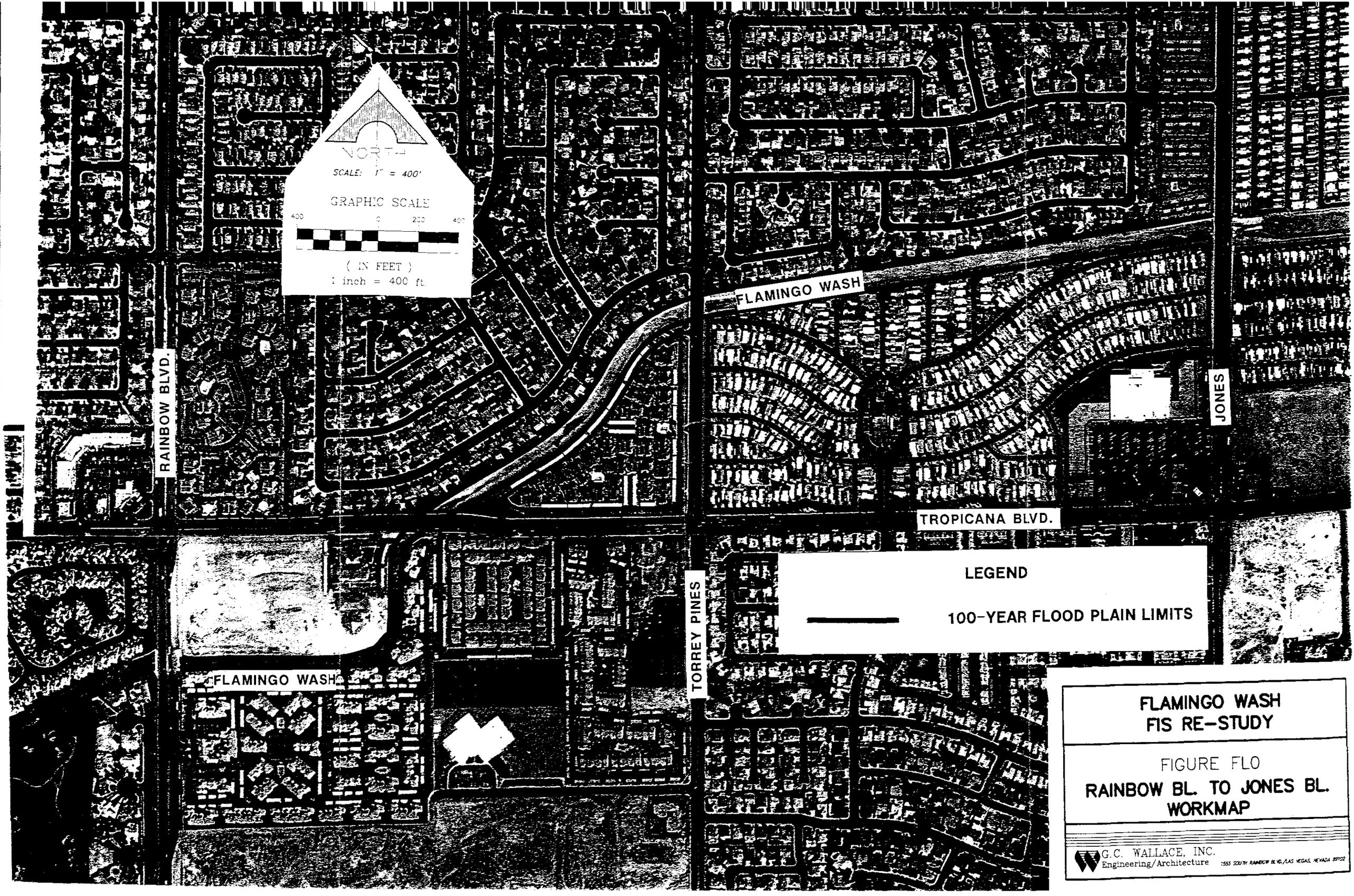


FLAMINGO WASH FIS RESTUDY

FIGURE P-FLO

RAINBOW BL. TO JONES BL. PHOTOGRAPH LOCATIONS

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102

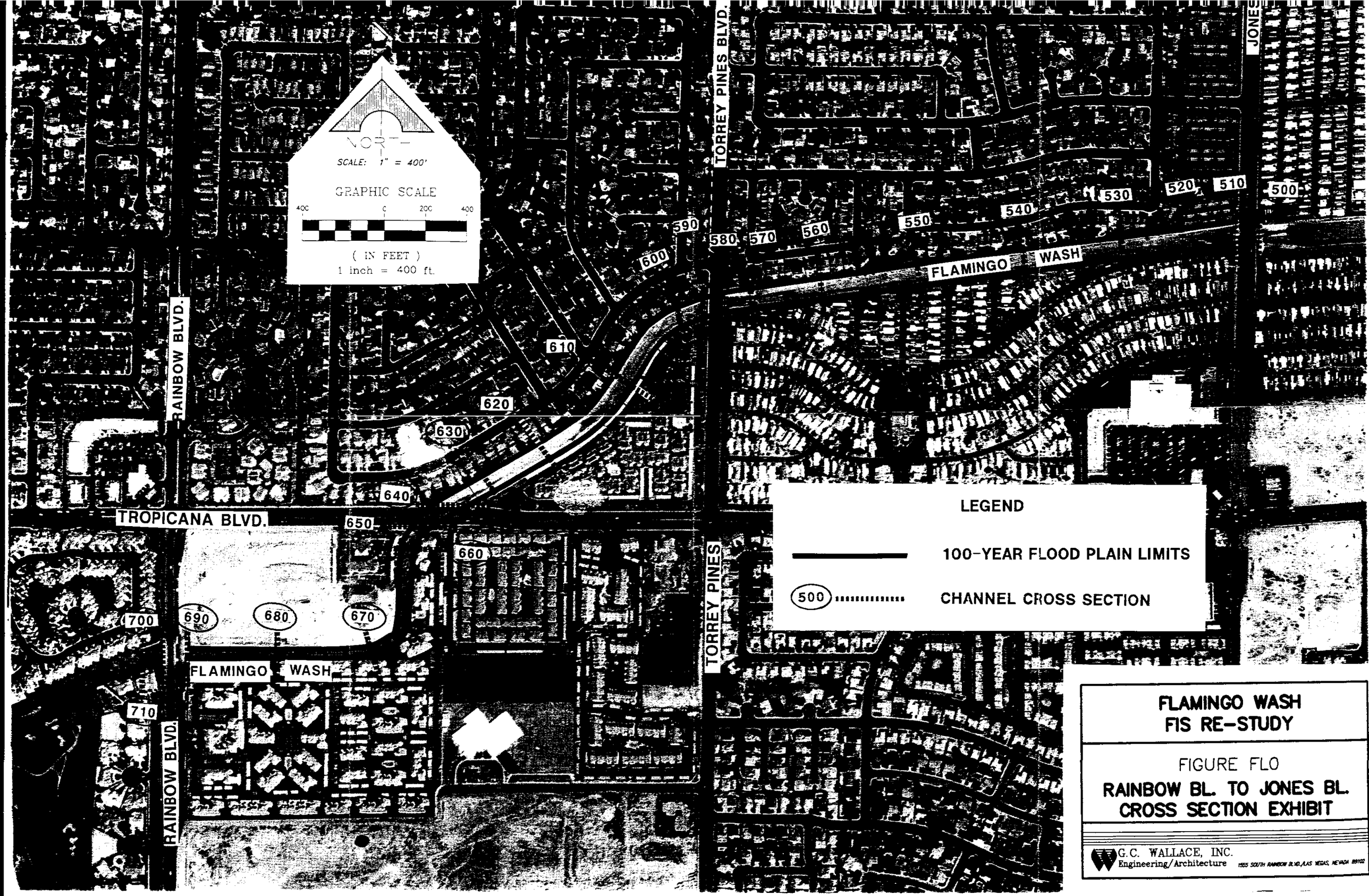


FLAMINGO WASH FIS RE-STUDY

FIGURE FLO

RAINBOW BL. TO JONES BL. WORKMAP

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102

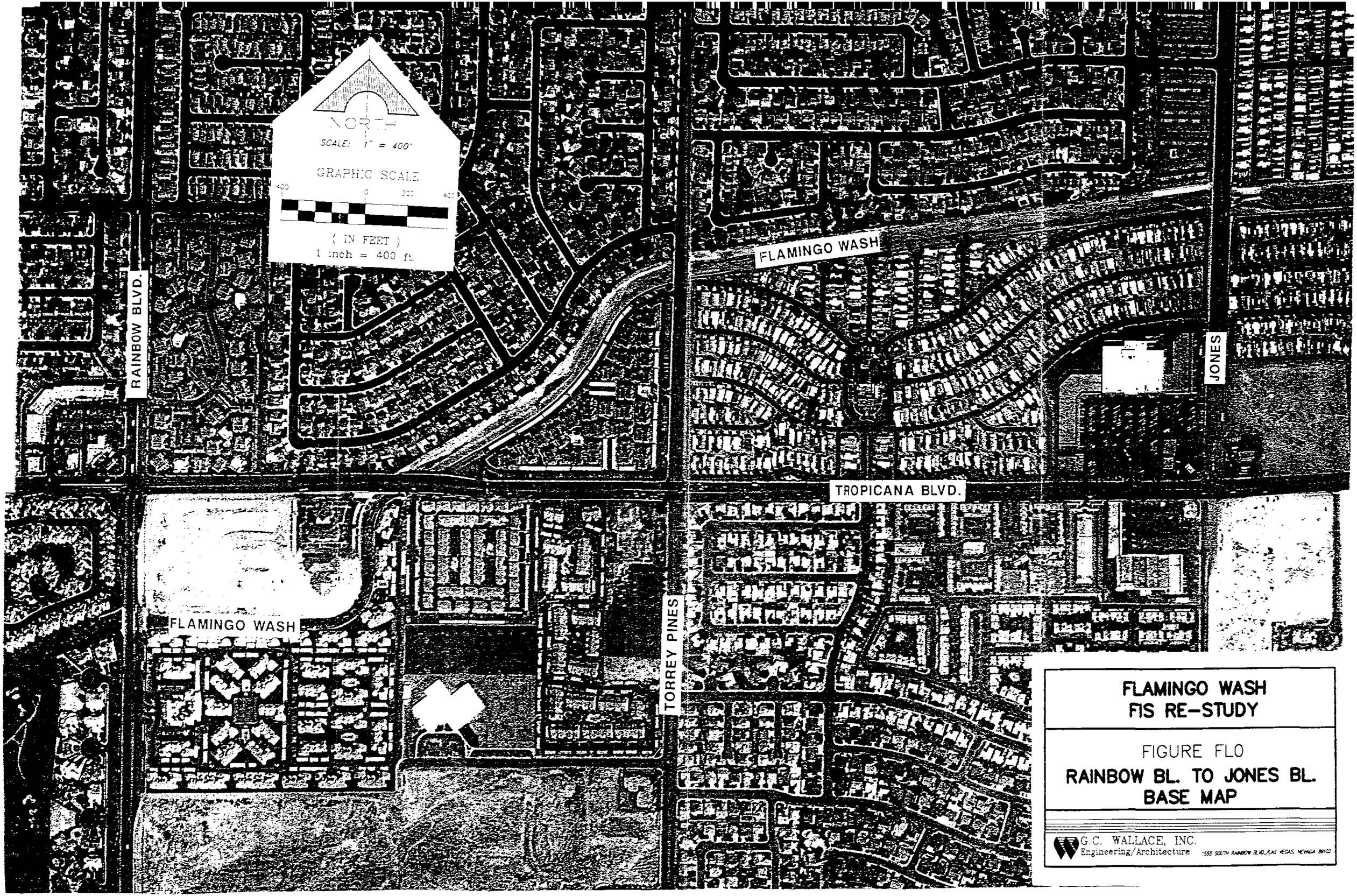


FLAMINGO WASH
FIS RE-STUDY

FIGURE FLO

RAINBOW BL. TO JONES BL.
CROSS SECTION EXHIBIT

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102



FLAMINGO WASH
FIS RE-STUDY

FIGURE FL0

RAINBOW BL. TO JONES BL.
BASE MAP

G.C. WALLACE, INC.
Engineering/Architecture
555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102

4.4.1 RAINBOW BLVD. TO JONES BLVD. REACH

THIS REACH WAS NOT FLOWN

4.4.2 JONES BLVD. TO INDUSTRIAL RD. REACH

NORTH





NORTH

NORTH



NORTH

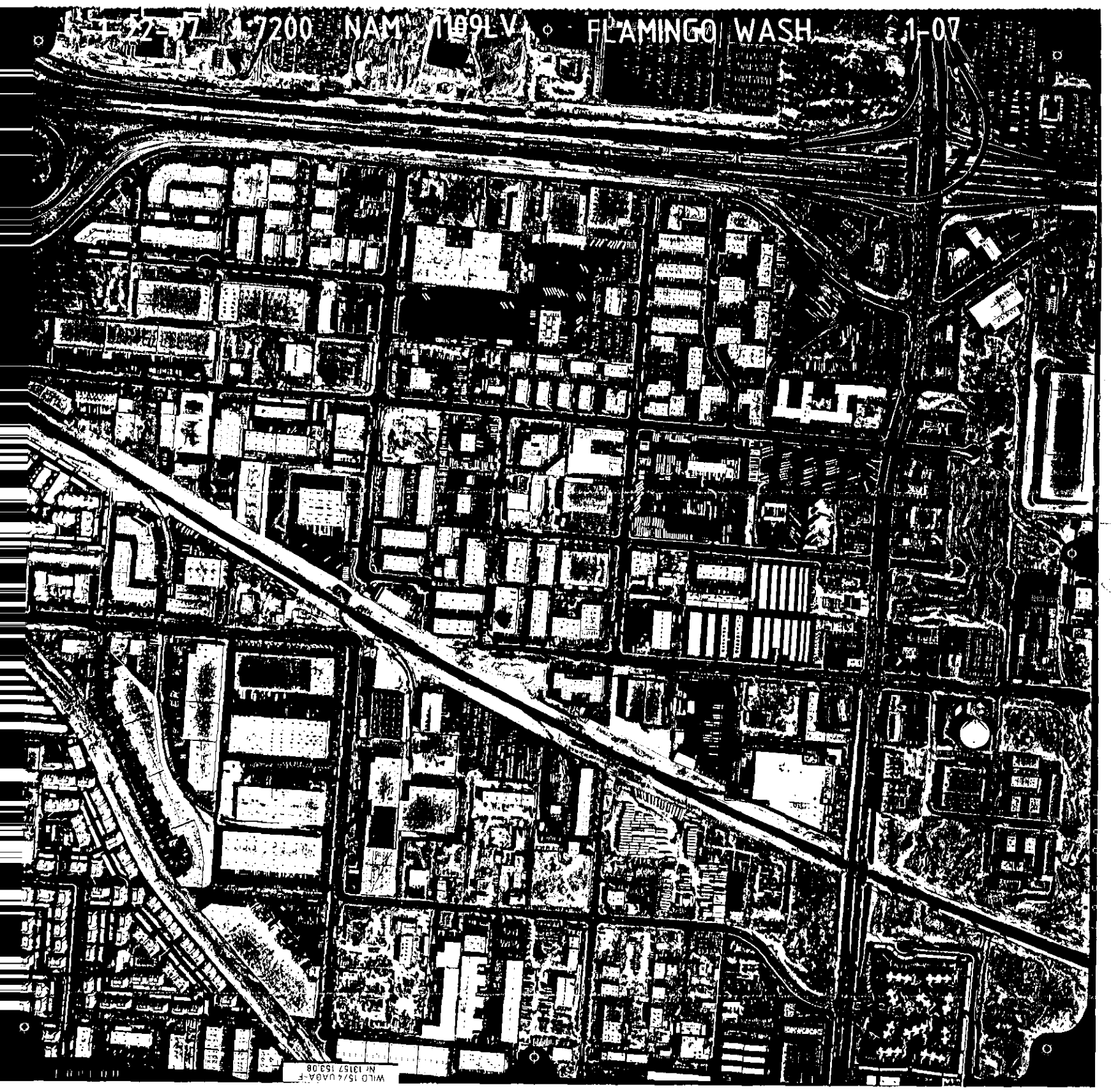


NORTH


NW 135TH AVE
NW 135TH ROAD
NW 135TH ROAD
NW 135TH ROAD


1-22-87 1:7200 NAM 1109L EL AMIGO WASH 1-06
WILD 15/4 UAGA-F
NF 13157 153.08

NORTH



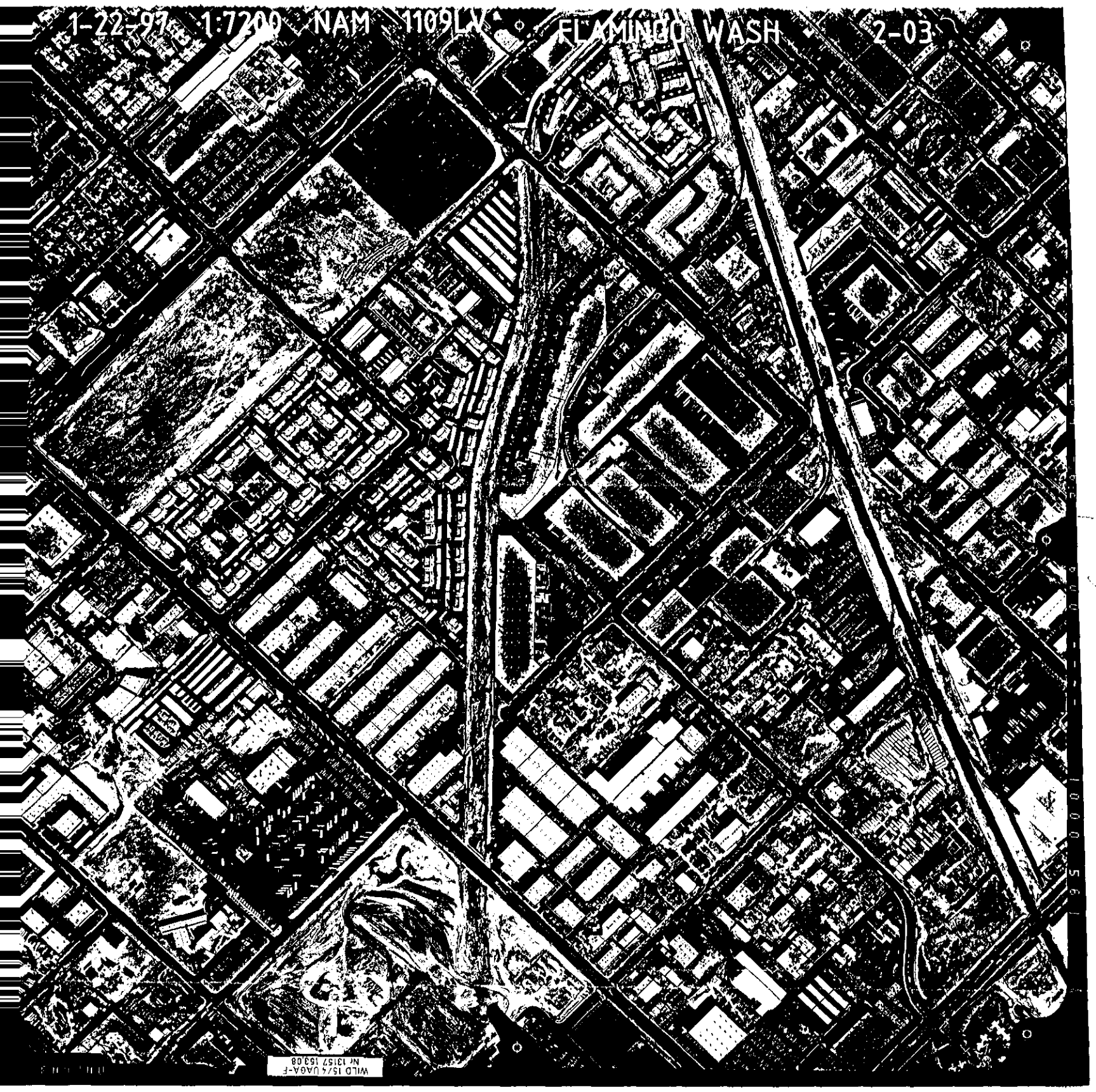
NORTH


1-22-97 1:7200 NAM 1109L-A
FLAMINGO WASH
2-01
WILD 1574 USGA-F
NF 13157 153.08

NORTH


1-22-97 1:7200 NAD 1983 FLAMINGO WASH 2-02
WILD 15A UAGA-F
NT 18157 153.08

NORTH


1-22-97 1:7200 NAM 1109LV FLAMINGO WASH 2-03
WILD 15/4 UAGA-F
NF 13157 153.08

NORTH


1-2-97 1:7200 NAM 1109LV FLAMINGO WASH 2-04
WILD 154 UAGA-F
NI 1357 153.08

NORTH



NORTH

4.4.3 IMPERIAL PALACE TO SPENCER ST. REACH


NORTH


WILD 15/7 UADA-F
15SF 153/08

NORTH




NORTH


WILD 1572 UADA-F
W 13°57' 153/08
7200 NAVAL DEPOT
FLAMINGO, VASH
3-05

NORTH


WILD 15/4 UAGA-F
Nr. 13157 15.3.08
22-9
1:7200 NAM 1102/54
FT. ANNING WASH
3-01


1-22-07
1:200
NAM 1109LV
FLAMINGO WASH
3-02
WILD 154 UAGA-F
NF 18157 153.08

NORTH


1-22-97 1:7200 NAM 1109UV
FLAMINGO WASH
3-06
WLD 15/4 UADA-F
N/ 13157 153.09

NORTH


1 32 11 4 7200 NAM 110 BV FLAMING 3 07
WILD 15/4 UAGA-F
Nr 13157 153.08

NORTH


NORTH


WILD 15/4 UAGA-F
Nr. 13157 153.08
BLVD.
FLAMINGO
BLVD.

4.4.4 EASTERN AVE. TO LAS VEGAS WASH REACH


1-22-97 1720 NAM 1109EV FLAMINGO WASH 1: 2,09
WILD 15/4 UAGA-F
N/ 13157 153.08

NORTH

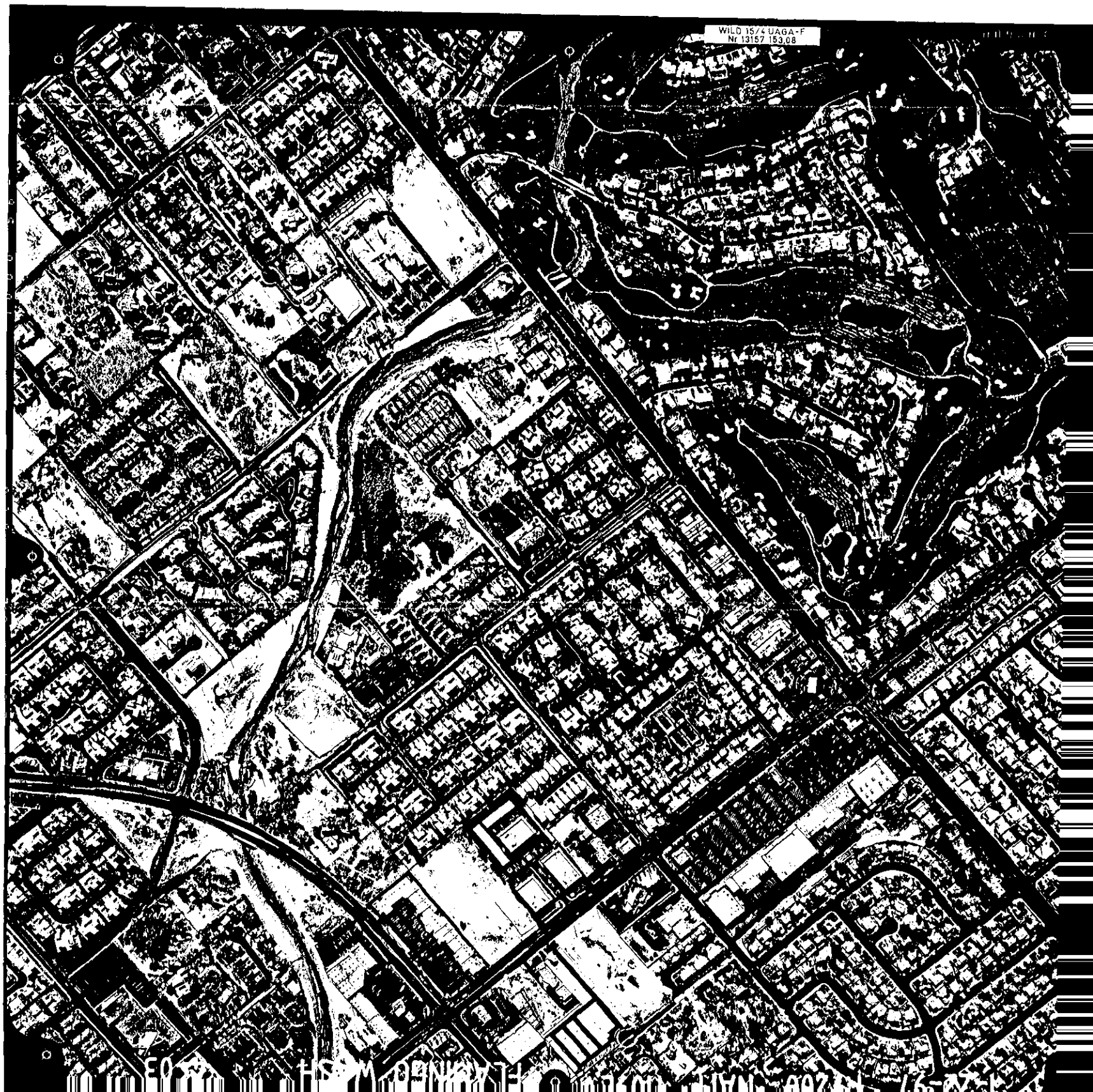

1-22-97 1:7200 NAM 1109LV FLAMINGO WASH 4-01
WILD 1574 UAGA-F
NF 13157 153.08

NORTH


NORTH


WILD 15/4 UAGA-F
Nr 13157 153,08


NORTH


WILD 1574 UAGA-F
Nr 13157 153.08


NORTH



NORTH


NORTH
WILD 15/4 UADA-F
Nr 13157 153.08



NORTH


NORTH


WILD 15(+) UAS+P
NO 3167 UAS+P

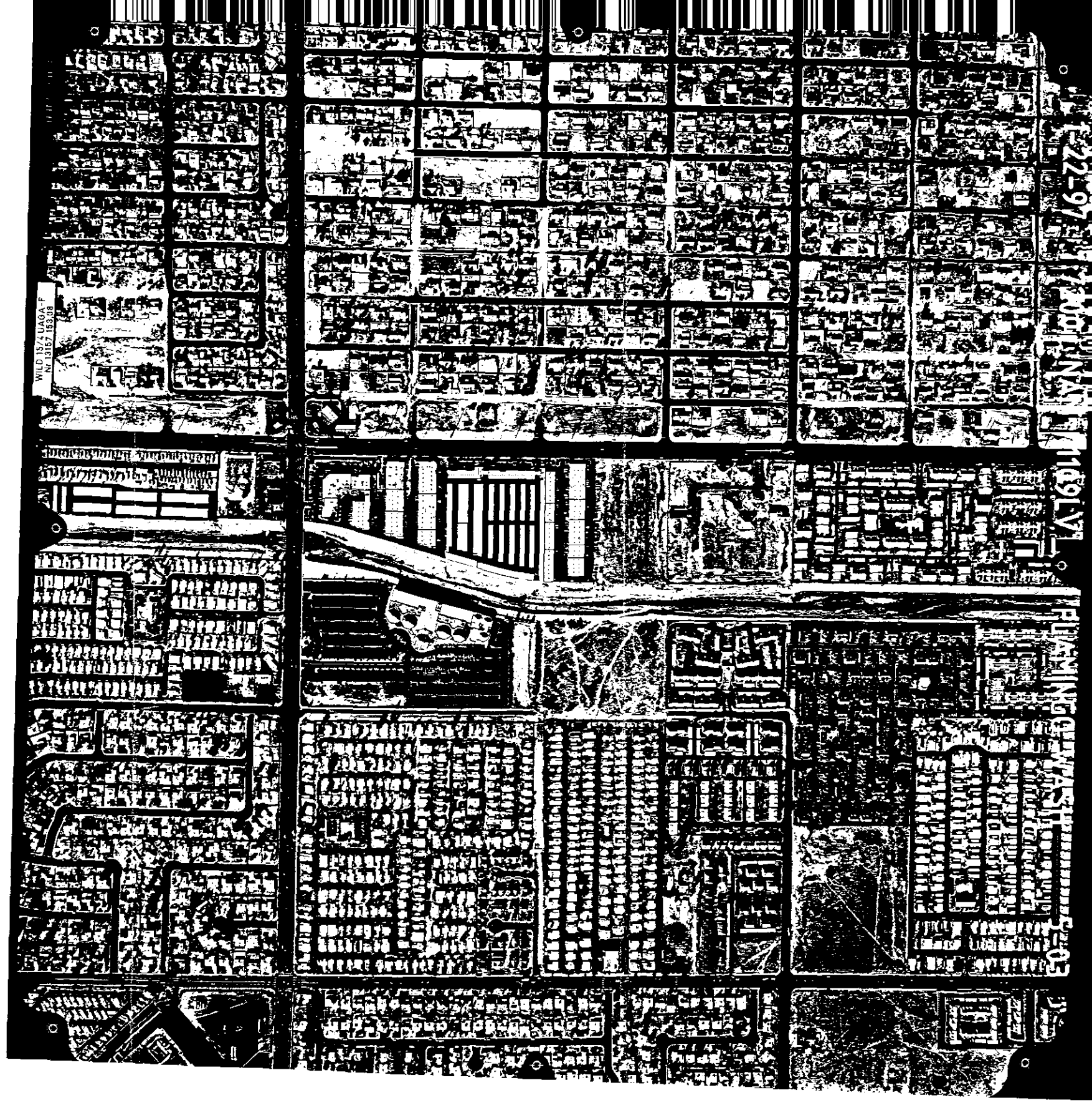

1-22-97 1:7200 NAD 1109LV FLAMINGO WASH 5-01
WILD 154 UAVA-F
NI 13157 153.08

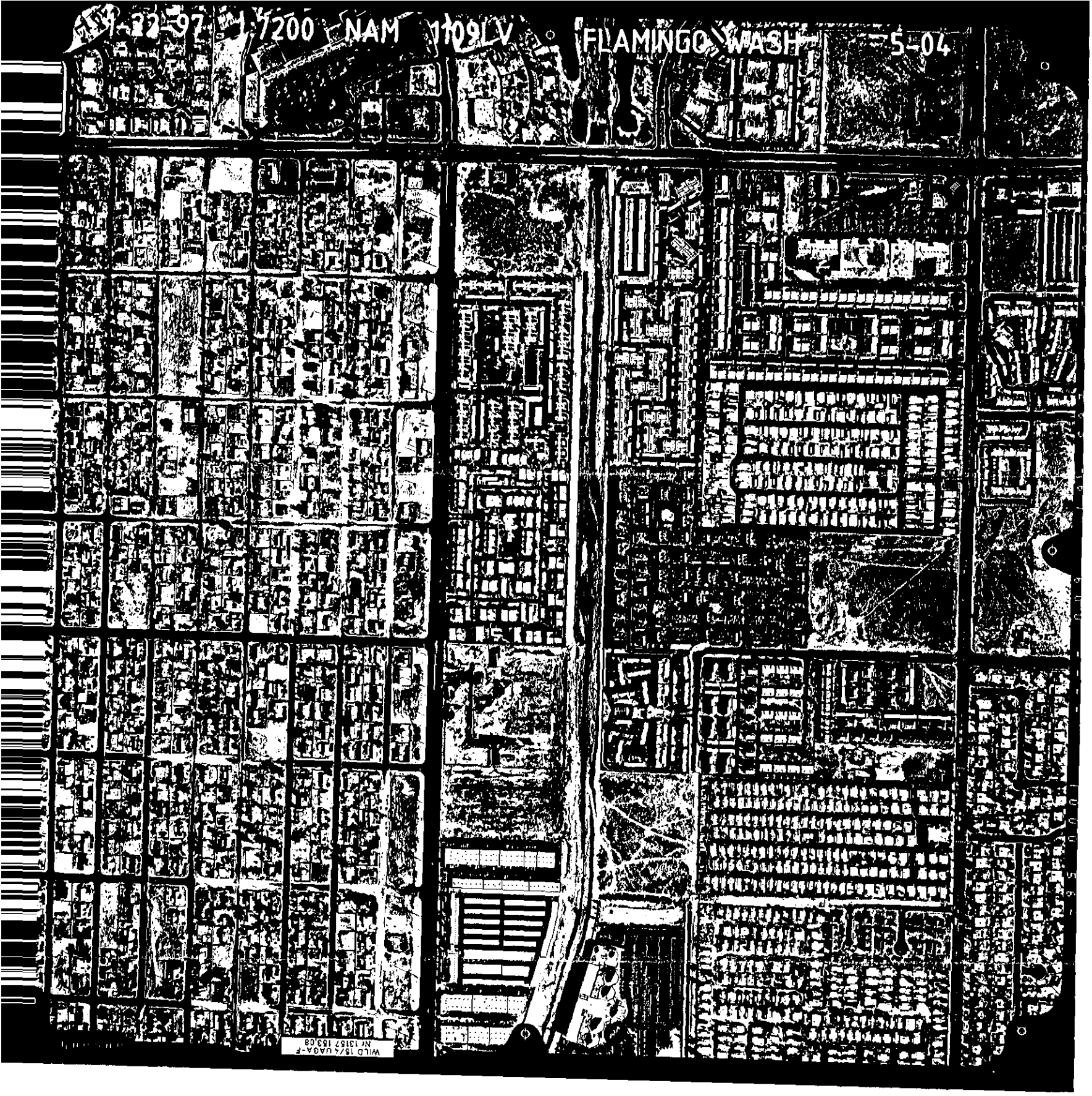
NORTH

NORTH



NORTH




9-22-97 1:7200 NAM 1709LV FLAMINGO WASH 5-04
WILD 15/4 UAGA-F
NV 13157 153.08

NORTH


NORTH

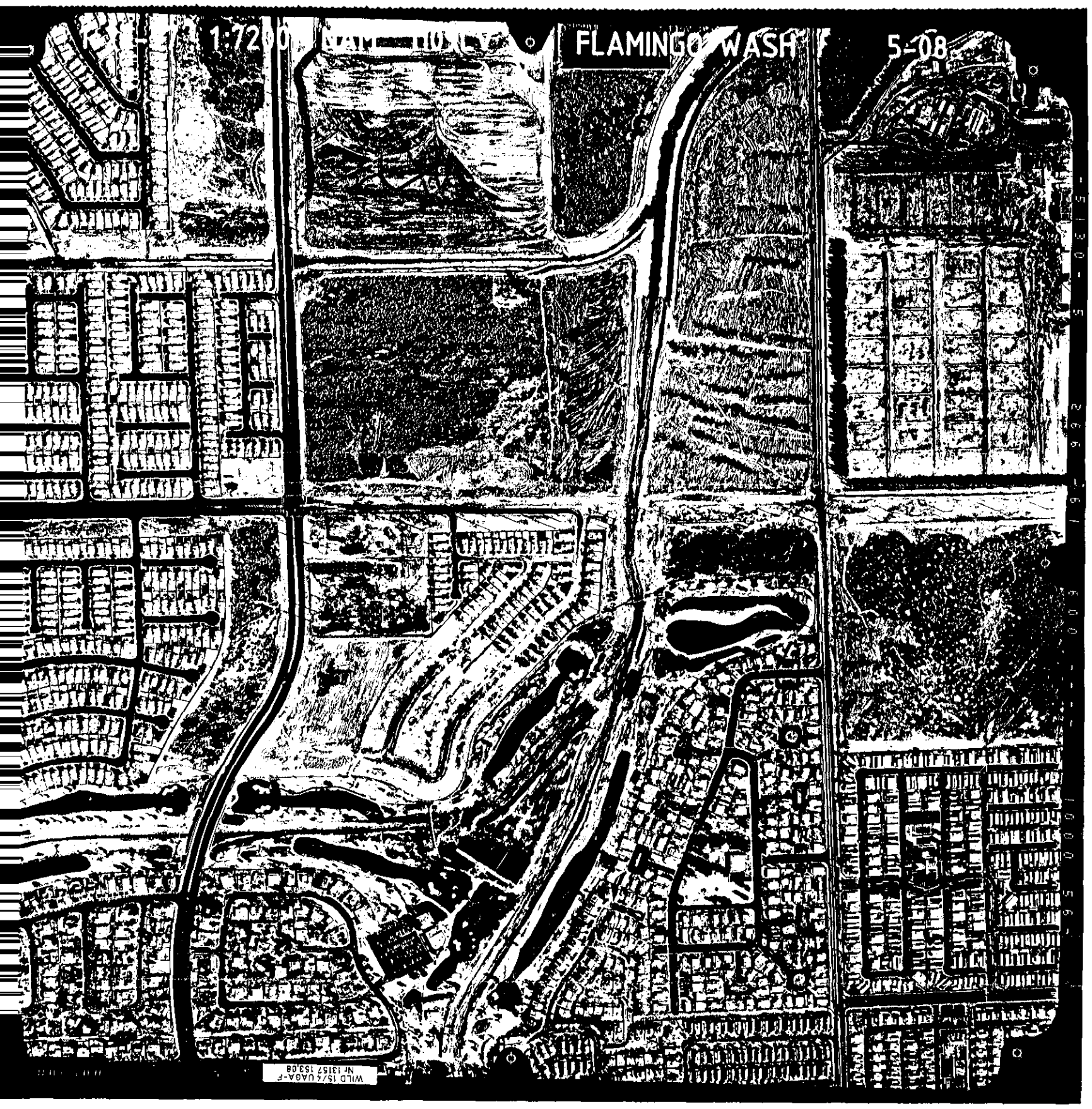

WLO 15/4 UA9A-F
NOAA/NESDIS



NORTH



NORTH



NORTH

NORTH



MAP REPOSITORY

City of Boulder City
Engineering Department
401 California Avenue
Boulder City, Nevada 89005
(Maps available for reference only, not for distribution.)

City of Henderson
Public Works Department
240 Water Street
Henderson, Nevada 89015
(Maps available for reference only, not for distribution.)

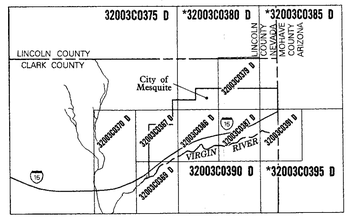
City of Las Vegas
Public Works Department
400 East Stewart Avenue, Fourth Floor
Las Vegas, Nevada 89101
(Maps available for reference only, not for distribution.)

City of Mesquite
Mesquite City Hall
11 East Mesquite Boulevard
Mesquite, Nevada 89024
(Maps available for reference only, not for distribution.)

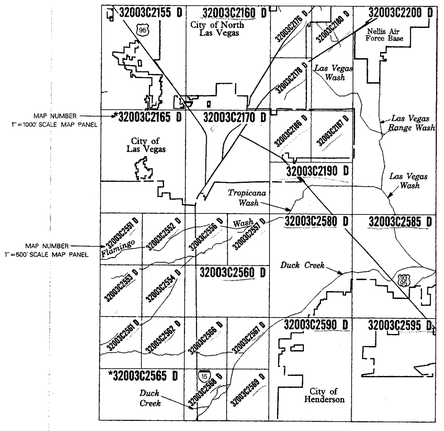
City of North Las Vegas
Public Works Department
2200 Civic Center Drive
North Las Vegas, Nevada 89030
(Maps available for reference only, not for distribution.)

Clark County
Office of the Director of Public Works
Clark County Bridger Building
225 Bridger Avenue
Las Vegas, Nevada 89155
(Maps available for reference only, not for distribution.)

ENLARGED AREA A



ENLARGED AREA B



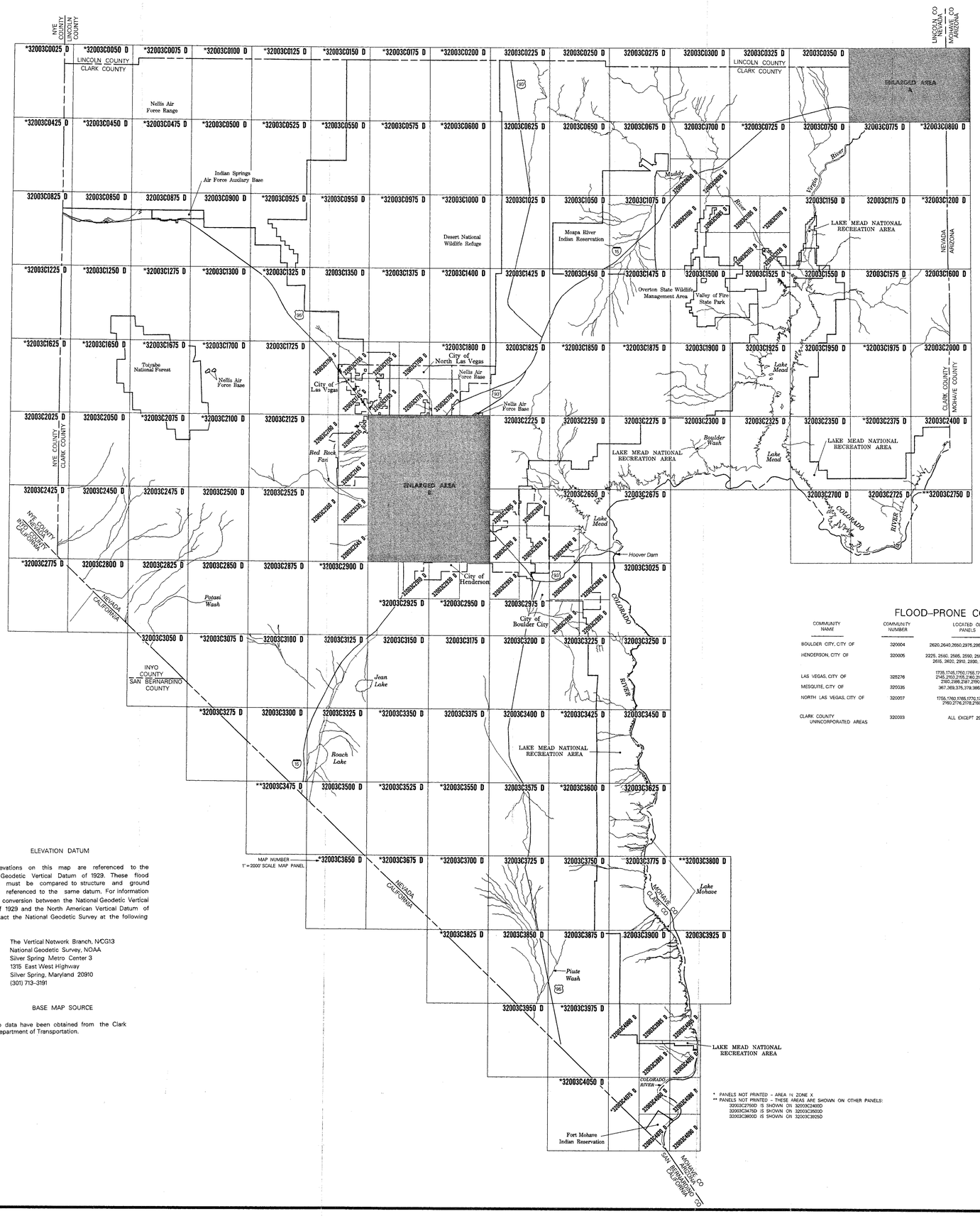
ELEVATION DATUM

Flood elevations on this map are referenced to the National Geodetic Vertical Datum of 1929. These flood elevations must be compared to structure and ground elevations referenced to the same datum. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, contact the National Geodetic Survey at the following address:

The Vertical Network Branch, NCG13
National Geodetic Survey, NOAA
Silver Spring Metro Center 3
1315 East West Highway
Silver Spring, Maryland 20910
(301) 713-3191

BASE MAP SOURCE

Base map data have been obtained from the Clark County Department of Transportation.



FLOOD-PRONE COMMUNITIES

COMMUNITY NAME	COMMUNITY NUMBER	LOCATED ON PANELS	INITIAL IDENTIFICATION DATE	POST FIRM DATE
BOULDER CITY, CITY OF	320004	2620,2640,2650,2975,2980,2990,2995	JUNE 28, 1974	SEPTEMBER 16, 1981
HENDERSON, CITY OF	320005	2225, 2580, 2585, 2590, 2595, 2605, 2610, 2615, 2620, 2910, 2930, 2955, 2975	JUNE 28, 1974	JUNE 15, 1982
LAS VEGAS, CITY OF	325276	1735,1745,1750,1755,1795,2135, 2145,2160,2195,2260,2570,2578, 2580,2586,2587,2590,2200	DECEMBER 3, 1976	SEPTEMBER 30, 1980
MESQUITE, CITY OF	320035	367,369,375,379,386,387,391	NOVEMBER 1, 1985	SEPTEMBER 28, 1990
NORTH LAS VEGAS, CITY OF	320007	1755,1760,1765,1770,1790,2155, 2160,2176,2178,2180,2186	FEBRUARY 16, 1974	JANUARY 16, 1981
CLARK COUNTY UNINCORPORATED AREAS	320003	ALL EXCEPT 2980	AUGUST 30, 1974	SEPTEMBER 29, 1989

* PANELS NOT PRINTED - AREA IN ZONE X
** PANELS NOT PRINTED - THESE AREAS ARE SHOWN ON OTHER PANELS:
32003C2750D IS SHOWN ON 32003C2400D
32003C3475D IS SHOWN ON 32003C3500D
32003C3800D IS SHOWN ON 32003C3525D

NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP

CLARK COUNTY, NEVADA AND INCORPORATED AREAS

(SEE TABLE SHOWN ABOVE FOR LISTING OF COMMUNITIES)

MAP INDEX

PANELS PRINTED: 375, 380, 375, 390, 320, 350, 367, 369, 375, 379, 386, 387, 390, 391, 455, 465, 475, 490, 495, 580, 755, 760, 765, 770, 775, 835, 845, 870, 890, 895, 1000, 1075, 1085, 1100, 1115, 1130, 1150, 1175, 1200, 1215, 1225, 1250, 1275, 1300, 1325, 1350, 1375, 1400, 1425, 1450, 1475, 1500, 1525, 1550, 1575, 1600, 1740, 1745, 1750, 1755, 1760, 1765, 1770, 1790, 1795, 1800, 1825, 1850, 1875, 1900, 1925, 1950, 1975, 2000, 2020, 2025, 2050, 2075, 2100, 2125, 2150, 2155, 2160, 2170, 2175, 2176, 2178, 2180, 2185, 2186, 2190, 2200, 2225, 2250, 2275, 2300, 2325, 2350, 2375, 2400, 2500, 2525, 2550, 2575, 2580, 2585, 2590, 2595, 2600, 2605, 2610, 2615, 2620, 2625, 2630, 2635, 2640, 2645, 2650, 2655, 2660, 2665, 2670, 2675, 2680, 2685, 2690, 2695, 2700, 2705, 2710, 2715, 2720, 2725, 2730, 2735, 2740, 2745, 2750, 2755, 2760, 2765, 2770,

ELEVATION REFERENCE MARKS

REFERENCE MARK	ELEVATION (FEET NGVD)	DESCRIPTION OF LOCATION
1002	2301.58	2-in dome head brass cap reference monument on top of curb, northeast corner of Jones Blvd. and Harmon Ave.
1003	2245.10	Rivet and square aluminum plate in top of curb, northeast corner of Tropicana Ave. and Decatur Blvd. near the pc of Tropicana Ave.
1004	2175.57	Rivet and square aluminum plate in top of curb, northeast corner of Tropicana Ave. and Valley View Blvd. near the pc of Tropicana Ave.
1005	2176.60	Rivet and square aluminum plate in top of curb, northeast corner of Wynn Rd. and Harmon Ave., east of the westerly driveway going into 4050 Harmon Ave.
1006	2152.90	Rivet and square aluminum plate in top of curb, northwest corner of Flamingo Rd. and Valley View Blvd. near the pc of Flamingo Rd.
1027	2141.40	USC&GS brass cap, in southeast headwall of railroad bridge, 325 ft. north of Flamingo Rd. overpass at tracks.

NOTES

MAP BASED ON 1"=400' TOPOGRAPHIC MAPPING PREPARED BY NEVADA AERIAL MAPPING FROM PHOTOGRAPHS TAKEN IN JANUARY 22, 1997.

VERTICAL CONTROL IS BASED ON THE NGVD 1929 HORIZONTAL CONTROL IS BASED ON NAD 1983, UTILIZING CLARK COUNTY MONUMENTS.

PANEL AFFECTS FIRMS 32003C2551 D, 32003C2552 D, & 32003C2556 D DATED AUGUST 16, 1995.

FLOODING SOURCE: FLAMINGO WASH

CONTOUR INTERVAL 4 FEET

FILE: FL1-BMP.DWG

CLARK COUNTY, NEVADA

NORTH

GRAPHIC SCALE

400 0 200 400 800 1600

(IN FEET)
1 inch = 400 ft.

LEGEND

ELEVATION REFERENCE MARK

JOINS PANEL FLO

1002 2301.58 CCBM 7C10 24W4

1003 2245.10 CCBM 7C11 19SWS

1004 2175.57 CCBM 6C11 20SWS

1005 2176.60 CCBM 7C11 19E6

1006 2152.90 CCBM 7C11 18SES

1027 2141.40 USCGS BM N-566

PANEL INDEX

FL1 FL2 FL3 FL4

REV	DATE	DESCRIPTION

RECOMMENDED

JERRY E. PRUITT

P.E. NO. 11902 DATE

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102

FLAMINGO WASH
F/S RE-STUDY
JONES BLVD. TO INDUSTRIAL RD.
BASE MAP

SHEET FL1 OF 4 SHEETS

550.032
PLOTTED: September 22, 1997 — FL1-BMP.DWG

ELEVATION REFERENCE MARKS

REFERENCE MARK	ELEVATION (FEET NGVD)	DESCRIPTION OF LOCATION
1007	2048.60	Rivet and square aluminum plate in top of curb, northeast corner of Paradise Rd. and driveway going into 3900 Paradise Rd. near the pc of Paradise Rd. 1/4 mile south of Sands Dr.-Twain Ave.
1008	2046.27	Rivet and square aluminum plate in top of curb, northeast corner of Paradise Rd. and Edson Ave., near the pc of Paradise Rd.
1009	2046.43	Rivet and square aluminum plate in top of curb, east side of Paradise Rd. at Tropicana Wash box, just north of south driveway into Villa De Paradise Apartments, at a light pole.
1011	2006.68	Rivet and square aluminum plate in top of curb, northeast corner of Maryland Pkwy. and Rochelle Ave. near the pc of Maryland Pkwy.
1012	1985.51	Rivet and square aluminum plate in top of curb, northeast corner of Maryland Pkwy. and Sierra Dr. near the pc of Maryland Pkwy.
1030	1986.23	Rivet and square aluminum plate in top of curb, east side of Maryland Pkwy. at the north side of Flamingo Wash.

NOTES

MAP BASED ON 1"=400' TOPOGRAPHIC MAPPING PREPARED BY NEVADA AERIAL MAPPING FROM PHOTOGRAPHS TAKEN IN JANUARY 22, 1997.

VERTICAL CONTROL IS BASED ON THE NGVD 1929 HORIZONTAL CONTROL IS BASED ON NAD 1983, UTILIZING CLARK COUNTY MONUMENTS.

PANEL AFFECTS FIRMS 32003C2556 D & 32003C2557 D DATED AUGUST 16, 1995.

FLOODING SOURCE: FLAMINGO WASH

CONTOUR INTERVAL 4 FEET

FILE: FL2-BMP.DWG

CLARK COUNTY, NEVADA

NORTH

GRAPHIC SCALE

400 0 200 400 800 1600

(IN FEET)
1 inch = 400 ft.

LEGEND

ELEVATION REFERENCE MARK

1007 2048.90 CCBM 6C11 15SWW6

1008 2046.27 CCBM 6C11 15NWW6

1009 2046.43 CCBM 6C11 22NWW6

1011 2006.68 CCBM 6C11 23NWW6

1012 1985.51 CCBM 6C11 14NWW6

1030 1986.23 CCBM 6C11 14SWW6

PANEL INDEX

FL1 FL2 FL3 FL4

REV	DATE	DESCRIPTION

RECOMMENDED

JERRY E. PRUITT DATE

P.E. NO. 11902

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102

FLAMINGO WASH
FIS RE-STUDY
IMPERIAL PALACE TO SPENCER ST.
BASE MAP

SHEET FL2 OF 4 SHEETS

550.032
PLOTTED: September 22, 1997 — FL2-BMP.DWG

ELEVATION REFERENCE MARKS

REFERENCE MARK	ELEVATION (FEET NGVD)	DESCRIPTION OF LOCATION
1020	1814.92	Rivet and square aluminum plate in top of curb, east side of Boulder Hwy, at north property line of 3745 Boulder Hwy, at projected centerline of Sandhill Rd.
1021	1804.74	Rivet and square aluminum plate in base of fire hydrant, east of Boulder Hwy, south of Dalhart St. and north of Flamingo Wash.
1022	1825.38	Rivet and square aluminum plate in top of curb, southeast corner of Desert Inn Rd. and Sandhill Rd. just east of wheel chair ramp.
1023	1895.32	Rivet and square aluminum plate in top of curb, northeast corner of Twain Ave. and Pecos-McLeod interconnect, near the pc of Pecos-McLeod interconnect.
1029	1889.46	Rivet and square aluminum plate in top of curb, southeast corner of Pecos-McLeod interconnect and the bridge at the Flamingo Wash.

NOTES

MAP BASED ON 1"=400' TOPOGRAPHIC MAPPING PREPARED BY NEVADA AERIAL MAPPING FROM PHOTOGRAPHS TAKEN IN JANUARY 22, 1997.

VERTICAL CONTROL IS BASED ON THE NGVD 1929 HORIZONTAL CONTROL IS BASED ON NAD 1983, UTILIZING CLARK COUNTY MONUMENTS.

PANEL AFFECTS FIRMS 32003C2580 D & 32003C2190 D DATED AUGUST 16, 1995.

FLOODING SOURCE: FLAMINGO WASH

CONTOUR INTERVAL 4 FEET

FILE: FL3-BMP.DWG

CLARK COUNTY, NEVADA

NORTH

GRAPHIC SCALE

400 0 200 400 800 1600

(IN FEET)

1 inch = 400 ft.

1020 ◻ 1814.92 CCBM 6C12 7C4

1021 ◻ 1804.74 CCBM 6C12 7NW6

1022 ◻ 1825.38 CCBM 6C12 18N4

1029 ◻ 1889.46 CCBM 6C11 13N6

1023 ◻ 1895.32 CCBM 6C11 13E6

JOINS PANEL FL4

LEGEND

◻ ELEVATION REFERENCE MARK

PANEL INDEX

FL1 FL2 FL3 FL4

550.032
PLOTTED: September 22, 1997 -- FL3-BMP.DWG

REV	DATE	DESCRIPTION

RECOMMENDED

JERRY E. PRUITT DATE

11902 P.E. NO.

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD, LAS VEGAS, NEVADA 89102

FLAMINGO WASH
FIS RE-STUDY
EASTERN AVE. TO US 95
BASE MAP

SHEET FL3 OF 4 SHEETS

ELEVATION REFERENCE MARKS

REFERENCE MARK	ELEVATION (FEET NGVD)	DESCRIPTION OF LOCATION
1015	1720.66	Rivet and square aluminum plate in top of curb, northeast corner of Nellis Blvd. and Vegas Valley Dr., near the pc of Nellis Blvd.
1016	1728.73	Rivet and square aluminum plate in top of curb, northeast corner of Nellis Blvd. and Sahara Ave. near the pc of Nellis Blvd.
1017	1727.38	Rivet and square aluminum plate in top of curb, east side of Nellis Blvd. at third street light pole, 250 ft. south of centerline of Flamingo Wash, at Desert Rose Golf Course.
1018	1777.46	Rivet and square aluminum plate in top of curb, northeast corner of Lamb Blvd. and Karen Ave. near the pc of Lamb Blvd.

NOTES

MAP BASED ON 1"=400' TOPOGRAPHIC MAPPING PREPARED BY NEVADA AERIAL MAPPING FROM PHOTOGRAPHS TAKEN IN JANUARY 22, 1997.

VERTICAL CONTROL IS BASED ON THE NGVD 1929 HORIZONTAL CONTROL IS BASED ON NAD 1983, UTILIZING CLARK COUNTY MONUMENTS.

PANEL AFFECTS FIRMS 32003C2190 D & 32003C2200 D DATED AUGUST 16, 1995.

FLOODING SOURCE: FLAMINGO WASH

CONTOUR INTERVAL 4 FEET

FILE: FL4-BMP.DWG

CLARK COUNTY, NEVADA

NORTH

GRAPHIC SCALE

400 0 200 400 800 1600

(IN FEET)
1 inch = 400 ft

JOINS PANEL FL3

1016
1728.73
CCBM 6C12 4SWS

1017
1727.38
CCBM 7C12 8NW6

1018
1777.46
CCBM 7C12 8NW6

1015
1720.66
CCBM 6C12 9W4

LEGEND

ELEVATION REFERENCE MARK

PANEL INDEX

FL1 FL2 FL3 FL4

REV	DATE	DESCRIPTION

RECOMMENDED

JERRY E. PRUITT

11902
P.E. NO. DATE

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102

FLAMINGO WASH
FIS RE-STUDY
US 95 TO LAS VEGAS WASH
BASE MAP

SHEET
FL4
OF 4 SHEETS

550.032
PLOTTED: September 22, 1997 - FL4-BMP.DWG

ELEVATION REFERENCE MARKS

REFERENCE MARK	ELEVATION (FEET NGVD)	DESCRIPTION OF LOCATION
1015	1720.66	Rivet and square aluminum plate in top of curb, northeast corner of Nellis Blvd. and Vegas Valley Dr., near the pc of Nellis Blvd.
1016	1728.73	Rivet and square aluminum plate in top of curb, northeast corner of Nellis Blvd. and Sahara Ave. near the pc of Nellis Blvd.
1017	1727.38	Rivet and square aluminum plate in top of curb, east side of Nellis Blvd. at third street light pole, 250 ft. south of centerline of Flamingo Wash, at Desert Rose Golf Course.
1018	1777.46	Rivet and square aluminum plate in top of curb, northeast corner of Lamb Blvd. and Karen Ave. near the pc of Lamb Blvd.

NOTES

MAP BASED ON 1"=400' TOPOGRAPHIC MAPPING PREPARED BY NEVADA AERIAL MAPPING FROM PHOTOGRAPHS TAKEN IN JANUARY 22, 1997.

VERTICAL CONTROL IS BASED ON THE NGVD 1929 HORIZONTAL CONTROL IS BASED ON NAD 1983, UTILIZING CLARK COUNTY MONUMENTS.

PANEL AFFECTS FIRMS 32003C2190 D & 32003C2200 D DATED AUGUST 16, 1995.

FLOODING SOURCE: FLAMINGO WASH

CONTOUR INTERVAL 4 FEET

FILE: FL4-WMP.DWG

CLARK COUNTY, NEVADA

NORTH

GRAPHIC SCALE

400 0 200 400 800 1600

(IN FEET)
1 inch = 400 ft.

JOINS PANEL FL3

1016
1728.73
CCBM 6C12 4SWS

1017
1727.38
CCBM 7C12 8NWS

1018
1777.46
CCBM 7C12 8NWS

1015
1720.66
CCBM 6C12 9W4

SFHA TO BE REMOVED

SFHA TO REMAIN

SFHA TO REMAIN

SFHA TO BE REMOVED

CONFLUENCE OF FLAMINGO WASH & LAS VEGAS WASH

CLUB HOUSE

CROSSHOUSE

LEGEND

- REVISED APPROXIMATE 100-YEAR FLOODPLAIN BOUNDARY
- EXISTING APPROXIMATE 100-YEAR FLOODPLAIN BOUNDARY
- APPROXIMATE 100-YEAR FLOODPLAIN BOUNDARY TIE-IN
- ELEVATION REFERENCE MARK
- SFHA — SPECIAL FLOOD HAZARD AREA

PANEL INDEX

FL1 FL2 FL3 FL4

RECOMMENDED
JERRY E. PRUITT
P.E. NO. DATE
11902

REV	DATE	DESCRIPTION

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102

FLAMINGO WASH
FIS RE-STUDY
US 95 TO LAS VEGAS WASH
WORKMAP

SHEET
FL4
OF 4 SHEETS

550.032
PLOTTED: November 11, 1997 — FL4-WMP.DWG

ELEVATION REFERENCE MARKS

REFERENCE MARK	ELEVATION (FEET NGVD)	DESCRIPTION OF LOCATION
1015	1720.66	Rivet and square aluminum plate in top of curb, northeast corner of Nellis Blvd. and Vegas Valley Dr., near the pc of Nellis Blvd.
1016	1728.73	Rivet and square aluminum plate in top of curb, northeast corner of Nellis Blvd. and Sahara Ave. near the pc of Nellis Blvd.
1017	1727.38	Rivet and square aluminum plate in top of curb, east side of Nellis Blvd. at third street light pole, 250 ft. south of centerline of Flamingo Wash, at Desert Rose Golf Course.
1018	1777.46	Rivet and square aluminum plate in top of curb, northeast corner of Lamb Blvd. and Karen Ave. near the pc of Lamb Blvd.

NOTES

MAP BASED ON 1"=400' TOPOGRAPHIC MAPPING PREPARED BY NEVADA AERIAL MAPPING FROM PHOTOGRAPHS TAKEN IN JANUARY 22, 1997.

VERTICAL CONTROL IS BASED ON THE NGVD 1929 HORIZONTAL CONTROL IS BASED ON NAD 1983, UTILIZING CLARK COUNTY MONUMENTS.

PANEL AFFECTS FIRMS 32003C2190 D & 32003C2200 D DATED AUGUST 16, 1995.

FLOODING SOURCE: FLAMINGO WASH

CONTOUR INTERVAL 4 FEET

FILE: FL4-CSE.DWG

CLARK COUNTY, NEVADA

NORTH

GRAPHIC SCALE

400 0 200 400 800 1600

(IN FEET)
1 inch = 400 ft.

N 266,000

E 104,000 E 106,000 E 108,000 E 110,000 E 112,000 E 114,000

N 264,000

N 262,000

N 260,000

BOSTON PATTERSON BALTIMORE CLEVELAND WELTER CINCINNATI SAHARA ST LOUIS

MINER LAMB LOUISE MARION ARDEN LAMONT FRANN NELLIS

RENNUL HILLMAN VILLAGE CASCADE CARAVELLE CITROEN CONSUL

CLEEK CORTINA FERRARI CONSUL BRASSY SEAHURST BONESTRING SLICE

WINTERWOOD BENTLEY ALFA ANGLIA ABARTH CHAMPIONS

SWITZER GRANNIS WALNUT

1016
1728.73
CCBM 6C12 4SWS

SFHA TO BE REMOVED

SFHA TO REMAIN

CLUB HOUSE

1017
1727.38
CCBM 7C12 8NW5

SFHA TO REMAIN

CONFLUENCE OF LAS VEGAS WASH

1018
1777.46
CCBM 7C12 8NW6

JOINS PANEL FL3

FALCONET BERRY LAMB KAREN LOUISE GRACELYNN LEEANN AARONDAVID

SPEARMINT BRANDONKANE AMBERLEIGH PRECINCT BERRY MACHER CARRIAGE PARK WHEELWRIGHT MARION CY CLIFFVIEW TWINVIEW

CHINA ASTER ENGLISH DAISY SESAME POPPYSEED CLOVE BUD SAFFRON IRISH MOSS JUNIPER HILLS GOLDSEED RUNOSEED

SPYGLASS HILL FOUR SPYGLASS HILL QUAKER RIDGE GUILLANE FORGET ME NOT

AUSTRALIAN TAHOE PLAINFIELD BEACONFALLS SANDYFALLS SFHA TO BE REMOVED

MESA VERDE TETONIA EVERGLADE GREEN TREE TAHOE

EL SEGUNDO AGRON ESPANITA PESO BALBOA PERIDO PLACITA PUENTA ESCUELA PEPE VEGAS VALLEY

1015
1720.66
CCBM 6C12 9W4

SWANDALE RIDGEDALE OAKDALE WOODLAND MOUNTAIN VISTA GARDENDALE LAWNDALE MONTDALE CLOVERDALE HILLDALE FERNDALE PARKDALE GREENDALE PALMDALE PALMVALE ROSEDALE LINDALE HAPPY VALLEY ALOHA SITTON

ALDAMA PETACA TRES PIEDRAS RIO ARRIBA OTERO

CABANA LA BARCA BELLAVISTA CHIMAYO TIJUAROSA CISNEROS GAVILAN

FL1 FL2 FL3 FL4

PANEL INDEX

LEGEND

- REVISED APPROXIMATE 100-YEAR FLOODPLAIN BOUNDARY
- EXISTING APPROXIMATE 100-YEAR FLOODPLAIN BOUNDARY
- APPROXIMATE 100-YEAR FLOODPLAIN BOUNDARY TIE-IN
- (80) CROSS-SECTION
- ELEVATION REFERENCE MARK

550.032
PLOTTED: November 11, 1997 - FL4-CSE.DWG

REV	DATE	DESCRIPTION

RECOMMENDED

JERRY E. PRUITT

11902
P.E. NO. DATE

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102

FLAMINGO WASH
FIS RE-STUDY
US 95 TO LAS VEGAS WASH
CROSS SECTION EXHIBIT

SHEET
FL4
OF 4 SHEETS

ELEVATION REFERENCE MARKS

REFERENCE MARK	ELEVATION (FEET NGVD)	DESCRIPTION OF LOCATION
1002	2301.58	2-in dome head brass cap reference monument on top of curb, northeast corner of Jones Blvd. and Harmon Ave.
1003	2245.10	Rivet and square aluminum plate in top of curb, northeast corner of Tropicana Ave. and Decatur Blvd. near the pc of Tropicana Ave.
1004	2175.57	Rivet and square aluminum plate in top of curb, northeast corner of Tropicana Ave. and Valley View Blvd. near the pc of Tropicana Ave.
1005	2176.60	Rivet and square aluminum plate in top of curb, northwest corner of Wynn Rd. and Harmon Ave, east of the westerly driveway going into 4050 Harmon Ave.
1006	2152.90	Rivet and square aluminum plate in top of curb, northwest corner of Flamingo Rd. and Valley View Blvd. near the pc of Flamingo Rd.
1027	2141.40	USC&GS brass cap in southeast headwall of railroad bridge, 325 ft. north of Flamingo Rd. overpass at tracks.

NOTES

MAP BASED ON 1"=400' TOPOGRAPHIC MAPPING PREPARED BY NEVADA AERIAL MAPPING FROM PHOTOGRAPHS TAKEN IN JANUARY 22, 1997.

VERTICAL CONTROL IS BASED ON THE NGVD 1929 HORIZONTAL CONTROL IS BASED ON NAD 1983, UTILIZING CLARK COUNTY MONUMENTS.

PANEL AFFECTS FIRMS 32003C2551 D, 32003C2552 D, & 32003C2556 D DATED AUGUST 16, 1995.

FLOODING SOURCE: FLAMINGO WASH

CONTOUR INTERVAL 4 FEET

FILE: FL1-WMP.DWG

CLARK COUNTY, NEVADA

NORTH

GRAPHIC SCALE

400 0 200 400 800 1600

(IN FEET)
1 inch = 400 ft.

LEGEND

- REVISED APPROXIMATE 100-YEAR FLOODPLAIN BOUNDARY
- EXISTING APPROXIMATE 100-YEAR FLOODPLAIN BOUNDARY
- ELEVATION REFERENCE MARK

100-YEAR FLOOD CONTAINED IN CULVERT WHICH EXTENDS TO THE IMPERIAL PALACE HOTEL AND CASINO

CONFLUENCE OF NORTH FORK OF FLAMINGO WASH

LIMIT OF STUDY

1002 2301.58 CCBM 7C10 24W4

1003 2245.10 CCBM 7C11 19SW5

1004 2175.57 CCBM 6C11 20SW5

1005 2176.60 CCBM 7C11 19E6

1006 2152.90 CCBM 7C11 18SE5

USC&GS BM N-566

PANEL INDEX

FL1 FL2 FL3 FL4

JOINS PANEL FLO

REV	DATE	DESCRIPTION

11902
P.E. NO. DATE

RECOMMENDED
JERRY E. PRUITT

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102

FLAMINGO WASH
FIS RE-STUDY
JONES BLVD. TO INDUSTRIAL RD.
WORKMAP

SHEET
FL1
OF 4 SHEETS

550.032
PLOTTED: November 11, 1997 - FL1-WMP.DWG

ELEVATION REFERENCE MARKS

REFERENCE MARK	ELEVATION (FEET NGVD)	DESCRIPTION OF LOCATION
1002	2301.58	2-in dome head brass cap reference monument on top of curb, northeast corner of Jones Blvd. and Harmon Ave.
1003	2245.10	Rivet and square aluminum plate in top of curb, northeast corner of Tropicana Ave. and Decatur Blvd. near the pc of Tropicana Ave.
1004	2175.57	Rivet and square aluminum plate in top of curb, northeast corner of Tropicana Ave. and Valley View Blvd. near the pc of Tropicana Ave.
1005	2176.60	Rivet and square aluminum plate in top of curb, northeast corner of Wynn Rd. and Harmon Ave. east of the westerly driveway going into 4050 Harmon Ave.
1006	2152.90	Rivet and square aluminum plate in top of curb, northeast corner of Flamingo Rd. and Valley View Blvd. near the pc of Flamingo Rd.
1027	2141.40	USC&GS brass cap, in southeast headwall of railroad bridge, 325 ft. north of Flamingo Rd. overpass at tracks.

NOTES

MAP BASED ON 1"=400' TOPOGRAPHIC MAPPING PREPARED BY NEVADA AERIAL MAPPING FROM PHOTOGRAPHS TAKEN IN JANUARY 22, 1997.

VERTICAL CONTROL IS BASED ON THE NGVD 1929 HORIZONTAL CONTROL IS BASED ON NAD 1983, UTILIZING CLARK COUNTY MONUMENTS.

PANEL AFFECTS FIRMS 32003C2551 D, 32003C2552 D, & 32003C2556 D DATED AUGUST 16, 1995.

FLOODING SOURCE: FLAMINGO WASH

CONTOUR INTERVAL 4 FEET

FILE: FL1-CSE.DWG

CLARK COUNTY, NEVADA

NORTH

GRAPHIC SCALE

400 0 200 400 800 1800

(IN FEET)
1 inch = 400 ft.

LEGEND

- REVISED APPROXIMATE 100-YEAR FLOODPLAIN BOUNDARY
- EXISTING APPROXIMATE 100-YEAR FLOODPLAIN BOUNDARY
- (80) CROSS-SECTION
- ELEVATION REFERENCE MARK

100-YEAR FLOOD CONTAINED IN CULVERT WHICH EXTENDS TO THE IMPERIAL PALACE HOTEL AND CASINO

NOTE: CROSS SECTIONS 10 & 20 ARE LOCATED 1,100-FEET EAST OF CROSS SECTION 30 IN THE CULVERT

1006 ☐ 2152.90 CCBM 7C11 18SES

1005 ☐ 2176.60 CCBM 7C11 19E6

1004 ☐ 2175.57 CCBM 6C11 20SWS

1003 ☐ 2245.10 CCBM 7C11 19SWS

1002 ☐ 2301.58 CCBM 7C10 24W4

USC&GS BM N-566

CONFLUENCE OF NORTH FORK OF FLAMINGO WASH

LIMIT OF STUDY

JONES PANEL FLO

PANEL INDEX

FL1 FL2 FL3 FL4

REV	DATE	DESCRIPTION

RECOMMENDED JERRY E. PRUITT P.E. NO. 11902 DATE

G.C. WALLACE, INC. Engineering/Architecture
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102

FLAMINGO WASH FIS RE-STUDY

JONES BLVD. TO INDUSTRIAL RD.
CROSS SECTION EXHIBIT

SHEET FL1 OF 4 SHEETS

550.032
PLOTTED: November 11, 1997 - FL1-CSE.DWG

ELEVATION REFERENCE MARKS

REFERENCE MARK	ELEVATION (FEET NGVD)	DESCRIPTION OF LOCATION
1007	2048.60	Rivet and square aluminum plate in top of curb, northeast corner of Paradise Rd. and driveway going into 3900 Paradise Rd. near the pc of Paradise Rd. 1/4 mile south of Sands Dr.-Twain Ave.
1008	2046.27	Rivet and square aluminum plate in top of curb, northeast corner of Paradise Rd. and Edson Ave., near the pc of Paradise Rd.
1009	2046.43	Rivet and square aluminum plate in top of curb, east side of Paradise Rd. at Tropicana Wash box, just north of south driveway into Villa De Paradise Apartments, at a light pole.
1011	2006.68	Rivet and square aluminum plate in top of curb, northeast corner of Maryland Pkwy. and Rochelle Ave. near the pc of Maryland Pkwy.
1012	1985.51	Rivet and square aluminum plate in top of curb, northeast corner of Maryland Pkwy. and Sierra Dr. near the pc of Maryland Pkwy.
1030	1986.23	Rivet and square aluminum plate in top of curb, east side of Maryland Pkwy. at the north side of Flamingo Wash.

NOTES

MAP BASED ON 1"=400' TOPOGRAPHIC MAPPING PREPARED BY NEVADA AERIAL MAPPING FROM PHOTOGRAPHS TAKEN IN JANUARY 22, 1997.

VERTICAL CONTROL IS BASED ON THE NGVD 1929 HORIZONTAL CONTROL IS BASED ON NAD 1983, UTILIZING CLARK COUNTY MONUMENTS.

PANEL AFFECTS FIRMS 32003C2556 D & 32003C2557 D DATED AUGUST 16, 1995.

FLOODING SOURCE: FLAMINGO WASH

CONTOUR INTERVAL 4 FEET

FILE: FL2-WMP.DWG

CLARK COUNTY, NEVADA

NORTH

GRAPHIC SCALE

400 0 200 400 800 1600

(IN FEET)
1 inch = 400 ft.

LEGEND

- REVISED APPROXIMATE 100-YEAR FLOODPLAIN BOUNDARY
- EXISTING APPROXIMATE 100-YEAR FLOODPLAIN BOUNDARY
- APPROXIMATE 100-YEAR FLOODPLAIN BOUNDARY TIE-IN
- ELEVATION REFERENCE MARK
- SHFA — SPECIAL FLOOD HAZARD AREA

1007 ◻ 2048.90 CCBM 6C11 15SWW6

1008 ◻ 2046.27 CCBM 6C11 15NWW6

1009 ◻ 2046.43 CCBM 6C11 22NWW6

1011 ◻ 2006.68 CCBM 6C11 23NWW8

1012 ◻ 1985.51 CCBM 6C11 14NWW6

1030 ◻ 1986.23

SFHA TO REMAIN

SFHA TO BE REMOVED

LIMIT OF STUDY

CONFLUENCE OF TROPICANA WASH BREAKOUT

PANEL INDEX: FL1, FL2, FL3, FL4

REV	DATE	DESCRIPTION

RECOMMENDED: JERRY E. PRUITT — P.E. NO. 11902 — DATE

G.C. WALLACE, INC. Engineering/Architecture
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102

FLAMINGO WASH
FIS RE-STUDY
IMPERIAL PALACE TO SPENCER ST.
WORKMAP

SHEET FL2 OF 4 SHEETS

550.032
PLOTTED: November 11, 1997 — FL2-WMP.DWG

ELEVATION REFERENCE MARKS

REFERENCE MARK	ELEVATION (FEET NGVD)	DESCRIPTION OF LOCATION
1007	2048.60	Rivet and square aluminum plate in top of curb, northeast corner of Paradise Rd. and driveway going into 3900 Paradise Rd. near the pc of Paradise Rd. 1/4 mile south of Sands Dr.-Twain Ave.
1008	2046.27	Rivet and square aluminum plate in top of curb, northeast corner of Paradise Rd. and Edison Ave. near the pc of Paradise Rd.
1009	2046.43	Rivet and square aluminum plate in top of curb, east side of Paradise Rd. at Tropicana Wash box, just north of south driveway into Villa De Paradise Apartments, at a light pole.
1011	2006.68	Rivet and square aluminum plate in top of curb, northeast corner of Maryland Pkwy. and Rochelle Ave. near the pc of Maryland Pkwy.
1012	1985.51	Rivet and square aluminum plate in top of curb, northeast corner of Maryland Pkwy. and Sierra Dr. near the pc of Maryland Pkwy.
1030	1986.23	Rivet and square aluminum plate in top of curb, east side of Maryland Pkwy. at the north side of Flamingo Wash.

NOTES

MAP BASED ON 1"=400' TOPOGRAPHIC MAPPING PREPARED BY NEVADA AERIAL MAPPING FROM PHOTOGRAPHS TAKEN IN JANUARY 22, 1997.

VERTICAL CONTROL IS BASED ON THE NGVD 1929 HORIZONTAL CONTROL IS BASED ON NAD 1983, UTILIZING CLARK COUNTY MONUMENTS.

PANEL AFFECTS FIRMS 32003C2556 D & 32003C2557 D DATED AUGUST 16, 1995.

FLOODING SOURCE: FLAMINGO WASH

CONTOUR INTERVAL 4 FEET

FILE: FL2-CSE.DWG

CLARK COUNTY, NEVADA

NORTH

GRAPHIC SCALE

400 0 200 400 800 1600

(IN FEET)
1 inch = 400 ft.

LEGEND

- REVISED APPROXIMATE 100-YEAR FLOODPLAIN BOUNDARY
- EXISTING APPROXIMATE 100-YEAR FLOODPLAIN BOUNDARY
- APPROXIMATE 100-YEAR FLOODPLAIN BOUNDARY TIE-IN
- (80) CROSS-SECTION
- ELEVATION REFERENCE MARK
- SFHA SPECIAL FLOOD HAZARD AREA

1007 ◻ 2048.90 CCBM 6C11 15SWW6

1008 ◻ 2046.27 CCBM 6C11 15NWW6

1009 ◻ 2046.43 CCBM 6C11 22NWW6

1011 ◻ 2006.68 CCBM 6C11 23NWW6

1012 ◻ 1985.51 CCBM 6C11 14NWW6

◻ 1986.23

SFHA TO REMAIN

SFHA TO BE REMOVED

LIMIT OF STUDY

CONFLUENCE OF TROPICANA WASH BREAKOUT

PANEL INDEX

FL1 FL2 FL3 FL4

DESCRIPTION	DATE	REV

RECOMMENDED

JERRY E. PRUITT

P.E. NO. 11902 DATE

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102

FLAMINGO WASH
FIS RE-STUDY
IMPERIAL PALACE TO SPENCER ST.
CROSS SECTION EXHIBIT

SHEET FL2 OF 4 SHEETS

560.032
PLOTTED: November 11, 1997 – FL2-CSE.DWG

ELEVATION REFERENCE MARKS

REFERENCE MARK	ELEVATION (FEET NGVD)	DESCRIPTION OF LOCATION
1020	1814.92	Rivet and square aluminum plate in top of curb, east side of Boulder Hwy. at north property line of 3745 Boulder Hwy., at projected centerline of Sandhill Rd.
1021	1804.74	Rivet and square aluminum plate in base of fire hydrant, east of Boulder Hwy., south of Dalhart St. and north of Flamingo Wash.
1022	1825.38	Rivet and square aluminum plate in top of curb, southeast corner of Desert Inn Rd. and Sandhill Rd. just east of wheel chair ramp.
1023	1895.32	Rivet and square aluminum plate in top of curb, northeast corner of Twain Ave. and Pecos-McLeod Interconnect, near the pc of Pecos-McLeod Interconnect.
1029	1889.46	Rivet and square aluminum plate in top of curb, southeast corner of Pecos-McLeod Interconnect and the bridge at the Flamingo Wash.

NOTES

MAP BASED ON 1"=400' TOPOGRAPHIC MAPPING PREPARED BY NEVADA AERIAL MAPPING FROM PHOTOGRAPHS TAKEN IN JANUARY 22, 1997.

VERTICAL CONTROL IS BASED ON THE NGVD 1929 HORIZONTAL CONTROL IS BASED ON NAD 1983, UTILIZING CLARK COUNTY MONUMENTS.

PANEL AFFECTS FIRMS 32003C2580 D & 32003C2190 D DATED AUGUST 16, 1995.

FLOODING SOURCE: FLAMINGO WASH

CONTOUR INTERVAL 4 FEET

FILE: FL3-WMP.DWG

CLARK COUNTY, NEVADA

NORTH

GRAPHIC SCALE

400 0 200 400 800 1600

(IN FEET)
1 inch = 400 ft.

JOINS PANEL FL4

1020
1814.92
CCBM 6C12 7N4

1021
1804.74
CCBM 6C12 7N6

1022
1825.38
CCBM 6C12 18N4

1029
1889.46
CCBM 6C11 13N8

1023
1895.32
CCBM 6C11 13E6

SFHA TO BE ADDED

SFHA TO BE REMOVED

SFHA TO REMAIN

LIMIT OF STUDY

LEGEND

- REVISED APPROXIMATE 100-YEAR FLOODPLAIN BOUNDARY
- EXISTING APPROXIMATE 100-YEAR FLOODPLAIN BOUNDARY
- APPROXIMATE 100-YEAR FLOODPLAIN BOUNDARY TIE-IN
- ELEVATION REFERENCE MARK
- SFHA SPECIAL FLOOD HAZARD AREA

PANEL INDEX

FL1 FL2 FL3 FL4

550.032
PLOTTED: November 11, 1997 - FL3-WMP.DWG

REV	DATE	DESCRIPTION

RECOMMENDED

JERRY E. PRUITT P.E. NO. DATE

11902

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102

FLAMINGO WASH
FIS RE-STUDY
EASTERN AVE. TO US 95
WORKMAP

SHEET
FL3
OF 4 SHEETS

ELEVATION REFERENCE MARKS

REFERENCE MARK	ELEVATION (FEET NGVD)	DESCRIPTION OF LOCATION
1020	1814.92	Rivet and square aluminum plate in top of curb, east side of Boulder Hwy. at north property line of 3745 Boulder Hwy. at projected centerline of Sandhill Rd.
1021	1804.74	Rivet and square aluminum plate in base of fire hydrant, east of Boulder Hwy. south of Dalhart St. and north of Flamingo Wash.
1022	1825.38	Rivet and square aluminum plate in top of curb, southeast corner of Desert Inn Rd. and Sandhill Rd. just east of wheel chair ramp.
1023	1895.32	Rivet and square aluminum plate in top of curb, northeast corner of Twain Ave. and Pecos-McLeod interconnect, near the pc of Pecos-McLeod interconnect.
1029	1889.46	Rivet and square aluminum plate in top of curb, southeast corner of Pecos-McLeod interconnect and the bridge at the Flamingo Wash.

NOTES

MAP BASED ON 1"=400' TOPOGRAPHIC MAPPING PREPARED BY NEVADA AERIAL MAPPING FROM PHOTOGRAPHS TAKEN IN JANUARY 22, 1997.

VERTICAL CONTROL IS BASED ON THE NGVD 1929 HORIZONTAL CONTROL IS BASED ON NAD 1983, UTILIZING CLARK COUNTY MONUMENTS.

PANEL AFFECTS FIRMS 32003C2580 D & 32003C2190 D DATED AUGUST 16, 1995.

FLOODING SOURCE: FLAMINGO WASH

CONTOUR INTERVAL 4 FEET

FILE: FL3-CSE.DWG

CLARK COUNTY, NEVADA

NORTH

GRAPHIC SCALE

400 0 200 400 800 1600

(IN FEET)
1 inch = 400 ft.

JOINS PANEL FL4

1020
1814.92
CCBM 6C12 7C4

1022
1825.38
CCBM 6C12 18N4

1023
1895.32
CCBM 6C11 13E6

1029
1889.46
CCBM 6C11 13E8

SFHA TO BE ADDED

SFHA TO BE REMOVED

SFHA TO REMAIN

LEGEND

- REVISED APPROXIMATE 100-YEAR FLOODPLAIN BOUNDARY
- EXISTING APPROXIMATE 100-YEAR FLOODPLAIN BOUNDARY
- APPROXIMATE 100-YEAR FLOODPLAIN BOUNDARY TIE-IN
- (80) CROSS-SECTION
- ELEVATION REFERENCE MARK
- SFHA SPECIAL FLOOD HAZARD AREA

PANEL INDEX

FL1 FL2 FL3 FL4

REV	DATE	DESCRIPTION

RECOMMENDED

JERRY E. PRUITT P.E. NO. 11902 DATE

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102

FLAMINGO WASH
FIS RE-STUDY
EASTERN AVE. TO US 95
CROSS SECTION EXHIBIT

SHEET
FL3
OF 4 SHEETS

550.032
PLOTTED: November 11, 1997 - FL3-CSE.DWG

NORTH

GRAPHIC SCALE

400 0 200 400 800 1600

(IN FEET)
1 inch = 400 ft.

CLARK COUNTY, NEVADA

JOINS PANEL FL3

1018
1777.46
CCBM 7C12 8NWW8

1017
1727.38
CCBM 7C12 8NWW6

1016
1728.73
CCBM 6C12 4SW5

1015
1720.66
CCBM 6C12 9W4

LEGEND

VIEW DIRECTION
2 PHOTO ROLL NUMBER
14 PHOTO NUMBER

ELEVATION REFERENCE MARK

PANEL INDEX

FL1 FL2 FL3 FL4

REV	DATE	DESCRIPTION

RECOMMENDED

JERRY E. PRUITT P.E. NO. DATE

11902

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD, LAS VEGAS, NEVADA 89102

FLAMINGO WASH
FIS RE-STUDY
US 95 TO LAS VEGAS WASH
PHOTOGRAPH LOCATIONS

SHEET
FL4
OF 4 SHEETS

590.032
PLOTTED: SEPTEMBER 24, 1997 - FL4-PH.dwg

LEGEND

VIEW DIRECTION
2 — PHOTO ROLL NUMBER
14 — PHOTO NUMBER
ELEVATION REFERENCE MARK

NORTH

GRAPHIC SCALE
400 0 200 400 800 1600
(IN FEET)
1 inch = 400 ft.

CLARK COUNTY, NEVADA

JOINS PANEL FL0

1002
2301.58
CCBM 7C10 24W4

1003
2245.10
CCBM 7C11 19SWS

1004
2175.57
CCBM 6C11 20SWS

1005
2176.60
CCBM 7C11 19E6

1006
2132.90
CCBM 7C11 18SES

FL1 FL2 FL3 FL4

PANEL INDEX

REV	DATE	DESCRIPTION

RECOMMENDED
JERRY E. PRUITT
P.E. NO. DATE
11902

G.C. WALLACE, INC.
Engineering/Architecture
1550 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102

FLAMINGO WASH
F/S RE-STUDY
JONES BLVD. TO INDUSTRIAL RD.
PHOTOGRAPH LOCATIONS

SHEET
FL1
OF 4 SHEETS

550.032
PLOTTED: September 23, 1997 – FL1-PH.dwg

NORTH

GRAPHIC SCALE

400 0 200 400 800 1600

(IN FEET)
1 inch = 400 ft.

CLARK COUNTY, NEVADA

1008
□ 2046.27
CCBM 6C11 15NWW6

1007
□ 2048.90
CCBM 6C11 15SWW6

1009
□ 2046.43
CCBM 6C11 22NWW6

1011
□ 2006.68
CCBM 6C11 23NWW6

1012
□ 1985.51
CCBM 6C11 14NWW6

1030
□ 1988.62
CCBM 6C11 14SWW6

LEGEND

3 — VIEW DIRECTION
14 — PHOTO ROLL NUMBER
PHOTO NUMBER

ELEVATION REFERENCE MARK

PANEL INDEX

FL1 FL2 FL3 FL4

END ROLL 3
BEGIN ROLL 4

550.032
PLOTTED: SEPTEMBER 23, 1997 - FL2-PH.DWG

REV	DATE	DESCRIPTION

RECOMMENDED
JERRY E. PRUITT DATE

11902
P.E. NO.

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD, LAS VEGAS, NEVADA 89102

FLAMINGO WASH
FIS RE-STUDY
IMPERIAL PALACE TO SPENCER ST.
PHOTOGRAPH LOCATIONS

SHEET
FL2
OF 4 SHEETS

CLARK COUNTY, NEVADA

NORTH

GRAPHIC SCALE

400 0 200 400 800 1600

(IN FEET)
1 inch = 400 ft.

JOINS PANEL FL4

BEGIN ROLL 5

1020
□ 1814.92
CCBM 6C12 7C4

1021
□ 1899.49
CCBM 6C13 3E8

1022
□ 1825.38
CCBM 6C12 18N4

1023
□ 1895.32
CCBM 6C11 13E6

LEGEND

4/14 VIEW DIRECTION
PHOTO ROLL NUMBER
PHOTO NUMBER

□ ELEVATION REFERENCE MARK

PANEL INDEX

FL1 FL2 FL3 FL4

RECOMMENDED

REV	DATE	DESCRIPTION

JERRY E. PRUITT — P.E. NO. — DATE

11902

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102

FLAMINGO WASH
FIS RE-STUDY
EASTERN AVE. TO U.S. 95
PHOTOGRAPH LOCATIONS

SHEET
FL3
OF 4 SHEETS

550.032
PLOTTED: SEPTEMBER 23, 1997 – FL3-PH.dwg

Study Contractor: G. C. Wallace, Inc.

MISCELLANEOUS REFERENCE MATERIALS INDEX

Clark County, Nevada
(COMMUNITY NAME, STATE)

FLOOD INSURANCE STUDY

INFORMATION TYPE	ITEM DATE	EXHIBIT NO.
HYDRAULIC MODEL STUDY	MAY 1993	5.1
PHOTOGRAPHS	MARCH 31, 1997	5.2
SURVEY DATA		5.3
GPS DATA		5.3.1
RAW DATA		5.3.2
DISKS		5.3.3
OPEN CHANNEL HYDRAULICS		5.4

HYDRAULIC MODEL STUDY
OF THE
FLAMINGO WASH/TROPICANA AVENUE DROP INLET STRUCTURE
CLARK COUNTY, NEVADA

BY

JERRY FITZWATER

[illegible] 1981

Hydraulic Model Study of the Flamingo Wash/Winnick Avenue Drop Inlet Structure Clark County, Nevada

by Jerry Fitzwater

Background

A proposed design for conveying the 100-year flood from the Flamingo Wash, through the Imperial Palace Hotel parking structure, along Winnick Avenue to Koval Lane has been completed. The proposed design called for a drop inlet structure at the upstream end of Winnick Avenue to capture 2,500 ft^3/s of the 5,000 ft^3/s design flow. The remaining 2,500 ft^3/s would continue to flow down Winnick Avenue to a drop inlet structure at Koval Lane. The initial design specified a cable type, Federal Highway-designed guardrail to be placed around the upstream inlet to prevent vehicles from entering the inlet during normal traffic and flood stages. Reclamation was contacted by the Clark County Board of County Commissioners to conduct a hydraulic model study and investigate the effectiveness of this design, and to model modifications to the design to improve the effectiveness of the inlet structure.

Conclusions

- The 1:12 scale model was constructed based on the original design prepared by personnel in the Department of Public Works, Clark County. When tested, it confirmed the intended design for interception of 50 percent of the design flow by the inlet. For 5,000 ft^3/s, 52 percent of the flow was intercepted (see fig. 1).

- The initial guardrail design failed to prevent vehicles from going into the inlet. When the vehicles were not washed into the inlet, they were held against the chain type guardrail, with water flowing over them (see fig. 4).

- Two additional drop inlet configurations were installed and tested in the model to achieve an acceptable design. A design was selected by Clark County which incorporates a 6-ft-high barrier at a flat angle to the flow. The barrier design used horizontal rails at four locations to slide the vehicles past the inlet as the flow carries them down Winnick Avenue (see fig. 5). The barrier will intercept vehicles at flows up to the design flow and should prevent them from entering the inlet.

- The final design also incorporated a ramp from the upstream end of the inlet to the box culvert invert and a grate covered section across the roadway near the end of the inlet to intercept a larger portion (up to 83 percent) of the smaller floods (discharges under 2,500 ft^3/s).

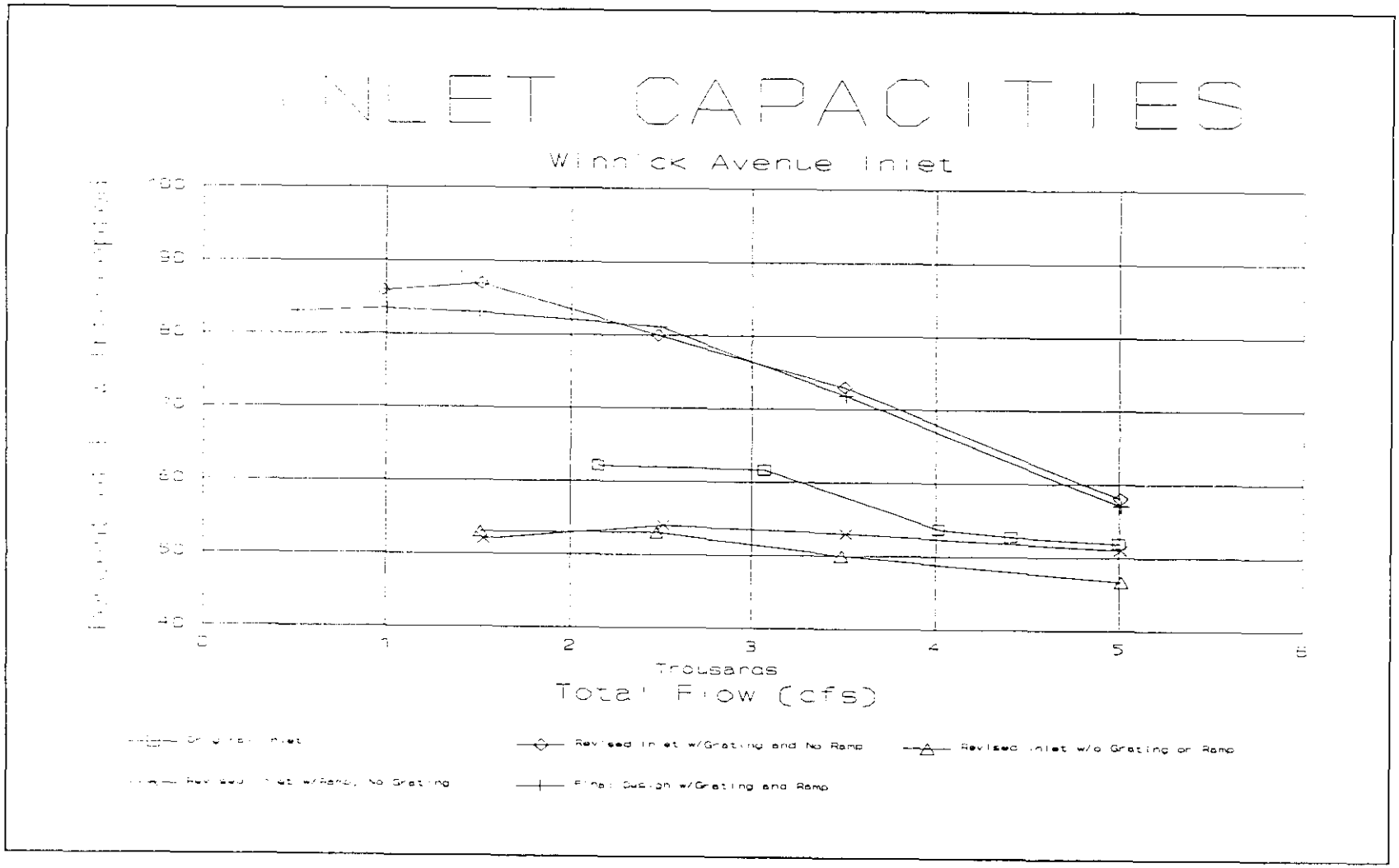


Figure 1 - Percent of flow captured at the Winnick Drop structure during a flood event.

Model

A 1:12 scale Froude based hydraulic model was designed and constructed in the hydraulics laboratory of the Bureau of Reclamation in Denver, Colorado, to study a drop inlet structure downstream from the Imperial Palace Hotel. Ten ft^3/s in the model simulates 5,000 ft^3/s in the prototype. The model included the exit from the Imperial Palace parking structure, the intersection with Winnick Avenue, the proposed drop inlet structure with the roadway above and the box culverts below, and a portion of Winnick Avenue downstream from the proposed drop inlet structure. The inlet was constructed with Plexiglas sidewalls to allow viewing the flow through the sidewalls. A cable type guardrail was placed around the inlet to represent the initial design. A general layout of the model is shown in figure 2.

Flow to the model was controlled and measured by the hydraulic laboratory supply and measurement system. Flow captured by the inlet was measured with a standard rectangular contracted weir which was incorporated into the model under Winnick Avenue at the end of the box culverts. Flow not intercepted by the inlet proceeded down Winnick Avenue, and plunged over the weir box, returning to the laboratory water storage reservoir. The intercepted flow percentage is calculated as the ratio of the flow through the weir box to the total flow supplied to the model.

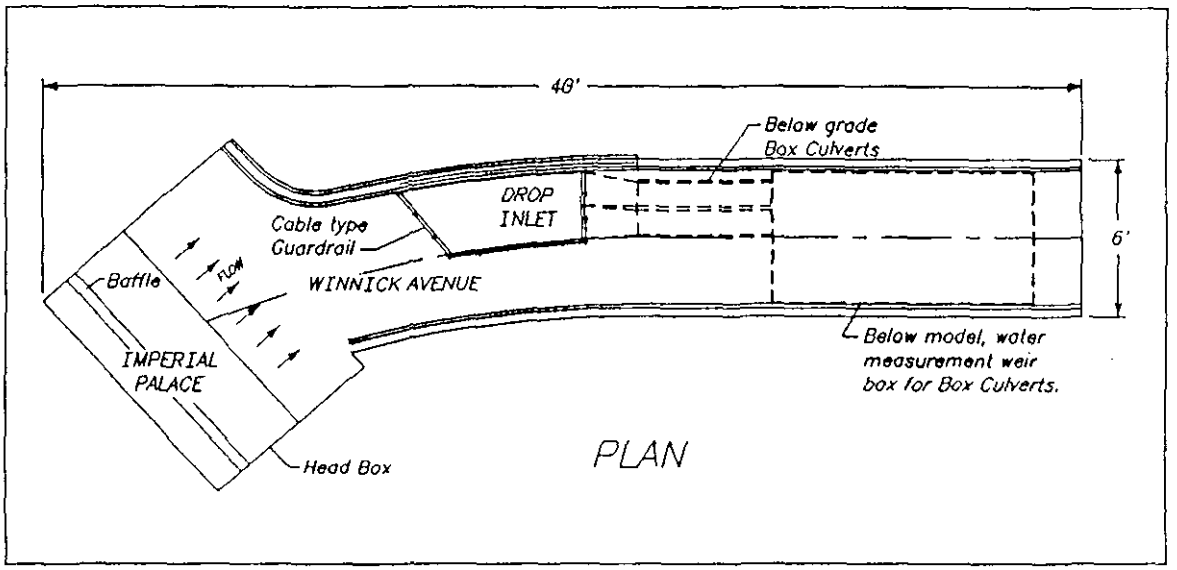


Figure 2 - Original Model Design.

Test Procedure

Flows of 1,000, 1,500, 2,000, 3,500, and 5,000 ft^3/s were tested to determine the percentage of the flow captured by the inlet (see fig. 1). A major goal of the model study was to prevent vehicles from being washed into the inlet. Therefore, tests were run using properly scaled and weighted model vehicles to simulate the effect of the flow washing out of the parking structure toward the inlet. The windows in the vehicles were covered with tape to simulate buoyancy. A guardrail was placed around the inlet to simulate the prototype design. Initially, flows of 2,500 and 5,000 ft^3/s were tested. After consulting with Clark County, the design of the inlet and barrier was changed twice to improve the performance. In addition, there was a desire to capture as much flow as possible at flows less than 2,500 ft^3/s. A steeper cross slope (3.5 percent as opposed to the original 2 percent) was tried on the south side of the inlet. When the tests were repeated, only a few percentage points in efficiency were gained.

Further design modifications as shown in figure 3 were tested and video taped. The final tests were run at 500, 1,000, 1,500, 2,500, 3,500, and 5,000 ft^3/s. In addition to the changes requested by Clark County, a "Jersey rail" was added to the downstream end of the inlet. This addition prevents vehicles and pedestrians from falling into the inlet and builds up the water depth during a flood and slightly increases efficiency. (see fig. 3, Final Design).

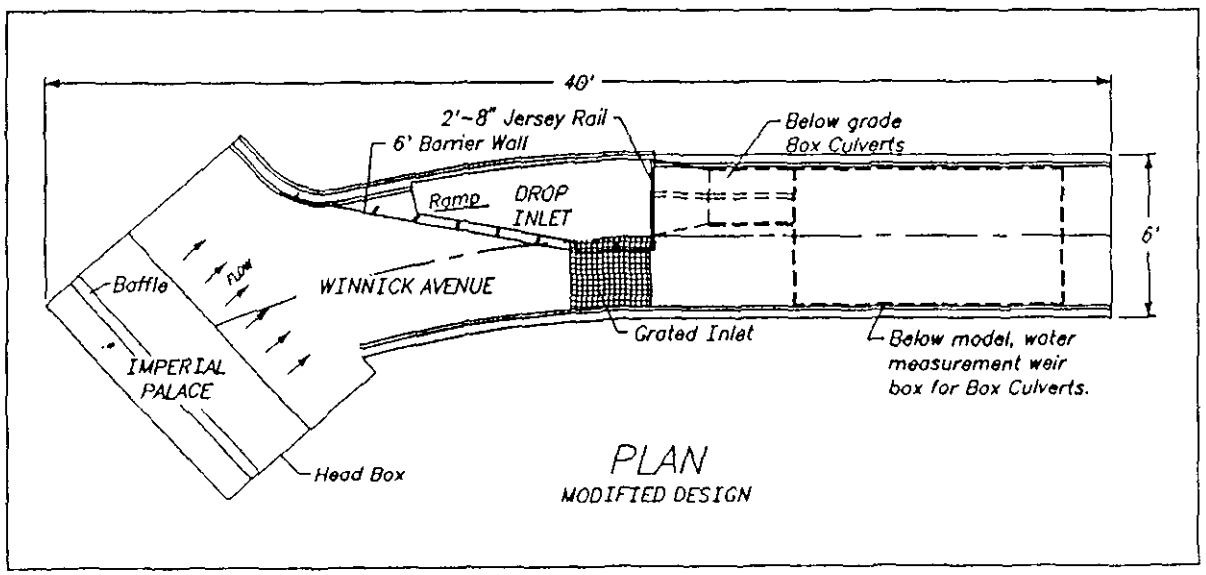


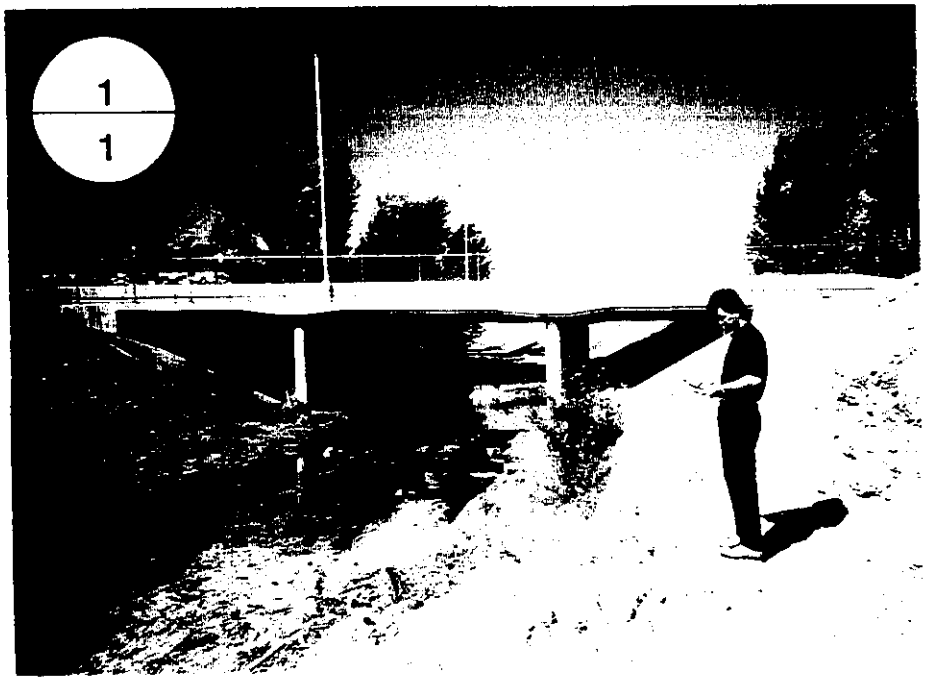
Figure 3 - Final Design.



Figure 4 - Photograph of the water overtopping the cars being held by the guardrail. Discharge is approximately 2,500 ft^3/s.

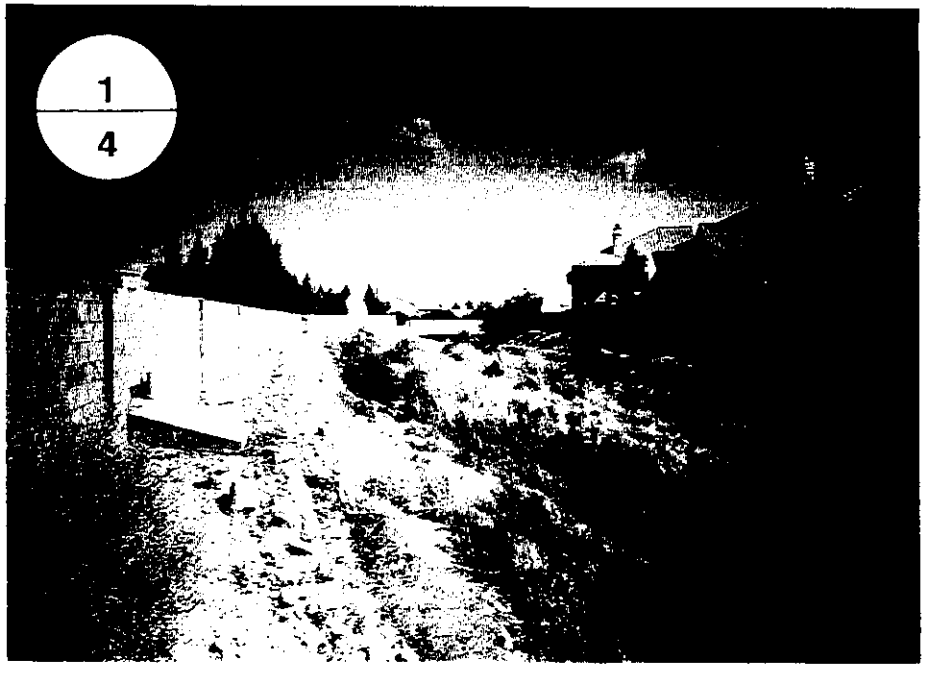


Figure 5 - Photograph of the Model with the Final Design.


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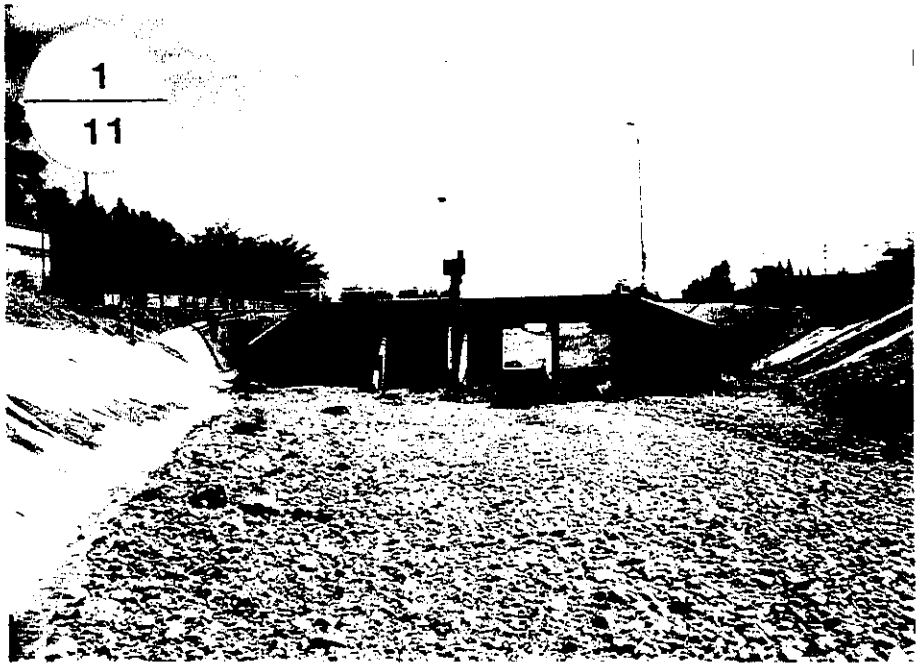

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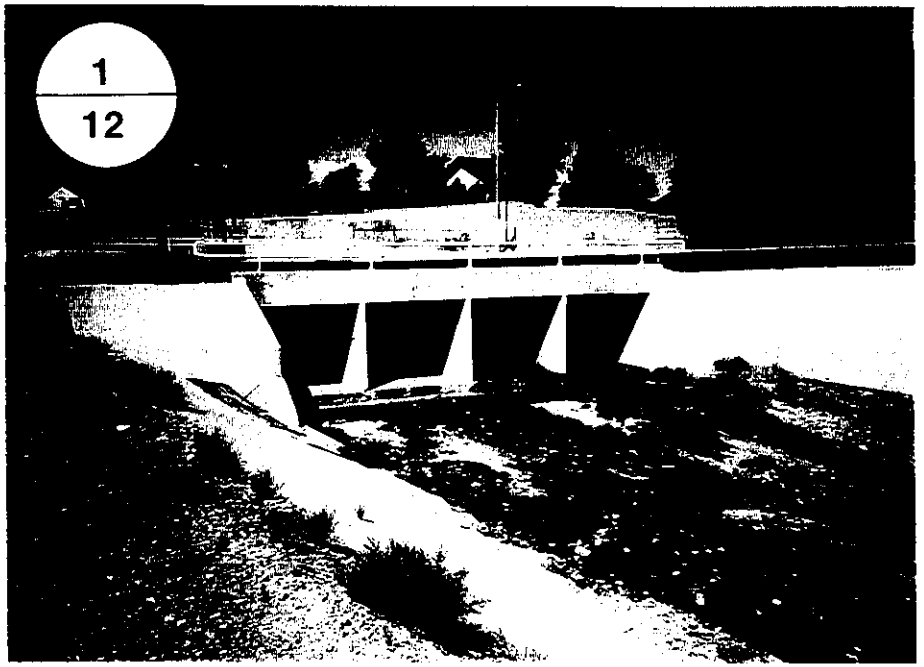

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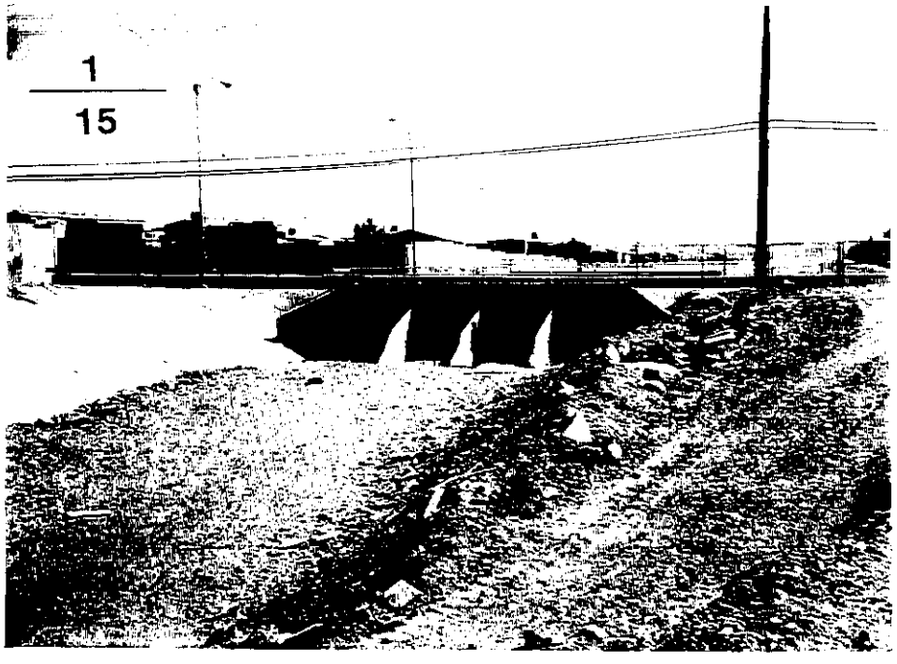
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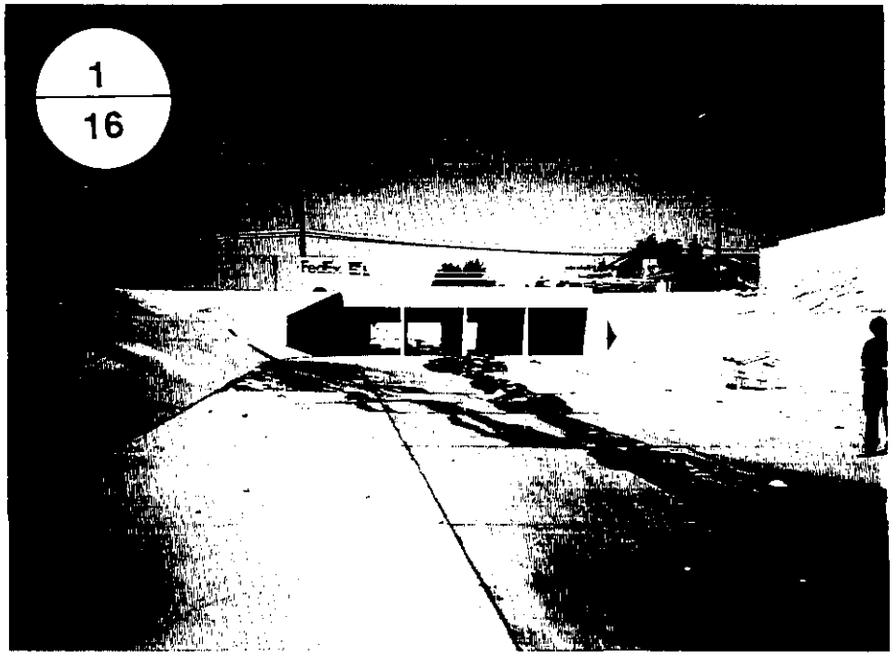
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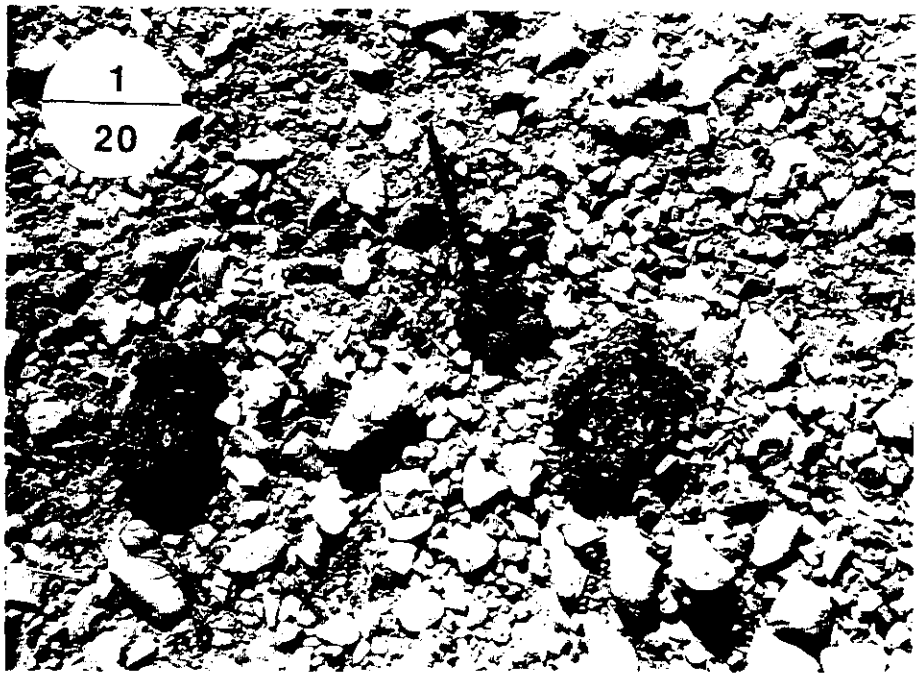
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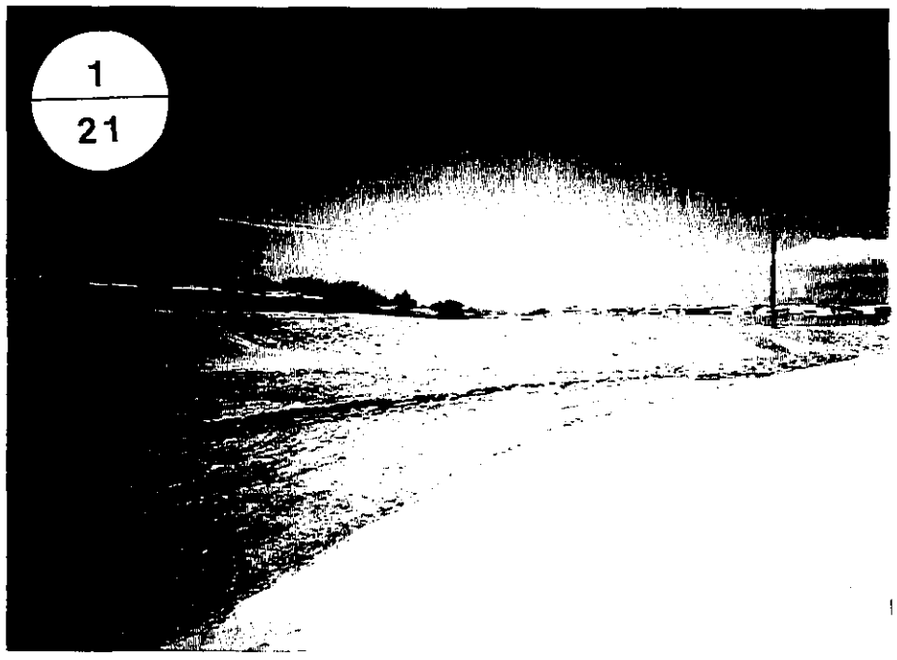


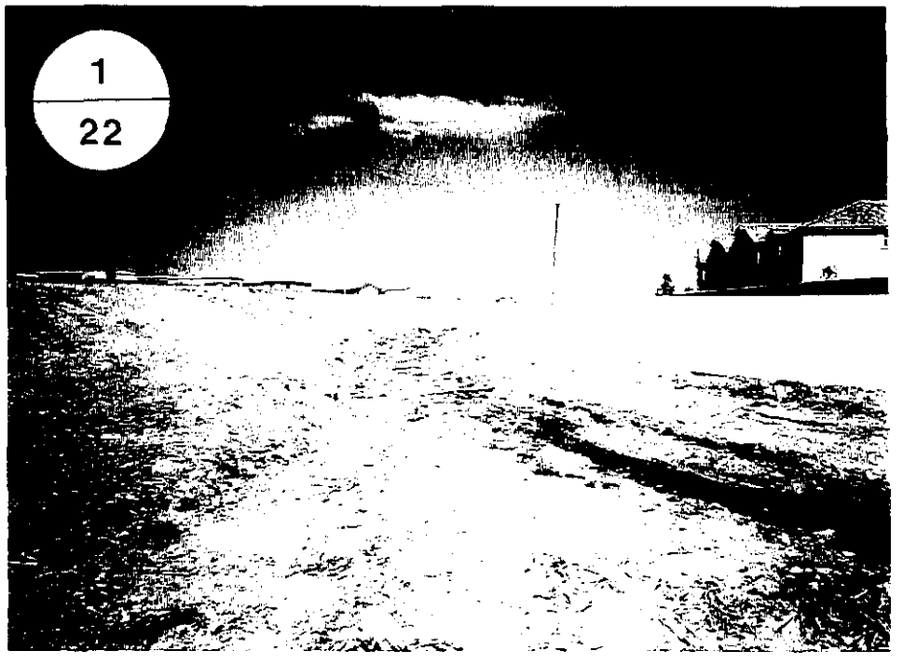

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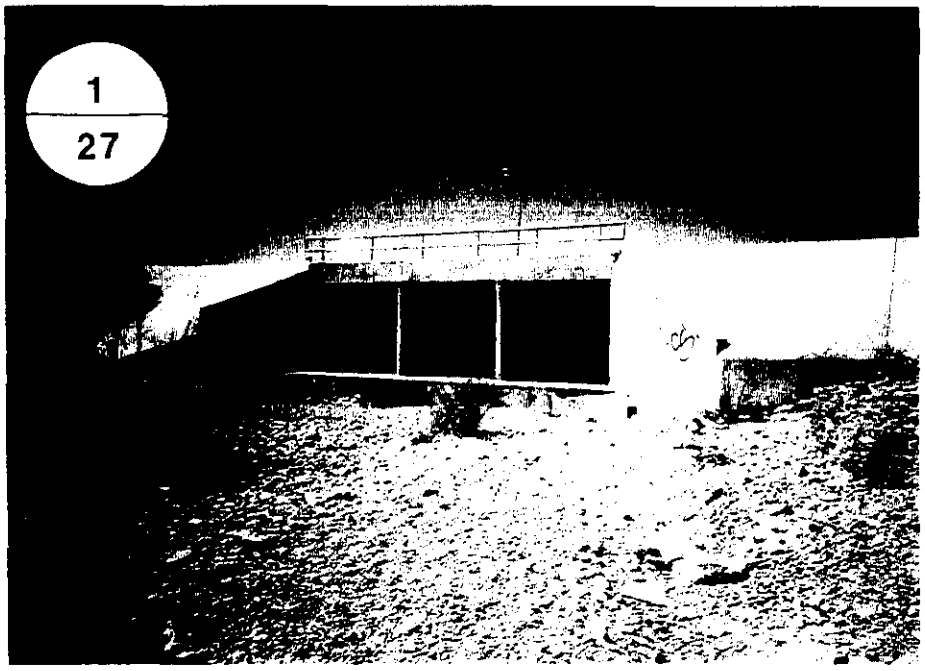

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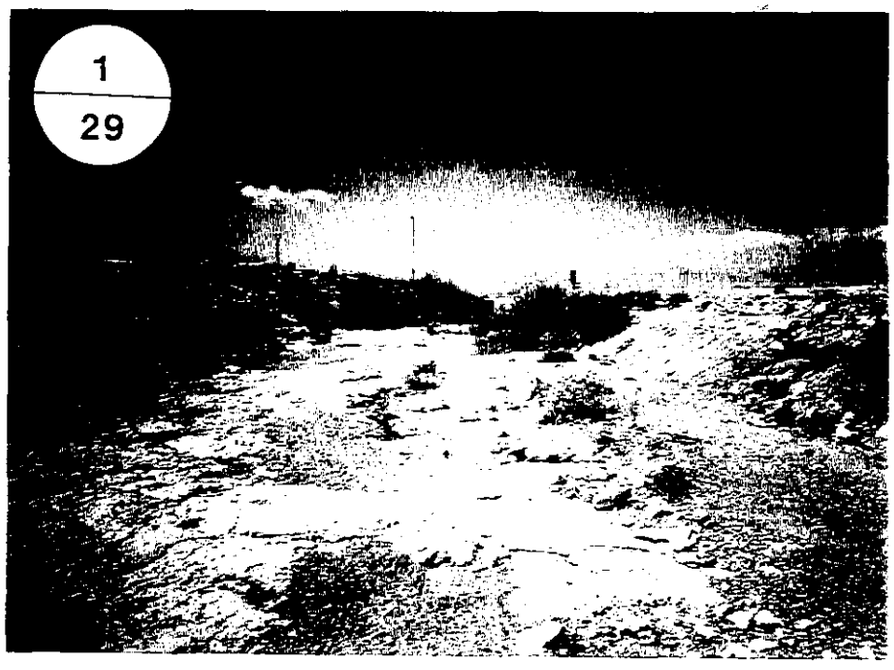

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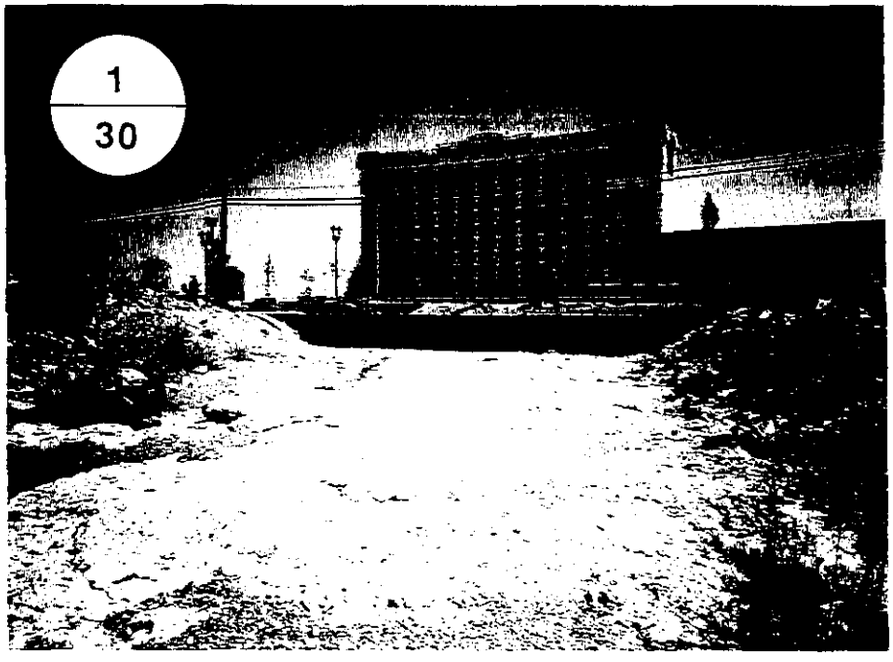

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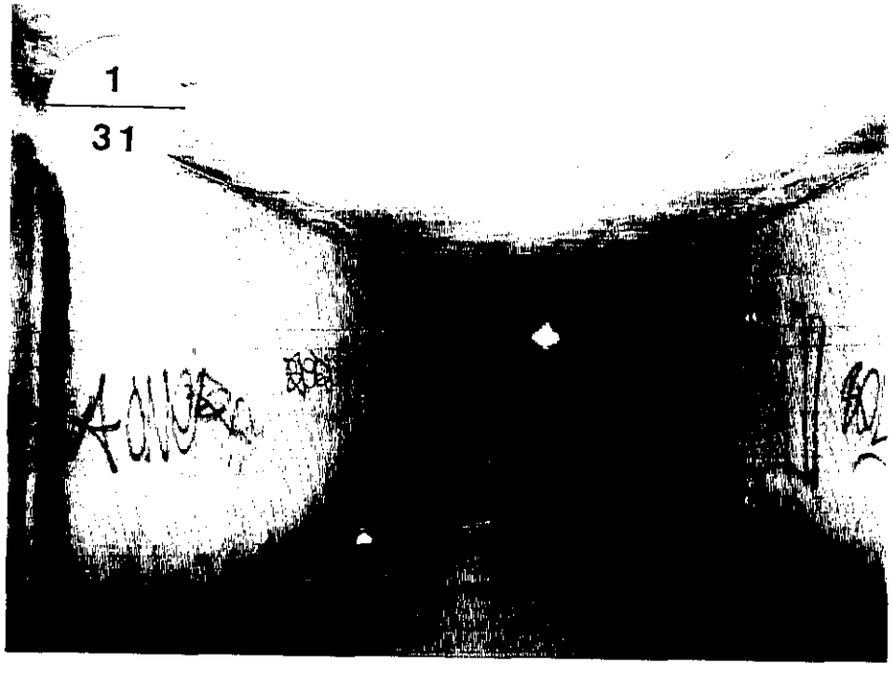

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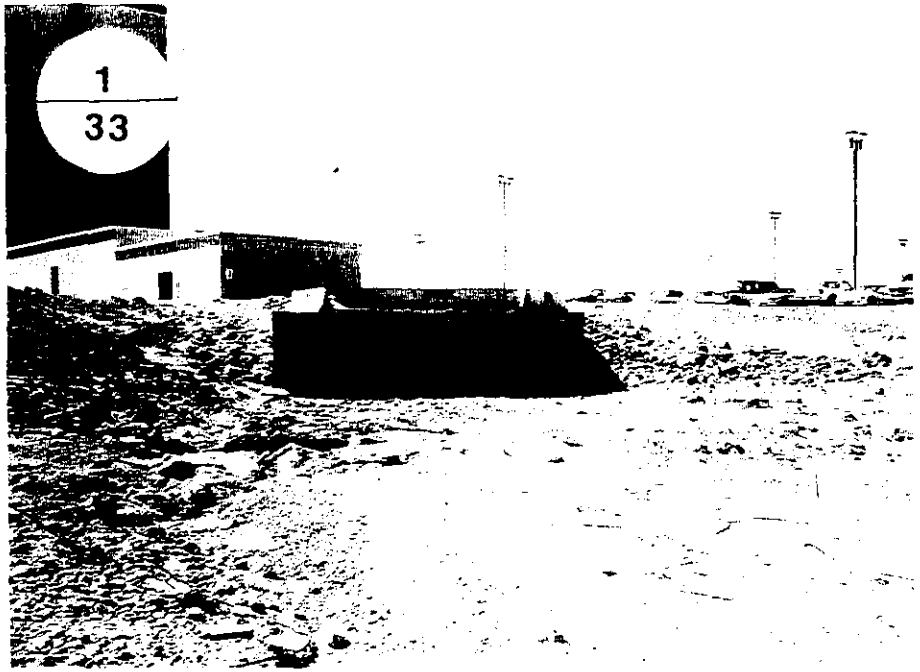

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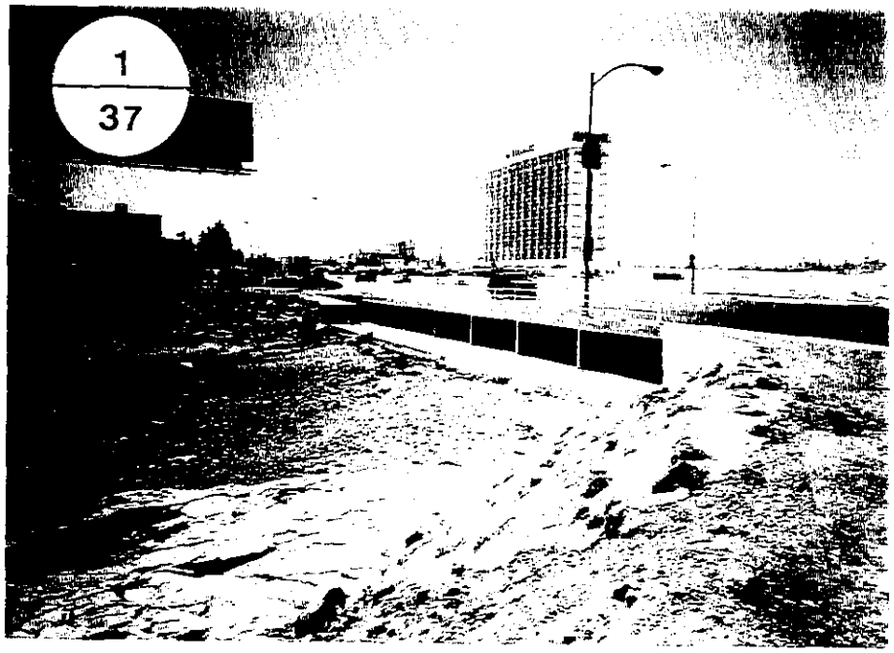

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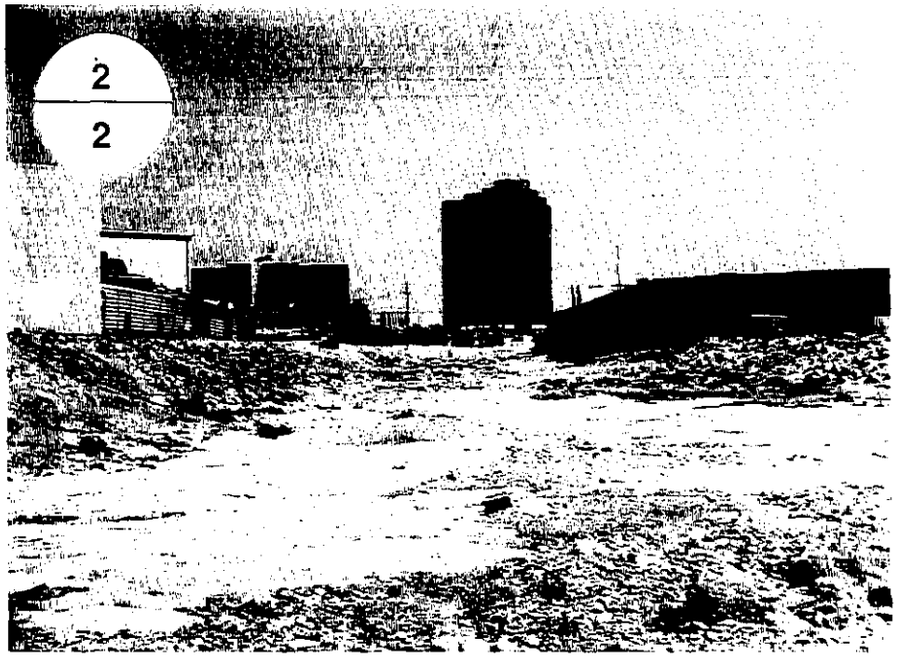

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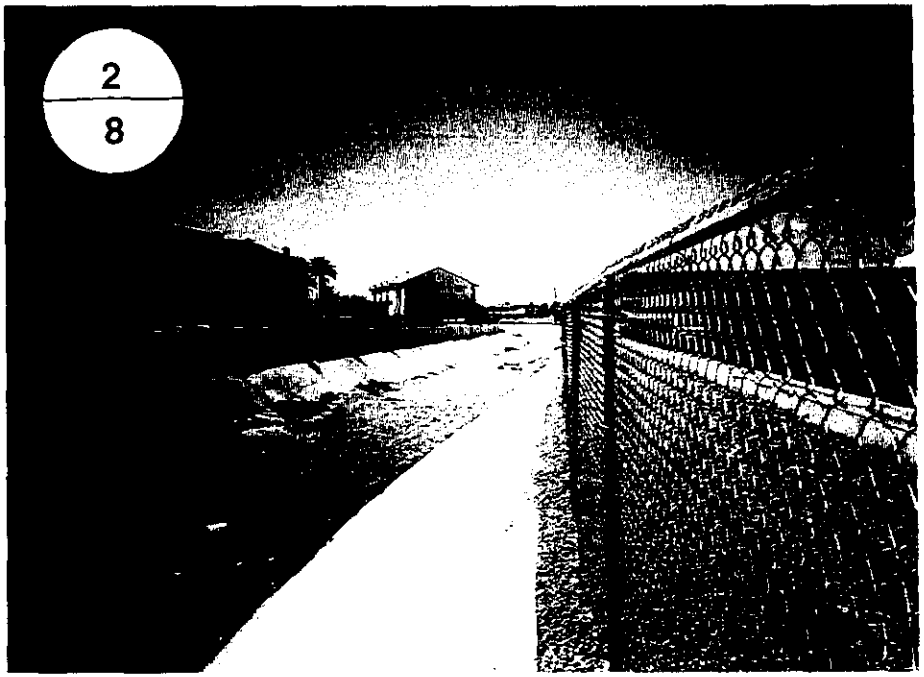
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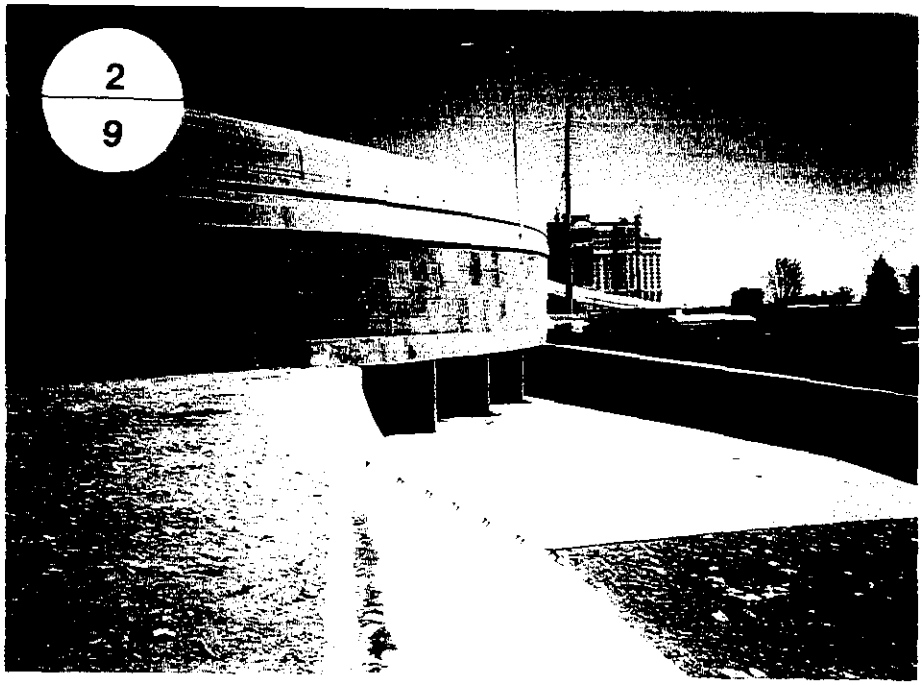
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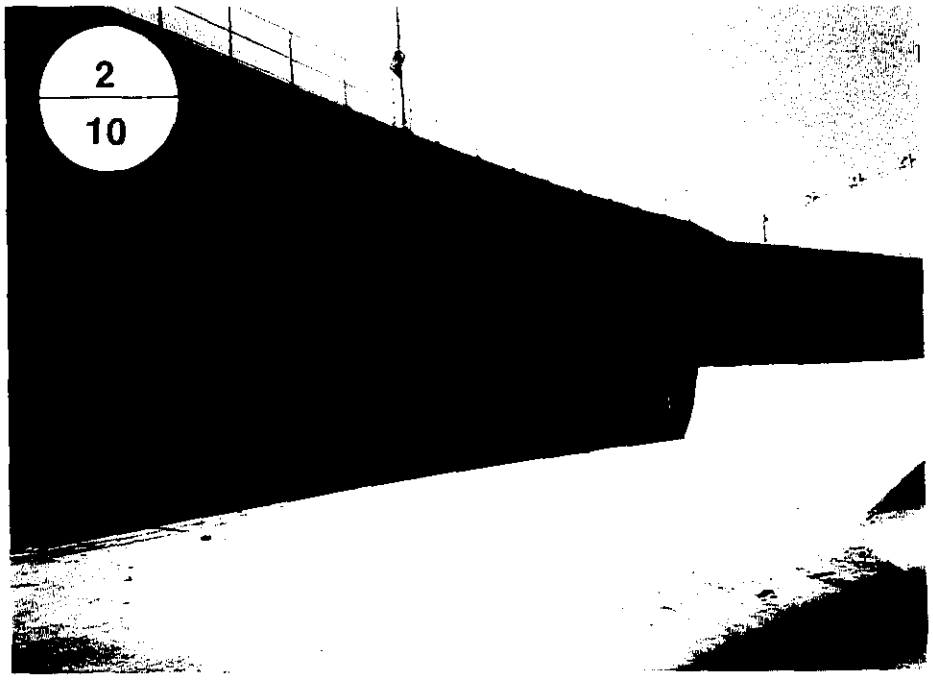


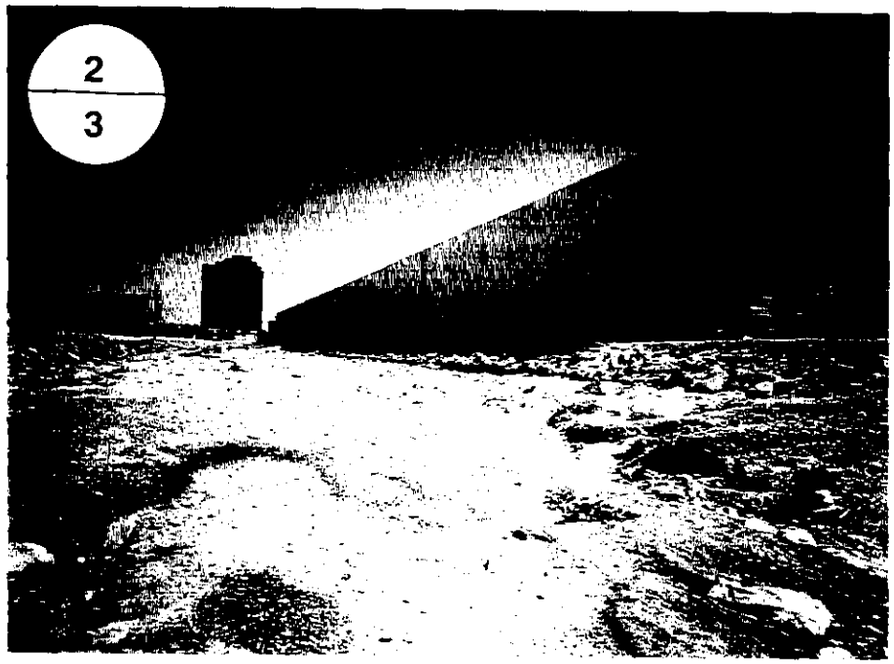



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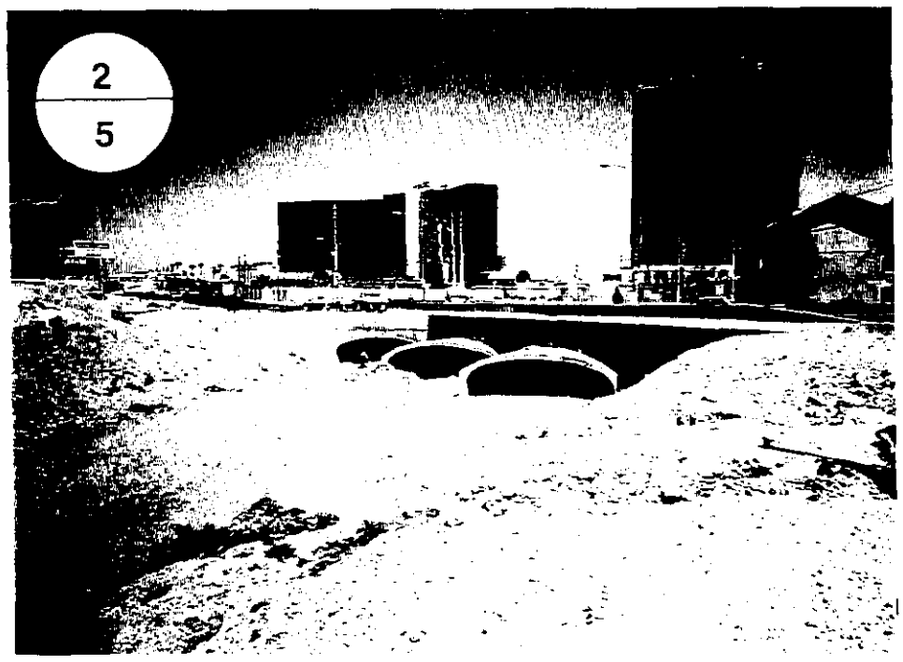

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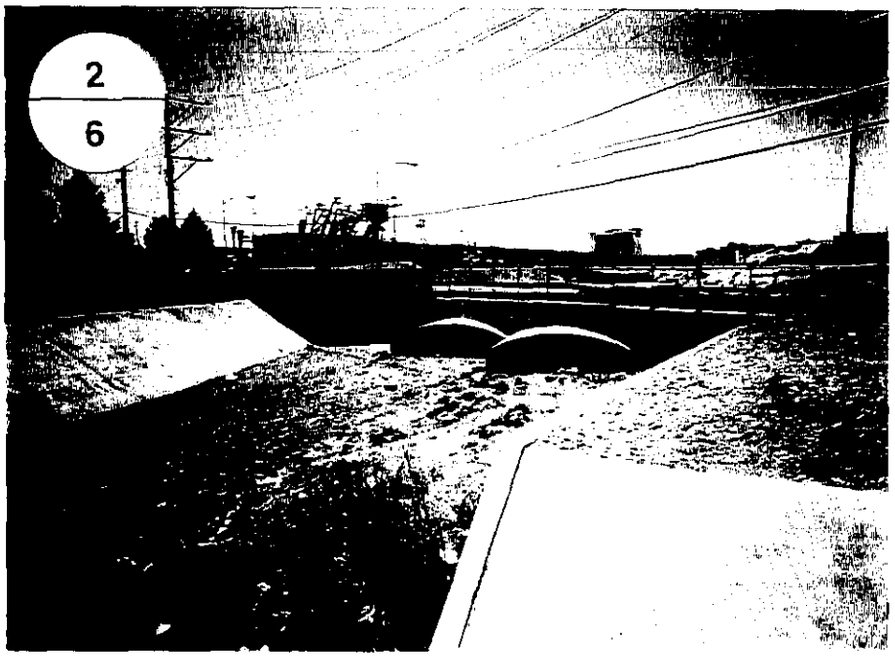

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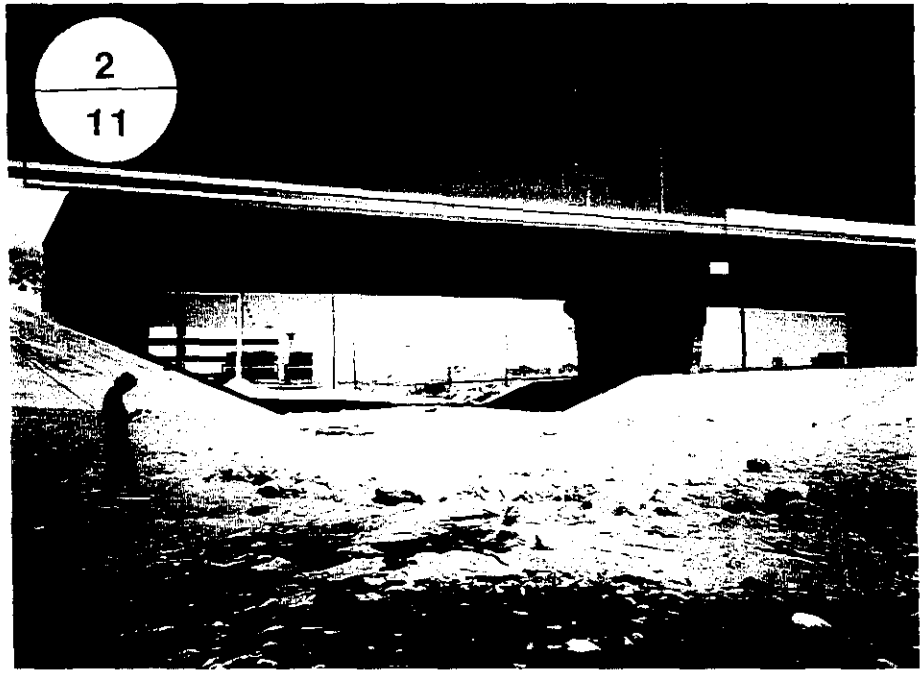

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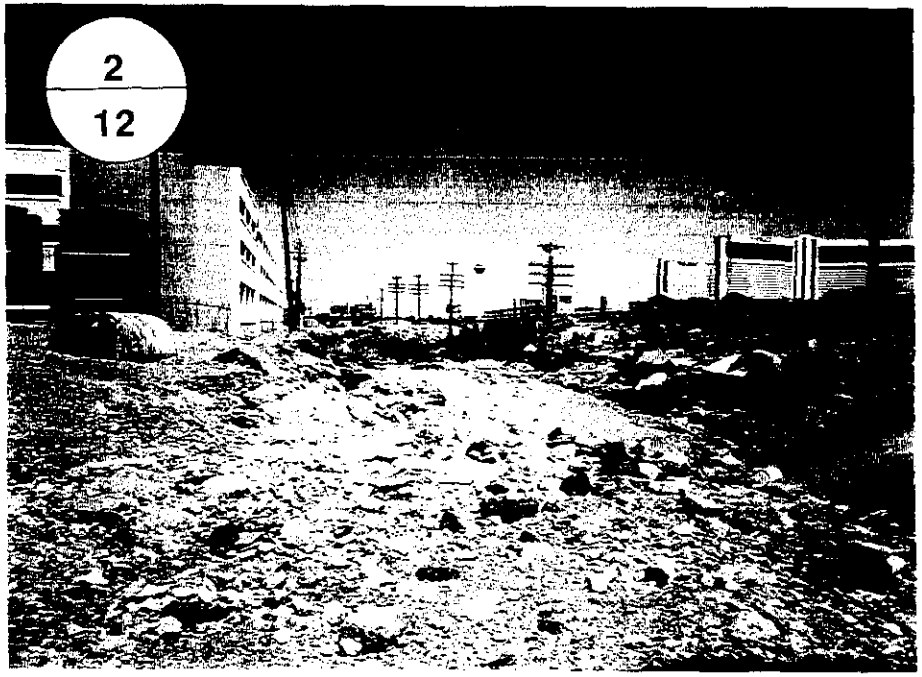

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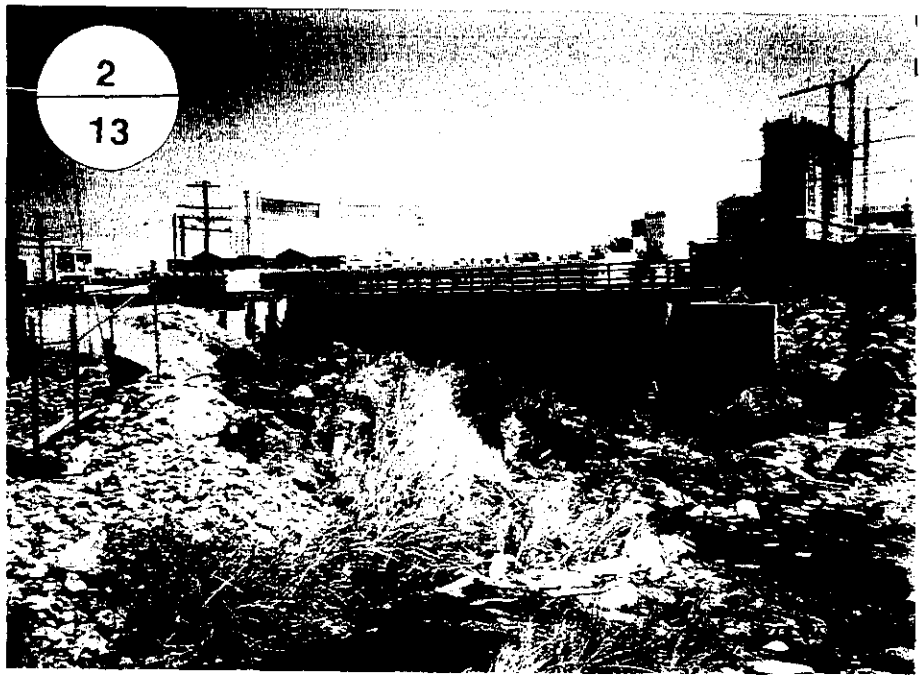

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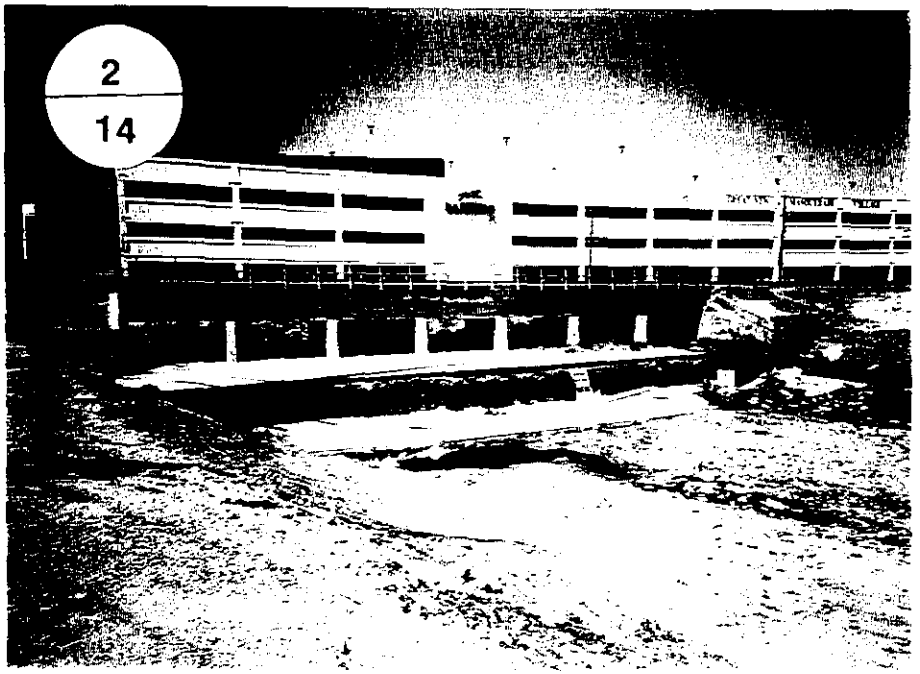

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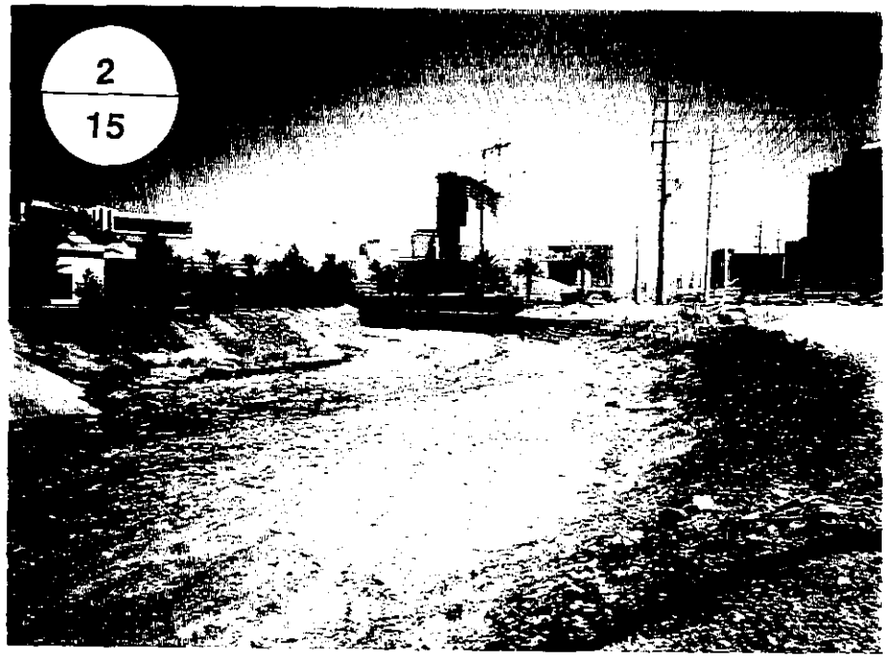

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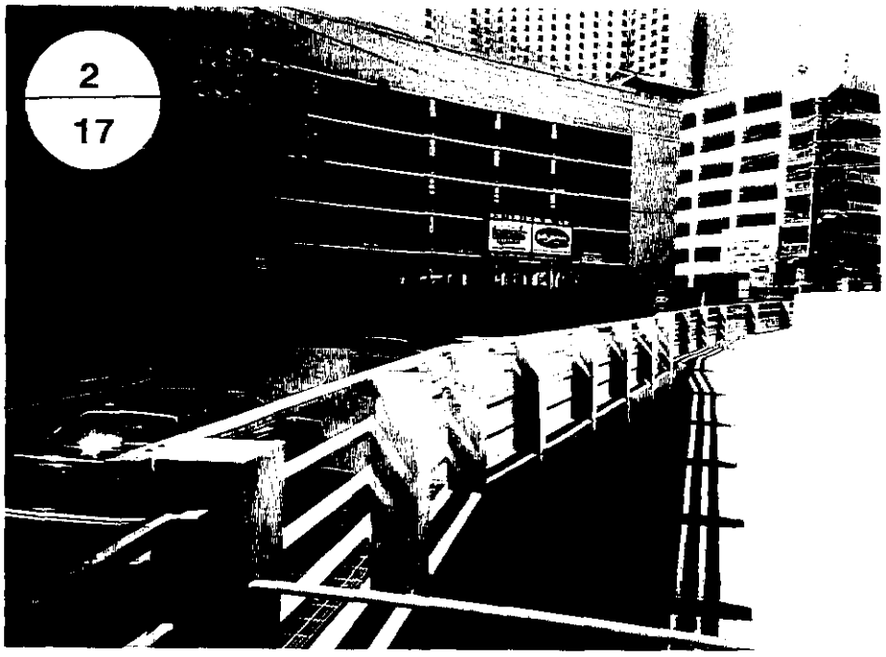

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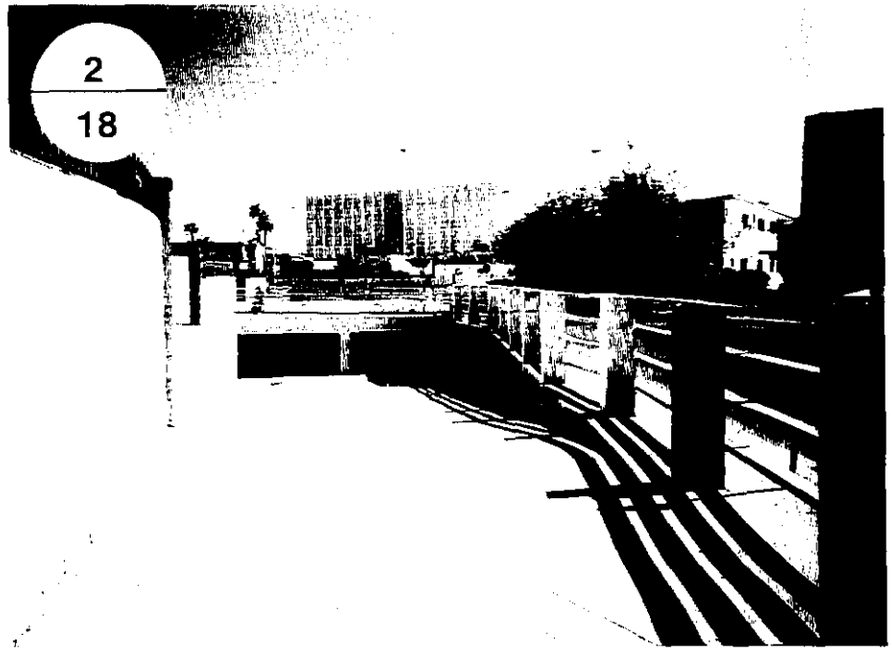

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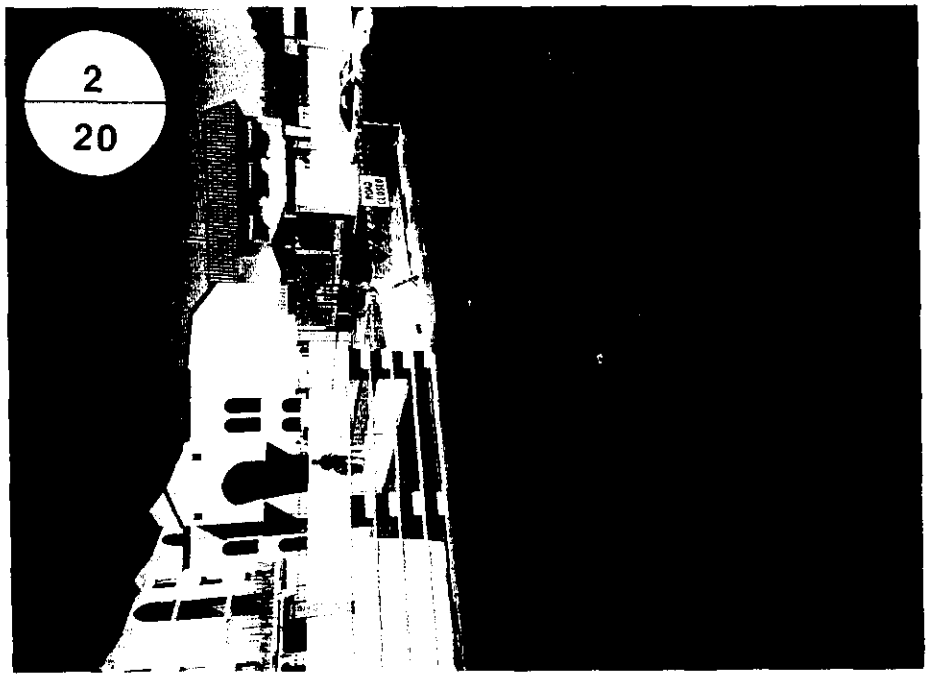

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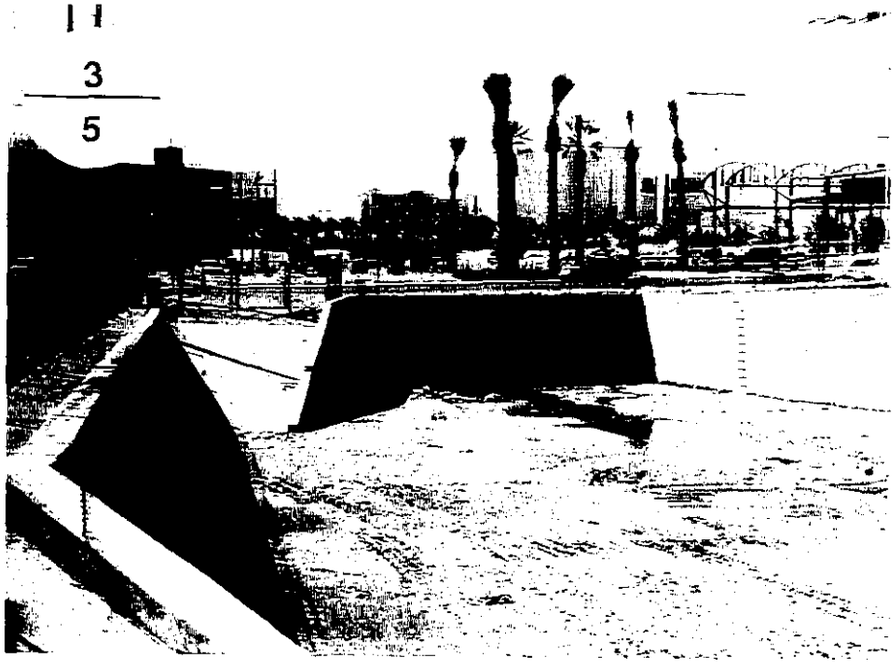

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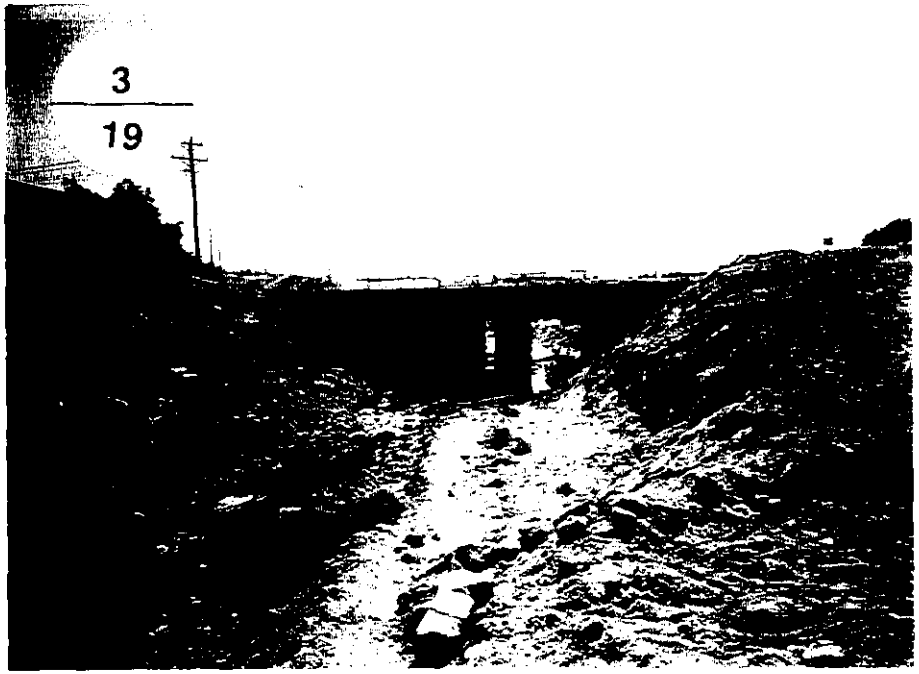

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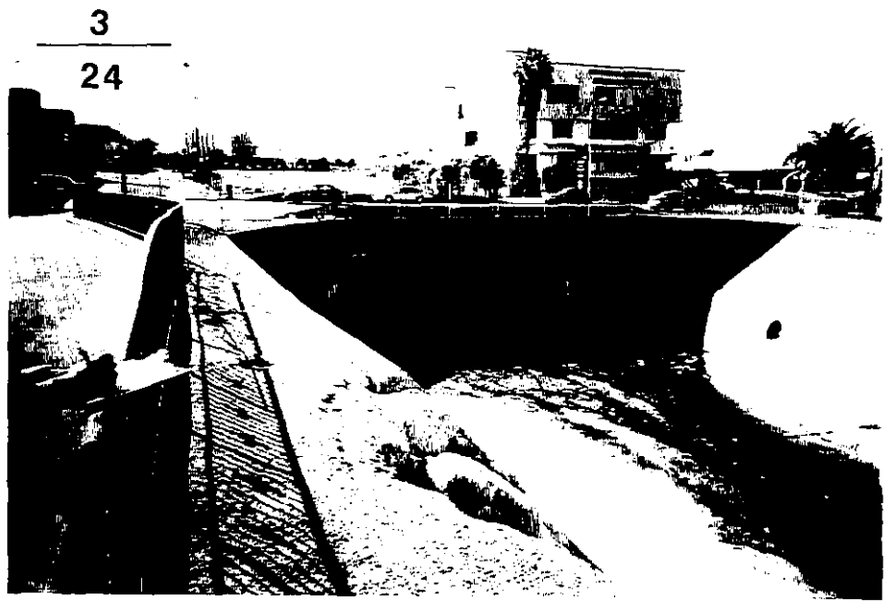

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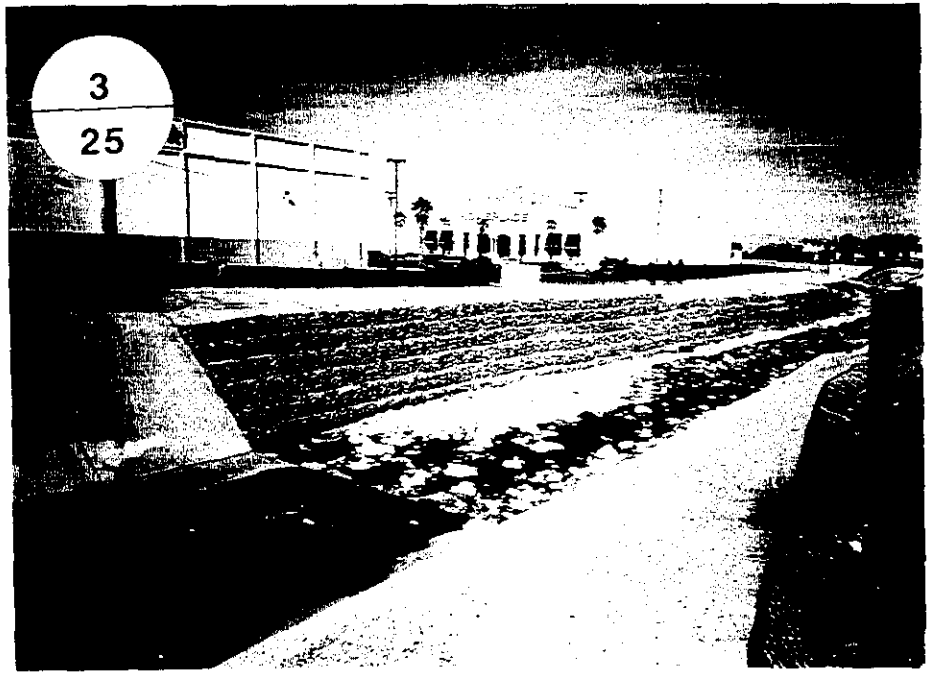

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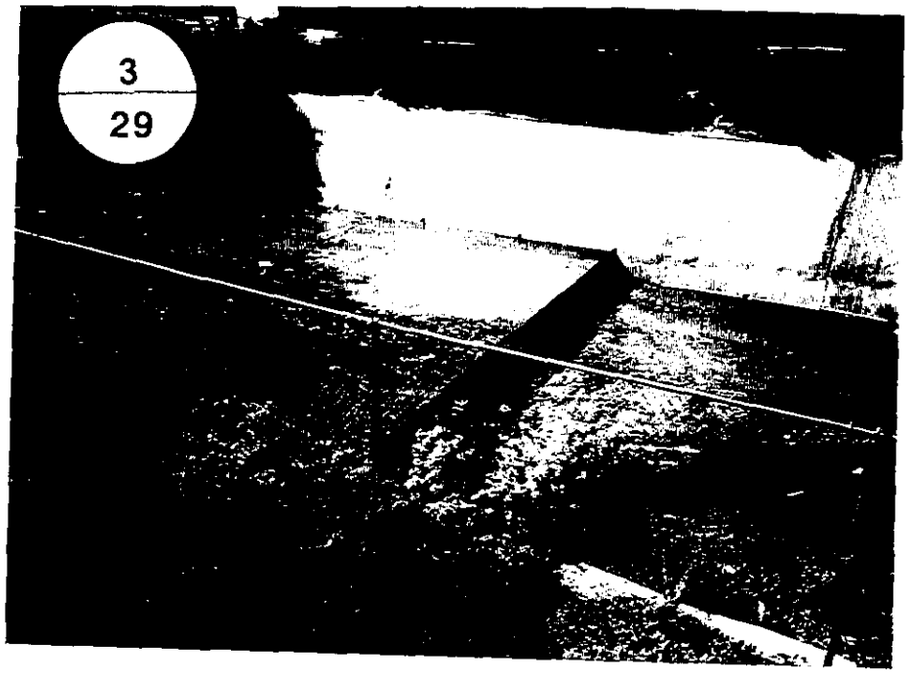

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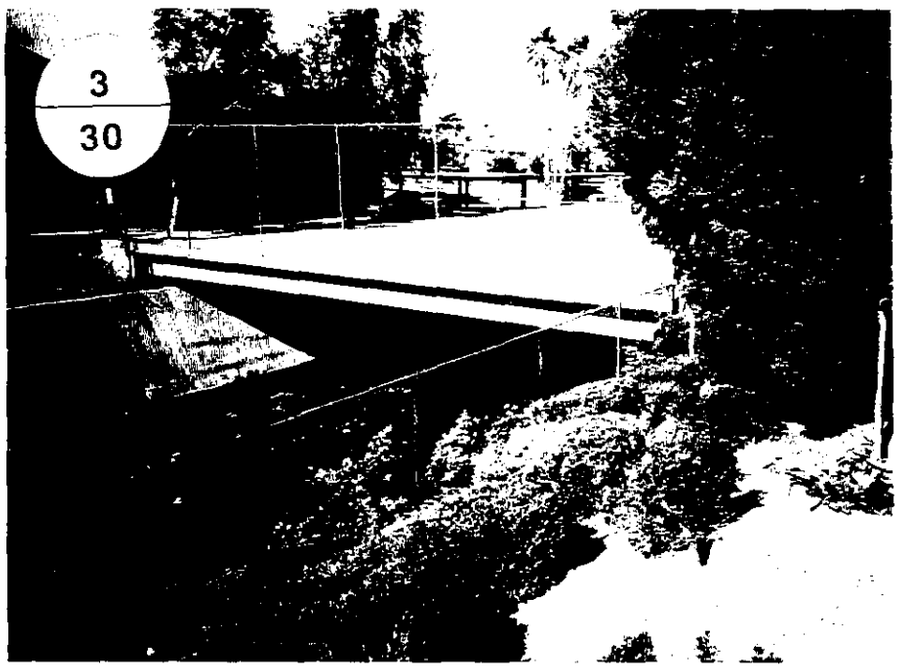

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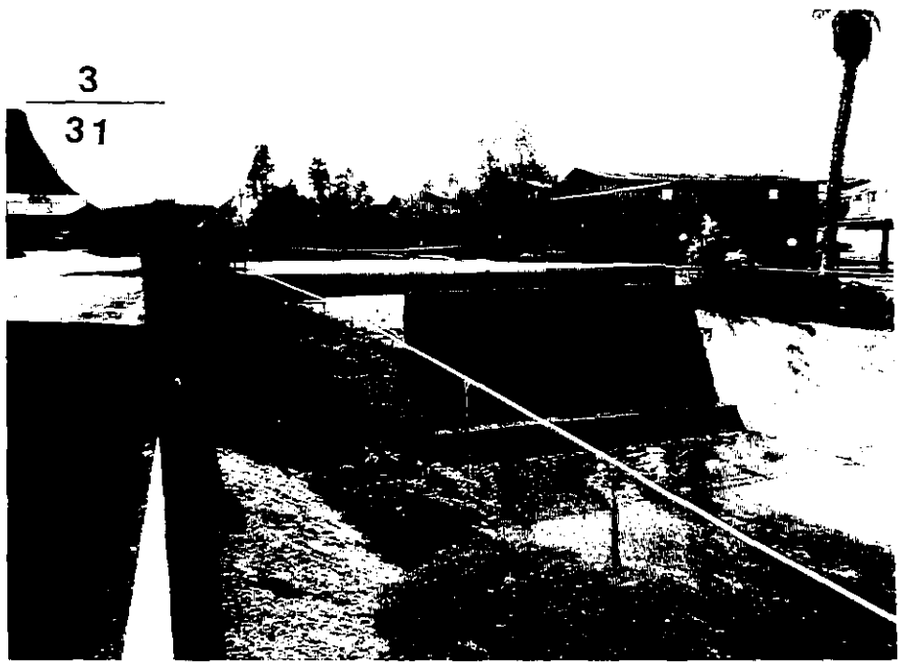

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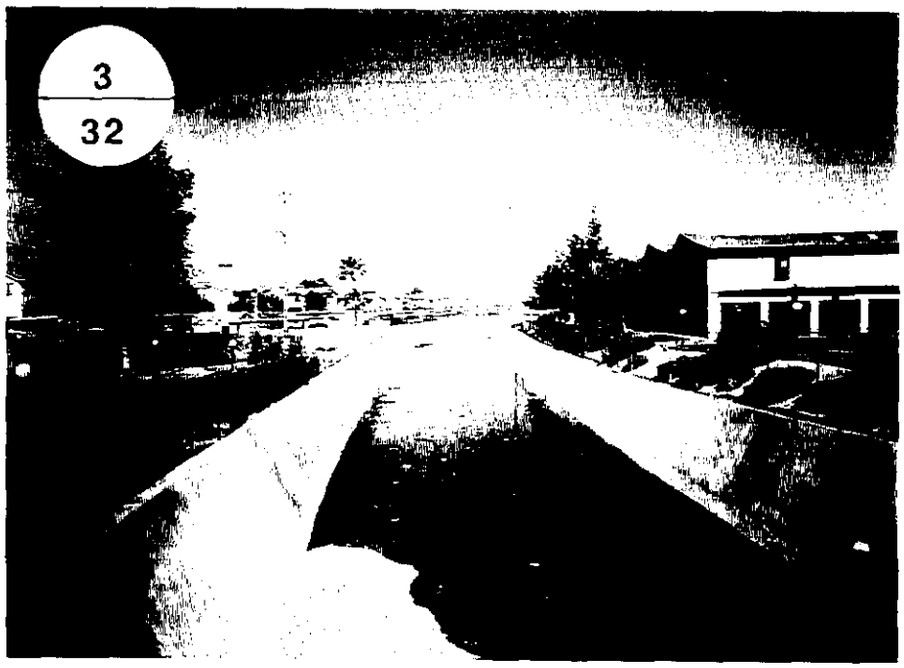

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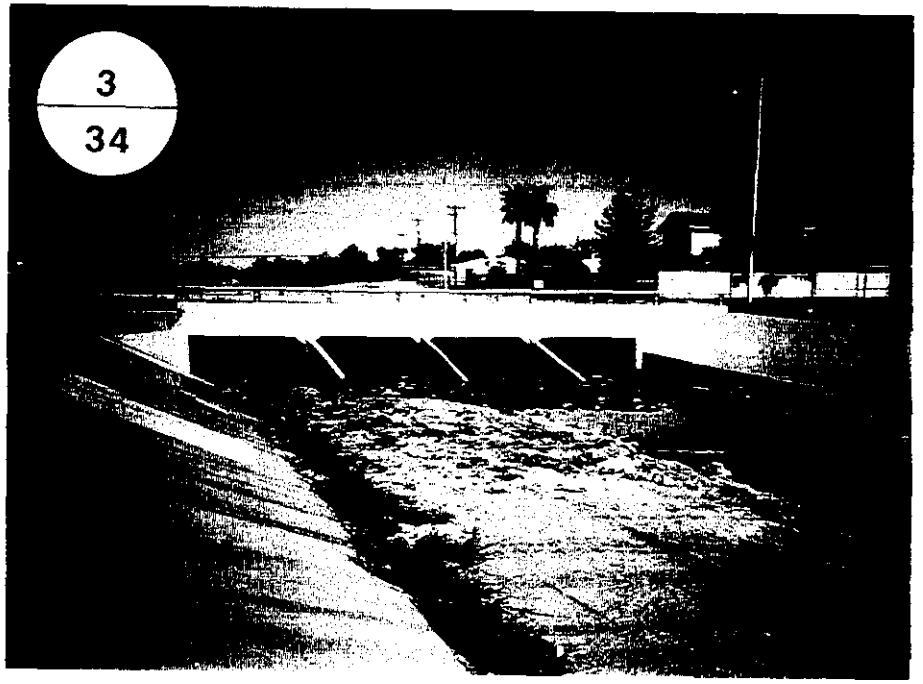

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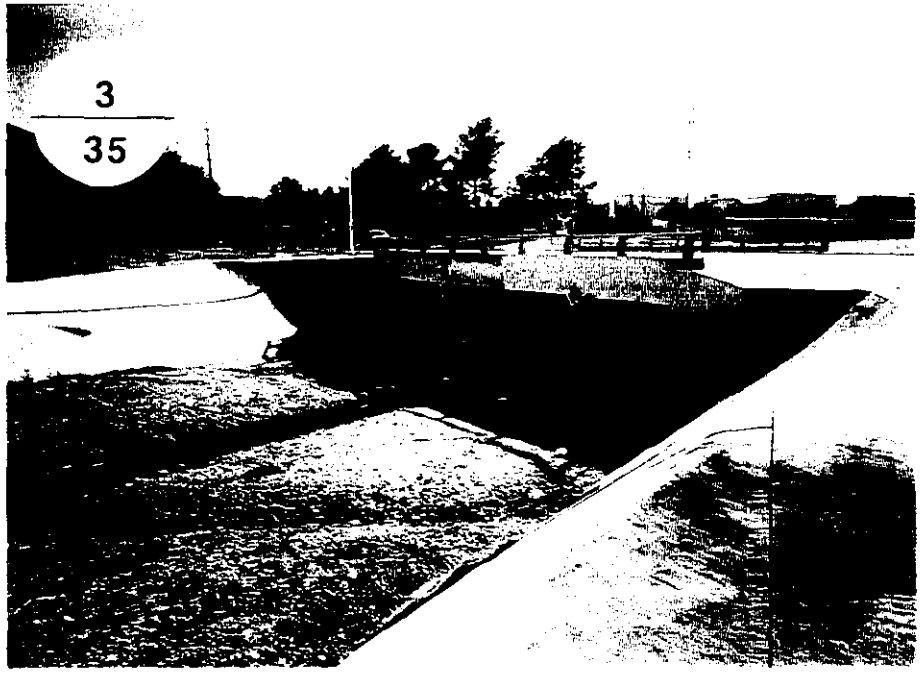

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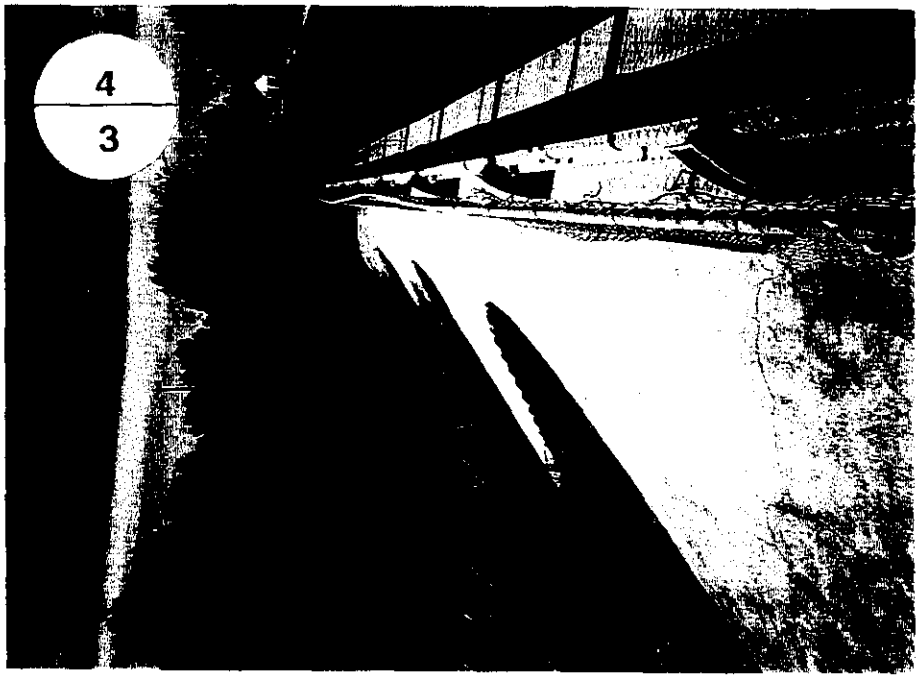


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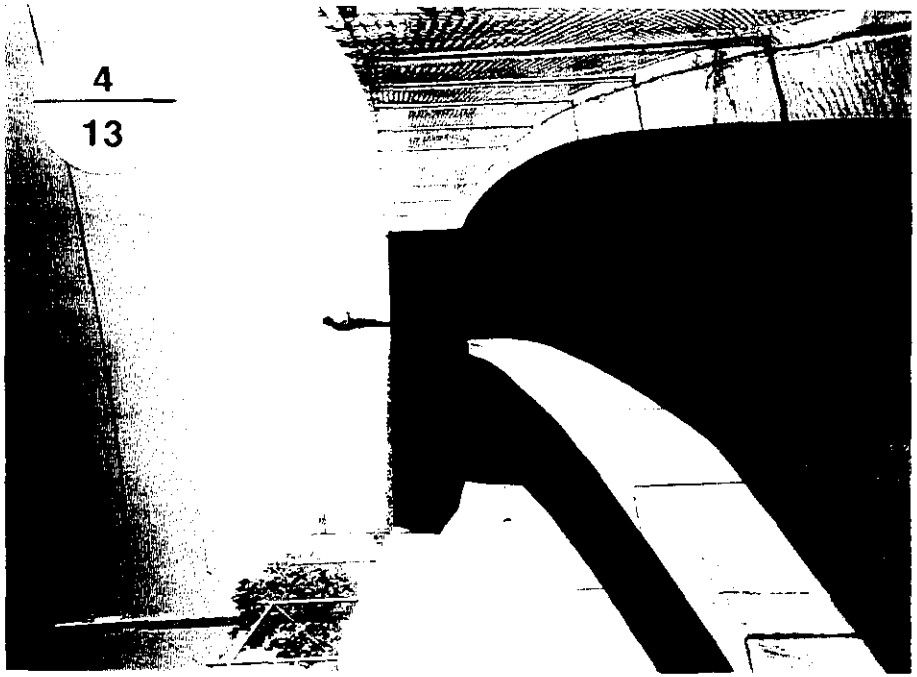
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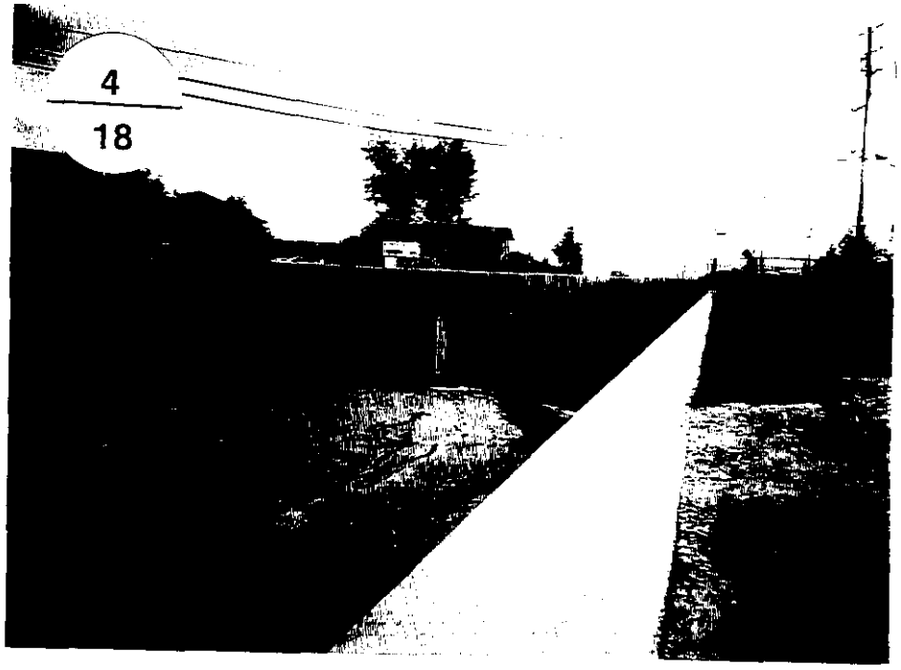
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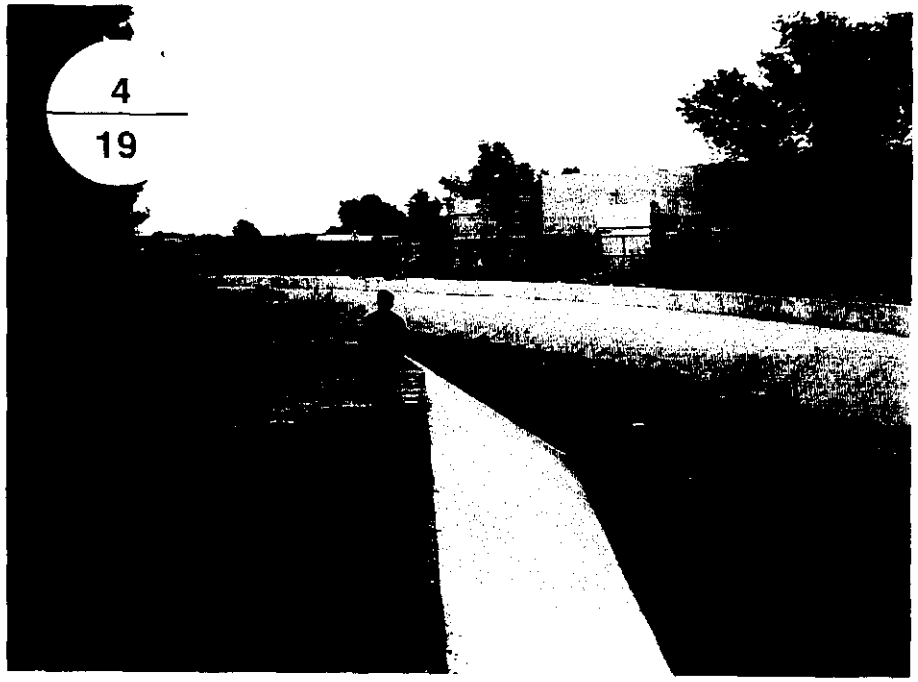
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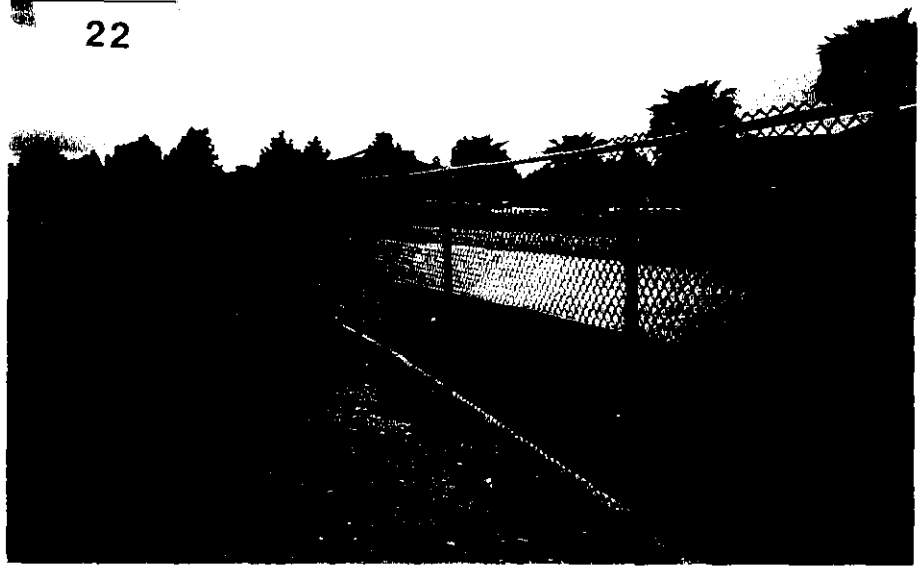
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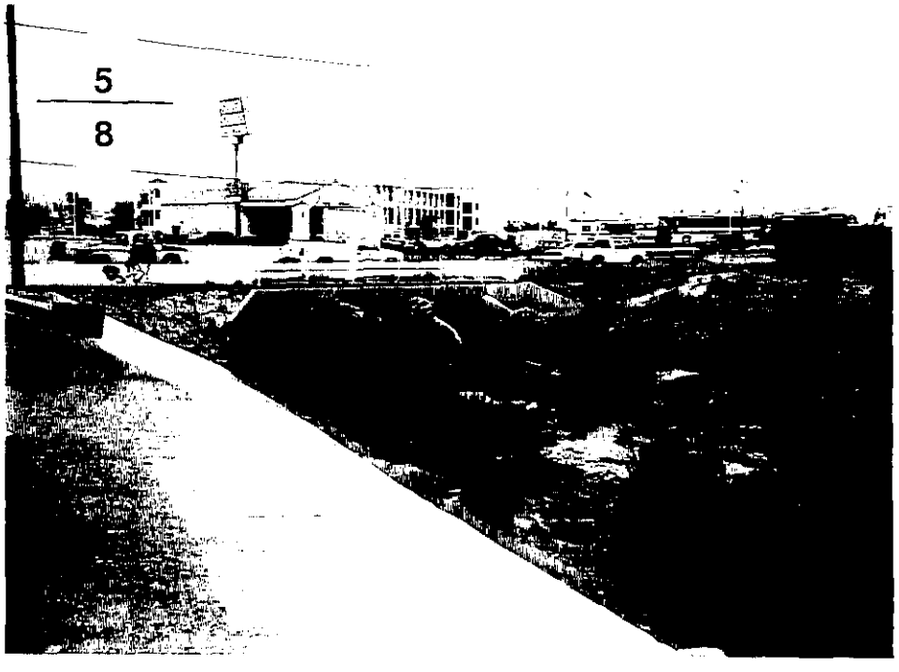
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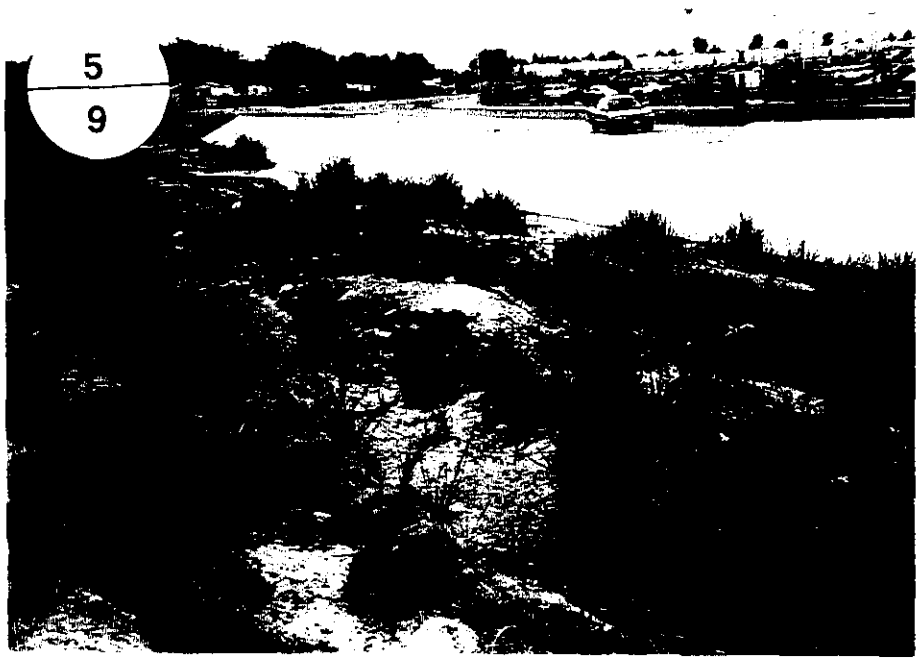


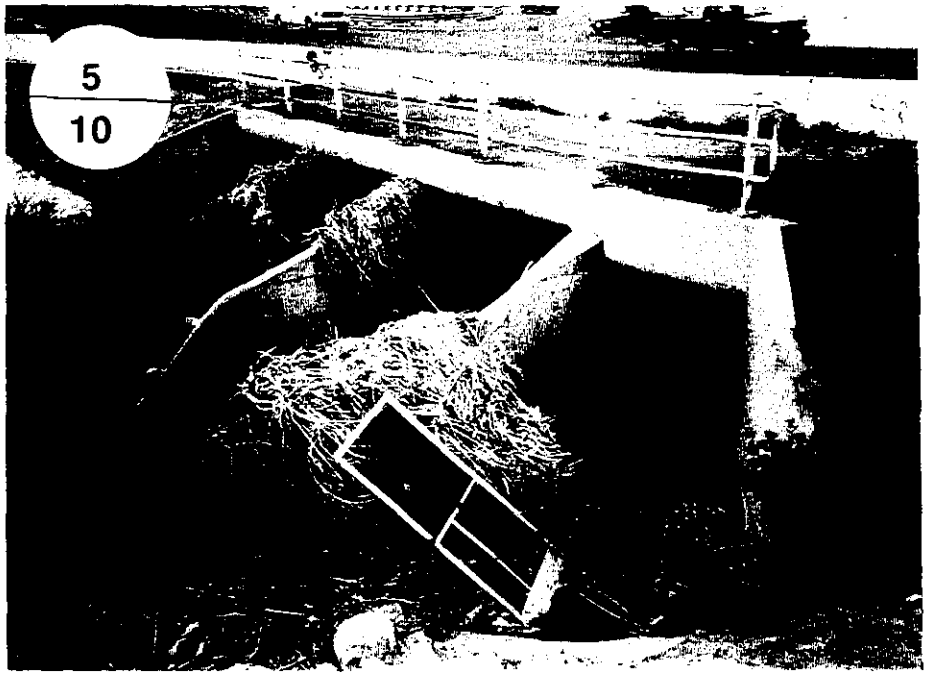
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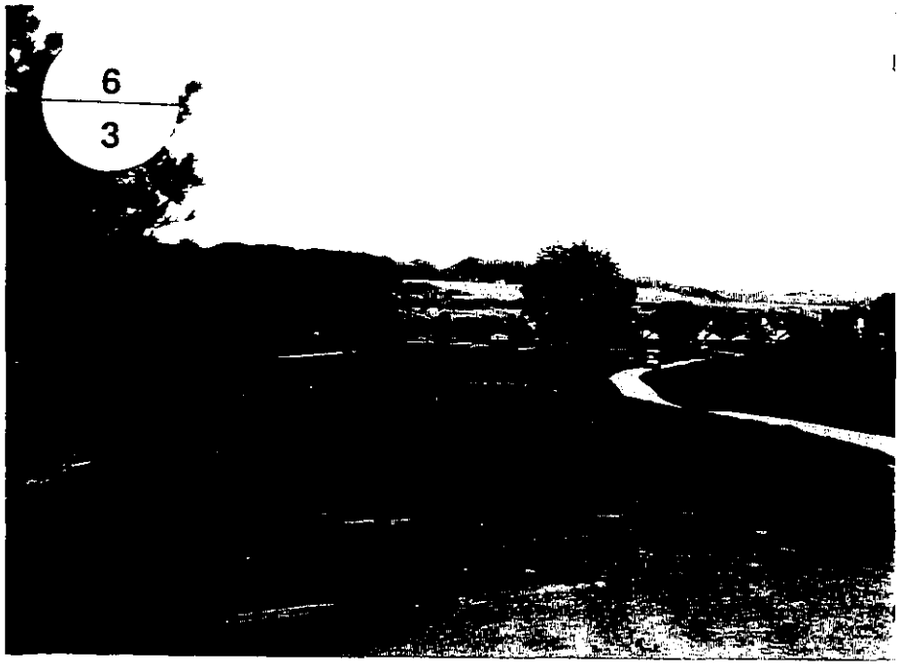


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5.3.1 GPS DATA

TABLE 4 ELEVATION REFERENCE MARKERS			
Map	**Name**	**Elevation**	**Description**
FL1	CCBM 7C10 24W4	2301.58	2-inch dome head brass cap reference monument on top of curb, northeast corner of Jones Blvd. And Harmon Ave.
FL1	CCBM 7C11 19SWS	2245.10	Rivet and square aluminum plate in top of curb, northeast corner of Tropicana Ave. And Decatur Blvd. Near the pc of Tropicana Ave.
FL1	CCBM 6C11 20SWS	2175.57	Rivet and square aluminum plate in top of curb, northeast corner of Tropicana Ave. And Valley View Blvd. Near the pc of Tropicana Ave.
FL1	CCBM 7C11 19E6	2176.60	Rivet and square aluminum plate in top of curb, northeast corner of Wynn. Rd. And Harmon Ave., east of the westerly driveway going into 4050 Harmon Ave.
FL1	CCBM 7C11 18SES	2152.90	Rivet and square aluminum plate in top of curb, northwest corner of Flamingo Rd. And Valley View Blvd. Near the pc of Flamingo Rd.
FL1	USCGS BM N-366	2141.40	USC&GS brass cap, in southeast headwall of railroad bridge, 325 ft. North of Flamingo Rd. Overpass at tracks.
FL2	CCBM 6C11 15SWW6	2048.60	Rivet and square aluminum plate in top of curb, northeast corner of Paradise Rd. And driveway going into 3900 Paradise Rd. Near the pc of Paradise Rd. ¼ mile south of Sands Dr.-Twain Ave.
FL2	CCBM 6C11 15NWW6	2046.27	Rivet and square aluminum plate in top of curb, northeast corner of Paradise Rd. And Edison Ave., near the pc of Paradise Rd.
FL2	CCBM 6C11 22NWW6	2046.43	Rivet and square aluminum plate in top of curb, east side of Paradise Rd. At Tropicana Wash box, just north of south driveway into Villa De Paradise Apartments, at a light pole.

FL2	CCBM 6C11 23NWW6	2006.68	Rivet and square aluminum plate in top of curb, northeast corner of Maryland Pkwy. And Rochelle Ave. Near the pc of Maryland Pkwy.
FL2	CCBM 6C11 23NWW6	1985.51	Rivet and square aluminum plate in top of curb, northeast corner of Maryland Pkwy. And Sierra Dr. near the pc of Maryland Pkwy.
FL2	CCBM 6C11 14SWW6	1986.23	Rivet and square aluminum plate in top of curb, east side of Maryland Pkwy. At the north side of Flamingo Wash.
FL3	CCBM 6C12 7C4	1814.92	Rivet and square aluminum plate in top of curb, east side of Boulder Hwy. At north property line of 3745 Boulder Hwy., at projected centerline of Sandhill Rd.
FL3	CCBM 6C12 7NW6	1804.74	Rivet and square aluminum plate in base of fire hydrant, east of Boulder Hwy., south of Dalhart St. and north of Flamingo Wash.
FL3	CCBM 6C12 18N4	1825.38	Rivet and square aluminum plate in top of curb, southeast corner of Desert Inn. Rd. And Sandhill Rd. Just east of wheel chair ramp.
FL3	CCBM 6C11 13E6	1895.32	Rivet and square aluminum plate in top of curb, northeast corner of Twain Ave. And Pecos-McCleod interconnect., near the pc of Pecos-McCleod interconnect.
FL3	CCBM 6C11 13N6	1889.46	Rivet and square aluminum plate in top of curb, southeast corner of Pecos-McCleod interconnect and the bridge at the Flamingo Wash.
FL4	CCBM 6C12 9W4	1720.66	Rivet and square aluminum plate in top of curb, northeast corner of Nellis Blvd. And Vegas Valley Dr., near the pc of Nellis Blvd.
FL4	CCBM 6C12 4SWS	1728.73	Rivet and square aluminum plate in top of curb, northeast corner of Nellis Blvd. And Sahara Ave., near the pc of Nellis Blvd.
FL4	CCBM 7C12 9NWW6	1727.38	Rivet and square aluminum plate in top of curb, east side of Nellis Blvd. at third street light pole, at Desert Rose Golf Course.
FL4	CCBM 7C12 8NWW6	1777.46	Rivet and square aluminum plate in top of curb, northeast corner of Lamb Blvd. And Karen Ave., near the pc of Lamb Blvd.

FLAMINGO WASH FIS RE-STUDY

Project: flam Thu Sep 4 21:20:32 1997

Point statistics:

Starting point number:	1
Max point number used:	1027
Min point number used:	1002
Current point number:	1028

Current Coordinate Listing (All)

Point	Northing	Easting	Elevation	Description
1002	249887.94	63230.31	2301.58	CCBM 7C10 24W4
1003	247599.99	68310.99	2245.10	CCBM 7C11 19SWS
1004	247659.32	73607.80	2175.57	CCBM 6C11 20SWS
1005	250275.91	72238.30	2176.60	CCBM 7C11 19E6
1006	252974.07	73387.06	2152.90	CCBM 7C11 18SES
1027	252917.03	75077.08	2141.40	USCGS BM N-366

FLAMINGO WASH FIS RE-STUDY

Project: flam Thu Sep 4 21:24:53 1997

Point statistics:

Starting point number:	1
Max point number used:	1030
Min point number used:	1007
Current point number:	1031

Current Coordinate Listing (All)

Point	Northing	Easting	Elevation	Description
1007	254070.29	83879.60	2048.90	CCBM 6C11 15SWW6
1008	256428.94	83878.96	2046.27	CCBM 6C11 15NWW6
1009	251610.66	84407.45	2046.43	CCBM 6C11 22NWW6
1011	251433.84	89024.15	2006.68	CCBM 6C11 23NWW6
1012	257245.87	89166.63	1985.51	CCBM 6C11 14NWW6
1030	253796.22	89004.21	1986.23	CCBM 6C11 14SWW6

FLAMINGO WASH FIS RE-STUDY

Project: flam Thu Sep 4 21:31:28 1997

Point statistics:

Starting point number:	1
Max point number used:	1029
Min point number used:	1020
Current point number:	1030

Current Coordinate Listing (All)

Point	Northing	Easting	Elevation	Description
1020	261378.32	102145.78	1814.92	CCBM 6C12 7C4
1021	262501.70	101136.92	1804.74	CCBM 6C12 7NW6
1022	258116.17	102509.05	1825.38	CCBM 6C12 18N4
1023	255388.76	98696.47	1895.32	CCBM 6C11 13E6
1029	256854.81	97397.43	1889.46	CCBM 6C11 13N6

FLAMINGO WASH FIS RE-STUDY

oject: flam Thu Sep 4 21:51:10 1997

Point statistics:

Starting point number:	1
Max point number used:	1018
Min point number used:	1015
Current point number:	1019

Current Coordinate Listing (All)

Point	Northing	Easting	Elevation	Description
1015	260959.11	110274.40	1720.66	CCBM 6C12 9W4
1016	263634.17	110289.62	1728.73	CCBM 6C12 4SWS
1017	262549.92	110284.47	1727.38	CCBM 7C12 9NWW6
1018	262253.40	105130.20	1777.46	CCBM 7C12 8NWW6

5.3.2 RAW DATA

FLAMINGO WASH FIS RE-STUDY

Project: flam Mon Sep 15 21:02:58 1997

Point statistics:

Starting point number:	1
Max point number used:	13028
Min point number used:	1
Current point number:	5

Current Coordinate Listing (All)

Point	Northing	Easting	Elevation	Description
1	262895.8720	110241.8240	1729.10	FW 1
2	262702.1770	110240.5840	1729.03	FW 2
3	263106.2530	105079.9840	1775.86	FW 3
4	262950.6630	105081.7060	1776.29	FW 4
7	262052.4185	100288.1363	1810.08	FW 7
8	262018.4110	100372.4990	1810.24	FW 8
9	259345.9464	98497.1116	1847.43	FW 9
10	259187.6391	98498.3787	1847.63	FW 10
11	258153.8020	97987.2980	1867.42	FW 11
12	258153.4890	97829.6840	1869.79	FW 12
13	256888.6750	97292.8780	1891.55	FW 13
14	256710.0530	97368.5690	1893.26	FW 14
15	255789.9800	94514.9740	1915.84	FW 15
16	255640.9810	94511.1290	1915.55	FW 16
17	254561.9890	91893.5520	1941.92	FW 17
18	254403.8980	91882.8340	1943.00	FW 18
19	253775.1095	89128.7226	1981.22	FW 19
20	253681.0440	89126.3540	1987.05	FW 20
21	253689.4129	88870.7464	1990.13	FW 21
22	253594.4855	87683.0232	1998.81	FW 22
23	253410.7635	87677.3120	1998.65	FW 23
24	253386.1010	86328.8670	2021.11	FW 24
25	253307.5410	86442.1340	2020.06	FW 25
26	253197.7820	85154.3546	2034.86	FW 26
27	253035.1954	85153.1722	2036.41	FW 27
28	253351.4930	83968.8950	2047.55	FW 28
29	253172.1630	84014.3840	2047.36	FW 29
30	253584.8770	81206.6780	2072.61	FW 30
31	253588.8100	81023.0230	2073.01	FW 31
32	253944.0140	79943.6820	2083.17	FW 32
33	253709.1230	80080.8050	2082.77	FW 33
34	253244.2050	76501.8290	2116.51	FW 34
35	253421.5780	76437.0450	2120.15	FW 35
36	252928.2584	75453.7434	2133.80	FW 36
37	252868.4991	75163.6064	2135.15	FW 37
38	252406.6190	74330.3450	2151.21	FW 38
39	252397.5020	74181.7210	2147.07	FW 39
40	252547.2110	74661.1350	2141.82	FW 40
41	252659.6270	74406.4230	2155.76	FW 40
42	252153.9990	73474.0310	2151.39	FW 42
43	252366.5770	73451.3130	2147.06	FW 43
44	249925.1600	70818.1060	2195.15	FW 44
45	249681.4030	70723.3380	2196.96	FW 45
46	249290.6690	70178.8720	2210.02	FW 46

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47	248385.0490	69371.7090	2223.19	FW 47
48	248280.3440	69373.1420	2223.37	FW 48
49	248131.1510	68161.7130	2243.43	FW 49
50	247965.3360	68261.5930	2243.58	FW 50
51	248667.3940	63179.1890	2295.20	FW 51
52	248496.8970	63178.2280	2295.35	FW 52
53	247074.6920	58989.3690	2337.38	FW 53
54	247232.0210	59386.4120	2339.68	FW 54
55	246497.5850	58072.1650	2352.93	FW 55
56	246545.7280	57855.4940	2353.68	FW 56
57	244323.6010	52661.5810	2414.84	FW 57
58	244326.6820	52867.5030	2415.47	FW 58
121	255643.7440	92059.6230	1941.31	HV 121
284	248551.3829	63082.3709	2295.43	GCWCONTROL
285	248526.1351	63134.5203	2294.77	TOP BC
286	248599.3231	63134.8881	2294.53	BC @ CL 4' D.I.
287	248668.1348	63135.3382	2294.73	TOP BC
288	248665.6947	63129.2737	2294.83	SIDEWALK
289	248524.2612	63128.3353	2294.89	SIDEWALK
290	248530.0788	63128.4660	2294.85	CONC ANG PNT
291	248530.1348	63123.1365	2294.94	CONC ANG PNT
292	248543.9106	63114.1786	2294.82	CONC ANG PNT
293	248556.9311	63104.4378	2291.48	CONC ANG PNT
294	248555.9206	63119.7514	2291.29	CONC ANG PNT
295	248572.1896	63127.8570	2295.55	TOP HEADWALL
296	248615.9983	63128.1160	2295.51	TOP HEADWALL
297	248615.1034	63127.9712	2295.07	TOP WINGWALL
298	248622.5387	63120.8345	2291.38	TOP WINGWALL
299	248573.0672	63127.7181	2295.15	TOP WINGWALL
300	248565.7694	63120.3261	2291.46	TOP WINGWALL
301	248565.9214	63120.2344	2286.60	CONC ANG PNT
302	248569.4220	63123.7432	2284.66	CONC ANG PNT
303	248573.3007	63127.8591	2284.47	EDGE CONC
304	248583.0064	63128.5545	2284.56	EDGE CONC
305	248593.6705	63128.6057	2284.54	EDGE CONC
306	248604.2481	63128.7556	2284.63	EDGE CONC
307	248614.8083	63128.0013	2284.53	EDGE CONC
308	248603.9487	63112.3259	2284.82	EDGE CONC
309	248593.4301	63112.4204	2284.80	EDGE CONC
310	248582.6858	63112.3791	2284.80	EDGE CONC
311	248622.3995	63120.4582	2286.91	CONC ANG PNT
312	248631.8578	63119.5040	2291.62	CONC ANG PNT
313	248619.5518	63123.2595	2284.56	CONC ANG PNT
314	248658.6256	63117.5309	2295.45	CONC ANG PNT
315	248643.9215	63121.7715	2295.12	EDGE CONC
316	248646.0144	63102.2636	2295.60	CONC ANG PNT
317	248655.0100	63096.6014	2296.15	NG
318	248607.0544	62836.0678	2304.66	CONC ANG PNT
319	248579.6729	62839.6122	2292.12	CONC ANG PNT
320	248539.9369	62849.8352	2287.14	TOE
321	248563.7373	62842.3437	2287.21	TOE
322	248521.5707	62858.2152	2296.35	TOP
323	248495.6873	62862.7062	2299.81	NG
324	248619.3309	63103.1537	2285.06	CONC ANG PNT

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325	248569.4393	63102.6648	2284.79	CONC ANG PNT
326	248532.1528	63101.8889	2295.76	NG
327	248500.3009	63222.3054	2294.85	TOP BC
328	248598.9286	63222.7829	2294.46	BC @ CL 4' D.I.
329	248649.0451	63223.1229	2294.62	TOP BC
330	248652.1081	63229.1024	2294.77	SIDEWALK
331	248635.7580	63228.7048	2294.77	CONC ANG PNT
332	248533.9256	63228.5483	2294.80	CONC ANG PNT
333	248499.1162	63228.2899	2294.95	SIDEWALK
334	248572.3988	63229.5816	2295.60	TOP HEADWALL
335	248573.0125	63229.5832	2284.09	EDGE CONC
336	248582.9183	63229.6349	2284.06	EDGE CONC
337	248593.5687	63229.7362	2284.07	EDGE CONC
338	248604.1548	63229.7959	2284.05	EDGE CONC
339	248614.6103	63229.7596	2284.08	EDGE CONC
340	248615.2579	63229.7639	2295.59	TOP HEADWALL
341	248572.8443	63229.7492	2294.70	TOP WINGWALL
342	248565.4230	63236.8382	2290.49	TOP WINGWALL
343	248614.7319	63229.8773	2294.73	TOP WINGWALL
344	248614.3545	63240.4091	2290.91	TOP WINGWALL
345	248559.6577	63243.4486	2285.93	FL PIPE
346	248565.6682	63252.2250	2283.43	EDGE CONC
347	248614.6106	63240.4362	2283.74	EDGE CONC
348	248622.8834	63377.5503	2279.85	EDGE CONC
349	248576.4469	63376.9309	2279.91	EDGE CONC
350	248560.3953	63376.6567	2286.10	CONC ANG PNT
351	248546.9885	63377.8678	2292.31	TOP
352	248509.8578	63377.8873	2292.32	NG
353	248501.3588	63245.0970	2294.35	NG
354	248536.9976	63252.7382	2294.22	TOP
355	248551.8865	63255.2563	2289.66	CONC ANG PNT
356	248636.6805	63378.3070	2286.50	CONC ANG PNT
357	248649.9202	63375.8800	2292.93	TOP
358	248641.0358	63253.0726	2295.65	TOP
359	248628.7996	63254.7451	2290.00	CONC ANG PNT
360	248634.9307	63254.0730	2291.59	CONC ANG PNT
361	248627.2972	63241.0555	2291.11	EDGE CONC
501	252462.2592	74628.3881	2136.10	FLY
502	252547.2030	74661.1532	2141.79	BSCHK
503	252489.3787	74502.1958	2168.70	TOP BC
504	252478.3467	74516.7665	2170.12	TOP BC
505	252470.0698	74533.1069	2171.40	TOP BC
506	252467.1142	74535.3551	2171.41	FL
507	252461.0504	74566.0643	2173.24	FL
508	252457.2456	74597.9793	2174.77	FL
509	252456.1951	74628.1803	2175.92	FL
510	252457.5989	74669.0657	2176.82	FL
511	252430.6999	74669.4911	2178.10	TOP BC
512	252429.5610	74640.9112	2177.24	TOP BC
513	252429.4674	74612.7591	2176.25	TOP BC
514	252425.1586	74584.5957	2175.22	TOP BC
515	252418.2092	74556.9481	2174.00	TOP BC
516	252420.4529	74522.3669	2172.18	TOP BC
517	252425.0040	74499.3858	2170.85	TOP BC

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518	252422.8965	74497.8164	2170.69	TOP BC
519	252416.8545	74530.3731	2172.57	TOP BC
520	252415.0629	74569.7265	2174.39	TOP BC
521	252419.1566	74606.2001	2176.03	TOP BC
522	252424.8430	74639.0168	2177.22	TOP BC
523	252428.6395	74675.2749	2178.23	TOP BC
524	252398.4969	74658.2302	2177.11	TOP BC
525	252392.8100	74619.3343	2175.61	TOP BC
526	252387.1990	74578.5476	2174.15	TOP BC
527	252387.4670	74537.7323	2172.38	TOP BC
528	252393.6220	74498.8872	2170.52	TOP BC
529	252407.3800	74454.1317	2168.08	TOP BC
530	252420.7899	74425.9056	2166.34	TOP BC
531	252439.4414	74395.7049	2164.41	TOP BC
532	252448.5745	74434.3600	2166.62	TOP BC
533	252449.1768	74438.3700	2166.88	TOP BC
534	252451.3741	74468.3777	2168.72	TOP BC
535	252444.0486	74490.4235	2170.31	TOP BC
536	252441.2383	74518.2081	2171.90	TOP BC
537	252442.3514	74519.5421	2171.84	TOP BC
538	252443.6464	74518.4876	2171.72	TOP BC
539	252452.9718	74492.3047	2170.01	TOP BC
540	252547.2110	74661.1350	2141.82	FW 40
541	252659.6270	74406.4230	2155.76	FW 41
542	252486.3682	74516.3816	2169.19	TOP
543	252472.2451	74537.3065	2170.89	TOP
544	252466.2814	74545.6139	2171.98	TOP RET WALL
545	252506.7080	74543.0649	2161.16	TOP RET WALL
546	252566.6632	74539.0965	2145.43	TOP RET WALL
547	252579.1632	74513.7103	2144.84	TOP RET WALL
548	252659.6479	74406.3756	2155.81	BSCHK
549	252560.2875	74637.1705	2142.64	NG
550	252527.5699	74599.5835	2144.62	NG
551	252489.7013	74567.7967	2145.84	NG
552	252465.9612	74545.5204	2147.10	NG
553	252501.2898	74543.2628	2145.75	NG
554	252539.9689	74541.2433	2145.30	NG
555	252568.5718	74540.1413	2144.56	NG
556	252549.8387	74560.5752	2145.81	SIGN
557	252561.3435	74595.3428	2143.60	NG
558	252544.3517	74656.3174	2141.98	TOP RET WALL
559	252522.0477	74628.1672	2143.35	TOP RET WALL
560	252497.6698	74597.2466	2144.98	TOP RET WALL
561	252490.0732	74589.6176	2145.35	TOP RET WALL
562	252475.6423	74570.9909	2146.34	TOP RET WALL
563	252466.6102	74559.5367	2146.98	TOP RET WALL
564	252465.1296	74556.4510	2147.05	TOP RET WALL
565	252465.2143	74554.8973	2150.30	HEAD WALL
566	252459.5273	74598.2667	2149.94	HEAD WALL
567	252458.8487	74648.0095	2149.56	HEAD WALL
568	252459.0952	74646.8530	2146.27	TOP RET WALL
569	252477.7590	74675.0670	2145.65	TOP RET WALL
570	252494.7627	74700.6797	2145.30	TOP RET WALL
571	252492.7933	74699.8853	2145.35	TOP RET WALL

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572	252482.4777	74707.3829	2145.25	TOP RET WALL
573	252469.5450	74716.8891	2145.18	TOP RET WALL
574	252464.2475	74691.7717	2147.62	STORM DRAIN MH
575	252547.2016	74661.1385	2141.82	TOP RET WALL
576	252547.2201	74661.1390	2141.82	TOP RIP RAP
577	252563.6330	74676.4857	2140.98	TOP RIP RAP
578	252543.4301	74690.7425	2135.98	TOE RIP RAP
579	252528.4910	74703.5342	2135.59	EDGE RIP RAP
580	252503.4531	74720.5166	2135.78	EDGE RIP RAP
581	252484.6418	74732.8499	2136.99	EDGE RIP RAP
582	252468.0344	74733.8372	2137.38	EDGE RIP RAP
583	252470.5198	74716.8172	2137.76	EDGE RIP RAP
584	252483.1216	74707.3655	2137.24	EDGE RIP RAP
585	252493.0240	74699.9857	2137.05	EDGE RIP RAP
586	252497.2434	74699.1965	2135.55	EDGE RIP RAP
587	252514.1043	74686.8673	2135.57	EDGE RIP RAP
588	252533.1332	74672.0912	2135.57	TOE RIP RAP
589	252532.8528	74671.7828	2135.57	CONC
590	252514.9756	74643.3760	2135.65	CONC
591	252497.9015	74614.2048	2136.15	CONC
592	252466.3409	74560.8583	2136.77	CONC
593	252464.0386	74566.6444	2136.72	INV.
594	252460.7094	74588.3408	2136.53	INV.
595	252459.0100	74610.9430	2136.29	INV.
596	252459.1981	74635.7269	2136.09	INV.
597	252458.6743	74623.6351	2136.29	WALL CENTER
598	252459.4233	74599.9942	2136.43	WALL CENTER
599	252461.7596	74577.2699	2136.64	WALL CENTER
600	252472.3162	74620.9437	2136.20	CONC
601	252498.5629	74658.4304	2135.65	CONC
602	252526.3866	74640.4419	2135.77	FL PIPE
603	252547.1790	74661.1227	2141.82	BSCHK
604	252365.4628	74390.7095	2138.83	FLY
605	252462.2530	74628.3729	2136.13	BSCHK
606	252385.5877	74500.2798	2137.63	INV.
607	252391.3667	74480.1962	2137.67	WALL CENTER
608	252398.0417	74459.7743	2137.97	WALL CENTER
609	252405.6761	74441.2956	2138.07	WALL CENTER
610	252413.5841	74425.1309	2138.24	INV.
611	252406.5911	74407.7005	2138.23	CONC
612	252394.9507	74383.7509	2138.42	EDGE CONC
613	252378.3138	74387.4590	2138.77	EDGE CONC
614	252361.5014	74391.0984	2138.78	EDGE CONC
615	252362.8638	74418.1269	2138.53	CONC
616	252373.0273	74460.5617	2137.92	CONC
617	252390.3829	74432.4198	2138.48	CONC
618	252382.6236	74405.3877	2138.67	CONC
619	252352.2626	74393.4665	2144.63	TOP RET WALL
620	252359.8234	74418.9169	2145.35	TOP RET WALL
621	252370.2981	74452.8124	2146.37	TOP RET WALL
622	252372.3261	74478.8587	2149.22	TOP RET WALL
623	252383.6369	74495.7339	2147.77	TOP RET WALL
624	252385.8053	74501.4189	2147.76	TOP RET WALL
625	252383.9399	74510.1513	2150.99	HEAD WALL

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626	252383.6314	74510.0793	2151.17	TOP WALL
627	252374.7029	74480.7847	2150.46	TOP WALL
628	252360.8977	74436.3949	2149.72	TOP WALL
629	252347.8650	74384.5370	2149.58	TOP WALL
630	252397.8437	74460.0273	2151.39	HEAD WALL
631	252417.5370	74416.7445	2151.60	HEAD WALL
632	252413.6283	74424.4805	2148.38	TOP WALL
633	252410.8478	74407.6035	2147.55	TOP RET WALL
634	252407.4809	74381.0547	2145.36	TOP RET WALL
635	252408.2166	74380.8311	2147.44	TOP RET WALL
636	252412.3817	74400.7592	2148.24	TOP RET WALL
637	252416.3123	74418.8294	2148.96	TOP RET WALL
850	248245.9000	69383.8767	2223.72	TOP BC
851	248246.0988	69378.7755	2223.88	SIDEWALK
852	248289.7739	69383.1461	2223.23	TOP BC END
853	248291.7958	69383.1200	2223.16	TOP BC END
854	248377.0959	69381.9325	2223.20	TOP BC
855	248411.9712	69381.4310	2223.04	TOP BC
856	248420.5811	69456.3505	2222.91	BC RETURN
857	248413.7090	69439.5982	2222.47	CL HANDI RAMP
858	248390.2255	69431.8002	2222.76	BC RETURN
859	248390.5369	69436.8631	2222.82	SIDEWALK
860	248357.1408	69432.2719	2222.73	TOP BC END
861	248355.0780	69432.2951	2222.73	TOP BC END
862	248339.2468	69432.5132	2222.75	TOP BC END
863	248337.2345	69432.5291	2222.73	TOP BC END
864	248320.7537	69432.7780	2222.72	TOP BC END
865	248318.7488	69432.8015	2222.73	TOP BC END
866	248299.0079	69432.9776	2222.75	TOP BC
867	248268.0490	69433.4880	2223.10	TOP BC
868	248290.6410	69438.3139	2222.99	EDGE CONC
869	248298.4783	69441.3695	2222.87	EDGE CONC
870	248305.9099	69440.9513	2222.57	EDGE CONC
871	248313.2372	69442.7512	2222.58	EDGE CONC
872	248328.7368	69441.1102	2222.54	EDGE CONC
873	248347.6615	69442.2909	2222.55	EDGE CONC
874	248362.8892	69440.6998	2222.58	EDGE CONC
875	248370.8127	69440.7075	2222.56	EDGE CONC
876	248379.6988	69439.4584	2222.49	EDGE CONC
877	248384.0730	69437.1273	2222.87	EDGE CONC
878	248356.2620	69438.0330	2222.55	GRATE INLET CENTER
879	248338.2437	69438.2491	2222.57	GRATE INLET CENTER
880	248319.8252	69438.5404	2222.58	GRATE INLET CENTER
881	248301.0372	69453.8763	2226.13	TOP BC
882	248379.9199	69452.7875	2226.16	TOP BC
883	248375.2505	69436.9838	2222.92	TOP BARACADE
884	248301.4031	69437.9497	2222.98	TOP BARACADE
885	248292.6776	69378.0669	2223.56	TOP BARACADE
886	248367.8588	69377.0797	2223.53	TOP BARACADE
887	248376.8589	69377.0158	2223.51	TOP HEADWALL
888	248283.5906	69378.2645	2223.60	TOP HEADWALL
889	248280.8144	69351.8602	2224.34	TOP
890	248257.5768	69275.8733	2226.20	TOP
891	248267.4303	69269.9370	2218.55	TOE

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892	248291.4422	69340.6240	2217.24	TOE
893	248293.4966	69377.9276	2217.33	EDGE CONC
894	248303.8850	69377.9466	2216.92	EDGE CONC
895	248314.6170	69377.7302	2217.00	EDGE CONC
896	248325.2871	69377.6181	2216.99	EDGE CONC
897	248335.9776	69377.4998	2216.97	EDGE CONC
898	248346.6464	69377.3731	2216.95	EDGE CONC
899	248357.2963	69377.2208	2216.92	EDGE CONC
900	248367.0516	69377.0975	2216.92	EDGE CONC
901	248359.3606	69350.5943	2217.80	TOE
902	248325.5572	69240.0459	2221.23	TOE
903	248334.1482	69237.3406	2226.75	TOP
904	248372.4800	69321.1038	2228.17	TOP
905	248374.5801	69352.5273	2224.91	TOP
906	248014.7305	68167.7706	2243.28	TOP BC
907	248080.9497	68167.2047	2243.00	BC @ CL 4' D.I.
908	248160.9561	68166.5153	2243.79	TOP BC
909	248160.8995	68161.4236	2243.88	SIDEWALK
910	248025.1745	68162.6413	2243.29	SIDEWALK
911	248062.4149	68161.7419	2243.24	TOP HEADWALL
912	248099.5046	68161.6030	2243.05	TOP HEADWALL
914	248107.4473	68153.0828	2237.80	TOP WINGWALL
915	248108.0241	68152.9698	2233.97	CONC
916	248134.7857	68098.7030	2238.87	EDGE CONC
917	248108.2074	68096.8271	2231.69	EDGE CONC
918	248103.3842	68141.4066	2231.01	EDGE CONC
919	248087.3487	68141.5366	2231.07	EDGE CONC
920	248074.8413	68141.4800	2231.07	EDGE CONC
921	248072.3832	68141.4090	2231.07	CONC ANG PNT
922	248054.2763	68153.5347	2231.09	EDGE CONC
923	248099.6673	68161.5745	2230.67	EDGE CONC
924	248087.5700	68161.5217	2230.81	EDGE CONC
925	248074.9869	68161.6152	2230.86	EDGE CONC
926	248062.6150	68161.7791	2230.93	EDGE CONC
927	248124.2649	68091.1552	2236.65	TOP
928	248124.1191	68036.3834	2237.18	TOP
929	248110.3867	68029.9459	2232.68	TOE
930	248023.1064	68039.0415	2233.87	TOP
931	248039.6861	68031.7307	2232.10	TOE
932	248066.8864	68137.9078	2231.60	TOE
933	248063.4271	68136.8546	2232.61	TOP
934	248041.8482	68134.4808	2231.82	TOE
935	247988.4962	68137.0842	2235.72	TOE
936	247990.4634	68151.4973	2243.22	TOP
937	248039.2965	68154.4045	2242.99	TOP
938	248217.5742	68257.6182	2244.16	TOP BC
939	248199.2671	68254.8777	2244.03	TOP BC ANG PNT
940	248109.1724	68255.6213	2243.09	TOP BC
941	248081.9277	68255.8339	2242.96	BC @ CL 4' D.I.
942	248031.5529	68256.1444	2243.28	TOP BC
943	247965.4404	68256.7517	2243.63	TOP BC
944	247965.3346	68261.5807	2243.67	SIDEWALK
945	247965.8410	68264.0884	2242.34	EDGE CONC
946	248037.9302	68264.1442	2241.09	CONC ANG PNT

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947	248038.0872	68261.0886	2243.31	SIDEWALK
948	248062.7553	68261.7301	2243.09	TOP HEADWALL
949	248100.9530	68261.4586	2243.13	TOP HEADWALL
950	248100.8760	68261.5559	2242.04	TOP WINGWALL
951	248063.2911	68261.9634	2242.28	TOP WINGWALL
952	248063.5688	68261.6910	2230.12	EDGE CONC
953	248075.9098	68261.7052	2230.10	EDGE CONC
954	248088.5035	68261.5201	2230.15	EDGE CONC
955	248100.4455	68261.3455	2230.14	EDGE CONC
956	248125.5467	68260.7028	2243.39	SIDEWALK
957	248198.9547	68260.0054	2244.02	SIDEWALK
958	248204.2034	68281.9356	2243.11	TOP
959	248194.5339	68299.0212	2242.36	TOP
960	248179.3240	68338.9419	2239.65	TOP
961	248170.1716	68395.6660	2237.61	TOP
962	248156.4150	68392.6782	2233.69	TOE
963	248172.0792	68324.7861	2237.12	TOE
964	248188.0395	68272.9909	2237.90	TOE
965	248184.9011	68266.0718	2239.09	CONC
966	248134.0711	68292.0412	2234.56	TOP
967	248142.2552	68364.5459	2234.01	TOP
968	248167.7385	68454.1279	2234.60	TOP
969	248148.3104	68454.1591	2227.21	TOE
970	248116.1134	68289.5337	2228.62	TOE
971	248111.6490	68276.5981	2229.34	EDGE CONC
972	248098.2495	68264.8394	2230.15	EDGE CONC
973	248064.4207	68265.1973	2230.26	EDGE CONC
974	248050.3218	68278.3447	2229.54	EDGE CONC
975	248044.1392	68275.8643	2231.33	EDGE CONC
976	248049.0234	68276.0183	2231.15	TOP WINGWALL
977	248054.4324	68270.6241	2234.28	TOP WINGWALL
978	248113.7526	68275.3411	2233.45	TOP WINGWALL
979	248046.0323	68304.5053	2229.50	TOE
980	248072.6883	68407.6890	2226.64	TOE
981	248051.6327	68410.6050	2238.67	TOP
982	248029.7972	68284.5786	2241.17	TOP
983	248054.5380	68270.3734	2237.29	TOP WINGWALL
1017	262549.9200	110284.4690	1727.38	CCBM 7C12 9NWW6
1018	262253.3950	105130.1970	1777.46	CCBM 7C12 8NWW6
1021	262501.7034	101136.9179	1804.74	CCBM 6C12 7NW6
1025	244392.0830	52580.1760	2415.19	CCBM 2C10 27W4
1027	252917.0260	75077.0840	2141.40	USCGS BM N-366
1029	256854.8060	97397.4250	1889.46	CCBM 6C11 13N6
1030	253796.2230	89004.2130	1986.23	CCBM 8C11 14SWW6
1031	247183.0180	59116.9620	2339.24	CCBM 7C10 23SSW6
1101	262629.4509	102572.4116	1802.91	TOP PIPE
1102	262582.3248	102576.3022	1803.16	200
1103	262629.0864	102572.9195	1802.75	200
1104	262629.2650	102572.4250	1799.72	TOP
1105	262650.8242	102571.0099	1792.10	GB
1106	262652.7518	102570.8948	1792.14	
1107	262679.9282	102619.7327	1791.18	
1108	262688.3551	102615.8903	1785.98	201
1109	262688.6474	102615.8780	1785.07	TOP RIP RAP

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1110	262695.7515	102613.4371	1780.86	TOE RIP RAP
1111	262677.7936	102567.0472	1781.07	TOE RIP RAP
1112	262666.4685	102565.6839	1786.13	TOP RIP RAP
1113	262666.2656	102565.7464	1786.88	201
1114	262656.1496	102555.3909	1787.50	201
1115	262640.3988	102549.4158	1788.00	201
1116	262627.7230	102547.5717	1788.73	201
1117	262645.8640	102571.2857	1794.54	FENCE
1118	262659.6682	102557.7335	1786.96	TOP RIP RAP
1119	262647.3044	102515.8117	1787.84	TOP RIP RAP
1120	262635.6279	102507.8220	1787.69	TOP RIP RAP
1121	262636.1962	102504.5278	1786.24	TOE RIP RAP
1122	262653.7563	102514.6819	1784.91	TOE RIP RAP
1123	262664.9201	102516.1395	1782.74	TOE
1124	262711.9066	102567.0246	1781.64	NG
1125	262866.9891	102560.2755	1803.35	200
1126	262812.7369	102562.7518	1802.99	200
1127	262812.4373	102562.4472	1803.13	TOP PIPE
1128	262812.2252	102562.3185	1799.98	VG ANG PNT
1129	262790.1832	102563.4524	1792.26	GB
1130	262774.9198	102571.7452	1786.59	201
1131	262814.5173	102606.3766	1791.63	VG ANG PNT
1132	262795.3694	102613.1196	1786.29	201
1133	262795.2817	102613.1150	1785.77	TOP RIP RAP
1134	262789.7507	102616.4768	1782.31	TOE RIP RAP
1135	262745.5750	102628.5469	1781.42	NG
1136	262774.6463	102571.9878	1786.00	TOP RIP RAP
1137	262769.6241	102574.3360	1782.70	TOE RIP RAP
1138	262750.1739	102487.6343	1788.04	TOP RIP RAP
1139	262742.3434	102491.4546	1784.50	TOE RIP RAP
1140	262733.0230	102489.0593	1782.76	TOE
1141	262776.3772	102556.0396	1786.96	201
1142	262786.6302	102540.6047	1787.09	201
1143	262810.5180	102531.5784	1787.65	201
1144	262795.4920	102562.8577	1794.10	FENCE
1145	262677.1661	102715.9029	1800.17	200
1146	262707.6609	102713.3112	1800.00	200
1147	262707.9744	102713.7897	1800.05	TOP PIPE
1148	262707.8919	102713.6549	1797.22	TOP
1149	262730.9917	102712.3940	1789.24	GB
1150	262713.0802	102679.5734	1789.87	VG ANG PNT
1151	262719.8265	102675.3277	1785.60	201
1152	262719.9573	102675.1435	1784.59	TOP RIP RAP
1153	262726.9021	102672.6673	1780.63	TOE RIP RAP
1154	262739.6094	102708.5195	1785.57	201
1155	262737.8720	102727.9720	1786.26	201
1156	262724.6336	102738.0003	1786.93	201
1157	262710.8969	102740.7491	1787.48	201
1158	262675.2410	102717.3519	1796.96	TOP
1159	262672.9375	102739.4584	1788.40	TOE
1160	262741.6604	102713.2912	1785.44	TOP RIP RAP
1161	262765.3402	102746.5982	1785.93	TOP RIP RAP
1162	262799.0084	102784.6368	1786.44	TOP RIP RAP
1163	262806.2695	102780.8274	1782.28	TOE RIP RAP

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1164	262814.1886	102777.3776	1780.06	TOE
1165	262782.8482	102747.4819	1780.29	STORM DRAIN
1166	262767.9845	102736.3623	1781.25	TOE RIP RAP
1167	262769.2634	102734.4036	1780.01	TOE
1168	262746.8580	102704.8522	1780.88	TOE RIP RAP
1169	262747.4283	102704.2571	1780.32	TOE
1170	262957.3331	102702.2084	1801.33	200
1171	262899.9495	102704.4506	1800.73	200
1172	262899.6942	102704.9025	1800.77	TOP PIPE
1173	262899.6210	102705.0246	1797.83	TOP
1174	262945.0911	102703.6820	1798.26	TOP
1175	262943.9290	102737.9343	1786.66	TOE
1176	262946.1797	102768.6598	1786.14	FENCE ANG PNT
1177	262891.1368	102734.4217	1784.38	STORM DRAIN
1178	262880.9265	102705.7427	1791.38	FENCE
1179	262862.4546	102706.5512	1784.71	201
1180	262869.8439	102706.1983	1788.91	VG ANG PNT
1181	262862.3450	102706.5119	1784.24	TOP RIP RAP
1182	262855.9809	102709.5236	1781.20	TOE RIP RAP
1183	262850.8501	102712.1450	1780.48	TOE
1184	262789.2591	102700.5278	1780.53	NG
1185	262766.6013	102652.4112	1781.35	NG
1186	262805.0949	102642.6671	1781.87	TOE RIP RAP
1187	262811.5439	102641.1942	1785.36	TOE RIP RAP
1188	262811.6128	102641.0036	1785.91	201
1189	262828.9494	102632.3849	1791.25	VG ANG PNT
1190	262907.8291	102749.7320	1782.28	TOE RIP RAP
1191	262911.7176	102742.8487	1785.61	TOP RIP RAP
1192	262070.5636	100307.7767	1810.32	TOP BC END
1193	262066.5714	100314.0372	1811.03	TOP BC PC
1194	262061.9476	100318.6255	1811.15	TOP BC PT
1195	262011.5314	100349.9543	1811.26	TOP BC PC
1196	262002.0892	100350.9476	1811.10	TOP BC PT
1197	261977.6331	100347.1206	1809.76	TOP BC END
1198	261990.7989	100402.5205	1809.46	TOP BC END
1199	261998.6437	100385.1487	1810.18	TOP BC PC
1200	262017.9461	100360.1251	1811.21	TOP BC ANG PNT
1201	262068.0967	100328.9001	1811.18	TOP BC PT
1202	262081.3162	100328.2884	1810.41	TOP BC END
1203	262087.6255	100362.7784	1810.98	TOP
1204	262076.9775	100336.3511	1810.23	200
1205	262075.9008	100327.1181	1810.91	200
1206	262066.5455	100313.3780	1810.99	200
1207	262061.0615	100309.3534	1810.48	200
1208	262048.5505	100284.7628	1809.56	200
1209	262044.3473	100293.9565	1806.06	200
1210	262057.3274	100318.5043	1805.30	200
1211	262067.3439	100331.5566	1805.30	200
1212	262066.9156	100331.7628	1807.24	200
1213	262079.3616	100363.8827	1806.86	200
1214	262029.5270	100292.4465	1803.86	TOE
1215	262026.1600	100294.1431	1800.00	TOP
1216	262044.8699	100324.6872	1803.11	TOE
1217	262042.1337	100325.6841	1799.31	TOP

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1218	262060.2410	100341.6193	1803.76	TOE
1219	262053.6726	100344.3591	1800.31	TOP
1220	262068.4500	100359.9292	1804.16	TOE
1221	262060.1535	100364.7513	1799.21	TOP
1222	262037.6328	100341.1345	1799.88	NG
1223	262036.0658	100336.5302	1807.34	201
1224	262035.4921	100426.2125	1808.83	200
1225	262029.7870	100394.5027	1809.76	200
1226	262013.6284	100365.0685	1811.07	200
1227	262003.5189	100350.8415	1811.08	200
1228	261996.9407	100332.0584	1810.31	200
1229	261983.7676	100305.3328	1809.45	200
1230	261999.3629	100313.5550	1804.98	200
1231	262005.7312	100325.3352	1805.68	200
1232	262011.8485	100338.6714	1806.33	200
1233	262014.5401	100348.9222	1804.19	200
1234	262026.1031	100356.1848	1801.98	200
1235	262032.5455	100365.5864	1802.63	200
1236	262038.3660	100398.4183	1805.66	200
1237	262041.6169	100425.9640	1805.20	200
1238	262050.6970	100415.8601	1803.10	TOP
1239	262057.1040	100412.7174	1797.89	TOE
1240	262034.3219	100367.0129	1801.85	TOP
1241	262037.9569	100364.7700	1798.63	TOE
1242	262019.2660	100337.6486	1802.52	TOP
1243	262021.6972	100335.2497	1799.05	TOE
1244	262007.3093	100318.2337	1803.98	TOP
1245	262009.4612	100317.5529	1799.49	TOE
1246	262283.2002	101100.6424	1802.47	TOP BC
1247	262332.7994	101052.5153	1802.74	TOP BC END
1248	262365.1806	101022.9793	1803.08	TOP BC END
1249	262370.5950	101017.6768	1803.13	TOP BC PC
1250	262384.1085	100989.1678	1803.17	CL HANDI RAMP
1251	262372.1086	100960.6799	1804.42	TOP BC END
1252	262371.0326	100961.4567	1806.85	200
1253	262378.3279	100972.3517	1806.48	200
1254	262382.4574	100985.1368	1806.09	200
1255	262382.6388	100993.3434	1805.92	200
1256	262378.7598	101005.2961	1805.71	200
1257	262369.7924	101016.7794	1805.53	200
1258	262334.0784	101050.1071	1805.48	200
1259	262331.4380	101051.5730	1805.45	200
1260	262328.7627	101052.0853	1805.41	200
1261	262355.3699	101005.4448	1799.72	VG CORNER
1262	262355.0331	101013.8709	1802.84	TOP PIPE
1263	262326.1424	101040.6942	1802.90	TOP PIPE
1264	262317.7798	101039.9258	1799.83	VG CORNER
1265	262316.5604	101041.5017	1800.07	FL
1266	262314.1688	101050.4819	1801.61	FL
1267	262321.9956	101061.3301	1801.72	FL
1268	262324.5193	101060.3688	1802.19	TOP BC END
1269	262319.9848	101065.1371	1802.32	TOP BC END
1270	262364.7788	101095.2330	1803.25	200
1271	262374.5270	101085.5433	1805.46	200

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1272	262409.4194	101054.1508	1805.75	200
1273	262428.5011	101048.8771	1806.07	200
1274	262435.6259	101055.3074	1806.43	200
1275	262435.9080	101075.0904	1807.01	200
1276	262383.2645	101123.6782	1806.27	200
1277	262380.2138	101125.5897	1806.28	200
1278	262377.2108	101126.3695	1806.24	200
1279	262375.9751	101119.1027	1800.79	WORK/CNTL PNT
1280	262307.8614	101042.2238	1801.91	EDGE ASPHALT
1281	262328.5672	101046.4494	1802.77	ASPHALT
1282	262307.1789	101032.1143	1802.38	TOP
1283	262276.6219	100965.3831	1804.79	TOP
1284	262319.0146	101032.6533	1794.48	201
1285	262314.0186	101031.5208	1798.32	201
1286	262310.8051	101032.9842	1800.57	201
1287	262318.9434	101021.1054	1794.94	TOE
1288	262306.5734	101004.7089	1795.39	TOE
1289	262277.5745	100950.9693	1796.69	TOE
1290	262295.3998	100947.5484	1798.66	GB
1291	262315.4836	100941.6354	1796.24	GB
1292	262318.9468	100940.5603	1794.44	GB
1293	262321.7928	100936.4374	1794.86	201
1294	262339.0446	100928.2320	1804.59	201
1295	262364.8025	100980.4426	1803.97	201
1296	262368.3424	100986.3944	1803.30	201
1297	262367.8602	100996.5823	1802.54	201
1298	262362.5666	101008.6892	1802.20	201
1299	262355.1669	101005.3031	1794.40	201
1300	262350.3669	101005.7965	1794.12	GB
1301	262342.4436	101010.7488	1796.56	GB
1302	262330.2882	101017.1659	1793.21	GB
1303	262329.9330	101018.0832	1794.30	201
1304	262337.7018	101010.4887	1796.15	201
1305	262326.0912	101021.6991	1794.29	201
1306	262321.1481	101026.5589	1794.88	201
1307	262352.1034	101016.6133	1794.14	
1308	262343.7750	101024.5068	1794.18	
1309	262335.1577	101031.9799	1794.20	
1310	262327.9454	101038.2067	1794.51	
1311	262330.8522	101036.1888	1801.48	VG CORNER
1312	262339.4821	101028.1031	1801.13	VG CORNER
1313	262347.2643	101020.8639	1801.21	VG CORNER
1314	262333.7399	101049.2119	1802.85	ASPHALT
1315	262363.3803	101022.2744	1803.09	ASPHALT
1316	262366.2673	101013.1120	1803.26	SIDEWALK
1317	262377.7095	100989.4674	1803.74	SIDEWALK
1318	262366.9231	100964.4757	1804.64	SIDEWALK
1319	262302.9524	100894.1145	1795.52	STORM DRAIN
1320	262400.4253	101063.1535	1794.21	
1321	262392.3724	101070.4621	1794.21	
1322	262384.4762	101077.8555	1794.17	
1323	262376.5969	101085.2537	1794.20	
1324	262424.1467	101085.7832	1793.37	
1325	262416.3205	101092.8547	1793.40	

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1326	262407.5621	101100.9362	1793.29	
1327	262398.6814	101109.4271	1793.32	
1328	262399.8484	101089.9186	1794.61	NG
1329	262405.3757	101086.8781	1793.50	
1330	262392.2294	101078.0038	1794.51	NG
1331	262385.6386	101094.9905	1794.60	NG
1332	262373.6036	101095.5374	1796.38	NG
1333	262385.6607	101111.1275	1795.46	NG
1334	262389.2935	101101.1382	1794.82	NG
1335	262372.0857	101090.6745	1802.38	TOP PIPE
1336	262371.4885	101089.7900	1802.37	TOP PIPE
1337	262400.6340	101063.0865	1802.28	TOP PIPE
1338	262401.3161	101063.6569	1802.36	TOP PIPE
1339	262409.9810	101055.7708	1802.31	TOP PIPE
1340	262422.5933	101068.5203	1801.87	TOP PIPE
1341	262430.6913	101077.3792	1801.72	TOP PIPE
1342	262426.5294	101081.0497	1797.75	
1343	262418.5287	101072.4036	1797.83	
1344	262418.3945	101072.1921	1798.54	TOP PIPE
1345	262426.6190	101081.0783	1798.41	TOP PIPE
1346	262435.1371	101073.2636	1803.77	NG
1347	262435.2757	101065.8550	1804.52	NG
1348	262435.0694	101055.5903	1804.56	NG
1349	262422.5097	101051.3202	1804.00	NG
1350	262322.5534	101133.0853	1802.83	GB
1351	262337.2259	101150.1447	1801.52	FL
1352	262343.5870	101159.2869	1803.39	GB
1353	262377.4250	101129.6101	1803.63	GB
1354	262370.3603	101122.4990	1800.69	FL
1355	262357.5658	101101.1753	1802.90	GB
1356	262364.6680	101098.4911	1801.22	VG ANG PNT
1357	262383.8478	101122.6139	1800.47	VG ANG PNT
1358	262586.1390	101206.2434	1805.15	NG
1359	262581.9457	101209.8327	1804.73	GB
1360	262565.4901	101224.3389	1799.41	GB
1361	262550.4186	101237.1082	1798.35	TOP
1362	262537.6558	101244.6326	1792.42	TOE
1363	262521.5022	101255.4553	1791.37	
1364	262504.5914	101265.9005	1791.23	
1365	262467.7643	101222.9235	1793.97	TOE RIP RAP
1366	262478.8720	101209.4806	1793.68	GB
1367	262488.5954	101201.2546	1792.03	
1368	262456.2080	101194.4937	1794.98	GB
1369	262443.3103	101198.7157	1793.58	TOE RIP RAP
1370	262444.1731	101185.8470	1794.27	TOE RIP RAP
1371	262452.9313	101166.8776	1793.34	
1372	262461.9197	101158.7034	1793.27	
1373	262470.8227	101150.4304	1793.27	
1374	262492.1380	101160.9051	1792.29	
1375	262498.1283	101156.1860	1799.93	VG ANG PNT
1376	262507.5932	101148.7600	1804.93	TOP
1377	262488.2449	101142.7148	1800.13	TOP PIPE
1378	262479.0455	101142.4988	1804.59	TOP PIPE
1379	262443.9129	101175.3013	1804.03	TOP PIPE

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1380	262443.3966	101184.6979	1799.55	VG CORNER
1381	262443.3133	101185.4409	1801.04	TOP RIP RAP
1382	262441.2834	101198.0897	1801.33	TOP RIP RAP
1383	262485.4322	101243.9170	1800.45	TOP RIP RAP
1384	262464.8350	101220.8333	1801.80	202
1385	262436.3345	101181.5074	1804.05	SIDEWALK
1386	262486.8184	101136.3523	1804.22	EDGE ASPHALT
1387	262513.8621	101119.0155	1804.39	CONC
1388	262553.5382	101118.9226	1804.47	EDGE ASPHALT
1389	262494.5162	101124.2285	1804.71	TOP BC END
1390	262484.7960	101128.8401	1804.61	TOP BC
1391	262476.0385	101134.7622	1804.52	TOP BC END
1392	262480.1545	101135.1900	1806.84	200
1393	262475.1087	101137.2402	1806.89	200
1394	262438.8473	101170.7311	1806.34	200
1395	262436.4595	101175.4342	1806.27	200
1396	262491.0254	100992.8515	1804.79	TOP PIPE
1397	262509.3658	101012.6242	1804.06	TOP PIPE
1398	262511.5504	101013.5432	1803.04	VG ANG PNT
1399	262491.7741	100992.9226	1803.50	VG ANG PNT
1400	262497.9563	100998.9251	1799.51	
1401	262505.9196	101007.7551	1799.36	
1402	262551.3610	100970.7249	1804.94	VG ANG PNT
1403	262545.7233	100964.8419	1800.65	
1404	262539.0021	100957.2001	1804.59	VG ANG PNT
1521	257007.0102	97489.0095	1881.75	GCW CONTROL
1522	257165.0837	97407.9257	1889.63	WORK/CNTL PNT
1523	256794.0998	97421.1410	1889.36	ASPHALT
1524	256851.2200	97398.7800	1888.98	ASPHALT
1525	256852.0544	97398.9741	1889.70	EDGE CONC
1526	256854.0463	97404.4820	1889.58	EDGE CONC
1527	256859.1065	97403.5640	1890.04	EDGE CONC
1528	256860.9278	97402.7124	1893.69	EDGE CONC
1529	256863.1899	97401.7585	1893.68	EDGE CONC
1530	256863.2322	97401.5322	1891.30	EDGE CONC
1531	256885.4015	97391.9964	1891.27	EDGE CONC
1532	256906.7531	97383.0259	1891.26	EDGE CONC
1533	256928.1732	97374.3466	1891.15	EDGE CONC
1534	256958.6721	97362.5500	1891.01	EDGE CONC
1535	256958.8948	97362.6665	1893.43	EDGE CONC
1536	256961.1811	97361.8310	1893.45	EDGE CONC
1537	256963.1381	97361.1656	1889.95	EDGE CONC
1538	256959.9263	97354.8139	1889.26	EDGE CONC
1539	256962.6141	97359.8141	1889.41	EDGE CONC
1540	256959.6239	97353.9479	1888.48	ASPHALT
1541	256997.3478	97333.6063	1888.25	ASPHALT
1542	257018.4117	97326.6803	1887.95	ASPHALT
1543	256927.7653	97327.3939	1890.57	TOP BC
1544	256863.5054	97353.9852	1891.15	TOP BC
1545	256797.7758	97383.6742	1891.13	TOP BC
1546	256789.8841	97371.0464	1891.68	TOP BC
1547	256852.9031	97342.2186	1891.77	TOP BC
1548	256914.0089	97316.9559	1891.13	TOP BC
1549	256939.8189	97275.0248	1891.30	ASPHALT

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1550	256915.9077	97282.7999	1891.48	ASPHALT
1551	256859.9966	97299.8716	1892.29	ASPHALT
1552	256859.8199	97299.4508	1893.00	EDGE CONC
1553	256858.1942	97293.8574	1893.08	EDGE CONC
1554	256863.6695	97401.6191	1887.41	EDGE CONC
1555	256869.6859	97414.0327	1882.72	EDGE CONC
1556	256870.0087	97414.2089	1879.81	NG
1557	256867.4549	97400.0766	1881.71	EDGE CONC
1558	256867.4480	97400.0722	1878.24	EDGE CONC
1559	256865.2374	97400.9603	1878.17	EDGE CONC
1560	256865.2475	97400.8694	1876.39	EDGE CONC
1561	256892.7077	97414.9855	1875.19	EDGE CONC
1562	256866.1009	97423.0630	1883.10	GB
1563	256907.5465	97427.7367	1878.23	GB
1564	256952.0368	97435.4860	1874.04	GB
1565	257043.3920	97467.8814	1866.45	TOE
1566	256995.8547	97445.6215	1865.81	TOE
1567	256943.3976	97421.5855	1866.14	TOE
1568	256901.7586	97399.9567	1866.27	EDGE CONC
1569	256902.7186	97444.4346	1879.53	GB
1570	256955.7121	97451.2752	1871.91	GB
1571	256891.3525	97462.3292	1883.30	TOP
1572	256919.3524	97456.9642	1883.47	TOP
1573	256989.2450	97480.5911	1882.01	TOP
1574	256959.8563	97362.5698	1888.23	EDGE CONC
1575	256982.3012	97361.2122	1885.28	EDGE CONC
1576	256995.9374	97369.5114	1886.60	TOP
1577	257048.7745	97375.6633	1886.73	TOP
1578	257107.3137	97395.7507	1885.09	TOP
1579	257102.3357	97432.7985	1866.82	TOE
1580	257050.0058	97421.5991	1867.11	TOE
1581	256983.0372	97395.1844	1867.11	TOE
1582	256959.1649	97384.2679	1867.45	EDGE CONC
1583	256969.0405	97370.9998	1874.79	EDGE CONC
1584	256956.2059	97363.7442	1883.29	EDGE CONC
1585	256959.0071	97362.7849	1888.00	EDGE CONC
1586	256956.1400	97363.7596	1877.68	EDGE CONC
1587	256958.2884	97362.9083	1877.68	EDGE CONC
1588	256958.3005	97362.9361	1875.30	EDGE CONC
1589	256599.0679	97247.3365	1887.52	GCW CONTROL
1590	256810.7289	97343.8334	1867.24	EDGE CONC
1591	256769.7481	97315.4715	1868.89	TOE
1592	256813.8691	97304.2568	1866.04	EDGE CONC
1593	256798.3820	97294.3281	1866.45	CONC ANG PNT
1594	256797.8751	97286.7217	1867.27	CONC ANG PNT
1595	256851.0836	97295.4418	1891.24	EDGE CONC
1596	256837.4360	97282.4816	1881.32	EDGE CONC
1597	256828.9256	97284.8561	1877.82	EDGE CONC
1598	256796.7949	97267.8124	1872.58	TOP
1599	256787.2543	97269.0404	1865.96	TOE
1600	256718.8539	97219.6696	1869.65	TOE
1601	256725.1527	97167.1458	1885.00	TOP
1602	256562.8457	97196.8215	1883.11	EDGE CONC
1603	256600.8040	97159.1946	1874.88	EDGE CONC

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1605	256665.7353	97226.2432	1872.80	EDGE CONC
1606	256700.6276	97258.2400	1872.78	CONC ANG PNT
1607	256687.3934	97274.0672	1873.38	EDGE CONC
1608	256673.4281	97291.3462	1882.94	CONC ANG PNT
1609	256734.2072	97324.1083	1881.65	EDGE CONC
1610	256851.5534	97295.6786	1894.46	EDGE CONC
1611	256825.2497	97306.9160	1894.65	EDGE CONC
1612	256784.4271	97325.3963	1894.80	EDGE CONC
1613	256760.1757	97336.8486	1894.79	EDGE CONC
1614	256829.9240	97312.9116	1893.14	EDGE CONC
1615	256791.2885	97330.2372	1893.31	EDGE CONC
1616	256759.8234	97344.6596	1893.19	EDGE CONC
1617	256831.5322	97305.2440	1893.16	SIDEWALK
1618	256789.9971	97323.9393	1893.35	SIDEWALK
1619	256750.0318	97343.0654	1893.16	SIDEWALK
1620	256758.9570	97344.4320	1893.13	TOP BC END
1621	256719.3627	97363.7975	1893.10	TOP BC
1622	256701.9086	97342.2779	1890.39	TOP
1623	256653.5646	97307.7411	1890.11	TOP
1624	256765.2994	97336.7975	1886.28	EDGE CONC
1625	256851.2158	97299.7632	1885.85	EDGE CONC
1626	256643.9805	97267.0165	1883.95	EDGE CONC
1627	256612.5541	97245.5610	1884.67	EDGE CONC
1628	253689.4089	88870.7423	1990.17	BS CHK
1629	253796.3196	89004.2499	1986.27	BM CHK
1630	253795.4031	89003.7431	1986.24	TOP BC
1631	253774.4939	89003.6043	1986.29	TOP BARACADE
1632	253764.5041	89003.2505	1988.57	TOP BARACADE
1633	253704.5458	89000.5335	1988.77	TOP BARACADE
1634	253694.5668	89000.0852	1986.52	TOP BARACADE
1635	253680.2265	89004.8226	1986.80	SIDEWALK
1636	253794.9213	89009.8445	1986.33	SIDEWALK
1637	253686.0223	89104.8805	1985.85	EDGE CONC
1638	253684.6864	89067.9349	1985.71	CONC ANG PNT
1639	253685.6370	89027.2461	1985.78	TOP HEADWALL
1640	253705.3522	89007.2277	1986.96	TOP WINGWALL
1641	253761.4068	89009.5923	1987.09	TOP WINGWALL
1642	253780.8657	89029.9694	1985.73	TOP HEADWALL
1643	253778.9495	89070.7444	1983.66	CONC ANG PNT
1644	253775.9833	89108.5601	1981.79	EDGE CONC
1645	253772.0364	89109.0546	1980.14	EDGE RIP RAP
1646	253769.5714	89109.0934	1979.74	EDGE RIP RAP
1647	253767.2899	89108.8202	1977.89	EDGE RIP RAP
1648	253764.1826	89108.7005	1975.11	EDGE RIP RAP
1649	253761.6754	89108.6937	1972.73	EDGE RIP RAP
1650	253759.4323	89108.5138	1970.07	EDGE RIP RAP
1651	253757.7412	89108.7403	1967.70	EDGE RIP RAP
1652	253755.8834	89107.6335	1965.75	EDGE CONC
1653	253760.6565	89010.6532	1966.30	EDGE CONC
1654	253760.5220	89010.5301	1968.68	EDGE CONC
1655	253746.5469	89009.9205	1968.59	EDGE CONC
1656	253732.4614	89009.4527	1968.69	EDGE CONC
1657	253718.3484	89008.7012	1968.70	EDGE CONC
1658	253706.4561	89008.4376	1968.64	EDGE CONC

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1659	253706.2958	89008.6876	1966.20	EDGE CONC
1660	253704.1076	89067.7302	1966.24	CONC ANG PNT
1661	253762.4260	89044.1010	1969.56	FL PIPE
1662	253767.1351	89017.0975	1975.34	FL PIPE
1663	253699.0479	89015.1999	1973.24	FL PIPE
1664	253706.2396	89105.6205	1965.83	EDGE CONC
1665	253679.9478	89154.1511	1985.81	TOP
1666	253719.6071	89152.8434	1964.18	TOE
1667	253754.5911	89161.3502	1965.24	TOE
1668	253757.2923	89163.6204	1967.44	EDGE RIP RAP
1669	253758.7084	89163.4053	1970.13	EDGE RIP RAP
1670	253761.0401	89163.9251	1972.78	EDGE RIP RAP
1671	253762.7594	89163.9526	1975.71	EDGE RIP RAP
1672	253764.8039	89164.5769	1978.34	EDGE RIP RAP
1673	253767.1910	89164.0895	1980.82	EDGE RIP RAP
1674	253769.9512	89164.0075	1980.35	EDGE RIP RAP
1675	253686.2079	88910.4441	1987.41	TOP BC
1676	253699.7664	88910.4467	1987.29	TOP BARACADE
1677	253709.7022	88910.8534	1989.39	TOP BARACADE
1678	253769.5061	88913.5875	1988.74	TOP BARACADE
1679	253778.5146	88914.0813	1986.58	TOP BARACADE
1680	253801.2318	88915.8421	1986.46	TOP BC
1681	253800.7111	88909.8528	1986.58	SIDEWALK
1682	253778.8683	88908.8712	1986.67	SIDEWALK
1683	253766.7380	88907.5519	1987.16	SIDEWALK
1684	253710.1549	88904.9516	1987.54	SIDEWALK
1685	253686.3448	88904.5010	1987.38	SIDEWALK
1686	253695.4428	88880.4762	1987.73	TOP HEADWALL
1687	253710.1929	88904.7910	1987.86	TOP WINGWALL
1688	253766.6543	88907.3202	1987.89	TOP WINGWALL
1689	253782.7858	88884.2808	1987.66	TOP HEADWALL
1690	253772.0914	88897.8393	1978.61	FL PIPE
1691	253765.5611	88906.5913	1969.62	EDGE CONC
1692	253753.4799	88905.7960	1969.81	EDGE CONC
1693	253739.3145	88905.0684	1969.76	EDGE CONC
1694	253725.2167	88904.6177	1969.73	EDGE CONC
1695	253711.3125	88903.6010	1969.52	EDGE CONC
1696	253724.9728	88881.0461	1971.70	CONC
1697	253739.3511	88881.9342	1971.92	CONC
1698	253753.5898	88882.0698	1971.64	CONC
1699	253766.6585	88857.7216	1973.99	CONC
1700	253712.4928	88855.5045	1973.98	CONC
1701	253723.4966	88804.4841	1976.78	EDGE CONC
1702	253766.1958	88808.1237	1975.95	EDGE CONC
1703	253694.8861	88800.9882	1991.24	CONC ANG PNT
1704	253709.0776	88564.7775	1992.80	EDGE CONC
1705	253737.4479	88563.9220	1979.30	EDGE CONC
1706	253788.0253	88570.6375	1980.91	EDGE CONC
1707	253804.0554	88570.9809	1988.64	EDGE CONC
1708	253795.3968	88711.4088	1988.23	EDGE CONC
1709	253408.8845	86367.2295	2020.36	TOP BC
1710	253409.0432	86361.8759	2020.46	SIDEWALK
1711	253344.8635	86365.7966	2020.15	BC @ TOP CL D.I.
1712	253315.6096	86365.1413	2020.11	TOP BC

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1713	253276.2854	86364.2964	2020.40	TOP BC
1714	253303.8933	86360.9000	2020.22	SIDEWALK
1715	253307.4131	86360.1444	2019.98	EDGE CONC
1716	253310.0936	86360.0123	2022.79	EDGE CONC
1717	253315.0486	86359.9270	2023.77	EDGE CONC
1718	253316.2893	86360.1009	2022.85	TOP HEADWALL
1719	253348.7444	86360.3725	2022.86	TOP HEADWALL
1720	253349.0390	86360.3034	2023.88	EDGE CONC
1721	253353.8909	86360.4149	2023.85	EDGE CONC
1722	253358.9056	86360.4225	2020.32	EDGE CONC
1723	253348.8595	86360.3657	2020.17	TOP WINGWALL
1724	253357.8906	86347.0954	2012.48	TOP WINGWALL
1725	253316.3304	86360.0403	2020.24	TOP WINGWALL
1726	253304.6676	86351.9094	2016.48	TOP WINGWALL
1727	253362.0077	86360.9802	2020.26	SIDEWALK
1728	253370.4600	86355.0853	2020.59	EDGE CONC
1729	253386.8692	86330.1880	2020.71	EDGE CONC
1730	253369.5990	86353.0293	2020.66	EDGE CONC
1731	253386.1011	86328.8671	2025.62	EDGE CONC
1732	253364.6940	86345.3426	2014.35	EDGE CONC
1733	253316.6486	86359.9749	2008.79	EDGE CONC
1734	253327.5248	86360.9867	2008.47	EDGE CONC
1735	253338.5604	86361.2065	2008.24	EDGE CONC
1736	253348.5648	86360.3642	2008.01	EDGE CONC
1737	253336.2790	86349.6268	2012.61	EDGE CONC
1738	253335.6269	86345.2767	2008.67	EDGE CONC
1739	253325.2009	86345.1654	2008.81	EDGE CONC
1740	253325.3864	86349.2269	2012.75	EDGE CONC
1741	253340.5717	86340.7236	2008.76	EDGE CONC
1742	253317.5087	86340.5403	2008.94	EDGE CONC
1743	253311.5580	86310.3434	2008.99	TOE
1744	253329.4963	86284.2265	2009.10	TOE
1745	253351.9475	86313.8738	2018.33	TOP
1746	253338.7200	86275.4712	2017.55	TOP
1747	253299.5109	86346.9075	2020.46	TOP
1748	253296.6345	86315.5209	2021.58	TOP
1749	253295.4421	86277.6337	2019.67	TOP
1750	253280.7018	86264.5253	2018.36	GB
1751	253272.6219	86260.6353	2022.94	NG
1752	253273.7139	86338.9818	2022.19	NG
1753	253332.0130	86440.8114	2008.04	EDGE CONC
1754	253342.6927	86440.8862	2008.05	EDGE CONC
1755	253353.3671	86441.0540	2008.05	EDGE CONC
1756	253364.0656	86441.2509	2008.02	EDGE CONC
1757	253378.2171	86441.3444	2022.86	TOP HEADWALL
1758	253317.3610	86440.6506	2022.90	TOP HEADWALL
1759	253307.2725	86439.9968	2020.25	EDGE CONC
1760	253286.7090	86434.6202	2020.33	TOP BC
1761	253317.7261	86439.4552	2020.22	SIDEWALK
1762	253336.4219	86435.5336	2020.11	BC @ TOP CL D.I.
1763	253377.9221	86440.1960	2020.33	SIDEWALK
1764	253378.3165	86436.3538	2020.18	TOP BC
1765	253412.3043	86437.0274	2020.37	TOP BC
1766	253388.2822	86441.2244	2020.22	EDGE CONC

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1767	253378.4310	86441.6631	2016.19	EDGE CONC
1768	253378.3314	86441.3079	2020.33	EDGE CONC
1769	253388.5504	86459.9480	2019.52	TOP
1770	253381.8282	86461.6266	2016.13	EDGE CONC
1771	253395.0066	86521.8495	2019.71	TOP
1772	253316.1223	86467.3242	2019.47	TOP
1773	253323.2492	86466.1645	2016.59	EDGE CONC
1774	253339.3500	86528.0425	2017.52	TOP
1775	253352.7970	86523.6683	2007.73	TOE
1776	253333.7553	86464.5159	2010.30	EDGE CONC
1777	253369.7722	86463.4496	2007.93	EDGE CONC
1778	253377.5212	86516.2021	2007.85	TOE
1801	253594.4855	87683.0232	1998.81	START
1802	253410.9142	87677.3167	1998.65	GCW CONTROL
1805	253469.1785	87729.8093	1999.87	GCW CONTROL
1806	253410.9111	87677.3129	1998.63	CHK
1810	253593.0972	87713.2804	1998.57	TOP BC
1811	253495.0725	87710.2887	1997.73	TOP BC
1812	253451.1109	87708.7669	1997.90	TOP BC
1813	253449.8585	87713.8631	1997.94	SIDEWALK
1814	253470.6129	87714.3620	1997.89	SIDEWALK
1815	253470.8233	87714.4626	1998.71	TOP WINGWALL
1816	253491.3234	87715.1298	1995.35	TOP HEADWALL
1817	253535.0877	87716.5485	1995.24	TOP HEADWALL
1818	253564.4169	87717.5774	1998.06	TOP WINGWALL
1819	253539.6320	87717.7829	1995.25	TOP HEADWALL
1820	253550.9673	87720.9839	1993.09	TOP HEADWALL
1821	253594.3342	87718.1370	1998.75	SIDEWALK
1822	253563.2305	87738.8935	1999.03	TOP
1823	253597.6044	87753.9756	2000.22	TOP
1824	253619.5554	87812.4938	2000.19	TOP
1825	253594.5438	87783.8108	1992.52	GB
1826	253580.4954	87787.9143	1991.59	GB
1827	253568.7646	87791.0011	1988.02	GB
1828	253559.9432	87795.2955	1983.14	TOE
1829	253619.8410	87838.3227	1990.27	GB
1830	253604.7881	87845.5931	1990.15	GB
1831	253594.1714	87851.9918	1982.38	TOE
1832	253471.0377	87725.2840	1999.10	TOP
1833	253478.1229	87715.0321	1997.21	TOP
1834	253488.8079	87724.2447	1989.64	TOP HEADWALL
1835	253484.9984	87769.1179	2001.54	TOP
1836	253502.5928	87762.7759	1992.00	GB
1837	253514.0839	87759.6653	1985.74	GB
1838	253522.8627	87755.5819	1986.80	GB
1839	253528.0847	87753.3684	1983.66	TOE
1840	253554.6430	87810.4525	1983.14	TOE
1841	253548.8102	87813.4477	1986.18	GB
1842	253537.6937	87817.3410	1986.89	GB
1843	253522.6995	87822.6131	1997.19	GB
1844	253517.7344	87825.8605	2001.57	TOP
1845	253598.4838	87653.2443	1998.67	TOP BC
1846	253598.9436	87648.4664	1998.75	SIDEWALK
1847	253512.2343	87650.6156	1997.68	TOP BC

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1848	253512.2879	87645.7921	1997.69	SIDEWALK
1849	253512.1147	87645.8533	1998.47	TOP WINGWALL
1850	253491.0681	87649.8839	1997.80	TOP BC
1851	253418.3831	87647.4958	1998.14	TOP BC
1852	253418.6080	87642.4468	1998.26	SIDEWALK
1853	253418.8605	87642.5828	1998.47	TOP WINGWALL
1854	253451.2753	87643.6294	1984.54	EDGE CONC
1855	253466.4109	87644.0096	1984.33	EDGE CONC
1856	253480.8821	87644.5458	1984.27	EDGE CONC
1857	253494.8525	87644.9615	1984.41	EDGE CONC
1858	253492.5066	87613.6759	1998.42	TOP
1859	253459.2762	87553.5391	2001.47	TOP
1860	253468.4548	87620.6235	1984.77	TOE
1861	253439.1574	87569.4923	1985.85	TOE
1862	253410.4120	87568.7025	1985.83	TOE
1863	253445.5032	87615.5111	1984.88	TOE
1864	253425.3648	87626.9308	1996.75	GB
1865	253388.2314	87555.2444	1996.09	GB
1866	253381.3539	87559.6990	1998.93	GB
1867	253405.8867	87615.7023	1999.46	GB
1868	253392.1290	87618.1579	2004.73	TOP
1869	253365.4630	87559.2294	2007.81	TOP
1870	253491.5539	87715.1255	1983.47	EDGE CONC
1871	253506.0011	87715.6221	1983.39	EDGE CONC
1872	253520.7180	87716.1077	1983.53	EDGE CONC
1873	253534.7616	87716.6386	1983.46	EDGE CONC
1931	247183.0180	59116.9620	2339.24	CCBM 7C10
1953	247074.6920	58989.3690	2337.38	FW 53
1954	247232.0210	59386.4120	2339.68	FW 54
1992	247074.7120	58989.4139	2337.45	BSCK
1993	247182.9328	59117.0298	2339.55	FSCK
2000	247182.7477	59127.3805	2339.13	FL
2001	247183.8832	59199.9701	2339.30	FL
2002	247185.5399	59310.3108	2339.45	FL
2003	247186.1360	59311.1844	2339.83	TOP BC
2004	247186.0832	59344.2241	2339.46	TOP BC
2005	247184.2410	59382.7073	2339.28	TOP BC
2006	247189.0393	59385.0001	2339.40	SIDEWALK
2007	247190.7635	59355.0387	2339.58	SIDEWALK
2008	247191.3733	59318.9080	2339.89	SIDEWALK
2009	247192.0987	59319.1482	2340.20	FENCE
2010	247192.5135	59320.4395	2339.91	COR BRIDGE
2011	247189.0182	59327.9835	2341.62	POWER POLE
2012	247191.5656	59328.0720	2339.64	GUY ANCHOR
2013	247192.5617	59320.5562	2339.47	EDGE CONC
2014	247195.4719	59323.9171	2339.98	EDGE CONC
2015	247210.0162	59348.1281	2340.05	EDGE CONC
2016	247225.1928	59373.4095	2339.91	EDGE CONC
2017	247226.7967	59372.3458	2339.87	TOP
2018	247246.3119	59360.3703	2326.92	EDGE CONC
2019	247250.5576	59357.7303	2324.81	TOE
2020	247268.8922	59345.8453	2325.00	CL WASH
2021	247284.6300	59334.9894	2326.15	TOE
2022	247306.0439	59321.0999	2336.03	TOP

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2023	247317.3717	59312.9875	2337.09	WALL FOOTING
2024	247297.7879	59280.5418	2337.18	WALL FOOTING
2025	247285.3069	59286.3190	2336.10	TOP
2026	247264.5805	59300.2374	2326.26	TOE
2027	247246.7681	59311.5420	2325.28	CL WASH
2028	247228.0081	59320.1777	2326.05	TOE
2029	247222.7223	59322.7492	2327.94	EDGE CONC
2030	247203.9074	59334.2482	2339.98	TOP
2031	247201.6287	59358.0798	2339.63	NG
2032	247215.1059	59385.5203	2339.69	NG
2033	247195.0110	59384.0065	2339.60	NG
2034	247196.9443	59322.8508	2339.94	TOP
2035	247198.4100	59320.3048	2338.86	TOP
2036	247197.8492	59301.5446	2333.75	TOP
2037	247192.1092	59294.0187	2333.66	TOP
2038	247191.9176	59292.1577	2333.69	TOP
2039	247215.6528	59311.3891	2328.03	EDGE CONC
2040	247216.6001	59310.7920	2327.09	EDGE CONC
2041	247195.1124	59276.4595	2327.08	EDGE CONC
2042	247192.1302	59275.3116	2327.53	EDGE CONC
2043	247191.5270	59247.6704	2327.25	EDGE CONC
2044	247190.8370	59207.7667	2327.42	EDGE CONC
2045	247190.5410	59183.1503	2327.83	EDGE CONC
2046	247189.8371	59164.7844	2334.27	TOP
2047	247190.1790	59162.4753	2334.21	EDGE CONC
2048	247195.8819	59164.9476	2334.31	EDGE CONC
2049	247195.8298	59170.4680	2333.78	EDGE CONC
2050	247214.1487	59197.2621	2333.92	EDGE CONC
2051	247221.1596	59192.5079	2337.02	EDGE CONC
2052	247233.0090	59183.8968	2337.53	EDGE CONC
2053	247234.5634	59185.8316	2337.47	WALL FOOTING
2054	247206.3399	59170.5519	2337.77	TOP
2055	247195.7858	59159.5099	2334.37	EDGE CONC
2056	247195.6986	59154.1729	2335.33	EDGE CONC
2057	247195.3825	59137.1154	2338.88	EDGE CONC
2058	247188.7810	59117.0640	2339.20	WALL ANG PNT
2059	247189.9777	59131.1646	2342.77	POWER POLE
2060	247189.0572	59137.0273	2339.69	FENCE
2061	247189.5017	59137.0944	2339.38	COR BRIDGE
2062	247194.0522	59132.3800	2338.76	FL
2063	247192.6063	59137.1171	2338.47	FL
2064	247192.8812	59158.2654	2334.43	FL
2065	247189.7636	59162.3646	2337.75	FRNT FACE BKWALL
2066	247189.7760	59162.5969	2334.48	FRNT FACE BKWALL
2067	247250.8175	59210.1916	2342.56	WALL FOOTING
2068	247239.9692	59219.8159	2340.96	TOP
2069	247222.1932	59234.3761	2331.39	TOE
2070	247172.9340	59157.1130	2328.03	TOE
2071	247168.3794	59144.2156	2330.09	INV PIPE
2072	247187.1844	59185.7822	2327.74	PILER
2073	247187.8277	59223.9833	2327.26	PILER
2074	247188.2782	59262.5689	2327.43	PILER
2075	247191.1779	59279.5272	2338.09	BTM BRIDGE
2076	247190.9931	59269.9298	2337.40	BTM BRIDGE

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2077	247190.8797	59262.6401	2337.40	BTM BRIDGE
2078	247190.7318	59253.2083	2337.93	BTM BRIDGE
2079	247190.5458	59240.6048	2337.90	BTM BRIDGE
2080	247190.4219	59231.3596	2337.37	BTM BRIDGE
2081	247190.2920	59224.0669	2337.33	BTM BRIDGE
2082	247190.1630	59214.8940	2337.76	BTM BRIDGE
2083	247189.9417	59202.4412	2337.74	BTM BRIDGE
2084	247189.8516	59193.3371	2337.18	BTM BRIDGE
2085	247189.7425	59186.0929	2337.17	BTM BRIDGE
2086	247189.5853	59176.3105	2337.84	BTM BRIDGE
2087	247171.5106	59244.6764	2327.53	TOE
2088	247174.2332	59163.2787	2327.92	FLY
2089	247191.7780	59295.0174	2333.78	FRNT FACE BKWALL
2090	247191.9173	59295.0095	2338.20	FRNT FACE BKWALL
2091	247195.0159	59297.5551	2333.39	FL
2092	247194.8885	59304.9914	2334.38	FL
2093	247195.4404	59320.3681	2338.72	FL
2094	247186.4380	59283.0639	2339.51	STREET LIGHT
2095	247190.2305	59227.5203	2339.33	FENCE
2096	247139.0493	59241.1351	2340.04	EDGE BRIDGE
2097	247087.4773	59164.7828	2339.65	COR BRIDGE
2098	247084.7023	59159.8611	2339.31	BEGIN FACE CURB
2099	247070.0947	59159.9732	2339.67	FACE CURB
2100	247078.6904	59166.0256	2339.50	SEWER MANHOLE
2101	247079.4693	59174.2435	2339.74	EDGE CONC
2102	247085.3307	59164.6136	2339.62	EDGE CONC
2103	247087.3715	59161.5189	2338.99	EDGE CONC
2104	247085.7072	59159.2849	2338.87	EDGE CONC
2105	247085.9232	59146.8845	2337.87	EDGE CONC
2106	247232.0132	59386.3818	2339.68	BSCK
2107	247151.8324	59214.4888	2327.66	TOE
2108	247142.1621	59218.9930	2334.23	TOP
2109	247140.0396	59217.5980	2334.33	FRNT FACE BKWALL
2110	247140.0801	59217.7272	2338.57	FRNT FACE BKWALL
2111	247115.2404	59160.4705	2328.17	TOE
2112	247106.2981	59165.1080	2334.53	TOP
2113	247137.8354	59084.6217	2338.27	FRNT FACE BKWALL
2114	247137.7619	59084.5168	2335.00	FRNT FACE BKWALL
2115	247136.8975	59085.3636	2334.89	TOP
2116	247128.9324	59091.9005	2328.50	TOE
2117	247099.4470	59040.7936	2331.25	INV PIPE
2118	247087.9216	59031.7995	2329.12	FLY
2119	247138.9129	59150.6897	2327.89	CL WASH
2120	247174.2508	59163.3056	2327.95	BSCK
2121	247074.7541	58989.3990	2337.49	FSCK
2122	247061.2474	58937.6740	2340.24	WALL FOOTING
2123	247062.3091	58991.3574	2339.56	WALL ANG PNT
2124	247057.3864	58994.2746	2339.27	WALL ANG PNT
2125	247045.5796	58985.6740	2340.01	WALL FOOTING
2126	247028.3194	58975.7405	2339.75	WALL FOOTING
2127	247032.7247	58982.3590	2339.12	TOP WALL
2128	247059.2542	58998.0922	2339.00	TOP WALL
2129	247060.9178	58998.0640	2335.92	EDGE CONC
2130	247071.4754	59005.3685	2334.50	EDGE CONC

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2131	247084.9914	59014.8711	2333.12	CONC ANG PNT
2132	247085.4026	59026.0726	2329.47	EDGE CONC
2133	247080.4029	59021.7637	2329.64	TOE
2134	247071.0674	59011.3545	2330.11	TOE
2135	247060.9007	59003.3373	2331.40	TOE
2136	247037.8028	58986.2871	2335.27	TOP
2137	247056.6976	58997.8222	2334.41	TOP
2138	247067.1265	59016.6583	2332.32	TOP
2139	247072.5129	59031.2349	2330.06	NG
2140	247050.3869	59009.0239	2329.61	TOE
2141	247035.1542	58999.2768	2329.69	TOE
2142	247063.4655	58991.5833	2338.24	TOP
2143	247074.2115	58996.4589	2337.38	TOP
2144	247085.2376	59001.9513	2337.50	TOP
2145	247074.6608	58975.5391	2337.59	CONC
2146	247074.7482	58954.6345	2337.79	CONC
2147	247062.6538	58955.2747	2338.78	CONC
2148	247062.9456	58971.3678	2338.49	CONC
2149	247231.9984	59386.3550	2339.60	BSCK
2150	247189.1204	59132.9410	2339.38	BALLARD
2151	247189.0449	59127.3325	2339.36	BALLARD
2152	247188.8028	59123.0927	2339.43	BALLARD
2153	247183.3214	59127.4803	2339.46	TOP BC
2154	247183.1621	59092.9360	2339.35	TOP BC
2155	247182.9892	59068.6461	2339.27	TOP BC
2156	247187.6797	59068.5175	2339.40	WALL FOOTING
2157	247187.8882	59095.2429	2339.42	WALL FOOTING
2158	247188.2225	59116.8890	2339.18	WALL ANG PNT
2159	247136.9491	59058.4945	2339.37	EDGE BRIDGE
2160	247085.1018	58981.2000	2339.02	COR BRIDGE
2161	247090.7161	58942.3944	2338.76	TOP BC
2162	247091.3577	58946.9910	2338.40	DRIVEWAY
2163	247091.8894	58979.1015	2338.55	DRIVEWAY
2164	247091.4039	58983.1179	2339.05	TOP BC
2165	247091.5162	58990.4144	2339.11	TOP BC
2166	247091.9205	58991.5553	2338.58	FL
2167	247092.9023	59056.7040	2338.81	FL
2168	247094.3365	59159.5945	2339.17	FL
2169	247093.8373	59160.7377	2339.24	FL
2170	247094.8316	59179.6819	2339.20	FL
2171	247094.2646	59183.8984	2339.71	TOP BC
2172	247094.4346	59196.7028	2339.77	TOP BC
2173	247089.2502	59193.7618	2339.86	SIDEWALK
2174	247089.0380	59178.8172	2339.79	SIDEWALK
2175	247086.9607	59178.7236	2339.68	SIDEWALK
2176	247087.5536	59160.4814	2339.20	SIDEWALK
2177	247068.6990	59159.3957	2339.52	WALL FOOTING
2178	247067.8543	59134.1489	2340.23	WALL ANG PNT
2179	247063.4014	59134.1468	2340.46	WALL ANG PNT
2180	247062.8249	59118.6740	2340.04	WALL ANG PNT
2181	247051.4447	59100.5632	2340.12	WALL FOOTING
2182	247033.7423	59077.2713	2340.93	WALL FOOTING
2183	247035.5841	59075.4761	2340.91	TOP
2184	247048.2757	59092.4171	2339.95	TOP

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2185	247059.5966	59108.6277	2339.43	TOP
2186	247063.6127	59101.5450	2334.97	TOP RIP RAP
2187	247051.7987	59082.2215	2334.90	TOP RIP RAP
2188	247037.7103	59061.3625	2335.25	TOP RIP RAP
2189	247041.7757	59054.7027	2329.25	TOE RIP RAP
2190	247058.7654	59078.3078	2329.74	TOE RIP RAP
2191	247070.7365	59096.2904	2329.85	TOE RIP RAP
2192	247086.8080	59118.4064	2328.67	TOE RIP RAP
2193	247084.7475	59139.3240	2335.70	TOP RIP RAP
2194	247081.2128	59128.3912	2335.31	TOP RIP RAP
2195	247071.1620	59128.4459	2339.87	TOP
2196	247082.7244	59144.5104	2338.82	TOP
2197	247087.2954	59147.9891	2334.21	GAS LINE
2198	247088.0504	59156.7914	2339.24	FENCE
2199	247087.5756	59091.3743	2338.84	FENCE
2200	247091.9171	59090.2025	2338.87	STREET LIGHT
2201	247086.1247	59064.8952	2337.91	GAS LINE
2202	247085.6826	58982.4448	2335.46	FENCE
2203	247084.9812	58939.5522	2335.20	FENCE
2204	247083.0085	58948.8135	2338.12	CONC
2205	247082.7672	58967.2365	2338.02	CONC
2206	247083.3129	58992.1417	2337.63	CONC
2207	247085.1841	59003.5732	2337.72	GAS LINE
2208	247085.6172	59006.6075	2337.22	FRNT FACE BKWALL
2209	247085.6360	59006.5510	2335.51	FRNT FACE BKWALL
2210	247085.0616	59008.1257	2335.37	TOP
2211	247086.3896	59022.0413	2337.31	BTM BRIDGE
2212	247086.5096	59032.0544	2336.65	BTM BRIDGE
2213	247086.6641	59039.4291	2336.66	BTM BRIDGE
2214	247086.7560	59048.5471	2337.17	BTM BRIDGE
2215	247086.9699	59061.3790	2337.28	BTM BRIDGE
2216	247087.0932	59070.5697	2336.84	BTM BRIDGE
2217	247087.2198	59077.8251	2336.83	BTM BRIDGE
2218	247087.3147	59087.0638	2337.34	BTM BRIDGE
2219	247087.4887	59099.5943	2337.37	BTM BRIDGE
2220	247087.6525	59108.5611	2336.92	BTM BRIDGE
2221	247087.7579	59115.9208	2336.96	BTM BRIDGE
2222	247087.8865	59125.4125	2337.65	BTM BRIDGE
2223	247087.5787	59139.2952	2337.64	FRNT FACE BKWALL
2224	247087.5836	59139.3350	2334.74	FRNT FACE BKWALL
2225	247087.5187	59136.4817	2335.01	TOP
2226	247086.9636	59118.8488	2328.54	EDGE CONC
2227	247090.1894	59115.7939	2328.81	PILER
2228	247089.6479	59077.8046	2328.41	PILER
2229	247089.1395	59039.3583	2328.89	PILER
2230	247093.7226	59128.0421	2328.32	TOE
3002	253421.5970	76437.0381	2120.16	BSCK
3003	253263.8257	76466.7660	2118.83	EDGE ASPHALT
3004	253210.8181	76494.4912	2118.61	EDGE ASPHALT
3005	253156.6929	76525.7069	2118.30	EDGE ASPHALT
3006	253098.4480	76558.6870	2118.37	EDGE ASPHALT
3007	253100.2348	76562.4105	2117.98	GUARD RAIL
3008	253144.3436	76534.3179	2118.20	GUARD RAIL
3009	253132.1791	76541.3562	2118.14	BARRIER WALL

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3010	253174.2103	76516.9512	2118.25	BARRIER WALL
3011	253227.2548	76486.9792	2118.45	BARRIER WALL
3012	253253.5056	76481.1977	2117.68	FL
3013	253230.9165	76502.8985	2113.54	FL
3014	253236.3043	76504.0997	2115.03	NG
3015	253260.8706	76488.4716	2118.66	NG
3016	253266.5031	76510.8089	2117.31	NG
3017	253260.1728	76519.2616	2116.14	FENCE ANG PNT
3018	253225.7305	76507.4487	2111.75	FENCE
3019	253225.0718	76508.1117	2111.99	WING WALL
3020	253220.0122	76503.8398	2116.60	WING WALL
3021	253219.0766	76503.0173	2116.61	HEAD WALL
3022	253187.7531	76521.1842	2116.52	HEAD WALL
3023	253157.3208	76539.0659	2116.45	HEAD WALL
3024	253148.2928	76548.2105	2114.88	HEAD WALL
3025	253148.1749	76548.3342	2111.93	EDGE CONC
3026	253147.7951	76561.0335	2111.76	EDGE CONC
3027	253147.7901	76561.1107	2116.51	WING WALL
3028	253161.1687	76573.6563	2114.27	EDGE CONC
3029	253153.2520	76543.5407	2108.82	EDGE CONC
3030	253161.1588	76573.8304	2116.43	HEAD WALL
3031	253140.4972	76560.2942	2111.92	NG
3032	253133.3321	76569.7221	2113.38	NG
3033	253130.5808	76564.0196	2115.45	SEWER MANHOLE
3034	253244.2050	76501.8290	2116.51	FW34
3035	253421.5780	76437.0450	2120.15	FW35
3036	253139.1568	76576.3951	2114.90	FENCE
3037	253147.1574	76561.8048	2112.37	FENCE ANG PNT
3038	253175.0866	76572.8640	2106.85	INV
3039	253204.2986	76570.8163	2106.79	INV
3040	253219.8067	76569.7762	2116.54	HEAD WALL
3041	253221.6815	76562.3563	2116.40	WING WALL
3042	253221.6572	76562.2737	2106.76	EDGE CONC
3043	253223.6303	76548.2763	2107.04	EDGE CONC
3044	253247.4885	76539.9392	2112.49	EDGE CONC
3045	253231.3838	76540.8042	2111.66	EDGE CONC
3046	253229.6963	76507.7595	2111.69	EDGE CONC
3047	253225.1202	76508.8415	2109.39	EDGE CONC
3048	253214.5736	76505.8625	2107.58	INV
3049	253204.2027	76511.9721	2107.56	INV
3050	253193.9448	76517.9259	2106.87	INV
3051	253183.7488	76523.9008	2107.24	INV
3052	253173.2070	76530.0066	2108.39	INV
3053	253161.8974	76536.4610	2108.20	INV
3054	253244.9001	76527.0879	2113.91	NG
3055	253268.5840	76545.2272	2116.47	WING WALL
3056	253268.8600	76546.1494	2116.51	FENCE
3057	253222.5518	76563.1131	2116.46	FENCE
3058	253220.4743	76569.7593	2116.32	FENCE
3059	253160.2234	76574.4875	2115.56	FENCE ANG PNT
3060	253151.0466	76572.5404	2116.00	ASPHALT
3061	253161.0374	76619.6725	2115.91	ASPHALT
3062	253200.5989	76605.3691	2115.95	ASPHALT
3063	253248.9854	76588.2007	2116.89	ASPHALT

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3064	253302.8181	76569.2316	2118.56	ASPHALT
3065	253285.7891	76544.2309	2118.02	ASPHALT
3066	253209.9401	76534.4288	2107.54	NG
3067	253193.8401	76546.5470	2107.72	NG
3502	254097.4544	79789.3301	2086.66	FLY
3503	254097.4544	79789.3301	2086.66	FLY
3504	254116.2769	80006.1322	2083.17	BSCK
3505	254000.2486	79143.6825	2092.03	FLY
3506	254097.4528	79789.3190	2086.68	BSCHK
3507	253966.6150	79154.0622	2090.93	PILER
3508	253986.1364	79154.1863	2091.31	PILER
3509	254004.7547	79154.7064	2091.90	PILER
3510	254019.8990	79155.0704	2092.44	PILER
3511	254032.4407	79155.4162	2092.92	PILER
3512	254010.3185	79136.6059	2092.70	PILER
3513	253956.0203	79154.1754	2091.03	PILER
3514	253942.7629	79153.8087	2091.48	PILER
3515	253942.6063	79162.4005	2091.41	PILER
3516	253949.9878	79130.5255	2091.15	PILER
3517	253950.8699	79100.3560	2091.36	PILER
3518	253952.9857	79075.1801	2091.96	PILER
3519	253952.5633	79092.0847	2091.60	PILER
3520	253952.8178	79135.3267	2091.07	PILER
3521	253962.6949	79102.7232	2091.57	WATER VALVE
3522	253964.5396	79105.4060	2091.50	WATER VALVE
3523	253966.3801	79105.6224	2091.53	WATER VALVE
3524	253979.8552	79107.4760	2092.01	WATER VALVE
3525	253986.5850	79119.9899	2091.93	WATER VALVE
3526	253986.8856	79125.9228	2091.86	WATER VALVE
3527	253994.3251	79154.8665	2091.60	CONC
3528	254006.5453	79189.2207	2091.04	CONC
3529	254017.2687	79217.6862	2090.74	CONC
3530	254036.1919	79206.9571	2091.50	CONC
3531	254022.9974	79164.7968	2092.25	CONC
3532	253944.0140	79943.6820	2083.17	FW32
3533	253709.1230	80080.8050	2082.77	FW33
3534	254037.0767	79155.8521	2093.02	BLDG COR
3535	253997.0562	79115.3524	2092.87	BLDG COR
3536	254014.5943	79116.2930	2092.84	HYDRANT
3537	253970.8133	79093.8272	2092.03	PIER
3538	253972.7896	79093.8954	2092.15	PIER
3539	253973.1206	79074.1900	2092.73	PIER
3540	253980.4938	79040.8523	2094.06	CONC
3541	253983.8154	79079.8859	2093.01	CONC
3542	254004.0288	79153.7587	2098.79	2ND FLR OVRHANG
3543	253967.9832	79152.0688	2097.75	2ND FLR OVRHANG
3544	253957.0510	79153.7647	2097.68	2ND FLR OVRHANG
3545	253957.1497	79153.1308	2099.16	2ND FLR OVRHANG
3546	253943.0092	79152.8567	2099.20	2ND FLR OVRHANG
3547	253943.5775	79131.2813	2099.14	2ND FLR OVRHANG
3548	253950.1603	79130.6661	2099.15	2ND FLR OVRHANG
3549	253950.6516	79105.1051	2099.15	2ND FLR OVRHANG
3550	253950.2467	79115.2922	2091.13	INV
3551	253943.2244	79141.4891	2091.42	INV

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3552	253942.8914	79158.9220	2091.43	INV
3553	253979.7952	79136.4853	2091.39	CONC
3554	253973.5309	79111.5008	2091.62	CONC
3555	254048.8786	79218.6003	2091.69	BLDG COR
3556	254058.7144	79230.4558	2091.69	BLDG COR
3557	254057.3083	79322.7863	2089.50	BLDG COR
3558	254056.9799	79322.9117	2089.50	EDGE CONC
3559	254049.7924	79322.5578	2089.30	CONC ANG PNT
3560	254033.4872	79281.0689	2089.75	EDGE CONC
3561	254019.8085	79246.2033	2090.16	CONC ANG PNT
3562	254050.6652	79234.3855	2091.47	EDGE CONC
3563	254006.6483	79217.4250	2090.45	PILER
3564	253958.4082	79167.9556	2091.00	CONC
3565	253942.9000	79164.4918	2091.42	FACE WALL
3566	253972.5570	79051.5371	2093.48	FLY
3567	254056.1876	79324.9618	2089.51	FLY
3568	253986.5858	79086.0605	2092.92	CONC
3569	253987.8965	79031.2264	2094.61	CONC
3570	253998.6816	79010.1380	2095.61	FACE WALL
3571	253961.9950	79027.1932	2094.42	CONC
3572	253961.8088	79076.0183	2092.14	CONC
3573	253962.7333	79185.7638	2090.95	BLDG COR
3574	253951.6935	79069.2435	2092.05	PILER
3575	253952.2891	79039.4238	2093.18	PILER
3576	253952.6763	79039.5212	2099.16	2ND FLR OVRHANG
3577	253951.4324	79052.6835	2092.33	INV
3578	253951.5567	79061.3835	2099.12	2ND FLR OVRHANG
3579	253952.4599	79013.9059	2095.17	FACE BLDG
4001	246497.1380	58354.8199	2350.97	TOP
4002	246490.4275	58354.4865	2346.16	TOE
4003	246484.5229	58354.7906	2345.75	EDGE RIP RAP
4004	246481.5231	58355.0197	2345.23	EDGE RIP RAP
4006	246479.6760	58354.7612	2342.32	EDGE RIP RAP
4008	246473.4867	58353.8027	2335.40	TOE
4009	246461.9882	58351.1578	2334.72	FL
4010	246451.5060	58368.0506	2334.89	TOE
4011	246448.1720	58367.0401	2336.08	EDGE RIP RAP
4012	246435.5844	58365.8275	2343.65	GB
4013	246421.8031	58363.6861	2351.79	TOP
4014	246420.0388	58363.6951	2352.09	WALL FOOTING
4015	246419.9716	58364.1643	2358.92	TOP WALL
4016	246435.9462	58865.0833	2349.45	WALL FOOTING
4017	246449.3117	58860.7891	2342.45	EDGE RIP RAP
4018	246462.1467	58861.8557	2333.69	EDGE RIP RAP
4019	246467.2509	58860.1740	2332.59	TOE
4020	246476.8115	58859.6994	2332.37	FL
4021	246487.6041	58840.8221	2333.24	TOE
4023	246492.9982	58838.7485	2338.05	EDGE RIP RAP
4025	246495.1855	58838.1268	2341.07	EDGE RIP RAP
4026	246498.0151	58838.0005	2341.07	EDGE RIP RAP
4027	246505.3164	58837.8000	2339.27	TOP
4028	246508.8497	58837.8181	2339.57	WALL FOOTING
4046	247515.7787	59643.0825	2339.92	TOP WALL
4047	247515.1040	59642.0732	2333.85	NG

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4048	247504.4900	59649.6504	2332.15	GB
4049	247500.5799	59651.7979	2330.86	TOP
4050	247490.7922	59657.2539	2324.57	GB
4051	247489.5068	59658.1099	2323.47	TOE
4052	247481.6430	59662.6964	2323.08	GB
4053	247479.7628	59664.1086	2322.65	GB
4054	247474.7283	59667.4376	2322.41	FL
4055	247458.1841	59678.2843	2323.18	GB
4056	247444.0526	59688.5452	2323.13	EDGE CONC
4057	247423.5217	59699.2064	2336.43	TOP
4058	247421.8052	59700.2508	2336.46	EDGE CONC
4059	247416.0573	59703.6441	2336.14	GB
4060	247413.2369	59705.2739	2335.28	WALL FOOTING
4061	247412.9910	59704.9994	2341.83	TOP WALL
4062	247780.0710	60103.8245	2336.77	TOP WALL
4063	247780.4614	60103.8596	2330.20	WALL FOOTING
4064	247781.2837	60102.6152	2330.49	GB
4065	247785.7323	60095.3446	2331.00	EDGE CONC
4066	247786.6261	60093.6292	2331.00	TOP
4067	247799.1957	60074.7781	2319.15	EDGE CONC
4068	247802.1011	60070.6587	2318.73	GB
4069	247811.3541	60055.3977	2318.72	GB
4070	247812.4108	60053.6053	2318.18	FL
4071	247813.0677	60051.9719	2318.69	GB
4072	247825.3633	60032.5985	2319.17	TOE
4076	247830.2412	60016.4450	2327.86	TOP
4077	247833.6128	60011.6111	2329.43	GB
4078	247841.3059	60000.2038	2328.89	NG
4081	248360.7580	61085.3693	2326.22	TOP WALL
4082	248360.6442	61085.3541	2319.58	NG
4083	248358.0756	61085.6816	2318.50	GB
4084	248342.8392	61088.1914	2317.24	TOP
4085	248316.1759	61092.2298	2302.47	TOE
4086	248295.1148	61095.5916	2302.36	FL
4087	248284.7689	61098.2196	2302.55	TOE
4088	248282.9271	61098.9147	2304.01	GB
4089	248280.8653	61099.0796	2304.21	GB
4090	248271.4165	61102.1400	2309.45	TOP
4091	248244.3261	61105.2762	2313.96	GB
4092	248235.3466	61106.2950	2314.75	GB
4093	248233.3991	61106.7407	2315.85	NG
4094	248303.1618	61580.8127	2309.23	NG
4095	248304.1172	61580.5647	2309.40	GB
4096	248306.0690	61580.3456	2308.23	GB
4097	248317.3977	61576.9762	2307.63	GB
4098	248340.7950	61572.7967	2304.93	TOP
4099	248359.1533	61570.6509	2298.01	TOE
4100	248372.0479	61569.3803	2297.68	FL
4101	248384.8729	61568.2904	2297.95	TOE
4102	248415.2506	61562.3407	2312.22	TOP
4103	248425.4474	61560.4049	2312.70	GB
4104	248430.2200	61559.6867	2314.27	NG
4105	248430.2926	61559.7272	2321.38	TOP WALL
4108	248505.8444	62073.7349	2306.39	WALL FOOTING

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4109	248501.5962	62074.4004	2308.09	GB
4110	248489.7140	62075.8065	2307.49	TOP
4111	248463.7719	62080.9153	2293.72	TOE
4112	248445.7196	62084.8060	2292.99	FL
4113	248428.3657	62086.8897	2294.28	TOE
4114	248414.2432	62090.7299	2301.07	TOP
4115	248401.1098	62093.5870	2301.85	GB
4116	248385.4350	62094.1128	2305.68	GB
4117	248381.3930	62094.4309	2306.02	GB
4118	248379.0135	62094.7522	2306.89	NG
4119	248378.9201	62094.8666	2311.79	TOP WALL
4120	248447.7705	62563.8361	2308.93	TOP WALL
4121	248447.8723	62564.1968	2303.77	WALL FOOTING
4122	248448.9587	62563.8503	2303.66	WALL FOOTING
4123	248450.0769	62563.6705	2302.73	GB
4124	248457.3422	62562.0731	2301.52	GB
4125	248475.5136	62559.6270	2297.34	GB
4126	248485.0067	62559.5626	2296.48	TOP
4127	248500.1527	62558.3424	2289.85	TOE
4128	248517.4891	62554.6106	2289.31	FL
4129	248531.9190	62553.7453	2289.49	TOE
4130	248550.8795	62551.2218	2299.44	GB
4131	248554.0681	62549.8850	2299.36	GB
4132	248562.3539	62549.2531	2304.10	TOP
4133	248572.3576	62547.6126	2305.16	GB
4134	248574.9288	62547.2620	2306.53	NG
4202	253709.1484	80080.7917	2082.66	BSCK
4203	253777.4491	79996.5042	2083.70	TOP BC
4204	253807.0338	79992.9738	2083.29	TOP BC
4205	253833.1774	79975.6616	2083.13	TOP BC PT
4206	253903.6235	79914.9284	2083.69	TOP BC ANG PNT
4207	253954.5181	79863.6470	2084.56	TOP BC PC
4208	253950.8725	79841.2208	2085.28	POC
4209	253943.7969	79839.5123	2085.32	TOP BC END
4210	253956.2932	79837.2905	2085.00	STORM DRAIN MH
4211	253964.0283	79848.4356	2084.44	STORM DRAIN MH
4212	253992.5969	79845.0187	2083.74	SEWER MANHOLE
4213	254028.7187	79830.4894	2083.74	SEWER MANHOLE
4214	254048.0483	79832.1094	2084.30	SEWER MANHOLE
4215	254050.4656	79838.8399	2084.57	STORM DRAIN MH
4216	254056.8268	79811.7756	2084.28	SEWER MANHOLE
4217	253998.5119	79823.8976	2084.05	WATER VALVE
4218	253998.7545	79820.9111	2084.01	WATER METER
4219	253996.7571	79822.5695	2084.07	WATER METER
4220	253995.2473	79820.5366	2084.12	WATER METER
4221	254038.3469	79780.2290	2084.77	EDGE CONC
4222	254028.9333	79816.7514	2083.65	EDGE CONC
4223	254001.4603	79817.6538	2084.01	EDGE CONC
4224	253996.5506	79811.2022	2084.30	EDGE CONC
4225	253988.2129	79818.0231	2084.50	EDGE CONC
4226	254054.0326	79781.1754	2084.66	EDGE CONC
4227	254052.2660	79816.3728	2084.09	EDGE CONC
4228	254085.6344	79816.4796	2086.23	EDGE CONC
4229	254085.4773	79833.6089	2086.53	EDGE CONC

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4230	254081.3351	79837.3260	2086.74	TOP BC
4231	254052.6297	79844.3352	2084.97	TOP BC
4232	253944.0140	79943.6820	2083.17	FW32
4233	253709.1230	80080.8050	2082.77	FW33
4234	254043.4341	79858.4345	2084.52	TOP BC
4235	254039.2074	79868.4415	2084.51	TOP BC END
4236	254038.8065	79868.3573	2084.56	TOP CONC WALL
4237	254011.7181	79902.0022	2084.33	TOP CONC WALL
4238	253990.7090	79925.2766	2084.17	TOP CONC WALL
4239	253970.1929	79945.1488	2083.83	HEAD WALL
4240	253946.6589	79918.8626	2083.86	HEAD WALL
4241	253961.8712	79955.0339	2083.80	FACE WALL
4242	253945.1162	79937.5856	2083.07	FACE WALL PC
4243	253941.3999	79928.5156	2082.86	FACE WALL POC
4244	253945.9374	79917.7790	2082.80	FACE WALL END
4245	253945.0879	79916.8804	2082.76	BEGIN GUARD RAIL
4246	253961.3420	79900.5810	2083.19	GUARD RAIL
4247	254009.5051	79870.1148	2083.64	GUARD RAIL
4248	254040.5486	79850.1772	2084.22	GUARD RAIL
4249	254063.4724	79842.9809	2085.63	GUARD RAIL
4250	254076.6759	79840.9438	2086.59	END GUARD RAIL
4251	254042.8191	79804.0028	2084.07	CONC
4252	254045.3509	79773.2506	2084.82	CONC
4253	253973.7481	79871.6994	2083.53	CONC
4254	253940.0876	79879.8203	2083.59	GRATE INLET EDGE
4255	253924.4939	79895.4495	2083.39	GRATE INLET EDGE
4256	253945.2122	79916.7079	2082.80	GRATE INLET EDGE
4257	253960.8523	79900.9841	2083.11	GRATE INLET EDGE
4258	253961.8949	79903.3532	2083.09	HEAD WALL
4259	253946.7395	79918.5654	2082.86	HEAD WALL
4260	253962.9791	79902.3493	2083.13	TOP CONC WALL
4261	253984.4245	79888.5451	2083.36	TOP CONC WALL
4262	254027.6127	79861.1139	2083.81	TOP CNC WLL END
4263	254032.9531	79864.6203	2083.84	CONC
4264	254005.1330	79889.6841	2079.20	CONC
4265	253976.5099	79915.8502	2074.53	CONC
4266	253988.0775	79927.4446	2074.56	CONC
4267	254010.7884	79902.7498	2078.35	CONC
4268	254038.4495	79868.4466	2083.82	CONC
4269	254021.7191	79864.9508	2083.04	CONC
4270	253994.8578	79882.2358	2079.09	CONC
4271	253963.1368	79902.5065	2074.48	CONC
4272	253964.3577	79937.9469	2074.17	INV
4273	253952.8655	79925.3552	2074.16	INV
4274	253953.9064	79911.7069	2074.32	INV
4275	254077.1809	79843.7774	2087.06	FACE BLK WALL
4276	254055.8571	79857.4070	2085.67	FACE BLK WALL
4277	254037.3186	79875.1647	2085.18	FACE BLK WALL
4278	254004.5180	79916.5233	2084.84	FACE BLK WALL
4279	254006.6463	79918.7105	2085.01	FACE BLK WALL
4280	253998.2247	79927.8802	2085.05	FACE BLK WALL
4281	253994.1539	79924.5647	2084.61	FACE BLK WALL
4282	253957.6551	79961.9274	2083.85	WALL ANG PNT
4283	253951.0415	79965.3439	2083.75	END BLK WALL

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4284	253936.4107	79978.8330	2083.56	BEGIN BLK WALL
4285	253892.9502	80015.9771	2083.33	FACE BLK WALL
4286	253890.2761	80012.3952	2083.29	TOP BC
4287	253921.9438	79985.1157	2083.38	TOP BC
4288	253924.2340	79982.9119	2083.14	DRIVEWAY
4289	253959.4685	79952.6088	2083.58	DEPRSD CURB
4290	253946.9805	79960.1724	2083.42	EDGE CONC
4291	253927.5716	79937.8509	2082.73	EDGE CONC
4292	253907.1700	79914.1529	2083.29	EDGE CONC
4293	253912.7461	79927.7975	2083.04	WATER VALVE
4294	253876.5079	79963.6237	2082.63	WATER VALVE
4295	253884.9566	79975.5476	2082.44	ASPHALT
4296	253914.6441	79947.1651	2082.62	ASPHALT
4297	253920.1401	79965.3916	2082.97	ASPHALT
4302	253588.8109	81022.9802	2073.06	BSCK
4303	253479.3581	81206.2112	2073.32	TOP BC
4304	253499.6394	81206.0414	2073.19	TOP BC
4305	253509.7824	81205.8728	2072.86	DEPRSED CURB
4306	253589.8336	81204.5972	2072.57	DEPRSED CURB
4307	253617.2017	81204.2947	2072.56	DEPRSED CURB
4308	253662.1175	81203.6487	2073.13	TOP BC
4309	253689.6847	81203.3678	2073.28	TOP BC
4310	253681.0009	81208.4339	2073.38	SIDEWALK
4311	253661.7643	81208.3943	2073.24	SIDEWALK
4312	253674.1484	81205.4421	2073.23	ELEC MANHOLE
4313	253659.7295	81208.9385	2073.30	COR BOX
4314	253659.7626	81208.6396	2073.30	COR 4FT RAIL
4315	253616.7232	81208.7314	2072.62	COR 4FT RAIL
4316	253615.8995	81207.5816	2072.97	STREET LIGHT
4317	253616.4376	81208.4851	2072.56	COR 3FT RAIL
4318	253588.6534	81209.5591	2072.57	EDGE BOX
4319	253569.3762	81207.8045	2072.59	SIGN
4320	253549.2643	81209.0936	2072.64	COR 3FT RAIL
4321	253535.4135	81207.4978	2072.78	POWER POLE
4322	253523.8537	81210.0878	2072.90	FENCE
4323	253524.5070	81209.9544	2072.89	COR 4FT RAIL
4324	253497.5116	81209.1334	2073.36	ELEC MANHOLE
4325	253499.6985	81209.9132	2073.37	SIDEWALK
4326	253499.6958	81210.9012	2073.36	SIDEWALK
4327	253482.6133	81211.1149	2073.42	SIDEWALK
4328	253486.3305	81215.9314	2073.22	WALL FOOTING
4329	253507.3740	81215.6231	2072.88	WALL ANG PNT
4330	253584.8770	81206.6780	2072.61	FW30
4331	253588.8100	81023.0230	2073.01	FW31
4332	253513.6793	81245.6758	2072.75	WALL FOOTING
4333	253513.8466	81245.9781	2072.75	FENCE ANG PNT
4334	253532.0129	81238.9726	2071.35	FENCE ANG PNT
4335	253507.8858	81209.9159	2072.93	EDGE CONC
4336	253507.9865	81210.7725	2072.96	EDGE CONC
4337	253509.6800	81218.2290	2072.87	EDGE CONC
4338	253516.6442	81260.2935	2072.61	WALL FOOTING
4339	253518.7136	81260.6062	2072.56	TOP
4340	253527.4198	81261.2333	2069.96	GB
4341	253540.8193	81261.9524	2069.22	GB

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4342	253556.7420	81263.4056	2065.63	GB
4343	253562.8599	81263.8848	2063.31	TOE
4344	253585.8507	81265.1508	2063.32	CONC
4345	253601.1589	81267.2075	2063.22	TOE
4346	253605.0143	81268.6130	2064.91	GB
4347	253632.3062	81274.6665	2072.59	TOP
4348	253634.4270	81275.7404	2072.84	WALL FOOTING
4349	253662.4606	81208.5607	2073.24	END WALL
4350	253659.7887	81208.9661	2073.18	TOP
4351	253617.0590	81209.8083	2066.12	GB
4352	253609.6672	81209.7661	2063.51	TOE
4353	253605.2609	81209.6847	2063.50	INV
4354	253592.4626	81209.8146	2063.44	INV
4355	253580.2924	81209.6211	2063.39	INV
4356	253565.7676	81210.0910	2063.44	INV
4357	253560.9716	81210.1985	2063.56	TOE
4358	253548.9942	81210.3767	2068.00	GB
4359	253524.7679	81210.6270	2072.86	TOP
4360	253681.1809	81176.0400	2073.29	ASPHALT
4361	253587.7287	81169.4889	2072.90	ASPHALT
4362	253481.5589	81169.0991	2073.35	ASPHALT
4402	252928.2338	75453.7904	2133.76	BSCK
4403	253029.6597	75533.8023	2132.83	ASPHALT
4404	252959.6674	75502.6787	2133.04	ASPHALT
4405	252868.2209	75467.6423	2133.39	ASPHALT
4406	252826.1689	75421.4142	2134.67	TOP BC
4407	252891.1216	75438.7973	2134.25	TOP BC PT
4408	252960.9384	75467.1388	2133.40	TOP BC
4409	253024.5699	75493.0396	2132.68	BC RETURN
4410	253021.4721	75486.4076	2132.76	SIDEWALK
4411	253022.0785	75484.8573	2132.89	BARRIER WALL
4412	252927.9751	75445.6621	2133.93	BARRIER WALL
4413	252905.9908	75439.3879	2134.31	STREET LIGHT
4414	252897.3159	75432.7419	2133.11	END RAIL
4415	252896.4851	75432.2648	2132.87	GAS VENT
4416	252877.4496	75388.7886	2135.06	TOP
4417	252927.7147	75444.7647	2132.14	TOP
4418	252905.9502	75422.2973	2130.83	TOE
4419	252884.0490	75382.5435	2131.22	TOE
4420	252888.3752	75381.5949	2130.39	TOP RIP RAP
4421	252927.5151	75439.3660	2129.31	TOP RIP RAP
4422	252929.8433	75441.2146	2129.35	WING WALL
4423	252917.2218	75407.8633	2121.71	TOE RIP RAP
4424	252954.7310	75420.5096	2121.96	CL WASH
4425	252998.7386	75442.0551	2121.86	TOE
4426	252999.8412	75442.2340	2130.09	TOP RIP RAP
4427	253002.6753	75451.4163	2129.84	EDGE CONC
4428	253008.6774	75479.0680	2121.13	INV
4429	253014.6381	75480.9896	2129.17	COR BOX
4430	252994.6369	75472.8892	2121.16	INV
4431	252982.2419	75467.7837	2121.16	INV
4432	252968.5115	75462.3324	2121.26	INV
4433	252954.6187	75456.3138	2121.25	INV
4434	252940.8037	75450.0036	2121.25	INV

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4435	252933.7726	75447.8628	2129.21	COR BOX
4436	252928.2584	75453.7434	2133.80	FW36
4437	252868.4991	75163.6064	2135.15	FW37
4438	252930.2759	75441.7830	2122.16	TOE RIP RAP
4439	252932.7204	75446.1871	2129.37	WING WALL
4440	252868.4631	75163.6985	2135.28	BSCK
4441	253009.5381	75448.6249	2132.32	EDGE CONC
4442	253009.5878	75453.0813	2131.97	EDGE CONC
4443	253018.6119	75478.9378	2131.37	EDGE CONC
4444	253022.9293	75479.5461	2132.34	EDGE CONC
4445	253022.4387	75483.4091	2132.22	EDGE CONC
4446	253014.6685	75480.4816	2129.15	WING WALL
4447	253012.5726	75475.7264	2129.22	WING WALL
4448	253022.0747	75484.8947	2132.92	SIDEWALK
4449	253021.4653	75486.4280	2132.80	SIDEWALK
4450	253032.1231	75490.6626	2132.70	TOP BC
4451	253036.4586	75482.9514	2132.86	TOP BC
4452	253030.5462	75479.3239	2133.44	NG
4453	252999.2123	75437.5043	2130.07	TOP RIP RAP
4454	253005.2654	75431.9376	2132.09	NG
4455	253025.8156	75482.3449	2133.04	STREET LIGHT
4779	253213.0187	85154.4016	2034.70	TOP BC
4780	253148.6550	85154.0116	2035.52	TOP BC
4781	253139.0199	85154.6683	2037.79	TOP BARACADE
4782	253072.2630	85154.0551	2038.34	TOP BARACADE
4783	253062.1099	85153.1458	2036.25	TOP BC
4784	253038.1651	85153.0041	2036.41	TOP BC
4785	253040.4150	85152.7867	2036.39	BM
4786	253039.1036	85158.0921	2036.51	SIDEWALK
4787	253099.0138	85158.5536	2035.99	SIDEWALK
4788	253191.7657	85159.3011	2035.05	SIDEWALK
4789	253171.5265	85103.9018	2035.20	TOP BC
4790	253139.7095	85103.6024	2035.58	TOP BC
4791	253129.8203	85102.9757	2037.86	TOP BARACADE
4792	253070.8282	85102.5668	2038.30	TOP BARACADE
4793	253070.5867	85103.1872	2036.08	TOP BC
4794	253040.4954	85103.0735	2036.38	TOP BC
4795	253040.5695	85098.1047	2036.49	SIDEWALK
4796	253093.1215	85098.3772	2036.06	SIDEWALK
4797	253171.7078	85098.9071	2035.32	SIDEWALK
4798	253158.7236	85099.7296	2035.45	WALL END
4799	253071.2143	85097.2080	2035.86	WALL END
4800	253193.1693	85253.3954	2035.31	TOP
4801	253166.0018	85263.1114	2025.26	TOE
4802	253146.7902	85259.9616	2025.38	TOE
4803	253115.6142	85270.5379	2035.49	TOP
4804	253068.3192	85189.8861	2035.32	TOP
4805	253063.2913	85172.1120	2036.14	TOP
4806	253069.0481	85164.9989	2032.91	TOP WINGWALL
4807	253074.4701	85159.3861	2035.65	TOP HEADWALL
4808	253074.4583	85159.1558	2025.97	EDGE CONC
4809	253087.7720	85159.2670	2025.98	EDGE CONC
4810	253101.0105	85159.3750	2025.98	EDGE CONC
4811	253114.3763	85159.4932	2025.96	EDGE CONC

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4812	253127.7655	85159.6542	2025.96	EDGE CONC
4813	253140.3278	85159.7822	2025.93	EDGE CONC
4814	253140.5354	85159.8530	2035.60	TOP HEADWALL
4815	253148.7631	85165.1153	2032.46	TOP WINGWALL
4816	253156.4273	85163.1854	2034.76	TOP
4817	253163.7828	85188.5817	2035.71	TOP
4818	253151.4974	85211.9744	2025.75	TOE
4819	253114.7033	85035.7101	2026.99	MISC MON
4820	253130.0005	85097.6674	2035.76	TOP HEADWALL
4821	253139.9821	85022.2178	2037.30	EDGE CONC
4822	253119.6314	85022.8045	2030.92	EDGE CONC
4823	253119.5265	85023.7026	2027.45	CONC FL
4824	253145.0778	85019.2188	2039.37	TOP
4825	253145.3551	84955.8225	2040.83	TOP
4826	253123.1835	84955.7943	2030.91	TOE
4827	253073.3191	84929.9228	2030.80	NG
4828	253073.3300	84929.9505	2041.79	TOP WALL
4829	253072.6093	85022.8379	2040.76	TOP WALL
4830	253072.6676	85022.8923	2029.38	CONC FL
4831	253072.7317	85023.1428	2026.62	CONC FL
4832	253072.4484	85062.8465	2026.33	CONC FL
4833	253066.7161	85097.3549	2026.22	CONC FL
4834	253079.4277	85097.4978	2026.14	CONC FL
4835	253079.4085	85119.7804	2025.98	CONC FL
4836	253092.0556	85097.7284	2025.98	CONC FL
4837	253092.1553	85118.9364	2025.91	CONC FL
4838	253095.3522	85139.8264	2025.92	CONC FL
4839	253104.7011	85097.8202	2025.85	CONC FL
4840	253104.7079	85118.0599	2025.81	CONC FL
4841	253107.5781	85136.8868	2025.82	CONC FL
4842	253117.3399	85098.0668	2025.94	CONC FL
4843	253117.2203	85118.0772	2026.11	CONC FL
4844	253120.0407	85134.0684	2026.25	CONC FL
4845	253131.3213	85131.2878	2026.15	CONC FL
4846	253129.1719	85116.1721	2026.32	CONC FL
4847	253128.9502	85097.5511	-99999999.00	CONC FL
4848	253071.8570	85097.1618	2033.92	CONC FL
4849	253066.1142	85097.1965	2035.91	TOP HEADWALL
5000	262950.6727	105081.7066	1776.28	BSCK 3-4
5001	262253.4002	105130.1829	1777.28	FSCK 3-4-1018
5002	263125.3555	104955.1211	1775.23	VG ANG PNT
5003	263123.6356	104955.1026	1775.19	GB
5004	263101.9853	104954.6516	1767.81	
5005	263100.7255	105030.3552	1766.92	
5006	263124.6705	105006.2789	1775.12	VG CORNER
5007	263125.1590	105006.7530	1775.18	VG CORNER
5008	263126.1022	105006.5571	1775.20	VG ANG PNT
5009	263103.7848	105030.3247	1776.08	TOP WALL
5010	263100.8942	105030.4735	1776.10	TOP WALL
5011	263101.7073	105031.5367	1778.58	TOP PIPE
5012	263101.7463	105030.6088	1778.57	TOP PIPE
5013	263075.4827	105030.9038	1778.59	TOP PIPE
5014	263075.4980	105031.7468	1778.58	TOP PIPE
5015	263022.0810	105032.1497	1778.56	TOP PIPE

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5016	263022.0739	105031.3172	1778.57	TOP PIPE
5017	262995.8984	105032.2920	1778.55	TOP PIPE
5018	262995.8501	105031.4265	1778.56	TOP PIPE
5019	262995.8897	105031.3353	1776.10	TOP WALL
5020	262996.7566	105031.2793	1776.11	TOP WALL
5021	262971.6035	105008.3349	1775.12	VG CORNER
5022	262972.0926	105007.8456	1775.06	VG CORNER
5023	262970.8026	105008.0941	1775.15	VG ANG PNT
5024	262996.8589	105031.1521	1766.92	
5025	262997.7537	104951.7146	1767.73	
5026	262975.6572	104950.8824	1775.18	
5027	262974.2742	104950.7769	1775.17	VG ANG PNT
5028	262979.7986	105000.7522	1773.08	STORM DRAIN
5029	262986.5842	105002.1602	1770.63	FL
5030	262985.0837	105006.4669	1774.40	SEWER MANHOLE
5031	263009.0571	105031.2051	1772.87	200
5032	263022.0902	105031.1610	1772.97	200
5033	263033.0774	105031.1054	1772.96	200
5034	263043.5384	105031.0628	1773.02	200
5035	263053.9786	105030.9705	1773.03	200
5036	263064.5821	105030.8458	1772.94	200
5037	263075.5896	105030.7312	1772.98	200
5038	263088.6198	105030.6525	1772.93	200
5039	263123.5571	105035.3477	1774.99	DRIVEWAY
5040	263101.7870	105035.5210	1775.18	TOP BC
5041	263097.4444	105036.1456	1774.76	GRATE INLET EDGE
5042	263049.7195	105035.8897	1775.53	TOP BC
5043	262995.7956	105036.2847	1775.49	TOP BC
5044	263000.8315	105036.8530	1775.04	GRATE INLET EDGE
5045	262967.8338	105036.6051	1775.37	DROP INLET
5046	262953.0160	105036.7192	1775.39	DROP INLET
5047	262954.5068	105035.3376	1775.44	STORM DRAIN MH
5048	262972.2232	105079.8129	1776.12	STORM DRAIN MH
5049	263045.2037	105079.7220	1776.13	ASPHT ANG PNT
5050	262940.7479	105124.9256	1775.52	DROP INLET
5051	262949.7408	105124.8950	1775.54	DROP INLET
5052	262949.7277	105127.7413	1775.65	DROP INLET
5053	262940.7913	105127.8957	1775.63	DROP INLET
5054	262942.2846	105126.4998	1775.60	STORM DRAIN MH
5055	262940.7750	105130.8836	1775.77	SIDEWALK
5056	262969.0148	105130.6129	1775.77	SIDEWALK
5057	262988.3395	105129.1624	1775.55	SIDEWALK
5058	262989.0316	105124.5231	1775.50	TOP BC
5059	263001.2659	105123.8238	1774.97	GRATE INLET EDGE
5060	263051.0401	105123.9289	1775.55	TOP BC
5061	263098.3009	105122.9372	1774.73	GRATE INLET EDGE
5062	263102.3532	105123.4869	1775.22	TOP BC
5063	263110.4312	105123.4408	1775.21	TOP BC
5064	263109.8307	105128.1630	1778.63	TOP PIPE
5065	263102.3922	105127.6704	1778.65	TOP PIPE
5066	263102.3927	105128.5546	1778.66	TOP PIPE
5067	263076.1721	105127.9064	1778.69	TOP PIPE
5068	263076.1589	105128.7817	1778.68	TOP PIPE
5069	263023.0373	105129.2133	1778.68	TOP PIPE

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5070	263023.0408	105128.3093	1778.67	TOP PIPE
5071	262996.6928	105128.5222	1778.64	TOP PIPE
5072	262996.7044	105129.4067	1778.66	TOP PIPE
5073	262989.2132	105129.0834	1778.62	TOP PIPE
5074	262997.4440	105129.6646	1766.55	
5075	262997.4160	105129.5028	1773.60	VG CORNER
5076	262996.7163	105129.5573	1773.63	VG CORNER
5077	262996.8522	105144.3466	1772.64	VG CORNER
5078	262997.5647	105144.3537	1772.63	VG CORNER
5079	262997.5646	105144.3523	1766.18	VG ANG PNT
5080	262997.6086	105144.4786	1762.58	VG ANG PNT
5081	262993.4637	105156.5770	1762.02	VG ANG PNT
5082	262992.9211	105156.6188	1758.21	VG ANG PNT
5083	262993.3544	105156.3844	1768.48	VG CORNER
5084	262992.8336	105155.6450	1768.46	VG CORNER
5085	262977.4639	105152.0870	1766.47	VG CORNER
5086	262977.3105	105152.7339	1766.52	VG CORNER
5087	262976.6875	105152.6372	1766.18	
5088	262964.6420	105211.4681	1766.31	VG ANG PNT
5089	262965.6237	105211.7140	1766.29	
5090	262981.2061	105214.6378	1758.19	
5091	262994.5531	105153.2957	1763.26	FL
5092	263102.4505	105128.6274	1773.58	VG CORNER
5093	263101.7519	105128.6443	1773.62	VG CORNER
5094	263101.4679	105128.6759	1770.56	
5095	263101.6351	105128.7831	1770.55	
5096	263102.4222	105143.7886	1772.66	VG CORNER
5097	263101.7849	105143.6887	1772.63	VG CORNER
5098	263101.6934	105143.4585	1766.17	VG ANG PNT
5099	263101.6813	105143.6353	1762.39	VG ANG PNT
5100	263094.8999	105180.5245	1758.03	VG ANG PNT
5101	263094.9071	105179.9220	1768.16	VG CORNER
5102	263095.7706	105179.3224	1768.16	VG CORNER
5103	263110.1708	105182.7114	1766.35	VG CORNER
5104	263109.9858	105183.3592	1766.37	VG CORNER
5105	263111.4133	105183.9359	1766.22	VG ANG PNT
5106	263109.9831	105183.5353	1766.15	
5107	263097.7645	105241.6461	1766.21	VG ANG PNT
5108	263097.6051	105241.8279	1766.21	
5109	263079.8854	105238.0532	1758.12	
5110	263127.3613	105187.3956	1775.73	FENCE
5111	263110.2411	105129.2564	1775.07	FENCE
6000	259345.9464	98497.1116	1847.43	BSCK FW10-FW9
6002	259324.5028	98447.2098	1846.96	DRIVEWAY
6003	259299.4281	98447.3766	1846.80	DRIVEWAY
6004	259290.3963	98447.5241	1846.73	DRIVEWAY
6005	259266.5669	98447.6805	1846.51	DRIVEWAY
6006	259260.5155	98447.7488	1846.54	DROP INLET
6007	259249.7176	98447.8925	1846.54	DROP INLET
6008	259214.3248	98448.1238	1846.99	DROP INLET
6009	259207.0566	98448.1811	1847.11	TOP BC
6010	259145.5127	98448.7873	1848.43	TOP BC
6011	259145.5494	98443.6928	1848.56	SIDEWALK
6012	259145.3559	98473.5087	1848.73	ASPHT ANG PNT

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6013	259206.7599	98472.9473	1847.14	ASPHT ANG PNT
6014	259253.3518	98472.7610	1846.81	WORK/CNTL PNT
6015	259296.4565	98472.2747	1846.93	ASPHT ANG PNT
6016	259324.5991	98471.7351	1847.20	ASPHT ANG PNT
6017	259376.5952	98471.4181	1847.72	ASPHT ANG PNT
6018	259377.2724	98496.7928	1847.86	TOP BC
6019	259321.8893	98497.1232	1846.99	DRIVEWAY
6020	259289.3550	98497.4058	1846.64	TOP BC
6021	259282.7943	98497.4408	1846.63	DROP INLET
6022	259257.8706	98497.6899	1846.57	DROP INLET
6023	259235.1978	98497.9750	1846.66	DROP INLET
6024	259229.7962	98498.0204	1846.68	TOP BC
6025	259145.2011	98498.8595	1848.91	TOP BC
6026	259246.5294	98575.7106	1846.80	TOP
6027	259266.1026	98570.2276	1832.26	TOE
6028	259296.9614	98569.1213	1831.19	
6029	259309.8058	98564.3109	1831.97	TOE
6030	259331.2856	98559.6533	1844.43	TOP
6031	259318.3095	98543.1250	1845.73	EDGE RIP RAP
6032	259307.5991	98525.9383	1845.94	EDGE RIP RAP
6033	259305.9709	98526.9012	1847.11	VG CORNER
6034	259306.7394	98526.3921	1847.14	VG CORNER
6035	259288.8169	98502.5560	1847.08	TOP PIPE
6036	259288.7730	98502.6534	1834.32	VG END
6037	259305.8399	98527.0091	1834.38	VG FL
6038	259302.3813	98529.0249	1834.41	VG ANG PNT
6039	259297.5036	98522.2600	1834.40	VG ANG PNT
6040	259273.3797	98522.5605	1834.21	
6041	259238.0105	98523.2608	1834.27	VG ANG PNT
6042	259238.7303	98552.9267	1846.81	EDGE RIP RAP
6043	259231.6765	98530.7843	1847.06	EDGE RIP RAP
6044	259234.1968	98532.8411	1847.00	VG CORNER
6045	259235.1860	98532.6962	1846.98	VG CORNER
6046	259235.1778	98532.6903	1834.23	VG FL
6047	259231.1138	98502.9134	1847.05	TOP PIPE
6048	259231.1034	98503.0124	1834.30	VG END
6049	259229.8684	98502.0405	1847.01	TOP PIPE
6050	259289.3948	98501.5672	1847.08	TOP PIPE
6051	259231.6737	98506.7502	1842.74	FL
6052	259207.1624	98443.9794	1847.40	VG CORNER
6053	259265.4624	98443.0561	1845.24	TOP PIPE
6054	259265.1885	98442.6476	1847.40	TOP PIPE
6055	259265.0878	98442.6789	1834.65	VG END
6056	259259.5609	98428.4779	1845.33	VG CORNER
6057	259260.1620	98428.1925	1845.33	VG CORNER
6058	259214.6052	98340.0896	1847.69	TOP RET WALL
6059	259214.1965	98340.3045	1847.67	TOP RET WALL
6060	259214.1220	98340.2976	1844.63	VG ANG PNT
6061	259205.4331	98345.8015	1837.82	
6062	259180.3828	98362.9720	1837.69	
6063	259172.1852	98369.0496	1844.72	
6064	259171.8799	98369.2072	1844.69	VG ANG PNT
6065	259189.7445	98400.0336	1844.96	VG ANG PNT
6066	259190.0751	98399.8584	1844.90	

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6067	259192.4340	98398.7271	1841.88	GB
6068	259201.6755	98428.3756	1845.42	VG CORNER
6069	259202.2814	98428.1215	1845.40	VG CORNER
6070	259207.6684	98443.0494	1847.40	TOP PIPE
6071	259207.6917	98442.9833	1834.66	VG END
6072	259218.8048	98442.8793	1842.88	200
6073	259230.6155	98442.9022	1842.45	200
6074	259241.8114	98442.7903	1842.45	200
6075	259253.5914	98442.7034	1842.82	200
6076	259213.3115	98428.1190	1835.41	201
6077	259225.1817	98428.2030	1835.16	201
6078	259236.7061	98428.7681	1834.96	201
6079	259248.0823	98428.7166	1834.98	201
6080	259259.7495	98428.8512	1834.95	VG FL
7001	246497.5805	58072.1854	2352.90	BSCK
7002	246585.6136	57939.2445	2352.46	TOP BC
7003	246576.6186	57918.0751	2352.17	TOP BC
7004	246554.8376	57909.5783	2352.99	BC RETURN
7005	246517.3095	57909.3558	2353.90	TOP BC
7006	246517.2596	57908.7105	2353.29	FL
7007	246455.9264	57910.0214	2354.39	FL
7008	246390.4662	57911.3304	2355.26	FL
7009	246390.0809	57913.0069	2355.75	DIA PLAT STEEL
7010	246390.2815	57917.9225	2355.65	DIA PLAT STEEL
7011	246383.1604	57918.1175	2355.86	DIA PLAT STEEL
7012	246382.9930	57913.2235	2355.96	DIA PLAT STEEL
7013	246382.4849	57913.1677	2355.92	TOP BC END
7014	246358.7322	57913.6520	2356.11	TOP BC
7015	246358.8140	57918.6931	2356.28	BW
7016	246382.5617	57918.2882	2355.85	BW
7017	246391.3024	57917.4004	2355.83	FENCE
7018	246447.7662	57916.1493	2354.39	FENCE
7019	246516.7969	57914.7246	2353.86	FENCE
7020	246517.3806	57914.2743	2353.81	BW
7021	246554.5842	57914.7249	2353.10	BW
7022	246573.3071	57921.7369	2352.32	BW
7023	246580.7594	57939.5528	2352.65	BW
7024	246548.8932	57913.5789	2353.29	STREET LIGHT
7025	246551.3945	57914.6738	2353.16	AIR RELSE VALVE
7026	246551.3510	57917.6313	2353.18	AIR RELSE VALVE
7027	246554.2608	57917.7021	2353.14	AIR RELSE VALVE
7028	246554.3381	57914.7418	2353.14	AIR RELSE VALVE
7029	246552.6293	57907.5348	2352.65	WTR VALVE
7030	246519.4303	57911.4406	2353.87	WTR VALVE
7031	246540.3056	57883.9504	2353.41	STRM SWR MH
7032	246517.3654	57915.2426	2353.82	EDGE BRIGE
7033	246455.8697	57916.4743	2354.18	EDGE BRIGE
7034	246390.6683	57917.8676	2355.56	EDGE BRIGE
7035	246391.3835	57917.8696	2355.84	BLOCK WALL
7036	246391.7923	57922.6774	2355.03	BLOCK WALL
7037	246439.6516	57911.6394	2354.56	STREET LIGHT
7038	246383.3995	57918.1819	2355.85	FACE CURB
7039	246391.1499	57922.6039	2355.05	FACE CURB
7040	246386.9655	57913.0530	2355.16	FL

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7041	246387.0673	57918.0577	2354.57	FL
7042	246391.1958	57920.8556	2353.81	FL
7043	246390.7285	57922.7868	2355.08	FACE WALL
7044	246379.6261	57929.9524	2356.27	FACE WALL
7045	246348.2034	57931.2780	2356.85	FACE WALL
7046	246516.0115	57855.0642	2354.08	EXPANTION JOINT
7047	246461.0983	57856.5878	2354.97	CL
7048	246389.4803	57858.1060	2356.03	EXPANTION JOINT
7049	246337.0620	57803.9905	2356.48	TOP BC
7050	246367.4273	57803.4151	2356.08	ANG PT BC
7051	246388.0924	57791.6778	2355.57	END BC
7052	246388.0075	57798.1645	2355.07	EDGE CONC
7053	246381.7974	57800.9588	2355.59	EDGE CONC
7054	246381.3388	57804.7213	2355.94	EDGE CONC
7055	246388.2857	57804.3150	2355.88	EDGE CONC
7056	246388.3894	57804.5005	2355.41	FL
7057	246443.7291	57803.3833	2354.57	FL
7058	246515.0647	57801.8660	2353.48	FL
7059	246515.2094	57801.2965	2353.93	TBC END
7060	246560.3729	57800.4612	2353.06	TBC
7061	246554.5366	57797.7238	2353.73	ELEC MH
7062	246533.3775	57798.7448	2353.70	CATV
7063	246533.3201	57797.1817	2353.71	CATV
7064	246530.6843	57797.3100	2353.66	CATV
7065	246516.3822	57799.4989	2353.84	TRFIC SIG BOX
7066	246516.3311	57797.7917	2353.87	TRFIC SIG BOX
7067	246515.3241	57797.6818	2353.99	TRFIC SIG BOX
7068	246437.3476	57802.0557	2354.60	STREET LIGHT
7069	246344.1153	57801.4708	2356.71	ELEC MH
7070	246362.6906	57798.6436	2356.79	CATV
7071	246362.8327	57801.3323	2356.51	CATV
7072	246366.5309	57801.3872	2356.39	CATV
7073	246382.0758	57801.0382	2355.59	TRFIC SIG BOX
7074	246382.1410	57802.1219	2355.72	TRFIC SIG BOX
7075	246385.3179	57801.6224	2355.59	TRFIC SIG BOX
7076	246373.2997	57801.6591	2355.28	FL
7077	246388.4972	57795.0336	2354.36	FL
7078	246374.6529	57780.6562	2356.92	FACE WALL
7079	246388.2948	57786.4055	2356.15	FACE WALL
7080	246388.2560	57800.0469	2355.98	FACE WALL
7081	246391.0364	57799.9700	2355.76	FACE WALL
7082	246391.1243	57799.0724	2355.67	FACE WALL
7083	246444.8028	57797.8416	2354.45	FACE WALL
7084	246514.8865	57796.4207	2354.11	FACE WALL
7085	246514.9855	57797.4518	2354.06	FACE WALL
7086	246517.8732	57797.3152	2353.99	FACE WALL
7087	246517.7780	57794.4746	2354.19	FACE WALL
7088	246541.7524	57781.6088	2354.06	FACE WALL
7089	246517.2790	57915.3393	2352.79	EDGE CONC
7090	246516.9830	57921.0687	2352.62	EDGE CONC
7091	246496.0208	57921.7832	2350.55	EDGE CONC
7092	246486.5031	57921.9472	2345.14	EDGE CONC
7093	246485.7937	57916.9445	2344.67	EDGE CONC
7094	246481.3022	57916.9083	2342.19	EDGE CONC

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7095	246469.1972	57917.6249	2337.71	TOE
7096	246471.1655	57913.2467	2338.53	PILER
7097	246474.3488	57908.2550	2337.95	EDGE CONC
7098	246486.3929	57919.3620	2344.82	FL
7099	246495.7568	57919.1496	2350.34	FL
7100	246514.0562	57918.4561	2351.75	FL
7101	246513.3937	57970.6122	2352.72	NG
7102	246496.5126	57970.6738	2351.39	TOP
7103	246488.3030	57970.5915	2345.41	TOE
7104	246480.5970	57970.0540	2345.06	TOP
7105	246480.0850	57969.8295	2342.18	TOE
7106	246471.1555	57969.7247	2338.19	TOE
7107	246469.1933	57915.7085	2352.11	BTM BRIDGE
7108	246473.2105	57915.6630	2352.05	BTM BRIDGE
7109	246478.6006	57915.5596	2352.67	BTM BRIDGE
7110	246495.4953	57915.2148	2352.49	FRNT FACE BKWALL
7111	246495.4966	57915.2014	2351.38	FRNT FACE BKWALL
7112	246477.2432	57885.5826	2339.66	INV RCP
7113	246470.8756	57899.6262	2338.08	PILER
7114	246470.7026	57885.9083	2337.64	PILER
7115	246470.3860	57872.7970	2338.49	PILER
7116	246470.3934	57859.1696	2339.27	PILER
7117	246470.6078	57853.1679	2339.17	PILER
7118	246443.4850	57970.1770	2338.19	TOE
7119	246412.4986	57972.1388	2354.93	TOP
7120	246409.2373	57977.0649	2354.44	FACE WALL
7121	246408.5448	57946.4860	2354.33	FACE WALL
7122	246403.9958	57931.2296	2354.49	FACE WALL
7123	246399.2040	57923.6344	2353.89	FACE CURB
7124	246412.1586	57923.4601	2351.81	FACE CURB
7125	246420.3828	57923.0859	2347.17	FACE CURB
7126	246421.0059	57920.7556	2345.50	FL
7127	246411.8894	57920.5243	2350.61	FL
7128	246397.7778	57920.7818	2352.77	FL
7129	246412.5347	57917.5266	2350.98	FRNT FACE BKWALL
7130	246412.6353	57917.1973	2353.41	FRNT FACE BKWALL
7131	246421.1637	57917.9218	2350.00	EDGE CONC
7132	246426.5260	57916.6840	2353.44	BTM BRIDGE
7133	246434.5075	57916.4978	2352.63	BTM BRIDGE
7134	246438.4939	57916.3770	2352.57	BTM BRIDGE
7135	246436.6717	57914.2976	2338.27	PILER
7136	246436.5300	57900.9769	2338.90	PILER
7137	246436.2777	57887.3097	2338.20	PILER
7138	246436.0276	57873.7280	2338.36	PILER
7139	246435.8063	57860.3351	2338.32	PILER
7140	246435.6369	57854.1285	2338.28	PILER
7141	246435.4289	57840.7974	2338.56	PILER
7142	246435.1285	57827.0816	2338.56	PILER
7143	246434.7503	57813.5405	2338.74	PILER
7144	246434.1965	57799.9098	2339.70	PILER
7145	246428.7036	57886.4239	2339.73	INV RCP
7146	246433.3843	57913.0874	2338.26	EDGE CONC
7147	246443.6248	57784.6379	2340.41	FLY
7148	246489.9391	57744.7455	2353.13	FACE WALL

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7149	246495.4262	57761.0301	2353.20	FACE WALL
7150	246515.7386	57794.3547	2353.63	FACE WALL
7151	246514.8621	57795.2912	2352.81	FACE WALL
7152	246513.0035	57790.2485	2353.24	EDGE CONC
7153	246493.1999	57789.8130	2351.41	EDGE CONC
7154	246483.7101	57790.2351	2346.18	EDGE CONC
7155	246483.9347	57794.9923	2346.04	EDGE CONC
7156	246477.3688	57795.1841	2341.86	EDGE CONC
7157	246468.8897	57798.9795	2339.83	PILER
7158	246469.4789	57812.6539	2339.42	PILER
7159	246469.7693	57826.4059	2338.94	PILER
7160	246470.0509	57839.6903	2338.85	PILER
7161	246494.1756	57855.6489	2351.38	FRNT FACE BKWALL
7162	246494.1584	57855.6562	2353.08	FRNT FACE BKWALL
7163	246493.0844	57795.7156	2351.71	FRNT FACE BKWALL
7164	246492.9561	57796.0978	2352.37	FRNT FACE BKWALL
7165	246511.0295	57793.3495	2352.50	FL
7166	246493.2970	57792.5223	2351.20	FL
7167	246484.3358	57792.4473	2346.25	FL
7168	246476.1848	57796.6007	2352.67	BTM BRIDGE
7169	246471.1650	57796.7688	2352.09	BTM BRIDGE
7170	246467.1346	57796.8354	2352.14	BTM BRIDGE
7171	246462.7154	57796.9071	2352.68	BTM BRIDGE
7172	246441.3990	57797.3478	2353.08	BTM BRIDGE
7173	246436.3912	57797.4724	2352.62	BTM BRIDGE
7174	246431.8601	57797.5284	2352.73	BTM BRIDGE
7175	246426.9697	57797.6111	2353.43	BTM BRIDGE
7176	246410.0933	57797.3750	2351.83	FRNT FACE BKWALL
7177	246410.1018	57797.3783	2353.76	FRNT FACE BKWALL
7178	246411.3410	57857.4319	2354.33	FRNT FACE BKWALL
7179	246411.3704	57857.2668	2351.39	FRNT FACE BKWALL
7180	246391.0316	57797.9206	2354.19	FACE WALL
7181	246390.9325	57797.0656	2354.28	FACE WALL
7182	246388.3653	57797.0938	2354.47	FACE WALL
7183	246397.6801	57787.3453	2355.17	FACE WALL
7184	246400.0991	57786.2270	2355.15	FACE WALL
7185	246398.8540	57783.5922	2353.86	FACE WALL
7186	246393.1425	57771.4196	2354.69	FACE WALL
7187	246397.9251	57772.1948	2354.06	TOP
7188	246400.2147	57786.1733	2354.62	EDGE CONC
7189	246409.3009	57789.4517	2352.10	EDGE CONC
7190	246413.1291	57790.8222	2349.52	EDGE CONC
7191	246417.9576	57790.8504	2347.00	EDGE CONC
7192	246418.1186	57795.9456	2346.71	EDGE CONC
7193	246424.9670	57795.7735	2342.70	EDGE CONC
7194	246436.1197	57793.3460	2339.80	TOE
7195	246425.0909	57766.0142	2341.74	TOE
7196	246443.1948	57762.3263	2341.63	CL WASH
7197	246454.4195	57759.5004	2341.58	TOE
7198	246490.1256	57753.5896	2352.67	TOP
7199	246466.8236	57775.1952	2339.56	INV 18IN RCP
7200	246451.0780	57794.5073	2338.49	CL WASH
7201	246452.6178	57832.1743	2337.78	CL WASH
7202	246456.2593	57934.6910	2337.90	CL WASH

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7203	246455.6735	57972.8472	2338.10	CL WASH
7302	244326.6828	52867.5578	2415.46	BSCK
7303	244325.4156	52793.9285	2415.08	TOP BC
7304	244324.5543	52736.7742	2414.88	TOP BC
7305	244323.8855	52689.9163	2414.78	TOP BC
7306	244322.8251	52621.9914	2414.74	TOP BC END
7307	244324.8461	52623.0855	2414.63	EDGE ASPHALT
7308	244349.8122	52621.0117	2415.19	ASPHT ANG PNT
7309	244349.9382	52566.7712	2415.35	EDGE ASPHALT
7310	244391.9315	52562.5222	2415.18	TOP BC
7311	244392.9163	52630.4638	2414.95	TOP BC
7312	244393.9605	52699.9852	2414.68	TOP BC
7313	244395.2149	52782.4354	2414.67	TOP BC
7314	244400.0776	52776.2109	2414.81	SIDEWALK
7315	244399.1202	52708.5597	2414.78	SIDEWALK
7316	244397.9840	52629.6680	2415.10	SIDEWALK
7317	244415.4350	52634.8781	2415.90	FACE WALL
7318	244413.6158	52662.5303	2415.00	FACE WALL
7319	244413.5577	52662.1550	2414.75	FENCE
7320	244404.8371	52673.8093	2414.04	FENCE
7321	244401.1012	52681.5618	2413.20	FENCE
7322	244401.8402	52721.6101	2413.23	FENCE
7323	244403.7418	52745.1398	2414.80	FENCE
7324	244403.4275	52745.4129	2414.78	FACE WALL
7325	244403.5282	52748.1375	2415.28	FACE WALL
7326	244404.8718	52748.4152	2415.83	WALL ANG PNT
7327	244406.7567	52759.7651	2415.09	FACE WALL
7328	244399.7114	52744.3441	2414.69	FACE CURB
7329	244400.5587	52744.1868	2414.67	FACE CURB
7330	244403.1405	52740.8288	2414.00	FACE CURB
7331	244402.3264	52734.1314	2413.44	FACE CURB
7332	244399.6240	52738.4871	2414.66	FACE CURB
7333	244399.8557	52740.8299	2413.56	FL
7334	244399.3885	52738.6627	2414.73	DIA PLATE STEEL
7335	244394.0958	52738.7753	2414.58	DIA PLATE STEEL
7336	244394.1964	52744.5776	2414.58	DIA PLATE STEEL
7337	244399.5862	52744.4044	2414.75	DIA PLATE STEEL
7338	244398.4656	52725.1883	2414.74	STREET LIGHT
7339	244399.9970	52727.3700	2414.57	HAND RAIL
7340	244399.4221	52707.2621	2414.63	HAND RAIL
7341	244398.6541	52675.5233	2414.87	HAND RAIL
7342	244398.9581	52679.0560	2414.92	DIA PLATE STEEL
7343	244393.1540	52679.2320	2414.78	DIA PLATE STEEL
7344	244393.0181	52673.2885	2414.81	DIA PLATE STEEL
7345	244398.8304	52673.1693	2414.91	DIA PLATE STEEL
7346	244398.7110	52672.6210	2414.89	FACE CURB
7347	244403.6819	52675.5594	2413.05	FACE CURB
7348	244358.8537	52757.6552	2414.90	ASPHALT
7349	244357.9466	52693.2410	2415.09	ASPHALT
7350	244356.7197	52610.5335	2415.32	ASPHALT
7351	244323.5582	52639.8118	2414.90	DIA PLATE STEEL
7352	244323.6052	52645.7563	2414.91	DIA PLATE STEEL
7353	244318.2189	52645.7916	2415.00	DIA PLATE STEEL
7354	244318.1090	52639.8796	2415.01	DIA PLATE STEEL

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7355	244322.9689	52638.9595	2414.87	EDGE CONC
7356	244317.7539	52639.1231	2415.00	EDGE CONC
7357	244323.6010	52661.5810	2414.84	FW57
7358	244326.6820	52867.5030	2415.47	FW58
7359	244317.8924	52646.5671	2414.96	EDGE CONC
7360	244323.2594	52646.4809	2414.91	EDGE CONC
7361	244315.3167	52633.7301	2414.64	FENCE
7362	244316.0000	52662.2755	2414.54	FENCE
7363	244316.2933	52690.9646	2414.05	FENCE ANG PNT
7364	244291.1247	52714.4577	2419.75	FENCE
7365	244311.2124	52697.1789	2413.43	FACE CURB
7366	244316.4895	52701.9352	2414.78	FACE CURB
7367	244318.5479	52701.8207	2414.80	FACE CURB
7368	244318.7610	52701.9669	2414.86	EDGE CONC
7369	244324.1044	52701.8541	2414.76	EDGE CONC
7370	244323.9081	52694.4751	2414.75	EDGE CONC
7371	244318.6169	52694.7018	2414.86	EDGE CONC
7372	244316.4970	52691.7560	2414.28	EDGE CONC
7373	244318.9243	52695.4126	2414.88	DIA PLATE STEEL
7374	244319.0591	52701.1159	2414.84	DIA PLATE STEEL
7375	244324.4532	52701.0076	2414.79	DIA PLATE STEEL
7376	244324.3524	52695.2675	2414.80	DIA PLATE STEEL
7377	244324.4531	52698.1911	2414.22	INV
7378	244318.6718	52698.4324	2414.03	INV
7379	244394.0123	52741.7764	2413.89	INV
7380	244393.1115	52676.2429	2414.22	INV
7381	244399.1780	52676.2044	2413.77	INV
7382	244323.6375	52643.0420	2414.40	INV
7383	244318.0387	52642.4950	2414.22	INV
7384	244310.2914	52638.1624	2413.78	EDGE CONC
7385	244309.1937	52642.2503	2412.36	EDGE CONC
7386	244311.5799	52642.9974	2412.76	EDGE CONC
7387	244314.1693	52646.2757	2413.94	EDGE CONC
7388	244311.8336	52643.0169	2412.87	WING WALL
7389	244315.0880	52649.7583	2414.25	COR HEAD WING
7390	244315.8280	52689.9792	2414.20	COR HEAD WING
7391	244309.6938	52692.8943	2411.72	WING WALL
7392	244307.9280	52694.2897	2412.38	FACE CURB
7393	244315.6950	52683.7595	2406.69	INV
7394	244315.3781	52669.8851	2406.47	INV
7395	244315.1107	52657.5379	2406.64	INV
7396	244314.4396	52666.2912	2406.99	FACE CURB
7397	244296.4069	52656.9928	2407.09	FACE CURB
7398	244274.3555	52640.6411	2406.96	FACE CURB
7399	244270.3400	52644.9390	2406.96	FACE CURB
7400	244292.4588	52661.6775	2406.98	FACE CURB
7401	244313.9227	52672.6356	2406.96	FACE CURB
7402	244311.8463	52668.3407	2406.48	FL
7403	244291.6711	52657.8601	2406.52	FL
7404	244272.4471	52642.5045	2406.48	FL
7405	244235.6486	52674.2329	2420.58	NG
7406	244262.7904	52695.4351	2420.23	NG
7407	244290.0687	52709.6946	2419.73	NG
7408	244296.7880	52700.5650	2418.05	TOP

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7409	244270.3232	52690.2122	2419.83	TOP
7410	244245.0224	52668.2976	2419.82	TOP
7411	244253.2857	52661.5012	2414.40	TOP RIP RAP
7412	244271.1324	52675.9233	2414.37	TOP RIP RAP
7413	244299.7206	52690.9451	2413.24	TOP RIP RAP
7414	244308.5595	52685.6448	2407.53	TOE RIP RAP
7415	244285.9098	52667.0534	2407.10	TOE RIP RAP
7416	244264.9856	52649.1088	2407.36	TOE RIP RAP
7417	244279.2696	52634.0833	2407.32	TOE RIP RAP
7418	244292.5463	52644.5073	2407.26	TOE RIP RAP
7419	244307.1850	52649.7637	2407.19	TOE RIP RAP
7420	244307.1411	52638.2190	2414.09	TOP RIP RAP
7421	244289.7755	52625.1160	2414.76	TOP RIP RAP
7422	244300.1685	52613.1079	2415.06	NG
7423	244319.3680	52706.6744	2414.34	TOE
7424	244318.5451	52750.8780	2415.27	TOE
7425	244305.1035	52753.6082	2418.89	TOP
7426	244303.0597	52721.5922	2419.28	TOP
7427	244291.5212	52738.9774	2419.67	NG
7428	244402.4540	52687.5435	2405.49	INV
7429	244402.1568	52701.1898	2405.41	INV
7430	244402.8300	52714.7360	2405.47	INV
7431	244410.2360	52731.7346	2412.00	FACE CURB
7432	244405.1579	52729.5049	2411.92	FACE CURB
7433	244405.4668	52729.1321	2411.94	WING WALL
7434	244402.4913	52721.8215	2413.19	COR HEAD WING
7435	244401.7604	52681.4951	2413.16	COR HEAD WING
7436	244407.6302	52678.7215	2410.94	WING WALL
7437	244407.9297	52678.0374	2411.53	FACE CURB
7438	244414.4124	52658.4182	2419.01	FACE WALL
7439	244446.6337	52672.7328	2418.96	FACE WALL
7440	244445.9202	52679.5697	2416.77	TOP
7441	244445.0509	52682.9565	2412.12	TOE
7442	244438.4585	52698.1466	2410.44	TOP
7443	244438.2629	52698.9046	2405.91	TOE
7444	244414.3600	52684.1126	2406.35	TOE
7445	244417.4103	52680.6814	2412.28	TOP
7446	244424.0373	52670.7784	2413.38	TOE
7447	244434.5030	52733.9783	2406.09	TOE
7448	244411.2349	52729.8869	2406.26	TOE
7449	244412.7288	52732.3616	2410.05	TOP
7450	244431.1811	52735.2994	2409.99	TOP
7451	244432.3140	52761.6510	2416.12	FACE WALL
7452	244406.6154	52746.6477	2415.68	FACE WALL
7453	244406.3698	52745.3105	2415.71	FACE WALL
7454	244446.7039	52722.2620	2406.13	CL WASH
7455	244421.2403	52710.1086	2405.96	CL WASH
7500	258153.8036	97987.3499	1867.30	BSCK FW12-FW11
7501	258153.8021	97987.3526	1867.30	BSCK 12-11 4/25
7502	258147.1822	98127.8759	1865.67	SIDEWALK
7503	258153.2627	98128.1995	1865.52	TOP BC
7504	258155.2084	98128.2982	1865.11	EDGE CONC
7505	258155.4420	98078.0983	1865.70	EDGE CONC
7506	258153.5367	98078.0923	1866.09	TOP BC

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7507	258147.4887	98078.0417	1866.20	SIDEWALK
7508	258148.5400	98065.4900	1866.30	STREET LIGHT
7509	258150.1565	98048.1297	1866.50	SIDEWALK
7510	258147.6929	98030.8142	1866.80	SIDEWALK
7511	258153.7208	98030.8653	1866.66	DRIVEWAY
7512	258155.5577	98030.7983	1866.30	EDGE CONC
7513	258155.8133	97990.5753	1866.85	EDGE CONC
7514	258153.8388	97990.5602	1867.28	DRIVEWAY
7515	258147.7835	97990.6429	1867.52	SIDEWALK
7516	258147.7928	97954.0811	1868.05	SIDEWALK
7517	258155.9892	97963.7014	1867.25	EDGE CONC
7518	258153.9923	97963.8716	1867.65	TOP BC ANG PNT
7519	258152.9374	97949.8969	1868.10	TOP BC ANG PNT
7520	258152.9538	97944.8777	1868.19	TOP BC
7521	258153.6809	97944.8730	1867.39	FL
7522	258153.6310	97949.9217	1867.27	FL
7523	258152.9478	97947.3874	1868.15	DROP INLET
7524	258152.9462	97941.8282	1868.25	TOP BC ANG PNT
7525	258154.8324	97941.8789	1867.59	EDGE CONC
7526	258155.1953	97874.8224	1868.73	EDGE CONC
7527	258153.2724	97874.7880	1869.35	TOP BC ANG PNT
7528	258148.8313	97955.1721	1868.08	SIDEWALK
7529	258149.0768	97875.0449	1869.38	SIDEWALK
7530	258148.3659	97874.1900	1869.44	SIDEWALK
7531	258148.5839	97839.2047	1870.03	SIDEWALK
7532	258153.5559	97839.7908	1869.81	TOP BC
7533	258154.1464	97839.6885	1869.11	FL
7534	258155.4058	97839.7664	1869.18	EDGE CONC
7535	258155.6915	97785.9898	1870.22	EDGE CONC
7536	258154.3254	97785.6820	1870.13	FL
7537	258153.6925	97785.6177	1870.59	TOP BC
7538	258148.7350	97785.5953	1870.76	SIDEWALK
7539	258198.7357	97784.3127	1871.36	ASPHALT
7540	258197.8794	97838.8105	1870.37	ASPHALT
7541	258197.8966	97892.9038	1869.48	ASPHALT
7542	258198.0283	97943.0508	1868.67	ASPHALT
7543	258197.2334	97990.4755	1867.87	ASPHALT
7544	258196.7277	98042.9941	1866.98	ASPHALT
7545	258196.9931	98094.6100	1866.33	ASPHALT
7546	258195.8693	98130.4354	1865.98	ASPHALT
7547	258240.2813	98129.3487	1865.09	EDGE CONC
7548	258242.2493	98129.5281	1865.42	TOP BC
7549	258247.2713	98129.4650	1865.56	SIDEWALK
7550	258246.2073	98129.3647	1865.57	STREET LIGHT
7551	258245.5733	98122.1059	1865.63	GUY ANCHOR
7552	258245.3799	98104.6020	1865.88	SERVICE POLE
7553	258247.4861	98079.7974	1866.26	SIDEWALK
7554	258242.4400	98088.8013	1865.99	TOP BC
7555	258242.5530	98074.9563	1866.25	TOP BC
7556	258241.9886	98074.7864	1865.51	FL
7557	258240.6841	98074.6929	1865.62	EDGE CONC
7558	258245.3110	98057.7480	1866.51	WATER MANHOLE
7559	258244.7529	98055.5901	1866.53	WATER MANHOLE
7560	258247.5784	98054.4172	1866.54	SIDEWALK

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7561	258246.5663	98053.5828	1866.56	SIDEWALK
7562	258242.6071	98053.5090	1866.53	TOP BC
7563	258241.9588	98053.5592	1865.76	FL
7564	258240.7384	98053.5581	1865.95	EDGE CONC
7565	258240.8838	97982.8041	1867.11	EDGE CONC
7566	258242.9112	97982.9955	1867.71	TOP BC
7567	258242.8835	97978.0023	1867.80	TOP BC
7568	258242.2202	97978.1299	1867.02	FL
7569	258240.9063	97978.1918	1867.20	EDGE CONC
7570	258242.9046	97980.4708	1867.76	DROP INLET
7571	258242.9014	97974.3239	1867.79	DRIVEWAY
7572	258246.8685	97974.5411	1867.90	SIDEWALK
7573	258247.8148	97974.5120	1867.91	SIDEWALK
7574	258248.0128	97943.8021	1868.44	SIDEWALK
7575	258243.0112	97945.1558	1868.30	DRIVEWAY
7576	258242.3339	97945.1214	1867.53	FL
7577	258241.0236	97945.0326	1867.77	EDGE CONC
7578	258236.8167	97940.8303	1867.92	STORM DRAIN
7579	258246.6159	97943.6661	1868.41	POWER POLE
7580	258247.2348	97936.1366	1868.55	STREET LIGHT
7581	258248.9557	97930.4222	1868.65	HYDRANT
7582	258248.1579	97903.2892	1869.12	SIDEWALK
7583	258243.2155	97903.9520	1869.05	DRIVEWAY
7584	258242.6030	97904.0338	1868.31	FL
7585	258241.2277	97904.1946	1868.41	EDGE CONC
7586	258243.1711	97898.2321	1868.49	DRIVEWAY
7587	258243.2714	97873.6606	1868.96	DRIVEWAY
7588	258243.3185	97869.9150	1869.28	DRIVEWAY
7589	258242.6876	97869.8205	1868.86	FL
7590	258241.3449	97869.9263	1868.96	EDGE CONC
7591	258241.5006	97836.6718	1869.55	EDGE CONC
7592	258242.8922	97836.6977	1869.43	FL
7593	258243.4563	97836.6919	1869.88	TOP BC
7594	258248.4662	97836.8876	1870.00	SIDEWALK
7595	258246.4628	97818.7897	1870.20	TRAFFIC SIGNAL BOX
7596	258248.5197	97789.5884	1870.87	POWER POLE
7597	258248.7195	97781.9016	1871.00	SIDEWALK
7598	258243.7538	97782.0180	1870.79	DRIVEWAY
7599	258243.0984	97782.1005	1870.37	FL
7600	258241.7419	97782.1307	1870.47	EDGE CONC
7601	258232.3754	97783.8848	1870.73	WATER VALVE
7602	258160.3919	97785.1175	1870.49	WATER VALVE
7603	258153.8006	97987.3491	1867.30	BSCK 12-11
7604	258104.5010	97773.3637	1872.61	NG
7605	258101.1252	97777.6086	1872.44	ALCAP
7606	258098.3923	97790.8558	1872.21	TOP
7607	258136.3072	97832.3314	1870.44	TOP
7608	258134.3056	97784.7561	1872.58	TOP
7609	258137.0566	97837.8280	1867.58	GB
7610	258143.0390	97859.6471	1864.33	GB
7611	258112.3191	97846.8606	1858.46	TOE
7612	258090.8945	97815.7076	1860.08	TOE
7613	258084.9128	97823.1982	1859.51	GB
7614	258081.7639	97826.7306	1857.06	TOE

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7615	258108.0611	97854.2358	1856.49	TOE
7616	258111.1743	97850.1335	1857.51	GB
7617	258058.2550	97907.8696	1869.94	NG
7618	258062.4945	97889.1420	1869.37	TOP
7619	258101.9477	97923.7001	1867.36	TOP
7620	258114.1815	97942.8345	1867.24	TOP
7621	258117.0839	97943.3672	1865.99	GB
7622	258122.9858	97944.9476	1864.58	GB
7623	258128.2687	97946.6992	1861.98	GB
7624	258132.2864	97947.6464	1859.67	GB
7625	258140.0958	97950.3955	1856.04	TOE
7626	258135.5913	97940.1595	1856.17	TOE
7627	258129.2662	97933.2830	1856.27	TOE
7628	258126.0896	97932.2015	1858.01	GB
7629	258115.4846	97917.8981	1858.44	GB
7630	258064.3988	97870.2188	1859.41	GB
7631	258068.7057	97853.0017	1858.63	GB
7632	258069.7694	97845.9430	1858.09	GB
7633	258070.8342	97843.8181	1856.51	TOE
7634	258106.7119	97879.8052	1856.31	TOE
7635	258105.5883	97882.7141	1858.16	GB
7636	258103.0625	97891.4920	1858.73	GB
7637	258118.3261	97908.7372	1857.69	GB
7638	258124.2708	97899.1721	1857.04	GB
7639	258124.9359	97897.5426	1856.17	TOE
7640	258136.1582	97927.8704	1856.31	CONC ANG PNT
7641	258137.2773	97871.2540	1856.71	CONC
7642	258137.1277	97879.9141	1856.67	DAYLIGHT
7643	258136.8518	97894.4158	1856.75	DAYLIGHT
7644	258136.4350	97909.8014	1856.54	DAYLIGHT
7645	258136.3389	97925.5589	1856.42	DAYLIGHT
7646	258147.9320	97890.3206	1864.92	DAYLIGHT
7647	258144.9637	97887.4899	1863.25	DAYLIGHT
7648	258142.6188	97885.1176	1861.96	DAYLIGHT
7649	258139.3019	97881.8169	1859.46	DAYLIGHT
7650	258147.9351	97906.3289	1864.52	DAYLIGHT
7651	258147.8791	97921.6504	1864.28	DAYLIGHT
7652	258147.8697	97937.3218	1864.07	DAYLIGHT
7653	258137.3318	97837.9297	1870.29	TOP WALL
7654	258138.3692	97837.6514	1870.29	TOP WALL
7655	258148.1897	97874.2783	1870.17	TOP WALL
7656	258147.2677	97874.4729	1870.17	TOP WALL
7657	258148.0523	97875.4233	1870.16	TOP WALL
7658	258148.9715	97875.0802	1870.17	TOP WALL
7659	258148.6821	97954.3648	1869.03	TOP WALL
7660	258147.8677	97952.8895	1869.00	TOP WALL
7661	258117.2180	97943.5716	1868.94	TOP WALL
7662	258116.9242	97944.5906	1868.95	TOP WALL
7663	258333.9866	98028.2061	1866.46	FENCE
7664	258309.5267	98002.6917	1866.52	FENCE
7665	258287.0462	97975.8459	1867.75	FENCE ANG PNT
7666	258264.5980	97975.5155	1867.21	FENCE
7667	258260.5469	97979.6758	1866.43	GATE
7668	258256.6763	97983.9793	1866.38	FENCE ANG PNT

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7669	258247.4642	97975.1459	1868.07	FENCE ANG PNT
7670	258247.0619	98052.9343	1867.14	FENCE ANG PNT
7671	258247.8670	98054.8001	1866.54	FENCE ANG PNT
7672	258255.6523	98066.0598	1865.27	FENCE
7673	258278.4492	98084.7733	1863.88	FENCE
7674	258308.6676	98107.7561	1862.50	FENCE
7675	258153.4889	97829.6333	1869.93	BSCK 11-12
7676	258247.8380	97974.5422	1868.11	TOP WALL
7677	258246.9578	97974.5494	1868.15	TOP WALL
7678	258247.8063	97975.8567	1868.08	TOP WALL
7679	258247.5781	98053.2759	1867.17	TOP WALL
7680	258246.7164	98053.4200	1867.17	TOP WALL
7681	258251.9925	97980.4282	1856.92	FL PIPE
7682	258259.1343	97987.1276	1865.88	EDGE CONC
7683	258259.5540	97986.7311	1865.84	EDGE CONC
7684	258297.0662	98022.2150	1862.69	EDGE CONC
7685	258153.4889	97829.6409	1869.93	BSCK 11-12
7686	258304.9930	98007.0658	1863.76	NG
7687	258293.4087	98018.7259	1862.98	EDGE CONC
7688	258293.1691	98019.1010	1862.96	GB
7689	258289.9023	98022.9274	1860.10	GB
7690	258290.2337	98023.6779	1853.23	FL
7691	258328.9650	98068.2845	1852.34	FL
7692	258335.9023	98059.6831	1859.53	GB
7693	258336.1624	98059.3650	1859.45	EDGE CONC
7694	258345.3696	98046.6392	1860.78	NG
7695	258319.5309	98081.9158	1852.32	FL
7696	258311.5961	98092.9833	1852.34	FL
7697	258306.3673	98101.0079	1862.53	TOP WALL
7698	258305.6865	98101.1616	1862.49	TOP WALL
7699	258306.0866	98101.4616	1862.48	TOP WALL
7700	258259.2037	98065.5178	1864.90	TOP WALL
7701	258259.5503	98065.0824	1864.90	TOP WALL
7702	258259.6485	98065.0045	1861.97	FL
7703	258259.5282	98064.8941	1853.40	GB
7704	258247.8411	98038.2546	1853.67	FL
7705	258247.7608	98021.7008	1853.83	FL
7706	258247.8440	98006.6497	1853.91	FL
7707	258247.7969	97990.2566	1854.17	FL
7802	253351.6190	83968.8630	2047.47	BSCK
7803	253361.6863	83966.2526	2047.50	SIDEWALK
7804	253356.9048	83966.6079	2047.47	BLK WALL
7805	253323.2672	83976.3494	2047.04	SIDEWALK
7806	253272.1410	83989.3204	2046.61	SIDEWALK
7807	253230.9265	83999.6213	2046.78	SIDEWALK
7808	253229.6806	83994.8431	2046.62	TOP BC
7809	253289.3794	83979.7930	2046.68	TOP BC
7810	253324.6053	83970.8458	2047.07	TOP BC
7811	253364.7038	83960.6462	2047.37	TOP BC
7812	253355.1750	83926.2685	2047.82	ASPHALT
7813	253308.0555	83937.8164	2047.30	ASPHALT
7814	253263.3790	83949.0573	2046.96	ASPHALT
7815	253224.2098	83959.3944	2047.02	ASPHALT
7816	253217.2031	83925.2169	2047.11	TOP BC

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7817	253261.6359	83914.0172	2047.14	TOP BC
7818	253337.0792	83895.1927	2048.36	BC RETURN
7819	253347.7364	83885.2348	2048.91	POC
7820	253347.5234	83856.0039	2049.39	BC RETURN
7821	253356.5122	84006.4922	2047.07	FACE WALL
7822	253356.1025	84012.8479	2047.18	FENCE
7823	253319.1993	84012.2563	2046.47	FENCE
7824	253316.9779	83996.2126	2046.58	FENCE
7825	253280.3939	83996.4371	2046.48	FENCE
7826	253274.6549	84000.1684	2046.11	FENCE
7827	253271.1325	84019.8448	2044.94	FENCE
7828	253351.4930	83968.8950	2047.55	FW28
7829	253172.1630	84014.3840	2047.36	FW29
7830	253248.6427	84019.9144	2045.20	FENCE
7831	253248.1801	84056.9016	2045.16	FENCE
7832	253229.7026	84056.3539	2045.01	ASPHALT
7833	253227.7637	84038.7828	2044.49	ASPHALT
7834	253230.2840	84006.2856	2046.47	ASPHALT
7835	253252.6957	83995.2770	2046.54	BALLARD
7836	253256.6461	83994.3397	2046.51	BALLARD
7837	253260.4697	83993.3864	2046.50	BALLARD
7838	253250.8116	83995.1337	2046.65	EDGE ASPHALT
7839	253250.7359	84010.5425	2045.62	EDGE ASPHALT
7840	253262.5697	84007.8791	2045.23	NG
7841	253241.8304	84027.6004	2044.39	POWER POLE
7842	253242.3468	84004.0436	2046.29	GUY ANCHOR
7843	253242.5938	83992.6667	2046.53	POWER POLE
7844	253301.2999	83989.3995	2046.43	NG
7845	253336.8151	83985.9111	2046.72	NG
7846	253337.7032	84017.5902	2046.20	NG
7847	253339.5073	84049.8121	2046.40	NG
7848	253356.1285	84052.2977	2046.15	FACE WALL
7849	253324.9965	84052.7168	2045.92	TOP RET WALL
7850	253320.9907	84026.3674	2046.13	TOP RET WALL
7851	253317.0520	83999.6947	2046.35	COR RET WING WLL
7852	253312.0978	83997.6548	2046.34	WING WALL
7853	253312.0608	83997.0273	2046.26	HEAD WALL
7854	253312.0608	83997.0273	2043.26	HEAD WALL
7855	253281.2679	83996.9313	2046.24	HEAD WALL
7856	253281.4056	83997.5545	2046.29	WING WALL
7857	253275.9891	84000.7977	2046.26	COR RET WING WLL
7858	253270.6085	84032.1555	2045.72	TOP RET WALL
7859	253266.6136	84055.1931	2039.73	TOP RET WALL
7860	253265.8320	84055.5221	2039.64	TOP RET WALL
7861	253265.7012	84054.6273	2038.33	CONC
7862	253251.2205	84053.5155	2038.85	CONC
7863	253251.1027	84055.5282	2045.39	TOP RET WALL
7864	253250.1589	84055.5619	2045.41	TOP RET WALL
7865	253250.0718	84055.5159	2044.93	EDGE ASPHALT
7866	253251.2834	84032.5508	2044.55	TOP RET WALL
7867	253250.5945	84031.9189	2043.51	EDGE ASPHALT
7868	253251.3601	84032.5264	2043.54	EDGE CONC
7869	253269.4985	84032.2653	2042.88	EDGE CONC
7870	253267.3426	84052.1230	2034.32	CONC

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7871	253293.9190	84051.9751	2033.89	CONC
7872	253296.6648	84052.0705	2033.71	FL
7873	253298.8704	84052.0210	2033.99	CONC
7874	253318.1252	84009.2546	2034.34	CONC
7875	253314.7632	83998.9377	2036.57	INV
7876	253312.0147	83997.8881	2034.22	INV
7877	253296.7435	83997.1213	2034.01	INV
7878	253281.5647	83997.6489	2034.23	INV
7879	253275.3553	84003.8963	2039.08	INV
7880	253275.0354	84008.6488	2034.39	CONC
7881	253296.3462	84013.8599	2033.94	FL
8002	252928.2362	75453.8089	2133.79	BSCHK
8003	252863.6694	75147.9409	2134.79	NG
8004	252880.1696	75151.6425	2133.05	TOP RIP RAP
8005	252894.0814	75154.2939	2126.77	TOE RIP RAP
8006	252900.7232	75155.9864	2125.17	TOE
8007	252942.2011	75167.7853	2124.65	FL
8008	252983.1471	75182.8512	2124.78	TOE
8009	252992.5657	75184.9756	2127.07	TOE RIP RAP
8010	253006.5400	75187.1682	2132.75	TOP RIP RAP
8011	253024.7826	75191.1944	2135.00	NG
8012	253035.2311	75165.1898	2135.69	TOE
8013	253038.0797	75141.6768	2140.07	RR BERM
8014	253041.7075	75136.1933	2142.66	RAIL
8015	253044.2766	75132.0518	2142.66	RAIL
8016	253050.6410	75123.7466	2141.61	CL RR ROW
8017	253057.8355	75116.3671	2142.65	RAIL
8018	253060.4472	75112.3094	2142.61	RAIL
8019	253065.9168	75102.6440	2139.53	RR BERM
8020	253074.9029	75087.7086	2138.16	NG
8021	253117.3358	75112.1122	2138.20	NG
8022	253110.0406	75129.6417	2139.81	RR BERM
8023	253105.6936	75135.8121	2142.27	RAIL
8024	253103.3545	75140.2345	2142.30	RAIL
8025	253098.8278	75148.7731	2141.12	CL RR ROW
8026	253094.0212	75158.0222	2142.27	RAIL
8027	253091.4855	75162.2656	2142.26	RAIL
8028	253087.9759	75170.3320	2139.47	RR BERM
8029	253082.3522	75181.5169	2139.32	TOP
8030	253078.9143	75189.8033	2135.65	TOE
8031	253059.5820	75225.3150	2135.33	NG
8032	253010.2677	75139.8929	2135.99	TOP RIP RAP
8033	253011.1358	75137.4382	2136.15	TOE
8034	253020.7464	75134.7677	2139.02	TOE
8035	253011.3824	75127.9829	2139.57	TOE
8037	252868.4991	75163.6064	2135.15	FW37
8038	253019.8426	75134.0166	2141.63	TIE WALL
8039	253010.8432	75127.1813	2141.89	TIE WALL
8040	253010.8668	75137.3976	2135.32	WING WALL
8041	253010.6226	75127.1070	2140.25	WING WALL
8042	253011.5141	75124.7380	2142.10	HEADWALL
8043	252918.5149	75075.9980	2142.79	HEADWALL
8044	252917.0477	75078.2117	2141.04	WINGWALL
8045	252913.0208	75085.7357	2135.52	WINGWALL

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8046	252911.9893	75088.6337	2136.33	TOP RIP RAP
8047	252902.6981	75083.5343	2136.62	TOP RIP RAP
8048	252907.7594	75084.0409	2136.93	TOE
8049	252915.4135	75077.8433	2139.78	TOE
8050	252905.1565	75074.2138	2140.89	TOE
8051	252906.0275	75074.3793	2142.66	TIEWALL
8052	252916.6794	75078.1784	2142.71	TIEWALL
8053	253011.5244	75127.4256	2141.91	HANDRAIL
8054	252971.4233	75105.5581	2142.40	HANDRAIL
8055	252916.5010	75077.3215	2142.73	HANDRAIL
8056	252927.4235	75035.0800	2140.85	HANDRAIL
8057	252974.5405	75060.7910	2142.53	HANDRAIL
8058	253028.0889	75087.8946	2141.26	HANDRAIL
8059	252985.0966	75072.3727	2142.79	RAIL
8060	252983.2064	75077.1122	2143.20	RAIL
8061	252975.6885	75084.6243	2141.83	CL RR ROW
8062	252970.2266	75092.8788	2143.20	RAIL
8063	252961.8925	75094.2946	2143.30	RAIL
8064	252905.9871	75064.9470	2143.73	RAIL
8065	252908.3319	75060.7096	2143.71	RAIL
8066	252912.9378	75051.7470	2141.79	CL RR ROW
8067	252917.0111	75042.5572	2143.69	RAIL
8068	252919.3073	75038.2067	2143.63	RAIL
8069	252923.7472	75032.9302	2141.22	RR BERM
8070	252877.5594	75009.0124	2141.87	RR BERM
8071	252874.5010	75014.5629	2144.01	RAIL
8072	252872.0006	75018.8356	2144.02	CL RR ROW
8073	252862.2429	75036.3786	2144.00	RAIL
8074	252860.4696	75041.1203	2144.01	RAIL
8075	252863.8110	75057.7758	2142.49	TOP
8076	252895.1175	75067.2767	2141.91	TOP
8077	252884.5386	75090.2046	2136.23	TOE
8078	252861.2135	75079.7431	2134.91	TOE
8079	252893.6976	75106.0623	2135.01	CONC PAD COR
8080	252898.9618	75086.4223	2135.84	CONC PAD COR
8081	252911.9402	75089.5980	2131.04	CONC PAD COR
8082	252901.5993	75107.5736	2130.99	CONC PAD COR
8083	252946.7719	75121.6739	2130.60	EDGE CONC
8084	253010.4077	75142.2339	2130.76	CONC PAD COR
8085	253010.5643	75137.5680	2130.83	CONC PAD COR
8086	253009.6936	75127.1010	2130.99	CONC
8087	253010.5051	75124.0042	2131.23	INV
8088	252964.9209	75100.4955	2130.96	INV
8089	252919.5603	75076.7086	2130.99	INV
8090	252904.7574	75107.9083	2130.38	TOP RIP RAP
8091	252952.0339	75123.5617	2129.45	TOP RIP RAP
8092	253009.7818	75142.3926	2129.57	TOP RIP RAP
8093	253003.0248	75141.0534	2126.89	CONC
8094	252953.9543	75124.9349	2125.36	CONC
8095	252909.7345	75110.6371	2127.12	CONC
8096	252907.2799	75128.3196	2126.38	EDGE CONC
8097	252945.1757	75140.4842	2125.18	EDGE CONC
8098	252996.7128	75156.8538	2126.08	EDGE CONC
8099	252928.2359	75453.8076	2133.82	BSCHK

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8100	252928.8693	75036.5446	2141.39	HEADWALLWINGWALL
8101	253026.2862	75087.6109	2140.64	HEADWALLWINGWALL
8102	253035.2230	75071.0046	2138.56	WINGWALL
8103	252931.8671	75029.7196	2139.38	WINGWALL
8104	252921.7567	75024.2090	2139.43	TOP RET WALL
8105	252929.5629	75036.9354	2132.83	INV.
8106	252946.5208	75045.2449	2128.80	INV.
8107	252972.4960	75058.8613	2128.30	INV.
8108	252999.6434	75073.4675	2129.88	INV.
8109	253025.7211	75087.1878	2131.30	INV.
8110	253035.2918	75066.0014	2139.80	TOP
8111	253022.3622	75042.3247	2139.17	TOP
8112	252992.3046	75017.3020	2139.67	TOP
8113	252944.8349	74972.8867	2137.71	TOP
8114	253027.7016	75078.9230	2135.06	TOE
8115	253003.0464	75051.7694	2131.96	TOE
8116	252979.8714	75019.9983	2133.07	TOE
8117	252941.8640	74979.5700	2133.58	TOE
8118	252950.0121	75009.5733	2131.50	CL
8119	252974.0882	75031.2185	2131.23	CL
8120	252995.5698	75056.4456	2131.49	CL
8121	252904.3518	74983.9170	2131.70	CL
8122	252904.3306	75003.2459	2131.64	TOE
8123	252930.3641	75027.7211	2131.06	TOE
8125	252547.2110	74661.1350	2141.82	FW 40
8126	252659.6270	74406.4230	2155.76	FW 41
8201	252659.6537	74406.3624	2155.80	BSCHK
8202	252827.2834	74887.7906	2138.77	FLY
8203	252462.2592	74628.3881	2136.10	FLY
8204	252591.1555	74617.1362	2141.57	TOE
8205	252588.7785	74639.9110	2142.08	101 117
8206	252583.9498	74668.3467	2140.80	101 117
8207	252586.7604	74700.3501	2138.90	101 117
8208	252600.9496	74723.5768	2137.21	101 117
8209	252621.4422	74739.1935	2136.02	101 117
8210	252648.1350	74753.3573	2135.41	101 117
8211	252675.3176	74765.9502	2135.60	101 117
8212	252702.3828	74778.7196	2135.76	101 117
8213	252719.9363	74810.7244	2135.93	NG
8214	252681.3577	74800.6525	2135.58	NG
8215	252644.0645	74781.2891	2136.08	NG
8216	252614.3050	74766.3013	2136.24	NG
8217	252583.3996	74736.8846	2136.26	NG
8218	252570.8944	74700.4219	2138.78	NG
8219	252568.7267	74665.7072	2141.53	NG
8220	252572.2549	74618.8800	2142.61	NG
8221	252549.7896	74703.9328	2136.59	NG
8222	252535.4470	74734.7476	2135.86	NG
8223	252521.2448	74765.6564	2136.33	NG
8224	252513.0099	74784.3290	2137.23	101 117
8225	252542.1544	74789.8574	2135.42	101 117
8226	252579.7088	74802.2746	2135.17	101 117
8227	252615.4264	74812.9360	2134.43	101 117
8228	252644.5714	74828.8292	2134.29	101 117

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8229	252681.7559	74848.9203	2134.06	101 117
8230	252716.9794	74874.8662	2133.90	101 117
8231	252757.6026	74905.0184	2131.93	101 117
8232	252743.4699	74922.9145	2142.09	100 117
8233	252712.4722	74897.1709	2142.24	100 117
8234	252679.7781	74870.3737	2142.27	100 117
8235	252643.8821	74851.6969	2142.86	100 117
8236	252610.8996	74834.6341	2143.43	100 117
8237	252569.0101	74820.6091	2143.89	100 117
8238	252506.7179	74800.0016	2144.62	100 117
8239	252505.2821	74803.6441	2144.70	EDGE CONC
8240	252547.2110	74661.1350	2141.82	FW40
8241	252659.6270	74406.4230	2155.76	FW41
8242	252548.5805	74818.0236	2144.23	EDGE CONC
8243	252609.5753	74838.0435	2143.49	EDGE CONC
8244	252642.2690	74855.1382	2143.07	EDGE CONC
8245	252678.1271	74873.8103	2142.42	EDGE CONC
8246	252709.9835	74900.1052	2142.37	EDGE CONC
8247	252740.9227	74926.1442	2142.19	EDGE CONC
8248	252710.1097	74916.3827	2142.24	NG
8249	252685.8925	74899.3462	2142.42	NG
8250	252674.9551	74882.2447	2142.11	PIER COR
8251	252626.6033	74481.8907	2143.11	PIER COR
8252	252629.9968	74481.0230	2143.67	PIER COR
8253	252642.3396	74495.3734	2143.63	NG
8254	252667.4116	74552.6234	2144.19	NG
8255	252513.9316	74569.7936	2152.44	COR ABT.
8256	252513.9597	74569.9092	2167.82	BOTT. BRIDGE
8257	252478.7510	74591.2161	2171.35	COR. ABT
8258	252472.1438	74597.0539	2170.94	100 177
8259	252458.0283	74606.5981	2169.65	TOP
8260	252547.2295	74661.1477	2141.81	BSCHK
8261	252728.2518	74756.1741	2151.31	COR. ABT.
8262	252728.2932	74756.0497	2168.07	BOTT. BRIDGE
8263	252740.1951	74715.7737	2172.18	ABT.
8264	252744.6408	74705.7031	2171.66	101 117
8265	252753.5209	74681.2259	2169.99	TOP
8266	252821.8199	74699.9731	2140.81	TOE
8267	252840.9265	74703.7618	2140.07	NG
8268	252830.8198	74739.1849	2140.58	NG
8269	252808.1168	74724.4511	2142.26	101 117
8270	252799.3251	74749.0021	2142.29	101 117
8271	252785.8078	74771.3464	2141.27	101 117
8272	252762.8358	74788.0388	2139.86	101 117
8273	252736.3715	74790.5441	2137.62	101 117
8274	252714.2317	74784.2335	2135.90	101 117
8275	252756.5079	74826.5468	2136.80	NG
8276	252796.6072	74828.0009	2139.71	NG
8277	252819.7829	74795.8802	2140.57	NG
8278	252751.1103	74673.6529	2170.36	FL
8279	252740.0044	74710.4303	2172.05	FL
8280	252728.7350	74753.9074	2173.70	COR. BRIDG
8281	252726.7861	74755.2788	2173.86	FL
8282	252714.9542	74795.4598	2175.31	FL

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8283	252705.7621	74826.7045	2176.20	FL
8284	252695.0444	74862.8426	2176.99	FL
8285	252686.8628	74890.8392	2177.47	FL
8286	252688.2708	74890.9611	2170.29	BOTT. BRIDG
8287	252806.5738	74855.3172	2139.10	NG
8288	252822.1949	74797.5173	2140.49	NG
8289	252770.6931	74852.9732	2137.51	NG
8290	252779.8050	74879.5326	2137.14	NG
8291	252767.1932	74891.5956	2133.80	NG
8292	252750.0538	74877.8807	2134.17	NG
8293	252730.9219	74858.6634	2134.17	NG
8294	252547.1871	74661.1891	2141.78	BSCHK
8295	252653.7956	74642.3338	2170.15	FL
8296	252642.4831	74680.7727	2171.91	FL
8297	252633.9571	74704.2446	2172.91	COR. BRIDGE
8298	252633.9534	74709.5959	2173.20	FL
8299	252622.6452	74747.7005	2174.66	FL
8300	252613.1367	74780.0888	2175.68	FL
8301	252601.7626	74818.4889	2176.60	FL
8302	252594.3041	74843.7031	2177.14	FL
8303	252594.3759	74842.1238	2170.88	SW BOTT.
8304	252634.3797	74867.0350	2178.75	CL
8305	252646.7673	74826.4197	2178.08	CL
8306	252658.3189	74787.1981	2177.14	CL
8307	252670.4234	74745.4975	2175.65	CL
8308	252680.8558	74710.2755	2174.08	CL
8309	252693.6858	74666.3776	2171.98	CL
8401	249925.1602	70818.1065	2195.15	FW 44
8402	249681.4029	70723.3378	2196.72	FW 45
8410	249942.5687	70803.5611	2194.92	TOP BC
8411	249897.1723	70804.1836	2195.61	TOP BC
8412	249835.8162	70805.2814	2195.55	TOP BC
8413	249774.9583	70806.3675	2195.55	TOP BC
8414	249742.0510	70806.7664	2195.73	TOP BC
8415	249776.6153	70805.7475	2195.00	GRATE INLET EDGE
8416	249779.7383	70811.3264	2195.56	SIDEWALK
8417	249780.7202	70812.2183	2195.59	CONC ANG PNT
8418	249781.7053	70812.1150	2195.59	CONC ANG PNT
8419	249776.2957	70822.1716	2195.61	TOP WALL
8420	249786.9087	70821.7993	2193.43	CONC ANG PNT
8421	249788.0009	70818.6871	2193.42	CONC ANG PNT
8422	249781.7191	70812.2096	2193.48	CONC ANG PNT
8423	249787.9361	70819.6082	2189.37	FL PIPE
8424	249786.9099	70822.0360	2191.88	EDGE RIP RAP
8425	249790.5615	70821.9329	2189.03	TOE RIP RAP
8426	249787.6388	70820.3990	2189.11	TOE RIP RAP
8427	249781.8963	70812.1668	2189.11	FL
8428	249798.4830	70811.9572	2189.10	FL
8429	249815.9276	70811.7201	2189.10	FL
8430	249833.2187	70811.4485	2189.11	FL
8431	249850.6057	70811.1954	2189.19	FL
8432	249867.8728	70810.9437	2189.22	FL
8433	249885.1114	70810.5517	2189.17	FL
8434	249902.0772	70810.2867	2189.17	FL

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8435	249911.8526	70819.7536	2189.04	EDGE CONC
8436	249901.8871	70810.1367	2195.66	CONC ANG PNT
8437	249902.2258	70809.5461	2195.69	CONC ANG PNT
8438	249901.9503	70809.2004	2195.68	CONC ANG PNT
8439	249887.4178	70803.7664	2195.09	FL
8440	249870.1082	70804.1399	2195.06	FL
8441	249852.9304	70804.4089	2195.09	FL
8442	249835.6328	70804.7546	2195.07	FL
8443	249818.7852	70805.0098	2195.11	FL
8444	249801.2410	70805.3111	2195.03	FL
8445	249822.2529	70735.9184	2196.03	FL
8446	249753.6382	70737.3092	2196.11	FL
8447	249713.4952	70737.6522	2196.03	GRATE INLET EDGE
8448	249654.4637	70737.9385	2196.76	TOP BC
8449	249708.8205	70737.0723	2196.66	TOP BC
8450	249771.5953	70736.0407	2196.63	TOP BC
8451	249830.7461	70734.9751	2196.62	TOP BC
8452	249893.9930	70734.4222	2195.91	TOP BC
8453	249681.4095	70722.0962	2196.81	TOP WALL
8454	249680.7920	70773.2028	2196.19	ASPHALT
8455	249741.8140	70771.7328	2195.84	ASPHALT
8456	249812.2735	70770.8471	2195.81	ASPHALT
8457	249864.4626	70770.0476	2195.76	ASPHALT
8458	249920.3516	70768.7643	2195.10	ASPHALT
8459	249912.5725	70814.4770	2192.16	GB
8460	249893.2030	70820.3177	2189.07	EDGE CONC
8461	249877.2699	70820.5991	2189.04	EDGE CONC
8462	249859.9792	70820.8710	2189.06	EDGE CONC
8463	249842.3031	70821.0985	2189.05	EDGE CONC
8464	249824.7764	70821.3816	2189.04	EDGE CONC
8465	249806.9638	70821.6863	2189.04	EDGE CONC
8466	249812.8385	70876.3335	2194.87	NG
8467	249832.1627	70877.2284	2195.41	TOP RIP RAP
8468	249848.3042	70877.1484	2189.45	TOE RIP RAP
8469	249869.7881	70872.6759	2187.48	FL
8470	249912.8857	70865.3259	2187.37	FL
8471	249953.8821	70866.1844	2187.82	TOE RIP RAP
8472	249969.2626	70861.6767	2194.95	TOP RIP RAP
8473	249977.9899	70859.4063	2195.11	NG
8474	249924.5456	70819.1957	2195.73	TOP WALL
8475	249867.5943	70810.5748	2195.69	EDGE CONC
8476	249818.1208	70811.4529	2195.63	EDGE CONC
8477	249826.0662	70730.0643	2196.79	CONC ANG PNT
8478	249825.1246	70729.1618	2196.82	CONC ANG PNT
8479	249824.2435	70729.1698	2196.79	CONC ANG PNT
8480	249829.4678	70720.1206	2196.89	TOP WALL
8481	249795.1648	70729.6980	2196.80	EDGE CONC
8482	249745.2803	70730.5128	2196.79	EDGE CONC
8483	249704.0908	70731.2199	2196.82	CONC ANG PNT
8484	249703.8170	70732.1320	2196.78	CONC ANG PNT
8485	249703.6772	70731.8854	2196.82	CONC ANG PNT
8486	249720.8195	70730.8262	2195.37	TOP WALL
8487	249738.0403	70730.5435	2195.40	TOP WALL
8488	249755.3407	70730.2199	2195.29	TOP WALL

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8489	249772.8090	70729.9219	2195.36	TOP WALL
8490	249789.9637	70729.6517	2195.28	TOP WALL
8491	249807.1270	70729.3254	2195.29	TOP WALL
8492	249826.3549	70725.2879	2193.14	CONC
8493	249824.1027	70729.1010	2190.28	FL
8494	249816.3063	70729.1353	2190.31	FL
8495	249798.8668	70729.4429	2190.31	FL
8496	249782.1858	70729.8153	2190.32	FL
8497	249764.1895	70730.1065	2190.33	FL
8498	249746.9160	70730.3870	2190.34	FL
8499	249729.3850	70730.7229	2190.33	FL
8500	249711.9548	70730.9691	2190.31	FL
8501	249704.0892	70731.1107	2190.33	FL
8502	249693.9992	70727.1138	2192.92	CONC
8503	249694.8354	70721.9219	2190.41	TOE
8504	249719.3924	70721.4986	2190.42	EDGE CONC
8505	249758.1423	70720.9902	2190.51	EDGE CONC
8506	249792.6287	70720.5342	2190.47	EDGE CONC
8507	249815.6580	70720.3861	2190.47	TOE
8508	249800.1179	70721.9955	2190.44	WALL END
8509	249782.9936	70722.2871	2190.44	WALL END
8510	249765.9694	70722.8281	2190.46	WALL END
8511	249748.6577	70723.1294	2190.47	WALL END
8512	249731.1129	70723.3811	2190.43	WALL END
8513	249713.8423	70723.6707	2190.42	WALL END
8514	249663.8458	70707.5986	2197.33	EDGE RIP RAP
8515	249655.5073	70682.2980	2192.16	EDGE RIP RAP
8516	249742.1971	70650.6258	2191.26	EDGE RIP RAP
8517	249754.6837	70642.8369	2196.97	EDGE RIP RAP
8518	249779.4220	70653.6277	2196.94	NG
8519	249766.4968	70653.0329	2197.14	TOP RIP RAP
8520	249747.5616	70654.6240	2191.04	TOE RIP RAP
8521	249706.3031	70656.8580	2190.48	FL
8522	249639.7493	70665.0948	2192.12	TOE
8523	249626.9337	70668.2724	2198.11	TOP
8524	249606.4850	70671.3337	2197.70	NG
8600	255640.9498	94511.1268	1915.58	BSCK 15-16
8601	255756.5412	94369.0829	1914.25	SET H:T RESECT.
8602	255640.9775	94511.1333	1915.57	FSCK 5001-15-16
8603	255789.9810	94514.9784	1915.82	BSCK 5001-15
8604	255609.2934	94466.6457	1915.71	EDGE CONC
8605	255609.3377	94465.3500	1915.61	FL
8606	255609.2773	94464.7568	1916.07	TOP BC
8607	255609.4715	94459.7997	1916.14	SIDEWALK
8608	255629.4939	94461.3909	1915.97	STREET LIGHT
8609	255658.5355	94461.2873	1915.96	CONC ANG PNT
8610	255658.4942	94466.2864	1915.84	TOP BC
8611	255658.3895	94466.8954	1915.36	FL
8612	255658.2386	94468.2269	1915.48	EDGE CONC
8613	255674.9134	94461.5493	1915.98	FENCE ANG PNT
8614	255682.2025	94463.1848	1915.92	ST LT PULL BOX
8615	255688.3886	94462.1987	1915.93	DROP INLET
8616	255697.3162	94462.4916	1915.92	DROP INLET
8617	255695.6824	94465.2456	1915.87	STORM DRAIN MH

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8618	255688.1803	94467.1762	1915.79	TOP BC
8619	255688.1257	94467.7166	1915.15	FL
8620	255688.1952	94469.0981	1915.41	EDGE CONC
8621	255697.2231	94469.3122	1915.42	EDGE CONC
8622	255697.2352	94468.0876	1915.15	FL
8623	255697.1822	94467.4198	1915.79	TOP BC
8624	255692.6962	94467.2755	1915.79	DROP INLET
8625	255732.7907	94463.3647	1916.11	FENCE ANG PNT
8626	255745.4948	94464.0337	1916.14	CONC ANG PNT
8627	255745.3027	94468.9222	1916.00	TOP BC
8628	255745.3013	94469.5214	1915.53	FL
8629	255745.2334	94470.7706	1915.64	EDGE CONC
8630	255761.2678	94465.4477	1916.16	STREET LIGHT
8631	255794.0671	94472.2578	1916.00	EDGE CONC
8632	255794.0099	94471.0159	1915.89	FL
8633	255793.9474	94470.3332	1916.32	TOP BC
8634	255794.0407	94465.4395	1916.45	SIDEWALK
8635	255794.5052	94516.1465	1915.83	ASPHALT
8636	255794.0495	94553.9053	1914.64	EDGE CONC
8637	255793.9871	94555.3767	1914.57	FL
8638	255793.9784	94555.9900	1914.99	TOP BC
8639	255794.3672	94561.9681	1915.13	SIDEWALK
8640	255787.7134	94561.7770	1915.11	WALL ANG PNT
8641	255757.6372	94561.4792	1915.04	FENCE ANG PNT
8642	255754.8781	94560.8252	1915.01	SIDEWALK
8643	255750.2878	94558.0590	1914.99	FENCE ANG PNT
8644	255746.0906	94552.6356	1914.61	EDGE CONC
8645	255746.0144	94553.9733	1914.34	FL
8646	255746.0660	94554.5569	1914.96	TOP BC
8647	255728.0836	94553.5401	1915.01	CONC FL
8648	255721.6134	94553.3209	1914.98	CONC FL
8649	255721.8304	94553.2198	1914.45	FL
8650	255727.8614	94553.4149	1914.31	FL
8651	255727.7449	94557.7877	1914.24	FL
8652	255721.7978	94557.6279	1914.19	FL
8653	255699.1862	94552.5047	1914.46	GRATE INLET CENTER
8654	255672.6832	94552.5240	1914.89	TOP BC
8655	255672.7631	94551.8569	1914.43	FL
8656	255672.7738	94550.4529	1914.56	EDGE CONC
8657	255662.9108	94552.1817	1914.91	DRIVEWAY
8658	255662.8316	94558.1425	1915.01	SIDEWALK
8659	255633.8332	94557.3545	1914.94	SIDEWALK
8660	255633.8718	94551.3229	1914.87	DRIVEWAY
8661	255633.8751	94550.7585	1914.46	FL
8662	255633.9069	94549.3063	1914.56	EDGE CONC
8663	255638.8512	94557.5787	1914.95	CONC ANG PNT
8664	255638.6878	94559.0436	1919.45	TOP WALL
8665	255623.7422	94511.2282	1915.61	ASPHALT
8666	255674.3585	94512.8257	1915.44	ASPHALT
8667	255724.4071	94514.0204	1915.52	ASPHALT
8668	255640.9682	94511.1447	1915.54	BSCK 5001-16
8669	255757.3240	94350.0594	1914.45	BC @ CTR DRAIN
8670	255730.7295	94354.8529	1915.16	BC @ CTR DRAIN
8671	255693.0826	94361.4401	1915.19	BC @ CTR DRAIN

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8672	255670.6892	94365.1965	1914.70	BC @ CTR DRAIN
8673	255730.7027	94355.1579	1908.29	TOP / TOE INTX
8674	255730.3771	94357.4231	1906.29	NG
8675	255692.3985	94361.9149	1909.19	TOP / TOE INTX
8676	255673.9437	94368.4618	1914.40	TOP
8677	255699.1399	94364.8483	1906.16	TOE
8678	255717.6997	94362.0788	1906.04	FL
8679	255736.0502	94359.0290	1905.78	TOE
8680	255750.2323	94354.7107	1914.22	TOP
8681	255756.0893	94386.7134	1914.22	TOP
8682	255742.0953	94380.4222	1909.48	EDGE CONC
8683	255732.9284	94384.2839	1905.67	TOE
8684	255726.1945	94435.7384	1905.33	TOE
8685	255748.0065	94439.9002	1914.77	CONC ANG PNT
8686	255739.7822	94449.9120	1912.29	EDGE CONC
8687	255735.5669	94454.9002	1906.52	EDGE CONC
8688	255728.9900	94453.6407	1905.07	TOE
8689	255734.1110	94455.7808	1905.38	FL PIPE
8690	255712.6645	94400.4733	1905.61	FL
8691	255706.0039	94452.6532	1905.12	FL
8692	255673.6974	94455.4657	1905.13	TOE
8693	255679.2636	94448.8728	1905.23	TOE
8694	255681.7247	94432.7261	1905.53	TOE
8695	255693.6503	94394.3765	1905.82	TOE
8696	255672.9471	94454.5797	1905.86	EDGE CONC
8697	255677.1502	94448.4839	1906.54	EDGE CONC
8698	255681.6762	94421.8850	1907.31	EDGE CONC
8699	255690.9211	94393.9459	1907.89	EDGE CONC
8700	255689.1119	94377.2450	1910.24	EDGE CONC
8701	255690.8744	94371.5013	1909.73	EDGE CONC
8702	255693.2741	94370.2121	1908.48	EDGE CONC
8703	255693.1320	94367.8669	1908.11	EDGE CONC
8704	255683.2009	94368.8557	1911.63	EDGE CONC
8705	255676.7273	94371.9115	1913.60	EDGE CONC
8706	255671.5456	94369.9536	1914.54	EDGE CONC
8707	255676.1231	94394.3842	1913.60	TOP
8708	255666.2267	94424.2105	1914.53	TOP
8709	255659.6387	94438.5329	1914.73	CONC ANG PNT
8710	255659.2864	94437.1484	1913.77	GB
8711	255665.8462	94412.3114	1912.59	GB
8712	255671.9727	94393.5905	1913.13	GB
8713	255670.9189	94380.2603	1914.11	EDGE CONC
8714	255669.0651	94380.1953	1914.17	EDGE CONC
8715	255669.2478	94394.0264	1913.86	EDGE CONC
8716	255670.8049	94393.9731	1913.75	EDGE CONC
8717	255664.2858	94412.0865	1913.66	EDGE CONC
8718	255662.3335	94411.6935	1913.68	EDGE CONC
8719	255656.6659	94436.8399	1914.67	EDGE CONC
8720	255657.9679	94436.9902	1914.57	EDGE CONC
8721	255669.7820	94451.0561	1914.37	EDGE CONC
8722	255675.7939	94458.4450	1914.31	TOP WALL
8723	255675.9150	94458.3493	1912.84	EDGE CONC
8724	255675.1787	94458.5557	1917.05	TOP WALL
8725	255675.1889	94459.4011	1917.05	TOP WALL

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8726	255732.6871	94461.1953	1916.97	TOP WALL
8727	255732.6373	94460.3124	1916.99	TOP WALL
8728	255731.9643	94460.1529	1913.94	TOP WALL
8729	255731.9811	94459.8667	1913.96	TOP WALL
8730	255738.0049	94452.2918	1914.08	EDGE CONC
8731	255721.5234	94459.9003	1913.03	BW @CTR 3'VG
8732	255721.5270	94459.5173	1912.96	BW @CTR 3'VG
8733	255710.5950	94459.5728	1913.00	BW @CTR 3'VG
8734	255710.5891	94459.1770	1913.00	BW @CTR 3'VG
8735	255699.1048	94459.2139	1913.06	BW @CTR 3'VG
8736	255699.1153	94458.5491	1912.84	BW @CTR 3'VG
8737	255687.0573	94458.8522	1912.99	BW @CTR 3'VG
8738	255687.0835	94458.3168	1912.94	BW @CTR 3'VG
8739	255698.7932	94458.6338	1913.06	EDGE CONC
8740	255640.9684	94511.1445	1915.54	BSCK 5001-16
8741	255676.0479	94458.5416	1905.04	TOE
8742	255677.1447	94458.5503	1904.16	GB
8743	255675.3166	94453.8908	1905.01	GB
8744	255685.5522	94452.4512	1905.19	GB
8745	255689.0235	94452.5322	1905.22	GB
8746	255697.6854	94453.0847	1905.16	GB
8747	255698.1122	94458.7515	1905.20	GB
8748	255697.0940	94458.7664	1904.26	GB
8749	255689.1196	94458.6473	1904.19	GB
8750	255688.1178	94458.4249	1905.13	GB
8751	255685.3976	94458.8200	1905.16	GB
8752	255684.9843	94458.6057	1904.16	GB
8753	255687.2285	94452.5662	1906.35	BW @CTR 3'VG
8754	255699.3134	94453.2304	1906.44	BW @CTR 3'VG
8755	255710.7973	94453.5600	1906.11	BW @CTR 3'VG
8756	255721.7725	94453.8799	1906.09	BW @CTR 3'VG
8757	255731.8959	94459.8743	1904.92	TOE
8758	255675.0959	94454.0833	1905.02	GB
8759	255780.0206	94664.0749	1913.84	SET60D2PT.RESECT
8760	255789.9817	94514.9483	1915.82	BSCK 5159-15
8761	255640.9662	94511.1156	1915.57	FSCK 5159-15-16
8762	255745.9909	94558.1408	1915.22	TOP WALL
8763	255745.9963	94557.5301	1915.23	TOP WALL
8764	255696.3988	94556.2700	1915.42	CONC ANG PNT
8765	255696.4188	94556.8121	1915.44	CONC ANG PNT
8766	255672.5720	94555.7746	1914.29	TOP WALL
8767	255672.6466	94556.4338	1914.28	TOP WALL
8768	255672.9368	94556.4975	1914.86	TOP WALL
8769	255661.1491	94569.7324	1913.84	TOP WALL
8770	255659.5649	94568.2065	1913.72	DRIVEWAY
8771	255638.2339	94567.6019	1913.94	DRIVEWAY
8772	255729.3019	94557.9181	1912.75	TOP WALL
8773	255729.6678	94558.2200	1912.76	TOP WALL
8774	255735.5857	94564.6822	1902.74	TOP WALL
8775	255729.0828	94557.7221	1903.84	FL
8776	255718.7863	94557.5165	1903.83	FL
8777	255707.7927	94557.1672	1903.82	FL
8778	255696.3657	94556.9159	1903.74	FL
8779	255684.3731	94556.6385	1903.69	FL

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8780	255673.3242	94555.8884	1903.61	FL
8781	255670.1711	94559.4197	1903.99	FL PIPE
8782	255670.4786	94563.2770	1904.05	TOE
8783	255677.1830	94579.0923	1904.14	TOE
8784	255676.8246	94611.8273	1904.72	TOE
8785	255665.5435	94616.9738	1907.35	GB
8786	255664.6816	94629.3287	1906.46	GB
8787	255656.8877	94627.5089	1910.94	TOP
8788	255659.5020	94601.7371	1913.22	TOP
8789	255659.8676	94576.0107	1914.34	TOP
8790	255639.7067	94570.0224	1913.90	TOE
8791	255640.2830	94591.9387	1913.56	TOE
8792	255641.5054	94615.5704	1912.74	TOE
8793	255641.0266	94634.9332	1912.25	TOE
8794	255639.5167	94668.8762	1911.64	TOE
8795	255634.0319	94667.9415	1914.45	TOP
8796	255635.5484	94633.6091	1914.61	TOP
8797	255636.8351	94603.7984	1915.42	TOP
8798	255651.3008	94674.2466	1910.34	EDGE DIRT RD
8799	255646.0176	94728.7229	1909.75	EDGE DIRT RD
8800	255656.5796	94674.4247	1908.88	TOP
8801	255665.0702	94658.9118	1905.47	TOE
8802	255664.7093	94629.3407	1906.46	TOE
8803	255659.9164	94629.3744	1908.69	TOP
8804	255680.7248	94615.9723	1903.35	GB
8805	255702.2265	94613.1235	1903.01	GB
8806	255720.0942	94617.1587	1901.85	GB
8807	255721.2722	94617.3665	1902.74	GB
8808	255732.4713	94619.8557	1903.97	GB
8809	255744.2889	94611.7627	1903.96	TOE
8810	255739.2188	94590.1979	1904.64	TOE
8811	255727.6276	94590.3688	1903.72	GB
8812	255726.1442	94590.1149	1903.09	GB
8813	255724.7326	94570.6601	1903.10	GB
8814	255735.0147	94565.5410	1904.99	GB
8815	255746.1307	94581.9622	1906.71	GB
8816	255750.7472	94597.3159	1907.35	GB
8817	255747.4129	94609.8802	1905.07	GB
8818	255771.5312	94617.5756	1913.17	TOP
8819	255762.4268	94590.1087	1914.10	TOP
8820	255746.0972	94558.2284	1914.46	TOP
8821	255738.7155	94558.1172	1911.38	GB
8822	255738.1166	94563.6701	1907.14	GB
8900	254403.9042	91882.8344	1943.07	BSCK 17-18
8901	254435.9728	91965.0966	1942.75	WALL ANG PNT
8902	254432.5172	91954.3706	1945.96	FENCE ANG PNT
8903	254432.1269	91954.0198	1942.21	SIDEWALK
8904	254432.1118	91949.9653	1942.14	TOP BC
8905	254432.0932	91949.3666	1941.67	FL
8906	254432.2347	91948.0375	1941.73	EDGE CONC
8907	254452.2521	91951.3984	1942.05	DRIVEWAY
8908	254474.6767	91952.8593	1941.93	DRIVEWAY
8909	254455.9005	91955.8348	1942.10	FENCE ANG PNT
8910	254461.5221	91966.8446	1941.87	FENCE ANG PNT

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8911	254468.6726	91966.9433	1941.56	GATE
8912	254475.7730	91967.5680	1941.55	FENCE ANG PNT
8913	254479.9179	91957.2992	1941.92	FENCE ANG PNT
8914	254498.0499	91958.4426	1941.89	FENCE
8915	254489.3372	91958.9765	1941.90	STREET LIGHT
8916	254494.1438	91960.0485	1941.90	204
8917	254499.0463	91954.4634	1941.85	DROP INLET
8918	254500.5900	91953.9644	1941.22	GRATE INLET EDGE
8919	254500.8077	91952.0087	1941.56	GRATE INLET EDGE
8920	254497.9053	91951.8429	1941.56	GRATE INLET EDGE
8921	254497.6372	91953.7616	1941.27	GRATE INLET EDGE
8922	254542.2418	91957.4494	1941.67	TOP BC
8923	254542.2962	91956.5623	1941.27	GRATE INLET CENTER
8924	254542.3124	91955.4776	1941.33	EDGE CONC
8925	254570.7151	91957.3428	1941.19	EDGE CONC
8926	254570.6203	91958.9582	1941.06	FL
8927	254570.5584	91959.3543	1941.48	TOP BC
8928	254569.4733	91963.7026	1941.58	FENCE
8929	254599.2089	91965.9298	1941.33	FENCE
8930	254637.4085	91967.9305	1941.05	SIDEWALK
8931	254637.6080	91963.8903	1940.97	TOP BC
8932	254637.7052	91963.2340	1940.60	FL
8933	254637.7685	91961.9044	1940.72	EDGE CONC
8934	254662.0444	91965.4599	1940.84	DRIVEWAY
8935	254662.0234	91969.5255	1940.76	SIDEWALK
8936	254669.4761	91970.0133	1940.25	SIDEWALK
8937	254669.5680	91965.8926	1940.35	DRIVEWAY
8938	254669.6107	91964.1303	1940.41	EDGE CONC
8939	254671.1676	91933.9833	1940.87	ASPHALT
8940	254619.7697	91930.1903	1941.43	ASPHALT
8941	254567.9885	91926.7543	1942.06	ASPHALT
8942	254517.3797	91923.5336	1942.43	ASPHALT
8943	254465.4440	91919.9825	1942.70	ASPHALT
8944	254411.5064	91916.2606	1943.05	ASPHALT
8945	254413.7221	91885.4409	1942.64	EDGE CONC
8946	254413.6641	91884.0508	1942.59	FL
8947	254413.7431	91883.5015	1943.07	TOP BC
8948	254413.6471	91879.5030	1943.13	SIDEWALK
8949	254432.8376	91880.7365	1943.00	FENCE ANG PNT
8950	254424.9885	91870.8808	1943.32	FENCE END
8951	254439.6780	91881.3673	1942.95	GATE
8952	254457.6687	91882.7579	1942.76	FENCE END
8953	254428.9343	91884.5858	1942.97	DRIVEWAY
8954	254450.7718	91886.0910	1942.80	DRIVEWAY
8955	254450.8238	91886.6454	1942.32	FL
8956	254450.6168	91888.0267	1942.44	EDGE CONC
8957	254509.9298	91892.0825	1942.05	EDGE CONC
8958	254510.1804	91891.0296	1941.97	GRATE INLET CENTER
8959	254510.2839	91890.1352	1942.47	TOP BC
8960	254530.3248	91887.2978	1942.37	FENCE
8961	254548.7743	91888.4225	1942.15	FENCE ANG PNT
8962	254555.4117	91872.0091	1941.50	FENCE ANG PNT
8963	254562.2819	91872.9249	1941.46	GATE
8964	254569.4937	91873.5285	1941.71	FENCE ANG PNT

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8965	254579.5673	91890.4685	1941.90	FENCE ANG PNT
8966	254620.4951	91893.4767	1941.40	FENCE ANG PNT
8967	254611.0740	91864.9343	1942.26	FENCE END
8968	254583.5225	91890.9551	1941.86	SIDEWALK
8969	254582.8684	91894.9905	1941.79	DRIVEWAY
8970	254582.6731	91895.5383	1941.33	FL
8971	254582.7414	91896.8360	1941.38	EDGE CONC
8972	254623.8081	91899.7553	1940.86	EDGE CONC
8973	254623.9411	91898.3590	1940.80	FL
8974	254623.8052	91897.7062	1941.26	TOP BC
8975	254624.1355	91893.8300	1941.40	SIDEWALK
8976	254455.5403	91881.3439	1942.68	STREET LIGHT
8977	254456.0722	91897.4447	1942.60	STORM DRAIN MH
8978	254513.1833	91782.3950	1942.21	EDGE CONC
8979	254511.8709	91782.8381	1942.37	TOP
8980	254499.9596	91786.1227	1936.81	TOE
8981	254480.4819	91790.1064	1937.65	GB
8982	254474.0672	91792.1471	1934.92	FL
8983	254488.1893	91836.4384	1934.62	FL
8984	254490.7392	91836.3347	1935.52	GB
8985	254512.3472	91831.7471	1935.86	TOE
8986	254524.6555	91828.5273	1941.98	TOP
8987	254525.8912	91828.2443	1942.06	EDGE CONC
8988	254536.0601	91866.4777	1941.58	CONC ANG PNT
8989	254548.1829	91888.4651	1942.20	CONC ANG PNT
8990	254534.3895	91869.2339	1940.94	GB
8991	254533.3223	91872.9232	1940.27	EDGE CONC
8992	254530.0693	91882.7280	1940.26	EDGE CONC
8993	254528.8815	91886.2811	1942.49	TOP WALL
8994	254539.9062	91887.3077	1942.25	GB
8995	254539.8965	91884.9475	1941.79	GB
8996	254524.0313	91876.0853	1934.45	CONC ANG PNT
8997	254530.2688	91881.3615	1937.20	GB
8998	254530.0575	91886.5183	1943.47	TOP WALL
8999	254530.1244	91887.4260	1941.31	TOP WALL
9000	254458.3006	91882.5805	1941.65	TOP WALL
9001	254458.3920	91881.6893	1943.83	TOP WALL
9002	254514.3390	91885.1918	1939.32	BW @CTR 3'VG
9003	254499.6887	91884.2200	1939.59	BW @CTR 3'VG
9004	254484.9440	91883.2786	1939.66	BW @CTR 3'VG
9005	254480.0090	91873.3818	1934.41	BW @CTR 3'VG
9006	254494.7039	91874.1465	1934.61	BW @CTR 3'VG
9007	254509.2261	91875.0619	1934.59	BW @CTR 3'VG
9008	254458.2971	91881.5409	1943.00	EDGE CONC
9009	254459.0276	91881.5810	1943.02	TOP
9010	254469.6891	91882.1733	1937.72	EDGE CONC
9011	254463.4011	91867.4791	1936.62	CONC ANG PNT
9012	254455.9927	91853.7044	1935.58	TOE
9013	254445.1086	91860.3713	1941.50	TOP
9014	254434.3278	91837.2389	1941.72	TOP
9015	254444.8598	91833.0909	1935.58	TOE
9016	254432.9542	91795.9828	1936.05	TOE
9017	254422.0771	91799.1164	1941.85	TOP
9018	254448.7511	91793.0789	1936.66	GB

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9019	254452.0228	91792.3319	1934.86	FL
9020	254463.2631	91828.2132	1934.60	FL
9021	254460.5143	91829.0198	1935.91	GB
9022	254463.6333	91867.5803	1934.97	GB
9023	254471.7177	91865.7547	1934.91	GB
9024	254472.6099	91865.4039	1934.33	FL
9025	254470.5850	91882.3458	1934.60	FL
9026	254667.4776	91978.1052	1939.84	FL
9027	254667.1333	91990.1625	1941.77	GB
9028	254666.7823	91999.7968	1942.10	CONC ANG PNT
9029	254666.7782	91999.9122	1942.46	TOP RET WALL
9030	254666.7689	92000.5380	1942.48	TOP RET WALL
9031	254657.5814	92003.5622	1941.98	TOP RET WALL
9032	254657.8666	92002.9550	1942.00	TOP RET WALL
9033	254657.9014	92002.8172	1941.58	CONC ANG PNT
9034	254652.9353	91990.5871	1940.60	CONC ANG PNT
9035	254653.6926	91994.0748	1941.19	TOP RET WALL
9036	254654.2093	91993.9137	1941.21	TOP RET WALL
9037	254654.2092	91993.7672	1942.28	TOP RET WALL
9038	254653.6820	91993.9791	1942.27	TOP RET WALL
9039	254652.6759	91991.5084	1942.08	TOP RET WALL
9040	254652.9460	91990.5871	1942.10	TOP RET WALL
9041	254632.2101	92003.8438	1940.30	TOP RET WALL
9042	254632.5571	92004.2751	1940.31	TOP RET WALL
9043	254614.0491	92016.1824	1937.79	TOP RET WALL
9044	254613.5121	92015.7699	1937.83	TOP RET WALL
9045	254613.4589	92015.7496	1936.24	CONC ANG PNT
9046	254610.5326	92030.1561	1932.56	CONC ANG PNT
9047	254610.6741	92030.0758	1934.28	TOP RET WALL
9048	254611.1937	92030.2079	1934.27	TOP RET WALL
9049	254602.4029	92032.3275	1929.08	TOE
9050	254594.5618	92012.8241	1929.19	TOE
9051	254607.7758	92006.7465	1933.39	FL
9052	254636.8840	91989.2741	1938.31	FL
9053	254649.9377	91983.3384	1939.42	FL
9054	254646.1292	91968.5113	1940.94	GB
9055	254623.4003	91967.0589	1941.19	GB
9056	254628.5619	91982.7514	1939.43	GB
9057	254599.4912	91995.3530	1938.71	TOP
9058	254595.1944	91979.0360	1940.30	TOP
9059	254587.7062	91971.0320	1940.90	TOP
9060	254576.6563	91967.4556	1940.53	TOP WALL
9061	254569.0034	91964.9784	1941.62	TOP WALL
9062	254566.7863	91964.3091	1941.61	TOP WALL
9063	254583.7924	91970.2324	1938.18	GB
9064	254576.5133	91967.5272	1936.39	GB
9065	254566.6284	91964.6666	1933.46	FL
9066	254572.5979	91977.5322	1928.09	TOE
9067	254577.1372	91980.5382	1929.35	TOE
9068	254586.9761	92001.3313	1929.48	TOE
9069	254581.4961	91986.4694	1928.43	FL
9070	254581.9723	91986.0275	1930.59	TOP PIPE
9071	254593.9517	91987.6401	1937.54	TOP PIPE
9072	254593.8005	91987.6591	1935.93	FL

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9073	254592.1170	91989.0295	1935.91	FL
9074	254595.9793	91996.8845	1936.48	FL
9075	254596.9206	91996.1282	1936.60	FL
9076	254597.1073	91996.0313	1937.70	TOP PIPE
9077	254597.8596	92035.0189	1929.69	NG
9078	254577.8511	92044.5872	1929.75	GB
9079	254574.2742	92045.9892	1927.72	FL
9080	254559.5270	92003.0097	1928.80	FL
9081	254563.7957	92002.0209	1929.93	GB
9082	254553.6751	91979.1697	1929.33	GB
9083	254568.6028	92052.2832	1927.80	FL
9084	254564.3429	92053.4996	1929.83	GB
9085	254548.8809	92060.6797	1929.27	TOE
9086	254525.8339	92017.0937	1929.75	TOE
9087	254531.5493	92014.2999	1930.13	NG
9088	254548.1729	92006.2891	1929.81	GB
9089	254550.7657	92005.1264	1928.83	FL
9090	254543.3735	91981.5871	1928.73	FL
9091	254539.8987	91986.9627	1929.58	GB
9092	254520.2018	91992.0833	1929.52	GB
9093	254516.7143	91992.9844	1928.60	TOE
9094	254531.3216	92069.3151	1938.73	TOP
9095	254529.9671	92069.7542	1938.78	CONC ANG PNT
9096	254508.2828	92024.6014	1938.87	EDGE CONC
9097	254509.8629	92024.0221	1938.82	TOP
9098	254500.5486	92004.5372	1938.91	TOP
9099	254499.1063	92005.2664	1938.95	EDGE CONC
9100	254488.0259	91982.5824	1940.84	CONC ANG PNT
9101	254489.8485	91982.2412	1940.86	TOP
9102	254497.5670	91959.3142	1941.87	TOP
9103	254488.2304	91957.7909	1941.93	CONC ANG PNT
9104	254504.5614	91960.0300	1933.62	FL
9105	254502.4729	91959.8317	1933.95	TOE
9106	254508.8678	91960.3155	1933.71	FL
9107	254522.8042	91961.2124	1933.69	BW @CTR 3'VG
9108	254537.6598	91962.2908	1933.60	BW @CTR 3'VG
9109	254552.1818	91963.3326	1933.52	BW @CTR 3'VG
9110	254403.9058	91882.8345	1943.06	BSCK 17-18
9111	254498.3096	91958.4654	1942.96	TOP WALL
9112	254498.2164	91959.2833	1942.96	TOP WALL
9113	254569.1019	91964.3302	1942.58	TOP WALL
9114	254569.1765	91963.4976	1942.59	TOP WALL
9115	254507.9904	91971.6534	1927.82	TOE
9116	254509.9566	91975.9504	1927.83	TOE
9117	254570.9054	91974.9694	1928.11	TOE
9118	254565.6641	91964.4449	1933.42	GB
9300	252366.5675	73451.3130	2147.34	BSCK FW42-43
9301	251986.3770	73462.4208	2153.21	NG
9302	251987.4593	73482.6909	2154.01	EDGE ASPHALT
9303	252001.9082	73479.9505	2153.82	BALLARD
9304	252040.2472	73481.4479	2153.70	EDGE CONC
9305	252040.2659	73482.5028	2153.39	EDGE ASPHALT
9306	252087.0434	73481.4427	2153.19	EDGE ASPHALT
9307	252135.8426	73480.2180	2152.80	EDGE ASPHALT

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9308	252174.8039	73479.3670	2152.46	EDGE ASPHALT
9309	252172.9416	73477.1396	2152.71	TOP BC PC
9310	252189.1190	73473.6012	2152.47	TOP BC
9311	252205.0940	73458.8259	2152.01	TOP BC
9312	252212.5212	73437.3146	2151.05	TOP BC PT
9313	252212.7395	73425.1616	2150.59	TOP BC
9314	252209.9423	73426.1383	2150.19	BALLARD
9315	252229.4097	73425.3265	2150.50	ASPHALT
9316	252243.5587	73424.0507	2150.47	EDGE ASPHALT
9317	252250.7052	73448.7197	2150.64	EDGE ASPHALT
9318	252270.4652	73468.5477	2150.70	EDGE ASPHALT
9319	252293.8243	73474.1069	2150.61	EDGE ASPHALT
9320	252345.3092	73472.7103	2150.33	EDGE ASPHALT
9321	252396.6472	73471.2993	2149.99	EDGE ASPHALT
9322	252397.3736	73493.7859	2150.19	ASPHALT
9323	252396.4036	73514.5135	2149.74	ASPHALT
9324	252364.1537	73513.8985	2150.00	EDGE CONC
9325	252364.2515	73515.4743	2150.29	DRIVEWAY
9326	252338.8221	73516.1032	2150.69	DRIVEWAY
9327	252339.4518	73520.8315	2150.66	SIDEWALK
9328	252306.6645	73515.9038	2150.35	EDGE ASPHALT
9329	252304.5218	73495.7902	2150.87	ASPHALT
9330	252246.8743	73498.4416	2151.52	ASPHALT
9331	252246.5788	73517.5486	2151.06	EDGE ASPHALT
9332	252193.4158	73519.0539	2151.47	EDGE ASPHALT
9333	252191.4820	73498.6944	2152.00	ASPHALT
9334	252136.3747	73500.0962	2152.34	ASPHALT
9335	252137.0612	73520.4578	2151.70	EDGE ASPHALT
9336	252136.9663	73522.3457	2152.06	BC RETURN
9337	252137.3290	73527.1872	2152.12	SIDEWALK
9338	252162.2020	73525.8847	2152.15	SIDEWALK
9339	252159.9383	73526.5949	2152.16	SIDEWALK
9340	252124.1223	73531.9919	2152.26	SIDEWALK
9341	252120.9563	73529.2729	2151.81	CL HANDI RAMP
9342	252116.9782	73541.7630	2152.12	BC RETURN
9343	252119.6467	73541.7334	2152.14	SIDEWALK
9344	252114.9995	73542.5495	2151.81	EDGE CONC
9345	252113.9762	73527.5013	2151.84	CONC ANG PNT
9346	252080.1523	73528.7811	2152.21	CONC ANG PNT
9347	252081.3882	73543.8435	2152.40	EDGE CONC
9348	252079.5256	73544.3053	2152.76	BC RETURN
9349	252076.0779	73544.6250	2152.90	SIDEWALK
9350	252068.4633	73532.6119	2152.97	SIDEWALK
9351	252071.1714	73528.9273	2152.37	CL HANDI RAMP
9352	252058.6648	73523.7646	2152.57	EDGE CONC
9353	252058.7476	73525.6168	2152.96	BC RETURN
9354	252058.8230	73530.6285	2153.02	SIDEWALK
9355	251987.0167	73534.1538	2153.96	SIDEWALK
9356	251986.8477	73529.1906	2153.85	TOP BC
9357	251986.6010	73527.2757	2153.45	EDGE CONC
9358	251984.6351	73504.0926	2154.30	ASPHALT
9359	252058.0823	73502.2376	2153.30	ASPHALT
9360	252113.1346	73500.7125	2152.54	ASPHALT
9361	252026.9942	73531.3002	2153.37	STREET LIGHT

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9362	252138.3700	73526.3942	2152.18	STREET LIGHT
9363	252251.6475	73518.2122	2151.61	STREET LIGHT
9364	252366.4427	73519.9307	2149.89	STREET LIGHT
9365	252208.0661	73421.6618	2150.73	STREET LIGHT
9366	252074.9775	73335.1005	2158.41	FENCE
9367	252059.5091	73352.8789	2156.92	TOP
9368	252051.4975	73363.7262	2150.96	GB
9369	252048.0694	73367.0029	2152.87	TOP
9370	252038.2972	73377.1099	2144.03	TOE
9371	252025.1164	73391.0125	2143.47	FL
9372	252012.9903	73402.0474	2143.59	TOE
9373	251996.3751	73420.4567	2152.04	TOP
9374	252022.7697	73429.9368	2150.03	TOP
9375	252043.9288	73451.6503	2149.77	TOP
9376	252042.4230	73460.4651	2152.47	TOP
9377	252052.1200	73476.6622	2153.62	TOP
9378	252073.4644	73478.2070	2144.15	TOE
9379	252057.2196	73445.9832	2144.26	TOE
9380	252033.3472	73416.0559	2143.21	TOE
9381	252045.3478	73403.7294	2143.41	FL
9382	252077.9316	73439.9061	2143.19	FL
9383	252105.3328	73428.0347	2143.75	TOE
9384	252155.7280	73455.2054	2143.41	TOE
9385	252155.2159	73440.0480	2154.17	TOP
9386	252133.4735	73428.2957	2151.70	TOP
9387	252126.6503	73423.2048	2152.98	TOP
9388	252078.2769	73388.6698	2153.48	TOP
9389	252080.6011	73385.8770	2151.74	GB
9390	252104.4879	73406.3096	2151.78	GB
9391	252114.8791	73413.5660	2153.15	GB
9392	252142.1806	73424.9381	2152.97	GB
9393	252157.3592	73426.8841	2149.30	TOE
9394	252187.9411	73418.7714	2149.51	TOE
9395	252191.2995	73400.9631	2150.35	TOE
9396	252177.3209	73401.2341	2158.28	TOP
9397	252177.6247	73415.4623	2157.87	TOP
9398	252155.1720	73417.7473	2157.51	TOP
9399	252128.6284	73415.8478	2156.06	TOP
9400	252122.3049	73411.7905	2157.48	TOP
9401	252095.7320	73386.3246	2157.43	TOP
9402	252150.4100	73407.2459	2158.39	FENCE ANG PNT
9403	252169.5980	73406.1883	2158.61	FENCE ANG PNT
9404	252155.8664	73435.9700	2153.08	TOP WALL
9405	252154.9606	73436.0563	2153.08	TOP WALL
9406	252156.8858	73461.6324	2153.18	TOP WALL
9407	252156.0035	73460.6641	2153.26	TOP WALL
9408	252140.7895	73476.9912	2153.16	TOP WALL
9409	252141.4731	73477.8240	2153.13	TOP WALL
9410	252040.2506	73480.3573	2153.65	TOP WALL
9411	252040.1569	73479.3145	2153.60	TOP WALL
9412	252048.4367	73474.3534	2153.66	TOP
9413	252079.1889	73478.3380	2147.03	TOP PIPE
9414	252086.8633	73478.1496	2149.03	TOP PIPE
9415	252094.4084	73477.9751	2149.49	TOP PIPE

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9416	252101.5131	73477.8019	2148.95	TOP PIPE
9417	252109.2596	73477.5224	2146.84	TOP PIPE
9418	252110.1305	73477.4998	2146.85	TOP PIPE
9419	252116.5129	73477.3784	2148.58	TOP PIPE
9420	252125.4989	73477.1679	2149.25	TOP PIPE
9421	252132.9584	73477.0041	2148.65	TOP PIPE
9422	252140.4079	73476.7982	2146.59	TOP PIPE
9423	252124.8166	73462.1579	2146.73	TOP PIPE
9424	252117.5676	73469.8100	2149.33	TOP PIPE
9425	252093.8690	73462.8968	2147.00	TOP PIPE
9426	252086.6236	73470.6153	2149.55	TOP PIPE
9427	252086.4138	73470.4292	2143.80	FL
9428	252093.6179	73462.8340	2143.15	FL
9429	252109.2281	73477.5798	2143.42	FL
9430	252117.8924	73469.2550	2143.00	FL
9431	252124.9200	73461.9186	2143.28	FL
9432	252154.5428	73478.8474	2155.09	BALLARD
9433	252060.5166	73480.9670	2155.92	BALLARD
9434	252157.3466	73521.3702	2154.04	BALLARD
9435	252157.3657	73521.6397	2154.04	BALLARD
9436	252319.5008	73517.0211	2152.77	BALLARD
9437	252340.4755	73521.6557	2150.62	TOP RET WALL
9438	252339.5713	73521.7163	2150.68	TOP RET WALL
9439	252338.1109	73544.1504	2150.61	TOP RET WALL
9440	252339.1694	73544.2372	2150.59	TOP RET WALL
9441	252364.4232	73520.9059	2150.60	TOP RET WALL
9442	252363.4602	73520.9318	2150.36	TOP RET WALL
9443	252363.3622	73543.6296	2150.28	TOP RET WALL
9444	252363.5879	73543.6797	2150.28	TOP RET WALL
9445	252364.2609	73543.7472	2150.28	TOP RET WALL
9446	252305.1317	73608.3860	2151.88	WALL ANG PNT
9447	252304.4015	73608.3793	2151.88	WALL ANG PNT
9448	252311.7231	73620.4635	2151.65	TOP RET WALL
9449	252312.2096	73620.1884	2151.65	TOP RET WALL
9450	252311.6776	73620.6235	2149.64	CONC ANG PNT
9451	252311.0097	73621.2792	2149.55	TOP
9452	252304.2025	73608.3258	2149.69	TOP
9453	252363.3793	73543.7660	2148.35	GB
9454	252307.0664	73592.0578	2145.13	GB
9455	252298.7689	73599.2530	2144.12	TOP
9456	252293.3553	73611.5616	2142.62	TOP
9457	252301.8200	73628.6989	2142.15	TOP
9458	252284.4965	73595.8142	2142.95	EDGE CONC
9459	252296.9998	73585.2228	2144.88	TOP
9460	252338.8414	73547.7736	2147.88	GB
9461	252279.9638	73588.7283	2149.95	TOP WALL
9462	252241.0879	73524.3400	2150.34	TOP WALL
9463	252241.0180	73524.2231	2151.91	TOP WALL
9464	252307.2275	73546.0950	2150.61	ELEC VAULT
9465	252306.8461	73551.3029	2150.59	ELEC VAULT
9466	252315.9999	73551.9446	2150.45	ELEC VAULT
9467	252316.3423	73546.7168	2150.49	ELEC VAULT
9468	252319.3101	73544.8493	2149.82	POWER POLE
9469	252350.8191	73544.1843	2148.04	GATE

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9470	252218.8060	73524.8860	2152.68	TOP WALL
9471	252218.7865	73525.7821	2152.68	TOP WALL
9472	252164.4845	73527.4375	2152.72	TOP WALL
9473	252164.0465	73526.5826	2152.70	TOP WALL
9474	252133.7685	73558.4197	2152.79	TOP WALL
9475	252280.4198	73579.6228	2150.21	WORK/CNTL PNT
9476	252154.0353	73474.0613	2151.39	BSCK 5175-FW42
9477	252366.6071	73451.3385	2147.34	FSCK5175-FW42-43
9478	252148.5183	73544.7332	2146.36	TOP PIPE
9479	252152.8589	73540.1252	2148.54	TOP PIPE
9480	252155.9705	73536.8012	2148.89	TOP PIPE
9481	252159.4491	73533.1434	2148.36	TOP PIPE
9482	252163.6125	73528.8483	2146.43	TOP PIPE
9483	252164.6874	73527.6928	2147.17	TOP PIPE
9484	252173.7159	73527.4107	2148.71	TOP PIPE
9485	252178.9221	73527.1886	2148.76	TOP PIPE
9486	252185.7508	73526.9812	2148.13	TOP PIPE
9487	252193.2045	73526.9269	2146.21	TOP PIPE
9488	252202.7493	73526.4562	2148.42	TOP PIPE
9489	252208.5395	73526.2344	2148.68	TOP PIPE
9490	252214.6296	73526.0643	2148.34	TOP PIPE
9491	252218.9204	73525.9072	2147.61	TOP PIPE
9492	252218.5983	73521.0315	2146.16	TOP PIPE
9493	252225.6297	73527.8406	2146.19	TOP PIPE
9494	252222.2118	73531.4413	2148.08	TOP PIPE
9495	252218.5463	73535.3203	2148.69	TOP PIPE
9496	252214.1984	73539.9631	2147.97	TOP PIPE
9497	252210.8152	73543.4721	2146.01	TOP PIPE
9498	252194.9478	73528.4024	2146.11	TOP PIPE
9499	252191.2999	73532.1826	2148.02	TOP PIPE
9500	252187.0470	73536.6552	2148.71	TOP PIPE
9501	252183.2035	73540.6351	2148.09	TOP PIPE
9502	252179.8089	73544.2349	2146.17	TOP PIPE
9503	252164.0829	73529.2311	2146.32	TOP PIPE
9504	252159.9388	73533.4709	2148.34	TOP PIPE
9505	252156.1267	73537.4955	2148.90	TOP PIPE
9506	252152.2314	73541.5205	2148.28	TOP PIPE
9507	252148.8581	73545.0905	2146.40	TOP PIPE
9508	252149.3543	73545.4916	2142.81	FL
9509	252156.3999	73537.4754	2142.99	FL
9510	252163.7520	73529.3016	2143.41	FL
9511	252179.9186	73544.3085	2142.82	FL
9512	252187.6611	73536.3129	2142.66	FL
9513	252194.9676	73528.4487	2142.60	FL
9514	252210.9304	73543.6345	2142.61	FL
9515	252218.4943	73535.7185	2142.88	FL
9516	252225.7508	73527.9710	2142.91	FL
9517	252218.8132	73521.1660	2143.76	FL
9518	252222.4449	73520.7654	2144.34	FL PIPE
9519	252238.6308	73520.3300	2143.73	FL
9520	252238.6356	73520.3338	2150.31	TOP WALL
9521	252251.9992	73542.7016	2142.53	FL
9522	252278.4629	73638.5249	2141.20	FL
9523	252259.9871	73610.6158	2141.60	FL

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9524	252228.3833	73567.6831	2142.24	FL
9525	252205.3238	73590.1820	2142.44	TOE
9526	252239.7658	73627.8308	2141.84	TOE
9527	252255.9211	73652.4566	2142.09	TOE
9528	252244.8657	73659.5558	2151.54	TOP
9529	252224.6477	73634.6247	2151.67	TOP
9530	252193.9305	73601.5106	2152.07	TOP
9531	252164.5475	73576.9000	2152.39	TOP
9532	252137.3194	73556.4612	2152.72	TOP
9533	252135.3876	73559.1108	2158.18	TOP WALL
9534	252150.8406	73569.5435	2158.20	TOP WALL
9535	252172.6823	73586.7514	2158.18	TOP WALL
9536	252192.5105	73603.4770	2157.40	TOP WALL
9537	252210.0354	73621.2360	2157.37	TOP WALL
9538	252245.3313	73663.9543	2157.34	TOP WALL
9600	247688.4621	59894.4121	2329.88	BSCKFW59-60/5073
9601	248110.0145	60476.5559	2322.58	SIDEWALK
9602	248110.2019	60482.5484	2322.41	BC RETURN
9603	248110.0707	60483.2393	2321.96	FL
9604	248110.1083	60484.6090	2322.04	EDGE CONC
9605	248110.0657	60516.8536	2322.01	ASPHALT
9606	248110.5324	60548.6380	2321.66	EDGE CONC
9607	248110.5224	60549.9805	2321.52	FL
9608	248110.4953	60550.6124	2321.97	TOP BC
9609	248109.9043	60557.5287	2322.12	SIDEWALK
9610	248109.3920	60557.8590	2327.42	TOP WALL
9611	248152.6313	60557.6653	2326.62	WALL ANG PNT
9612	248152.8424	60557.6330	2322.00	SIDEWALK
9613	248152.9554	60550.9417	2321.80	TOP BC
9614	248152.8823	60550.2271	2321.36	FL
9615	248152.6058	60548.8608	2321.48	EDGE CONC
9616	248150.7333	60539.3529	2321.63	STORM DRAIN MH
9617	248152.5561	60517.3349	2321.79	ASPHALT
9618	248152.3270	60484.7543	2321.92	EDGE CONC
9619	248152.3026	60483.4009	2321.80	FL
9620	248152.2112	60482.8142	2322.26	TOP BC
9621	248152.0869	60477.0006	2322.47	SIDEWALK
9622	248146.9716	60482.7356	2322.28	DRIVEWAY
9623	248125.1811	60482.7247	2322.34	DRIVEWAY
9624	248120.1998	60473.7189	2322.44	ELEC MANHOLE
9625	248131.9416	60458.8789	2322.80	GATE
9626	248138.8260	60458.4605	2322.58	FENCE ANG PNT
9627	248146.8069	60476.8223	2322.50	FENCE ANG PNT
9628	248168.8016	60476.8905	2322.41	FENCE
9629	248168.5471	60479.1678	2322.36	TRAFFIC SIGNAL BOX
9630	248204.6936	60482.9572	2322.16	TOP BC
9631	248204.6460	60483.6741	2321.48	FL
9632	248204.7448	60485.0080	2321.80	EDGE CONC
9633	248211.5686	60485.0151	2321.79	EDGE CONC
9634	248211.6697	60483.6904	2321.49	FL
9635	248211.5852	60482.9997	2322.14	TOP BC
9636	248208.1846	60482.9634	2322.15	DROP INLET
9637	248208.2471	60517.9573	2321.63	ASPHALT
9638	248204.1245	60549.1905	2321.32	FL

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9639	248204.2024	60550.5835	2321.05	FL
9640	248204.2293	60551.2404	2321.69	TOP BC
9641	248211.3534	60551.2998	2321.69	TOP BC
9642	248211.2730	60550.5783	2321.01	FL
9643	248211.2951	60549.2709	2321.31	EDGE CONC
9644	248207.8184	60551.2617	2321.70	DROP INLET
9645	248181.0907	60556.9460	2321.87	FENCE
9646	248226.0493	60556.9656	2321.77	FENCE
9647	248255.1949	60551.5996	2321.65	DRIVEWAY
9648	248277.3153	60551.7073	2321.64	DRIVEWAY
9649	248257.8838	60557.7925	2321.77	FENCE ANG PNT
9650	248266.6512	60577.3057	2321.98	FENCE ANG PNT
9651	248273.7985	60577.5427	2321.81	GATE
9652	248286.3342	60577.3259	2322.08	FENCE
9653	248286.7506	60576.7516	2327.75	TOP WALL
9654	248283.6150	60557.9603	2327.79	WALL ANG PNT
9655	248283.5370	60557.8592	2321.92	SIDEWALK
9656	248283.6103	60551.7269	2321.71	TOP BC
9657	248283.7080	60551.1358	2321.25	FL
9658	248283.8287	60549.8110	2321.34	EDGE CONC
9659	248283.0492	60517.2637	2321.72	ASPHALT
9660	248284.2145	60485.2828	2322.64	EDGE CONC
9661	248284.1353	60483.9663	2322.55	FL
9662	248284.0474	60483.2825	2322.95	TOP BC
9663	248283.9456	60477.2986	2323.11	SIDEWALK
9664	248283.9108	60477.4208	2331.32	TOP WALL
9665	248249.0340	60476.9938	2322.68	WALL ANG PNT
9666	248213.6400	60476.7991	2322.26	FENCE
9667	248111.0670	60477.5577	2322.52	STREET LIGHT
9668	248176.3496	60555.9907	2321.80	STREET LIGHT
9669	248244.3625	60477.9666	2322.64	STREET LIGHT
9670	248232.4384	60406.2268	2333.04	TOP WALL
9671	248232.5114	60406.4708	2325.28	NG
9672	248215.6516	60409.9409	2323.99	TOP
9673	248227.2176	60431.6376	2323.76	TOP
9674	248236.1276	60452.9431	2323.98	TOP
9675	248234.3150	60469.3092	2322.95	TOP
9676	248216.3764	60476.6468	2322.02	EDGE CONC
9677	248224.4119	60474.1010	2321.70	EDGE CONC
9678	248230.4445	60468.0783	2319.21	EDGE CONC
9679	248229.3289	60454.7778	2318.74	EDGE CONC
9680	248220.4592	60433.6791	2319.19	EDGE CONC
9681	248211.7562	60420.0827	2319.46	EDGE CONC
9682	248204.6509	60397.6415	2320.06	EDGE CONC
9683	248193.9477	60399.9543	2313.73	TOE
9684	248201.6862	60422.9566	2313.13	TOE
9685	248217.7865	60461.9627	2312.49	TOE
9686	248218.2711	60468.3436	2312.47	TOE
9687	248218.7817	60468.8854	2314.54	GB
9688	248213.5849	60476.0192	2317.83	GB
9689	248217.4751	60461.9660	2312.53	EDGE CONC
9690	248208.9430	60462.0917	2312.40	EDGE CONC
9691	248203.5455	60461.0427	2312.34	EDGE CONC
9692	248201.5222	60459.9314	2312.35	EDGE CONC

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9693	248177.3337	60459.9056	2312.37	EDGE CONC
9694	248160.0430	60468.5835	2312.44	EDGE CONC
9695	248158.9950	60462.4321	2312.81	TOE
9696	248153.6033	60431.4996	2313.88	CONC ANG PNT
9697	248158.5785	60430.3882	2313.81	CONC ANG PNT
9698	248156.8775	60423.0237	2313.87	CONC ANG PNT
9699	248151.4972	60423.7915	2314.10	CONC ANG PNT
9700	248148.8121	60428.8918	2315.18	FL
9701	248145.8481	60429.4550	2315.13	FL
9702	248145.6743	60429.5236	2316.84	TOP PIPE
9703	248134.4553	60432.7563	2321.74	EDGE CONC
9704	248132.1753	60440.1650	2323.35	EDGE CONC
9705	248138.9262	60451.8557	2321.36	EDGE CONC
9706	248145.5638	60458.1669	2318.95	EDGE CONC
9707	248147.0412	60467.7613	2319.11	EDGE CONC
9708	248148.8265	60472.3680	2320.14	EDGE CONC
9709	248152.1235	60475.0880	2321.04	EDGE CONC
9710	248156.4584	60476.4663	2321.63	EDGE CONC
9711	248162.2065	60476.7670	2321.91	EDGE CONC
9712	248168.7555	60475.9229	2321.88	GB
9713	248160.0161	60469.5338	2315.08	GB
9714	248101.0155	60362.0295	2325.30	TOP
9715	248102.6887	60361.1324	2325.31	TOP
9716	248122.1447	60352.1944	2315.06	TOE
9717	248125.6103	60364.9190	2316.18	EDGE DIRT RD
9718	248140.0623	60362.9624	2314.88	EDGE DIRT RD
9719	248141.7446	60383.2346	2319.15	EDGE DIRT RD
9720	248125.6291	60382.4223	2318.97	EDGE DIRT RD
9721	248120.0370	60405.6515	2324.50	EDGE DIRT RD
9722	248133.1332	60409.2690	2324.08	EDGE DIRT RD
9723	248145.3110	60361.2620	2313.67	TOE
9724	248149.9377	60379.7119	2313.71	TOE
9725	248149.8090	60402.1847	2313.94	TOE
9726	248186.4630	60329.1168	2325.25	TOP
9727	248181.1289	60330.2622	2321.55	EDGE CONC
9728	248169.6626	60333.8977	2314.06	TOE
9729	248148.3702	60342.4986	2314.10	FL
9730	248165.7028	60392.7656	2313.31	FL
9731	248181.2405	60446.6761	2312.18	FL
9732	248178.4378	60460.3676	2312.37	BW @CTR 3'VG
9733	248189.2684	60460.5601	2312.38	BW @CTR 3'VG
9734	248199.8270	60460.5114	2312.35	BW @CTR 3'VG
9735	248192.5080	60475.2133	2312.27	FL PIPE
9736	248192.8789	60475.0292	2326.13	FL PIPE
9737	248192.6710	60475.2612	2328.15	FL PIPE
9738	248202.0661	60475.9087	2319.96	BW @CTR 3'VG
9739	248191.3859	60475.8951	2320.04	BW @CTR 3'VG
9740	248180.6941	60475.8465	2320.04	BW @CTR 3'VG
9741	248160.0173	60468.5599	2319.29	TOP WALL
9742	248159.6315	60469.1998	2319.31	TOP WALL
9743	248168.8362	60475.7740	2322.72	TOP WALL
9744	248169.2462	60475.2316	2322.73	TOP WALL
9745	248170.2116	60475.8809	2322.76	TOP WALL
9746	248212.6280	60475.8866	2322.85	TOP WALL

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9747	248212.9418	60475.4538	2322.85	TOP WALL
9748	248213.2983	60475.6445	2322.90	TOP WALL
9749	248218.8451	60468.8992	2317.84	TOP WALL
9750	248218.2469	60468.4456	2317.81	TOP WALL
9751	248213.4294	60475.9437	2323.27	TOP WALL
9752	248213.4487	60476.7844	2323.26	TOP WALL
9753	248169.0673	60476.8644	2323.24	TOP WALL
9754	248168.9068	60475.9437	2323.24	TOP WALL
9755	248170.3277	60475.8716	2312.24	FL
9756	248212.5145	60475.9259	2312.23	FL
9757	248181.2201	60557.0997	2322.70	TOP WALL
9758	248181.3191	60557.9369	2322.71	TOP WALL
9759	248225.6712	60558.0563	2322.79	TOP WALL
9760	248225.6661	60557.1546	2322.78	TOP WALL
9761	248224.4185	60558.0759	2322.40	TOP WALL
9762	248225.2295	60558.6496	2322.40	TOP WALL
9763	248225.7028	60558.2096	2322.35	TOP WALL
9764	248234.6257	60564.6715	2318.82	TOP WALL
9765	248234.2303	60565.3102	2318.83	TOP WALL
9766	248181.4064	60558.2689	2322.23	TOP WALL
9767	248182.0937	60558.2621	2322.22	TOP WALL
9768	248182.7649	60567.0710	2317.46	TOP WALL
9769	248183.3679	60567.0045	2317.46	TOP WALL
9770	248182.6803	60567.2101	2315.38	GB
9771	248183.4735	60567.2183	2315.02	GB
9772	248184.0696	60570.4710	2311.71	GB
9773	248182.9313	60558.2764	2311.81	FL
9774	247688.4677	59894.4183	2329.86	BSCK FW59-60
9775	248188.0217	60591.7051	2311.54	EDGE CONC
9776	248186.9964	60592.0295	2311.62	TOE
9777	248175.2560	60593.9341	2317.64	TOP
9778	248174.0911	60594.2274	2317.66	EDGE CONC
9779	248170.5473	60571.9836	2318.15	EDGE CONC
9780	248171.9166	60571.9259	2318.15	GB
9781	248168.8994	60557.2732	2321.84	CONC ANG PNT
9782	248177.5969	60572.2329	2315.92	TOP PIPE
9783	248181.9858	60578.7150	2312.82	FL
9784	248183.4519	60579.5880	2312.54	FL
9785	248233.9181	60565.2217	2312.11	CONC ANG PNT
9786	248233.5581	60565.8120	2312.08	CONC ANG PNT
9787	248236.5337	60588.4051	2311.80	CONC ANG PNT
9788	248237.4164	60588.4037	2311.70	TOE
9789	248249.7682	60586.6289	2317.34	TOP
9790	248241.2997	60586.6346	2313.65	FL
9791	248242.8962	60584.8741	2313.83	FL
9792	248245.2042	60579.9423	2316.11	TOP PIPE
9793	248234.8048	60564.7109	2315.77	GB
9794	248225.8148	60558.0575	2321.82	GB
9795	248242.2749	60557.7569	2321.76	GB
9796	248254.2747	60570.1479	2321.59	GB
9797	248258.3069	60580.8309	2321.43	GB
9798	248284.1512	60561.0740	2322.34	TOP BC
9799	248283.9312	60560.5455	2321.86	FL
9800	248258.4383	60581.2859	2321.83	TOP BC

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9801	248250.4551	60587.6864	2317.40	TOP BC END
9802	248213.8468	60609.6705	2309.62	FL
9803	248212.0423	60582.1042	2310.02	FL
9804	248208.7750	60558.0116	2310.83	FL
9805	248224.4014	60558.0509	2311.79	FL
9806	248213.9561	60557.9425	2311.79	FL
9807	248203.1087	60557.9036	2311.79	BW @CTR 3'VG
9808	248192.4416	60557.8567	2311.78	BW @CTR 3'VG
9809	248182.1632	60558.0863	2311.51	FL
9810	248192.0754	60709.5352	2316.47	TOP
9811	248203.6730	60707.3563	2310.55	TOE
9812	248224.8540	60704.6426	2307.49	GB
9813	248236.4353	60706.9198	2306.89	GB
9814	248254.1653	60707.3504	2310.41	TOE
9815	248266.4076	60705.4818	2316.39	TOP
9905	262822.2548	110455.2247	1718.98	GC-CONTROL
9906	262828.9004	110094.9673	1722.74	GC-CONTROL
9907	262847.9092	110019.2053	1728.08	TOP
9908	262838.6497	110020.2971	1724.20	TOE
9909	262853.5226	110090.9742	1728.35	VG ANG PNT
9910	262842.2124	110090.9815	1722.91	
9911	262842.6695	110131.0133	1722.71	
9912	262849.0837	110190.7518	1728.88	VG CORNER
9913	262853.4659	110131.0659	1728.16	VG ANG PNT
9914	262850.6262	110190.6184	1728.89	VG ANG PNT
9915	262869.0924	110191.9402	1729.18	SIDEWALK
9916	262862.3353	110191.0625	1728.67	SIDEWALK
9917	262793.7658	110190.4724	1729.08	TOP PIPE
9918	262740.5655	110190.0922	1728.95	SIDEWALK
9919	262728.6328	110189.9280	1728.28	SIDEWALK
9920	262722.7449	110190.6625	1729.06	SIDEWALK
9921	262742.5107	110189.9810	1728.88	VG CORNER
9922	262740.6893	110189.8980	1728.87	VG ANG PNT
9923	262739.1884	110130.9346	1728.19	VG ANG PNT
9924	262739.4499	110090.8630	1728.35	VG ANG PNT
9925	262750.6112	110091.2108	1722.91	
9926	262749.8544	110130.8734	1722.80	
9927	262732.8632	110025.8887	1728.99	TOP
9928	262744.8634	110025.9907	1723.48	TOE
9929	262724.5432	110195.4788	1728.90	BW @CTR 3'VG
9930	262740.3367	110195.0317	1731.62	BW @CTR 3'VG
9931	262851.0129	110195.8519	1731.64	BW @CTR 3'VG
9932	262869.0573	110196.9166	1729.11	BW @CTR 3'VG
9933	262850.3580	110197.0103	1729.12	ASPHALT
9934	262741.5372	110196.3638	1729.11	ASPHALT
9935	262818.5388	110180.3987	1722.58	
9936	262774.0195	110179.9669	1722.51	
9937	262848.9779	110190.8628	1722.49	
9938	262819.6372	110190.4345	1722.55	
9939	262816.0134	110190.5630	1722.49	
9940	262775.7313	110190.1830	1722.53	
9941	262772.1234	110190.1681	1722.53	
9942	262742.7850	110190.0750	1722.39	
9943	262848.6122	110246.1055	1722.23	

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9944	262819.2340	110245.8376	1722.30	
9945	262817.4158	110180.3847	1722.55	
9946	262772.8796	110180.0856	1722.52	
9947	262814.8797	110188.5847	1722.48	BC @ CTR DRAIN
9948	262862.3602	110303.6720	1729.09	BW @CTR 3'VG
9949	262850.2546	110303.6375	1731.06	BW @CTR 3'VG
9950	262739.7247	110302.8768	1730.89	BW @CTR 3'VG
9951	262727.8526	110302.7538	1729.21	BW @CTR 3'VG
9952	262727.5994	110302.7482	1729.24	BC @ CTR DRAIN
9953	262723.2515	110304.6646	1728.76	BC @ CTR DRAIN
9954	262721.3571	110309.2035	1728.78	BC @ CTR DRAIN
9955	262724.3764	110319.3703	1728.67	BC @ CTR DRAIN
9956	262733.6921	110332.2049	1728.21	BC @ CTR DRAIN
9957	262736.8302	110343.2908	1727.99	BC @ CTR DRAIN
9958	262736.3542	110386.0925	1727.76	BC @ CTR DRAIN
9959	262736.5560	110391.4510	1727.76	BC @ CTR DRAIN
9960	262739.7059	110407.5882	1727.51	BC @ CTR DRAIN
9961	262738.5324	110419.4436	1727.78	BC @ CTR DRAIN
9962	262738.8067	110443.2324	1727.17	BC @ CTR DRAIN
9963	262739.6634	110422.5167	1727.18	STORM DRAIN MH
9964	262779.8783	110591.4920	1724.18	TOP / TOE INTX
9965	262790.9344	110589.2015	1720.03	CONC FL
9966	262791.7763	110589.2115	1719.87	NG
9967	262805.9489	110588.0742	1717.64	FL
9968	262835.9860	110584.5942	1718.55	TOE
9969	262863.1312	110578.3084	1725.91	TOP
9970	262851.9670	110441.6650	1726.67	TOP / TOE INTX
9972	262760.8246	110445.4320	1720.87	CONC FL
9973	262749.1651	110448.1330	1726.15	TOP / TOE INTX
9974	262756.0650	110418.7476	1721.02	204
9975	262841.5708	110416.5966	1720.91	204
9976	262754.3351	110410.6207	1721.50	204
9977	262753.1098	110404.8850	1721.46	204
9978	262750.6245	110393.3800	1721.26	204
9979	262749.4097	110390.7876	1721.25	CONC FL
9980	262737.4605	110390.9978	1727.09	TOP / TOE INTX
9981	262737.7245	110352.9091	1727.23	TOP / TOE INTX
9982	262741.5644	110302.9864	1727.41	TOP / TOE INTX
9983	262748.8798	110352.8985	1721.50	CONC FL
9984	262741.9490	110303.0280	1721.90	CONC FL
9985	262771.2548	110303.1040	1721.93	205
9986	262774.9669	110303.1652	1721.89	205
9987	262815.2524	110303.4448	1721.92	205
9988	262818.9263	110303.4687	1721.84	205
9989	262848.3273	110303.6884	1721.84	205
9990	262851.9790	110303.5663	1721.78	205
9991	262861.5477	110303.9402	1721.77	205
9992	262861.5085	110292.3433	1721.81	205
9993	262861.5254	110297.7537	1722.36	FL PIPE
9994	262857.0100	110292.3772	1722.31	FL PIPE
9995	262861.6484	110308.8102	1721.79	CONC FL
9996	262840.3795	110353.6067	1721.53	CONC FL
9997	262851.6514	110353.8587	1727.20	TOP / TOE INTX
9998	262861.9256	110308.8157	1727.56	TOP / TOE INTX

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9999	262861.7245	110303.7846	1727.67	TOP / TOE INTX
10000	262862.7328	110302.9686	1727.96	BC @ CTR DRAIN
10001	262879.1713	110306.7731	1730.12	BC @ CTR DRAIN
10002	262898.5878	110315.4342	1731.06	BC @ CTR DRAIN
10003	262840.1166	110393.6870	1721.24	CONC FL
10004	262838.6868	110397.6273	1718.81	CONC FL
10005	262837.7776	110416.4305	1718.86	CONC FL
10006	262756.1747	110418.3431	1718.74	205
10007	262754.0953	110407.5999	1718.22	205
10008	262751.4938	110396.7007	1718.77	205
10009	262889.3213	110291.5070	1730.48	TOP RET WALL
10010	262862.4804	110291.6906	1730.27	TOP RET WALL
10011	262868.5295	110286.6532	1728.75	BW @CTR 3'VG
10012	262850.3569	110287.4469	1731.29	BW @CTR 3'VG
10013	262740.0764	110286.6205	1731.24	BW @CTR 3'VG
10014	262721.4373	110285.6483	1728.81	BW @CTR 3'VG
10015	262687.9880	110285.5608	1728.51	TOP BC
10016	262687.6014	110290.7255	1730.00	TOP RET WALL
10017	262740.2039	110247.0898	1729.82	TOP BC
10018	262740.5339	110234.4663	1729.75	TOP BC
10019	262850.5282	110235.0477	1729.76	TOP BC
10020	262850.5255	110247.9670	1729.83	TOP BC
12000	253208.1356	82371.1306	2067.11	WP 2000
12001	253365.9618	82535.9715	2048.55	CONC
12002	253352.1155	82539.9901	2048.53	CONC
12003	253326.8197	82510.8190	2048.89	CONC
12004	253326.8460	82510.8499	2057.45	CONC
12005	253337.1859	82544.1519	2057.03	CONC
12006	253337.2218	82544.1999	2048.48	CONC
12007	253336.5585	82544.4863	2059.06	8"RET.WALL WEST
12008	253366.7978	82535.6685	2058.99	8"RET.WALL WEST
12009	253366.0142	82535.8247	2056.99	CONC
12010	253353.3771	82495.3923	2057.39	CONC
12011	253353.3671	82495.3887	2048.84	CONC
12012	253355.7212	82560.1816	2059.36	NG
12013	253317.1001	82588.2318	2059.55	TOE
12014	253332.4206	82543.1946	2057.33	TOE
12015	253317.4525	82495.2444	2056.36	TOE
12016	253299.2555	82492.0427	2065.48	TOP BC
12017	253302.2701	82553.8419	2065.63	TOP BC
12018	253291.0311	82592.1501	2065.29	TOP BC
13000	249233.5708	70179.2944	2211.65	TOP BC
13001	249371.1115	70178.6029	2207.69	TOP BC
13002	249373.0660	70178.5261	2207.20	FL
13003	249372.6562	70275.8832	2202.76	FL
13004	249340.1265	70340.5172	2196.76	FL
13005	249396.1181	70338.7166	2197.81	TOE
13006	249442.3197	70290.8989	2205.06	TOP
13007	249389.5715	70259.4791	2205.91	TOP
13008	249350.6594	70247.8170	2206.57	TOP
13009	249305.9440	70195.8502	2208.75	TOP
13010	249233.6073	70196.0106	2210.10	4
13011	249181.8402	70232.9411	2211.67	TOP
13012	249177.3471	70296.2179	2211.79	TOP

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13013	249245.1180	70348.2331	2209.87	TOP
13014	249356.5397	70432.8438	2206.51	TOP
13015	249367.1611	70422.8760	2201.16	TOP RET WALL
13016	249367.1215	70422.5675	2198.31	RET WALL FOOTING
13017	249292.0496	70365.9826	2201.83	TOP RET WALL
13018	249292.1289	70365.9164	2198.52	RET WALL FOOTING
13019	249192.6866	70290.6693	2203.19	TOP RET WALL
13020	249191.3174	70290.9099	2208.77	8"RET.WALL WEST
13021	249197.8877	70282.3489	2199.87	CONC
13022	249204.2374	70273.9905	2199.89	CONC
13023	249210.5760	70265.3140	2199.87	CONC
13024	249211.0928	70264.4795	2208.75	8"RET.WALL WEST
13025	249244.4948	70244.5157	2201.04	TOE
13026	249312.8876	70235.3705	2200.69	TOE
13027	249351.0879	70281.2091	2199.02	TOE
13028	249437.3518	70352.1886	2198.00	TOE

5.3.3 DISKS

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factory results it lends to practical applications, the Manning formula has become the most widely used of all uniform-flow formulas for open-channel flow computations.[1] A nomographic solution of the formula is given in Appendix C.

Within the normal ranges of slope and hydraulic radius, the values of Manning's n and Kutter's n are generally found to be numerically very close. For practical purposes, the two values may be considered identical when the slope is equal to or greater than 0.0001 and the hydraulic radius is between 1.0 and 30 ft. Typical values good for both Kutter's n and Manning's n are shown in Table 5-6 and illustrated in Fig. 5-5.

Comparing the Chézy formula with the Manning formula, it can be seen that

$$C = \frac{1.49}{n} R^{1/6} \tag{5-7}$$

This equation provides an important relationship[2] between Chézy's C and Manning's n.

The exponent of the hydraulic radius in the Manning formula is actually not a constant but varies in a range depending mainly on the channel shape and roughness (see a previous footnote). For this reason, some hydraulicians prefer to use the formula with a variable exponent. For example, the uniform-flow formula widely used in the U.S.S.R. is of this type; this is the *Pavlovskiĭ formula* [21], proposed in 1925.* This formula in *metric* units is

$$C = \frac{1}{n} R^y \tag{5-8}$$

where
$$y = 2.5\sqrt{n} - 0.13 - 0.75\sqrt{R}(\sqrt{n} - 0.10) \tag{5-9}$$

and where C is the resistance factor in the Chézy formula expressed in *metric* units. The exponent y depends on the roughness coefficient and hydraulic radius. The formula is valid for R between 0.1 and 3.0 m and

basis of other later studies, some authors suggested a value of $\frac{3}{4}$ [20], and others suggested a variable depending on R and n [21].

[1] The Manning formula was suggested for international use by Lindquist [3] at the Scandinavia Sectional Meeting of the World Power Conference in 1933 in Stockholm. The final recommendation for such use was made by the Executive Committee at the 3d World Power Conference in 1936 in Washington, D.C.

[2] On account of this relationship, the Manning formula is sometimes considered a variation of the Chézy formula with Chézy's C defined by Eq. (5-7).

* The Pavlovskiĭ formula was published in several editions of Pavlovskiĭ's "Handbook of Hydraulics" [21]. An article about this formula entitled *Formula dlia koeffitsienta Chézy* (*Formula for a Chézy coefficient*) is given in pp. 140–149 of the 1937 edition of the book. A footnote in this article reads: "The formula was proposed in 1925."

for n between 0.011 and 0.040. For practical purposes, the following approximate forms of Eq. (5-9) are generally suggested for use:

$$y = 1.5\sqrt{n} \quad \text{for } R < 1.0 \text{ m} \tag{5-10}$$
$$y = 1.3\sqrt{n} \quad \text{for } R > 1.0 \text{ m} \tag{5-11}$$

5-7. Determination of Manning's Roughness Coefficient. In applying the Manning formula or the G. K. formula, the greatest difficulty lies in the determination of the roughness coefficient n; for there is no exact method of selecting the n value. At the present stage of knowledge, to select a value of n actually means to estimate the resistance to flow in a given channel, which is really a matter of intangibles. To veteran engineers, this means the exercise of sound engineering judgment and experience; for beginners, it can be no more than a guess, and different individuals will obtain different results.

In order to give guidance in the proper determination of the roughness coefficient, four general approaches will be discussed; namely, (1) to understand the factors that affect the value of n and thus to acquire a basic knowledge of the problem and narrow the wide range of guesswork, (2) to consult a table of typical n values for channels of various types, (3) to examine and become acquainted with the appearance of some typical channels whose roughness coefficients are known, and (4) to determine the value of n by an analytical procedure based on the theoretical velocity distribution in the channel cross section and on the data of either velocity or roughness measurement. The first three approaches will be given in the next three articles, and the fourth approach will be taken up in Art. 8-7.

5-8. Factors Affecting Manning's Roughness Coefficient. It is not uncommon for engineers to think of a channel as having a single value of n for all occasions. In reality, the value of n is highly variable and depends on a number of factors. In selecting a proper value of n for various design conditions, a basic knowledge of these factors should be found very useful. The factors that exert the greatest influence upon the coefficient of roughness in both artificial and natural channels are therefore described below. It should be noted that these factors are to a certain extent interdependent; hence discussion about one factor may be repeated in connection with another.

A. Surface Roughness. The surface roughness is represented by the size and shape of the grains of the material forming the wetted perimeter and producing a retarding effect on the flow. This is often considered the only factor in selecting a roughness coefficient, but it is actually just one of several major factors. Generally speaking, fine grains result in a relatively low value of n and coarse grains, in a high value of n.

In alluvial streams where the material is fine in grain, such as sand,

clay, loam, or silt, the retarding effect is much less than where the material is coarse, such as gravels or boulders. When the material is fine, the value of n is low and relatively unaffected by change in flow stage. When the material consists of gravels and boulders, the value of n is generally high, particularly at low or high stage. Larger boulders usually collect at the bottom of the stream, making the channel bottom rougher than the banks and increasing the value of n at low stages. At high stages, a portion of the energy of flow is used in rolling the boulders downstream, thus increasing the value of n. A theoretical discussion of surface roughness will be given in Art. 8-2.

B. Vegetation. Vegetation may be regarded as a kind of surface roughness, but it also markedly reduces the capacity of the channel and retards the flow. This effect depends mainly on height, density, distribution, and type of vegetation, and it is very important in designing small drainage channels.

At the University of Illinois an investigation has been made to determine the effect of vegetation on the coefficient of roughness [22]. On one of the drainage ditches in central Illinois under investigation, an average n value of 0.033 was measured in March, 1925, when the channel was in good condition. In April, 1926, there were bushy willows and dry weeds on the side slopes, and n was found to be 0.055. This increase in n represents the result of one year's growth of vegetation. During the summers of 1925 and 1926 there was a thick growth of cattails on the bottom of the channel. The n value at medium summer stages was about 0.115, and at a nearly bankfull stage it was 0.099. The cattails in the channel were washed out by the high water in September, 1926; the average value of n found after this occurrence was 0.072. The conclusions drawn from this investigation were, in part, as follows:

1. The minimum value of n that should be used for designing drainage ditches in central Illinois is 0.040. This value is obtainable at high stages during the summer months in the most carefully maintained channels, where the bottom of the channel is clear of vegetation and the side slopes are covered with grass or low weeds, but no bushes. This low value of n should not be used unless the channel is to be cleared annually of all weeds and bushes.
2. A value of $n = 0.050$ should be used if the channel is to be cleared in alternate years only. Large weeds and bushy willows from 3 to 4 ft high on the side slopes will produce this value of n.
3. In channels that are not cleared for a number of years, the growth may become so abundant that values of $n > 0.100$ may be found.
4. Trees from 6 to 8 in. in diameter growing on the side slopes do not impede the flow so much as do small bushy growths, provided overhanging branches are cut off.

The U.S. Soil Conservation Service has made studies on flow of water in small shallow channels protected by vegetative linings (Chap. 7, Sec. C). It was found that n values for these channels varied with the shape and cross section of the channel, the slope of the channel bed, and the depth of flow. Comparing two channels, all other factors being equal, the lesser average depth gives the higher n value, owing to a larger proportion of affected vegetation. Thus, a triangular channel has a higher n value than a trapezoidal channel, and a wide channel has a lower n value than a narrow channel. A flow of sufficient depth tends to bend over and submerge the vegetation and to produce low n values. A steep slope causes greater velocity, greater flattening of the vegetation, and low n values.

The effect of vegetation on flood plains will be discussed later in item *H*.

C. Channel Irregularity. Channel irregularity comprises irregularities in wetted perimeter and variations in cross section, size, and shape along the channel length. In natural channels, such irregularities are usually introduced by the presence of sand bars, sand waves, ridges and depressions, and holes and humps on the channel bed. These irregularities definitely introduce roughness in addition to that caused by surface roughness and other factors. Generally speaking, a gradual and uniform change in cross section, size, and shape will not appreciably affect the value of n, but abrupt changes or alternation of small and large sections necessitates the use of a large value of n. In this case, the increase in n may be 0.005 or more. Changes that cause sinuous flow from side to side of the channel will produce the same effect.

D. Channel Alignment. Smooth curvature with large radius will give a relatively low value of n, whereas sharp curvature with severe meandering will increase n. On the basis of flume tests, Scobey [23] suggested that the value of n be increased 0.001 for each 20 degrees of curvature in 100 ft of channel. Although it is doubtful whether curvature ever increases n more than 0.002 or 0.003, its effect should not be ignored, for curvature may induce the accumulation of drift and thus indirectly increase the value of n. Generally speaking, the increase of roughness in unlined channels carrying water at low velocities is negligible. An increase of 0.002 in n value would constitute an adequate allowance for curve losses in most flumes containing pronounced curvatures, whether built of concrete or other materials. The meandering of natural streams, however, may increase the n value as high as 30%.

E. Silting and Scouring. Generally speaking, silting may change a very irregular channel into a comparatively uniform one and decrease n, whereas scouring may do the reverse and increase n. However, the dominant effect of silting will depend on the nature of the material deposited. Uneven deposits such as sand bars and sand waves are

channel irregularities and will increase the roughness. The amount and uniformity of scouring will depend on the material forming the wetted perimeter. Thus, a sandy or gravelly bed will be eroded more uniformly than a clay bed. The deposition of silt eroded from the uplands will tend to even out the irregularities in a channel dredged through clay. The energy used in eroding and carrying the material in suspension or rolling it along the bed will also increase the n value. The effect of scouring is not significant as long as the erosion on channel bed caused by high velocities is progressing evenly and uniformly.

F. Obstruction. The presence of log jams, bridge piers, and the like tends to increase n. The amount of increase depends on the nature of the obstructions, their size, shape, number, and distribution.

G. Size and Shape of Channel. There is no definite evidence about the size and shape of a channel as an important factor affecting the value of n. An increase in hydraulic radius may either increase or decrease n, depending on the condition of the channel (Fig. 5-4).

H. Stage and Discharge. The n value in most streams decreases with increase in stage and in discharge. When the water is shallow, the irregularities of the channel bottom are exposed and their effects become pronounced. However, the n value may be large at high stages if the banks are rough and grassy.

When the discharge is too high, the stream may overflow its banks and a portion of the flow will be along the flood plain. The n value of the flood plains is generally larger than that of the channel proper, and its magnitude depends on the surface condition or vegetation. If the bed and banks of a channel are equally smooth and regular and the bottom slope is uniform, the value of n may remain almost the same at all stages; so a constant n is usually assumed in the flow computation. This happens mostly in artificial channels. On flood plains the value of n usually varies with the stage of submergence of the vegetation at low stages. This can be seen, for example, from Table 5-4, which shows the n values for various flood stages according to the type of cover and depth

TABLE 5-4. VALUES OF n FOR VARIOUS STAGES IN THE NISHNABOTNA RIVER, IOWA, FOR THE AVERAGE GROWING SEASON

Depth of water, ft	Channel section	Flood-plain cover				
		Corn	Pasture	Meadow	Small grains	Brush and waste
Under 1	0.03	0.06	0.05	0.10	0.10	0.12
1 to 2	0.03	0.06	0.05	0.08	0.09	0.11
2 to 3	0.03	0.07	0.04	0.07	0.08	0.10
3 to 4	0.03	0.07	0.04	0.06	0.07	0.09
Over 4	0.03	0.06	0.04	0.05	0.06	0.08

of inundation, as observed in the Nishnabotna River, Iowa, for the average growing season [24]. It should be noted, however, that vegetation has a marked effect only up to a certain stage and that the roughness coefficient can be considered to remain constant for practical purposes in determining overbank flood discharges.

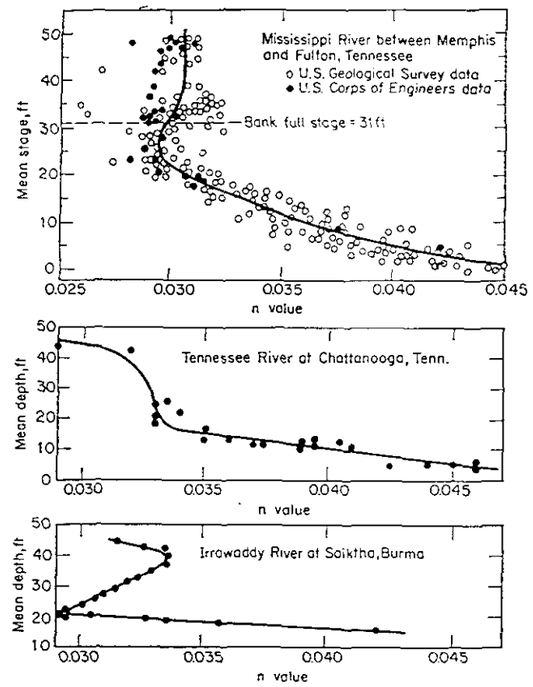


FIG. 5-4. Variations of the n value with the mean stage or depth.

Curves of n value versus stage (Fig. 5-4) in streams have been given by Lane [25], showing how value of n varies with stage in three large river channels. For the roughness of large canals, a study in connection with the design of the Panama Canal was made by Meyers and Schultz [26].[1] The two most important conclusions reached from this study were (1) that the n value for a river channel is least when the stage is at or somewhat above normal bankfull stage, and tends to increase for both

[1] A table of n values for eleven large channels at the most efficient depths and the curves showing the variations of n value with hydraulic radius in eight river channels are also given in this reference.

higher and lower stages; and (2) that the bankfull n values do not vary greatly for rivers and canals in different kinds of material and in widely separated locations.

For circular conduits, Camp [27,28] was able to show that the n value for a conduit flowing partially full is greater than that for a full conduit. Using measurements on clean sewer pipe and drain tile, both clay and concrete, from 4 to 12 in. in size, he found an increase of about 24% in the n value at the half-depth (Fig. 6-5).[1] The n value for the pipe flowing full was found to vary from 0.0095 to 0.011. Taking an average value of 0.0103, the n value at half-depth should be about 0.013. This is identical with the usual design value, which is based largely on measured values in sewers flowing partially full.

I. Seasonal Change. Owing to the seasonal growth of aquatic plants, grass, weeds, willow, and trees in the channel or on the banks, the value of n may increase in the growing season and diminish in the dormant season. This seasonal change may cause changes in other factors.

J. Suspended Material and Bed Load. The suspended material and the bed load, whether moving or not moving, would consume energy and cause head loss or increase the apparent channel roughness.

All the above factors should be studied and evaluated with respect to conditions regarding type of channel, state of flow, degree of maintenance, and other related considerations. They provide a basis for determining the proper value of n for a given problem. As a general guide to judgment, it may be accepted that conditions tending to induce turbulence and cause retardance will increase n value and that those tending to reduce turbulence and retardance will decrease n value.

Recognizing several primary factors affecting the roughness coefficient, Cowan [32] developed a procedure for estimating the value of n. By this procedure, the value of n may be computed by

$$n = (n_0 + n_1 + n_2 + n_3 + n_4)m_5 \tag{5-12}$$

where n_0 is a basic n value for a straight, uniform, smooth channel in the natural materials involved, n_1 is a value added to n_0 to correct for the effect of surface irregularities, n_2 is a value for variations in shape and size of the channel cross section, n_3 is a value for obstructions, n_4 is a value for vegetation and flow conditions, and m_5 is a correction factor for meandering of channel. Proper values of n_0 to n_4 and m_5 may be selected from Table 5-5 according to the given conditions.

[1] The n/n_0 curve was based on measurements by Wilcox [29] on 8-in. clay and concrete sewer pipes and by Yarnell and Woodward [30] on open-butt-joint concrete and clay drain tiles 4 to 12 in. in size. For depths less than about $0.15d_0$, the curve was verified by the data of Johnson [31] for large sewers.

In selecting the value of n_1, the degree of irregularity is considered *smooth* for surfaces comparable to the best attainable for the materials involved; *minor* for good dredged channels, slightly eroded or scoured side slopes of canals or drainage channels; *moderate* for fair to poor dredged channels, moderately sloughed or eroded side slopes of canals or drainage channels; and *severe* for badly sloughed banks of natural streams, badly eroded or sloughed sides of canals or drainage channels, and unshaped, jagged, and irregular surfaces of channels excavated in rock.

In selecting the value of n_2, the character of variations in size and shape of cross section is considered *gradual* when the change in size or shape occurs gradually, *alternating occasionally* when large and small sections alternate occasionally or when shape changes cause occasional shifting of main flow from side to side, and *alternating frequently* when large and small sections alternate frequently or when shape changes cause frequent shifting of main flow from side to side.

The selection of the value of n_3 is based on the presence and characteristics of obstructions such as debris deposits, stumps, exposed roots, boulders, and fallen and lodged logs. One should recall that conditions considered in other steps must not be reevaluated or double-counted in this selection. In judging the relative effect of obstructions, consider the following: the extent to which the obstructions occupy or reduce the average water area, the character of obstructions (sharp-edged or angular objects induce greater turbulence than curved, smooth-surfaced objects), and the position and spacing of obstructions transversely and longitudinally in the reach under consideration.

In selecting the value of n_4, the degree of effect of vegetation is considered

(1) *Low* for conditions comparable to the following: (*a*) dense growths of flexible turf grasses or weeds, of which Bermuda and blue grasses are examples, where the average depth of flow is 2 to 3 times the height of vegetation, and (*b*) supple seedling tree switches, such as willow, cottonwood, or salt cedar where the average depth of flow is 3 to 4 times the height of the vegetation.

(2) *Medium* for conditions comparable to the following: (*a*) turf grasses where the average depth of flow is 1 to 2 times the height of vegetation, (*b*) stemmy grasses, weeds, or tree seedlings with moderate cover where the average depth of flow is 2 to 3 times the height of vegetation, and (*c*) brushy growths, moderately dense, similar to willows 1 to 2 years old, dormant season, along side slopes of a channel with no significant vegetation along the channel bottom, where the hydraulic radius is greater than 2 ft.

(3) *High* for conditions comparable to the following: (*a*) turf grasses where the average depth of flow is about equal to the height of vegetation,

(*b*) dormant season—willow or cottonwood trees 8 to 10 years old, intergrown with some weeds and brush, none of the vegetation in foliage, where the hydraulic radius is greater than 2 ft, and (*c*) growing season—bushy willows about 1 year old intergrown with some weeds in full foliage along side slopes, no significant vegetation along channel bottom, where hydraulic radius is greater than 2 ft.

(4) *Very high* for conditions comparable to the following: (*a*) turf grasses where the average depth of flow is less than one-half the height of vegetation, (*b*) *growing season*—bushy willows about 1 year old, intergrown with weeds in full foliage along side slopes, or dense growth of cattails along channel bottom, with any value of hydraulic radius up to 10 or 15 ft, and (*c*) growing season—trees intergrown with weeds and brush, all in full foliage, with any value of hydraulic radius up to 10 or 15 ft.

In selecting the value of m_5, the degree of meandering depends on the ratio of the meander length to the straight length of the channel reach. The meandering is considered *minor* for ratios of 1.0 to 1.2, *appreciable* for ratios of 1.2 to 1.5, and *severe* for ratios of 1.5 and greater.

In applying the above method for determining the n value, several things should be noted. The method does not consider the effect of suspended and bed loads. The values given in Table 5-5 were developed from a study of some 40 to 50 cases of small and moderate channels. Therefore, the method is questionable when applied to large channels whose hydraulic radii exceed, say, 15 ft. The method applies only to unlined natural streams, floodways, and drainage channels and shows a minimum value of 0.02 for the n value of such channels. The minimum value of n in general, however, may be as low as 0.012 in lined channels and as 0.008 in artificial laboratory flumes.

5-9. The Table of Manning's Roughness Coefficient. Table 5-6 gives a list of n values for channels of various kinds.[1] For each kind of channel the minimum, normal, and maximum values of n are shown. The normal values for artificial channels given in the table are recommended only for channels with good maintenance. The boldface figures are values generally recommended in design. For the case in which poor maintenance is expected in the future, values should be increased according to the situation expected. Table 5-6 will be found very useful as a guide to the quick selection of the n value to be used in a given problem. A popular table of this type was prepared by Horton [34] from an examination of the best available experiments at his time.[2] Table 5-6 is compiled

[1] The minimum value for Lucite was observed in the Hydraulic Engineering Laboratory at the University of Illinois [33]. Such a low n value may perhaps be obtained also for smooth brass and glass, but no observations have yet been reported.

[2] A table showing n values and other elements from 269 observations made on many existing artificial channels is also given by King [35].

TABLE 5-5. VALUES FOR THE COMPUTATION OF THE ROUGHNESS COEFFICIENT BY EQ. (5-12)

Channel conditions		Values	
Material involved	Earth	n_0	0.020
	Rock cut		0.025
	Fine gravel		0.024
	Coarse gravel		0.028
Degree of irregularity	Smooth	n_1	0.000
	Minor		0.005
	Moderate		0.010
	Severe		0.020
Variations of channel cross section	Gradual	n_2	0.000
	Alternating occasionally		0.005
	Alternating frequently		0.010–0.015
Relative effect of obstructions	Negligible	n_3	0.000
	Minor		0.010–0.015
	Appreciable		0.020–0.030
	Severe		0.040–0.060
Vegetation	Low	n_4	0.005–0.010
	Medium		0.010–0.025
	High		0.025–0.050
	Very high		0.050–0.100
Degree of meandering	Minor	m_5	1.000
	Appreciable		1.150
	Severe		1.300

TABLE 5-6. VALUES OF THE ROUGHNESS COEFFICIENT n
(Boldface figures are values generally recommended in design)

Type of channel and description	Minimum	Normal	Maximum
A. CLOSED CONDUITS FLOWING PARTLY FULL			
A-1. Metal			
a. Brass, smooth	0.009	**0.010**	0.013
b. Steel			
1. Lockbar and welded	0.010	0.012	0.014
2. Riveted and spiral	0.013	0.016	0.017
c. Cast iron			
1. Coated	0.010	0.013	0.014
2. Uncoated	0.011	0.014	0.016
d. Wrought iron			
1. Black	0.012	0.014	0.015
2. Galvanized	0.013	0.016	0.017
e. Corrugated metal			
1. Subdrain	0.017	0.019	0.021
2. Storm drain	0.021	**0.024**	0.030
A-2. Nonmetal			
a. Lucite	0.008	0.009	0.010
b. Glass	0.009	**0.010**	0.013
c. Cement			
1. Neat, surface	0.010	0.011	0.013
2. Mortar	0.011	0.013	0.015
d. Concrete			
1. Culvert, straight and free of debris	0.010	0.011	0.013
2. Culvert with bends, connections, and some debris	0.011	**0.013**	0.014
3. Finished	0.011	0.012	0.014
4. Sewer with manholes, inlet, etc., straight	0.013	0.015	0.017
5. Unfinished, steel form	0.012	0.013	0.014
6. Unfinished, smooth wood form	0.012	**0.014**	0.016
7. Unfinished, rough wood form	0.015	0.017	0.020
e. Wood			
1. Stave	0.010	0.012	0.014
2. Laminated, treated	0.015	0.017	0.020
f. Clay			
1. Common drainage tile	0.011	**0.013**	0.017
2. Vitrified sewer	0.011	0.014	0.017
3. Vitrified sewer with manholes, inlet, etc.	0.013	0.015	0.017
4. Vitrified subdrain with open joint	0.014	0.016	0.018
g. Brickwork			
1. Glazed	0.011	0.013	0.015
2. Lined with cement mortar	0.012	0.015	0.017
h. Sanitary sewers coated with sewage slimes, with bends and connections	0.012	0.013	0.016
i. Paved invert, sewer, smooth bottom	0.016	0.019	0.020
j. Rubble masonry, cemented	0.018	0.025	0.030

TABLE 5-6. VALUES OF THE ROUGHNESS COEFFICIENT n (*continued*)

Type of channel and description	Minimum	Normal	Maximum
B. LINED OR BUILT-UP CHANNELS			
B-1. Metal			
a. Smooth steel surface			
1. Unpainted	0.011	**0.012**	0.014
2. Painted	0.012	0.013	0.017
b. Corrugated	0.021	0.025	0.030
B-2. Nonmetal			
a. Cement			
1. Neat, surface	0.010	0.011	0.013
2. Mortar	0.011	0.013	0.015
b. Wood			
1. Planed, untreated	0.010	0.012	0.014
2. Planed, creosoted	0.011	0.012	0.015
3. Unplaned	0.011	0.013	0.015
4. Plank with battens	0.012	0.015	0.018
5. Lined with roofing paper	0.010	0.014	0.017
c. Concrete			
1. Trowel finish	0.011	**0.013**	0.015
2. Float finish	0.013	0.015	0.016
3. Finished, with gravel on bottom	0.015	0.017	0.020
4. Unfinished	0.014	0.017	0.020
5. Gunite, good section	0.016	0.019	0.023
6. Gunite, wavy section	0.018	0.022	0.025
7. On good excavated rock	0.017	0.020	
8. On irregular excavated rock	0.022	0.027	
d. Concrete bottom float finished with sides of			
1. Dressed stone in mortar	0.015	0.017	0.020
2. Random stone in mortar	0.017	0.020	0.024
3. Cement rubble masonry, plastered	0.016	0.020	0.024
4. Cement rubble masonry	0.020	0.025	0.030
5. Dry rubble or riprap	0.020	0.030	0.035
e. Gravel bottom with sides of			
1. Formed concrete	0.017	0.020	0.025
2. Random stone in mortar	0.020	0.023	0.026
3. Dry rubble or riprap	0.023	0.033	0.036
f. Brick			
1. Glazed	0.011	**0.013**	0.015
2. In cement mortar	0.012	**0.015**	0.018
g. Masonry			
1. Cemented rubble	0.017	0.025	0.030
2. Dry rubble	0.023	0.032	0.035
h. Dressed ashlar	0.013	0.015	0.017
i. Asphalt			
1. Smooth	0.013	0.013	
2. Rough	0.016	0.016	
j. Vegetal lining	0.030	.....	0.500

TABLE 5-6. VALUES OF THE ROUGHNESS COEFFICIENT n (*continued*)

Type of channel and description	Minimum	Normal	Maximum
C. EXCAVATED OR DREDGED			
a. Earth, straight and uniform			
1. Clean, recently completed	0.016	0.018	0.020
2. Clean, after weathering	0.018	**0.022**	0.025
3. Gravel, uniform section, clean	0.022	0.025	0.030
4. With short grass, few weeds	0.022	0.027	0.033
b. Earth, winding and sluggish			
1. No vegetation	0.023	0.025	0.030
2. Grass, some weeds	0.025	0.030	0.033
3. Dense weeds or aquatic plants in deep channels	0.030	0.035	0.040
4. Earth bottom and rubble sides	0.028	0.030	0.035
5. Stony bottom and weedy banks	0.025	0.035	0.040
6. Cobble bottom and clean sides	0.030	0.040	0.050
c. Dragline-excavated or dredged			
1. No vegetation	0.025	0.028	0.033
2. Light brush on banks	0.035	0.050	0.060
d. Rock cuts			
1. Smooth and uniform	0.025	0.035	0.040
2. Jagged and irregular	0.035	0.040	0.050
e. Channels not maintained, weeds and brush uncut			
1. Dense weeds, high as flow depth	0.050	0.080	0.120
2. Clean bottom, brush on sides	0.040	0.050	0.080
3. Same, highest stage of flow	0.045	0.070	0.110
4. Dense brush, high stage	0.080	0.100	0.140
D. NATURAL STREAMS			
D-1. Minor streams (top width at flood stage <100 ft)			
a. Streams on plain			
1. Clean, straight, full stage, no rifts or deep pools	0.025	**0.030**	0.033
2. Same as above, but more stones and weeds	0.030	0.035	0.040
3. Clean, winding, some pools and shoals	0.033	0.040	0.045
4. Same as above, but some weeds and stones	0.035	0.045	0.050
5. Same as above, lower stages, more ineffective slopes and sections	0.040	0.048	0.055
6. Same as 4, but more stones	0.045	0.050	0.060
7. Sluggish reaches, weedy, deep pools	0.050	0.070	0.080
8. Very weedy reaches, deep pools, or floodways with heavy stand of timber and underbrush	0.075	0.100	0.150

TABLE 5-6. VALUES OF THE ROUGHNESS COEFFICIENT n (*continued*)

Type of channel and description	Minimum	Normal	Maximum
b. Mountain streams, no vegetation in channel, banks usually steep, trees and brush along banks submerged at high stages			
1. Bottom: gravels, cobbles, and few boulders	0.030	0.040	0.050
2. Bottom: cobbles with large boulders	0.040	0.050	0.070
D-2. Flood plains			
a. Pasture, no brush			
1. Short grass	0.025	0.030	0.035
2. High grass	0.030	0.035	0.050
b. Cultivated areas			
1. No crop	0.020	0.030	0.040
2. Mature row crops	0.025	0.035	0.045
3. Mature field crops	0.030	0.040	0.050
c. Brush			
1. Scattered brush, heavy weeds	0.035	0.050	0.070
2. Light brush and trees, in winter	0.035	0.050	0.060
3. Light brush and trees, in summer	0.040	0.060	0.080
4. Medium to dense brush, in winter	0.045	0.070	0.110
5. Medium to dense brush, in summer	0.070	0.100	0.160
d. Trees			
1. Dense willows, summer, straight	0.110	0.150	0.200
2. Cleared land with tree stumps, no sprouts	0.030	0.040	0.050
3. Same as above, but with heavy growth of sprouts	0.050	0.060	0.080
4. Heavy stand of timber, a few down trees, little undergrowth, flood stage below branches	0.080	0.100	0.120
5. Same as above, but with flood stage reaching branches	0.100	0.120	0.160
D-3. Major streams (top width at flood stage >100 ft). The n value is less than that for minor streams of similar description, because banks offer less effective resistance.			
a. Regular section with no boulders or brush	0.025	.....	0.060
b. Irregular and rough section	0.035	.....	0.100

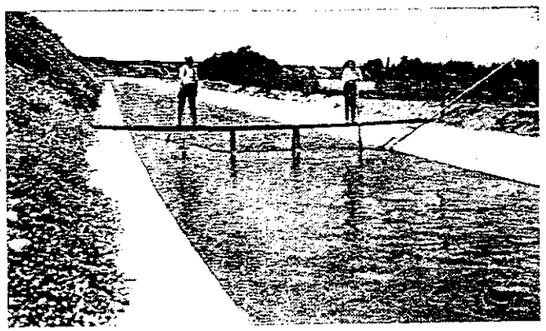
from up-to-date information collected from various sources ([34,36,38], and unpublished data); hence it is much broader in scope than the Horton table.

5-10. Illustrations of Channels with Various Roughnesses. Photographs of a number of typical channels, accompanied by brief descriptions of the channel conditions and the corresponding n values, are shown in Fig. 5-5. These photographs are collected from different sources and arranged in order of increasing magnitude of the n values. They provide a general idea of the appearance of the channels having different n values and so should facilitate selection of the n value for a given channel condition. The n value given for each channel represents approximately the coefficient of roughness when the photograph was taken.

The above type of visual aid is also employed by the U.S. Geological Survey. The Survey has made several determinations of channel roughness in streams, mostly in the northwestern United States. These include measurements of cross-sectional area, width, depth, mean velocity, slope, and computation of the roughness coefficient. The reaches were photographed in stereoscopic color, and the photographs have been circulating among the district offices of the Survey as a guide in evaluating n.

FIG. 5-5. Typical channels showing different n values. (*These photographs are reproduced from* [37] *and* [38] *with the permission of the U.S. Department of Agriculture. The original pictures used for reproduction purposes were supplied through the courtesy of Mr. F. C. Scobey for photographs* 1 *to* 14 *and photograph* 19, *and through the courtesy of Mr. C. E. Ramser for the others.*)

(1)



(2)



(3)

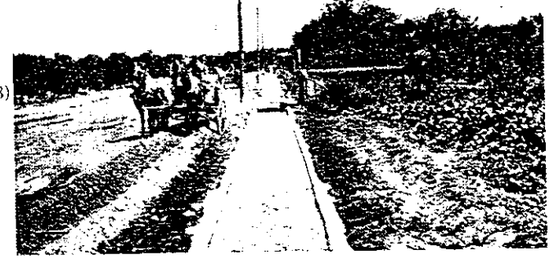


FIG. 5-5 (1-3)

1. $n = 0.012$. Canal lined with concrete slabs having smooth neat cement joints and very smooth surface, hand-troweled and with cement wash on concrete base.
2. $n = 0.014$. Concrete canal poured behind screeding and smoothing platform.
3. $n = 0.016$. Small concrete-lined ditch, straight and uniform, bottom slightly dished, the sides and bottom covered with a rough deposit, which increases the n value.

(4)



(5)



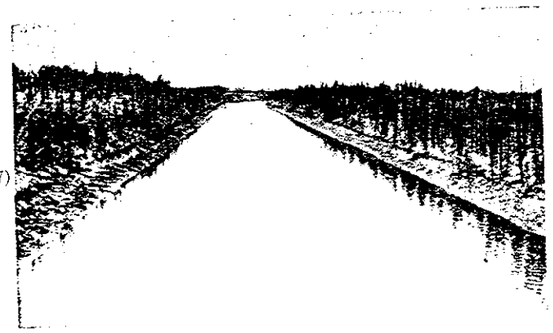
(6)



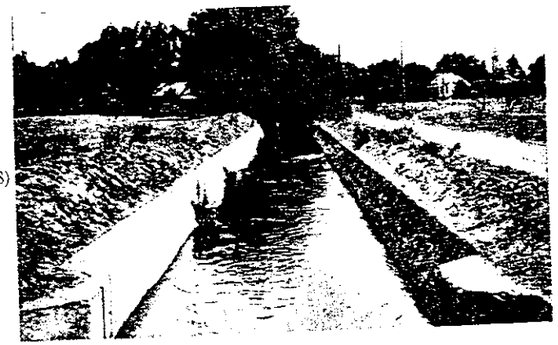
FIG. 5-5 (4-6)

4. $n = 0.018$. Shot-concrete lining without smooth treatment. Surface covered with fine algae and bottom with drifting sand dunes.
5. $n = 0.018$. Earth channel excavated in a clay loam, with deposit of clean sand in the middle and slick silty mud near the sides.
6. $n = 0.020$. Concrete lining made in a rough lava-rock cut, clean-scoured, very rough, and deeply pitted.

(7)



(8)



(9)

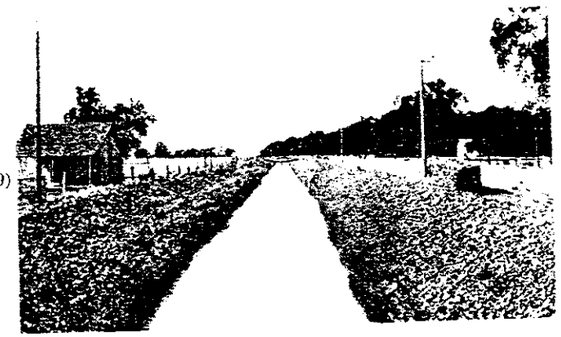


FIG. 5-5 (7–9)

7. $n = 0.020$. Irrigation canal, straight, in hard-packed smooth sand.
8. $n = 0.022$. Cement-plaster lining applied directly to the trimmed surface of the earth channel. With weeds in broken places and loose sand on bottom.
9. $n = 0.024$. Canal excavated in silty clay loam. Slick and hard bed.

(10)



(11)



(12)

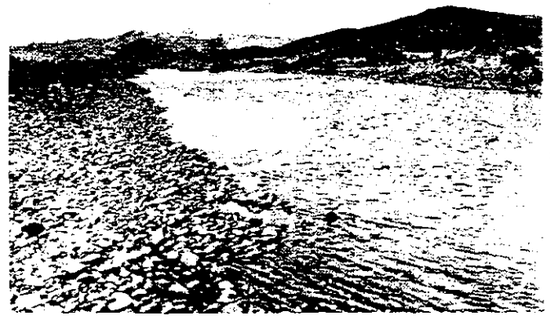
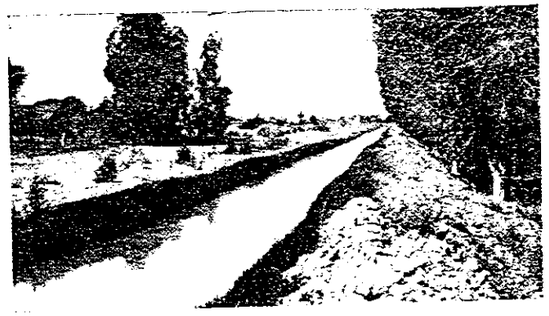


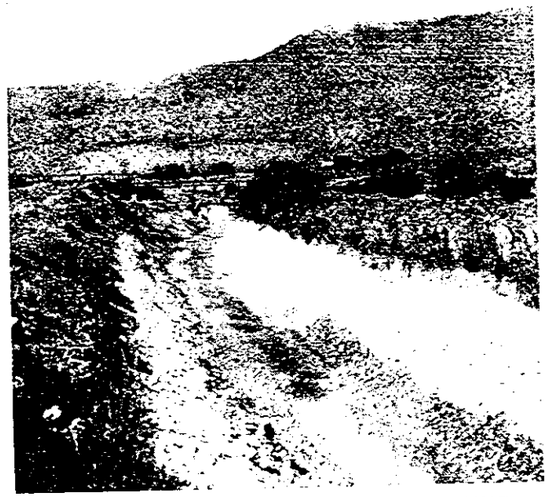
FIG. 5-5 (10–12)

10. $n = 0.024$. Ditch lined on both sides and bottom with dry-laid unchinked rubble. Bottom quite irregular, with scattered loose cobbles.
11. $n = 0.026$. Canal excavated on hillside, with upper bank mostly of willow roots and lower bank with well-made concrete wall. Bottom covered with coarse gravel.
12. $n = 0.028$. Cobble-bottom channel, where there is insufficient silt in the water or too high a velocity, preventing formation of a graded smooth bed.

(13)



(14)



(15)



FIG. 5-5 (13–15)

13. $n = 0.029$. Earth canal excavated in alluvial silt soil, with deposits of sand on bottom and growth of grass.

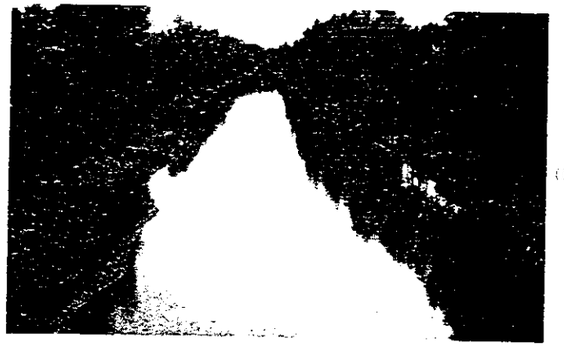
14. $n = 0.030$. Canal with large-cobblestone bed.

15. $n = 0.035$. Natural channel, somewhat irregular side slopes; fairly even, clean and regular bottom; in light gray silty clay to light tan silt loam; very little variation in cross section.

(16)



(17)



(18)

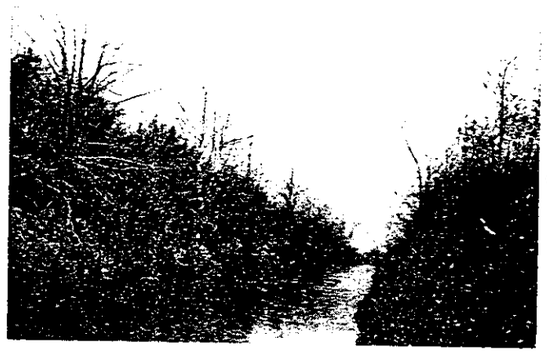


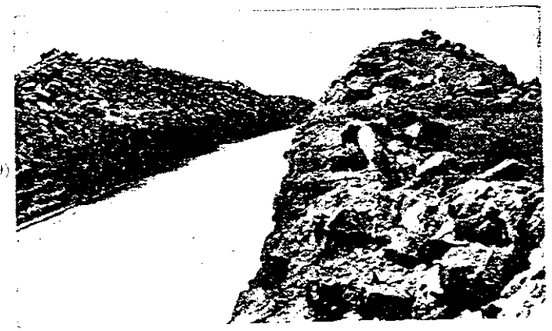
FIG. 5-5 (16–18)

16. $n = 0.040$. Rock channel excavated by explosives.

17. $n = 0.040$. Ditch in clay and sandy loam; irregular side slopes, bottom, and cross section; grass on slopes.

18. $n = 0.045$. Dredge channel, irregular side slopes and bottom, in black, waxy clay at top to yellow clay at bottom; sides covered with small saplings and brush, slight and gradual variations in cross section.

(19)



(20)



(21)



FIG. 5-5 (19-21)

19. $n = 0.050$. Dredge channel with very irregular side slopes and bottom, in dark-colored waxy clay, with growth of weeds and grass. Slight variation in shape of cross section for variation in size.

20. $n = 0.060$. Ditch in heavy silty clay; irregular side slopes and bottom; practically entire section filled with large-size growth of trees, principally willows and cottonwoods. Quite uniform cross section.

21. $n = 0.080$. Dredge channel in black slippery clay and gray silty clay loam, irregular wide slopes and bottom, covered with dense growth of bushy willows, some in bottom; remainder of both slopes covered with weeds and a scattering growth of willows and poplars, no foliage; some silting on bottom.

(22)



(23)



(24)



FIG. 5-5 (22-24)

22. $n = 0.110$. Same as (21), but with much foliage and covered for about 40 ft with growth resembling smart weed.

23. $n = 0.125$. Natural channel floodway in median fine sand to fine clay, none side slopes; fairly even and regular bottom with occasional flat bottom sloughs; variation in depth; practically virgin timber, very little undergrowth except occasional dense patches of bushed and small trees, some logs and dead fallen trees.

24. $n = 0.150$. Natural river in sandy clay soil. Very crooked course, irregular side slopes and uneven bottom. Many roots, trees and bushes, large logs and other drift on bottom; trees continually falling into channel due to bank caving.

Flamingo Wash Fis Add. Info

FLAMINGO WASH FIS RESTUDY
ADDITIONAL INFORMATION

550.033

March 1998

Prepared for:

Clark County Regional Flood Control District
301 East Clark Avenue, Suite 301
Las Vegas, NV 89101
Phone: (702) 455-3139
Fax: (702 455-3870

G.C. WALLACE, INC.
Engineering/Architecture

FLAMINGO WASH FIS RESTUDY
ADDITIONAL INFORMATION

550.033

March 1998

Prepared for:

Clark County Regional Flood Control District
301 East Clark Avenue, Suite 301
Las Vegas, NV 89101
Phone: (702) 455-3139
Fax: (702 455-3870

ATTACHMENT 1

REVISED FIRM COMMUNITY PANEL NUMBER

32003C2556D

DATED AUGUST 16, 1995

550.033

DRAFT

March 18, 1998

Michael Baker Jr., Inc.
3601 Eisenhower Avenue, Suite 600
Alexandria, Virginia 22304

Attention: Ms. Pernille Buch-Pedersen

Subject: Flamingo Wash FIS Restudy (Case No. 98-09-225P)
Additional Information

Gentlemen:

The purpose of this letter is to provide additional information in support of the Flamingo Wash FIS Restudy. The following information is attached:

1. A copy of the revised FIRM Community Panel Number 32003C2556 D dated August 16,1995 showing the existing culvert alignment which extends from Industrial Road to the Imperial Palace and confines the 100-year peak storm flow.

2. A copy of the revised HEC-2 model reflecting the 5300 cfs peak storm flow from the Tropicana Wash controlling the Flamingo Wash flow along the reach between the Tropicana Wash Confluence and Spencer Street. The analysis indicates that the changes in the proposed floodplain boundary limits are less than the width of the plotted boundary line and changes to the plotted workmaps are not warranted.

3. A copy of the old aerial photographs dated February 21, 1978 illustrating the alignment of the Flamingo Wash around the time the original flood insurance study was done. A comparison of the old and new aerial photographs shows that a lot of the Flamingo Wash left natural has not moved significantly over the years.

4. A copy of supplemental photographs taken along the Flamingo Wash to further illustrate the existing conditions of the wash. Also, copies of the photograph location maps are included. A copy of the digital files are also included.

5. A copy of the As-built 1993 Improvement Plans for the Flamingo Wash/Winnick Avenue Storm Drain.

6. A copy of the video tape titled "Flamingo Wash/Winnick Avenue Hydraulic Model" dated January 29, 1993 illustrating the Bureau of Reclamations original modeling efforts.

7. A copy of the video tape titled "Winnick Avenue Inlet Revision

Without Ramp" illustrating the Bureau of Reclamations revision modeling efforts.

8. A copy of the Base Maps marked up to show the consistency and extent of the lined portions of the existing wash.

Please accept the enclosed supplemental information to support the Flamingo Wash FIS Restudy. If you should need further information, please call.

Sincerely,

Kevin Eubanks, P.E.
Assistant General Manager

KE

Encl.

pc: Calvin Black, GCW w/o encl.
Noel Laughlin, GCW w/o encl.
Jerry Pruitt, GCW w/o encl.

ATTACHMENT 2

REVISED HEC-2 MODEL

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*                                         *
*  Version   4.6.2;  May 1991             *
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*  HYDROLOGIC ENGINEERING CENTER       *
*  609 SECOND STREET, SUITE D          *
*  DAVIS, CALIFORNIA 95616-4687        *
*           (916) 756-1104             *
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THIS RUN EXECUTED 18FEB98 09:39:58

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HEC-2 WATER SURFACE PROFILES

Version 4.6.2; May 1991
****

T1 550.032
T2 FLAMINGO WASH FIS RESTUDY
T3 FLOODPLAIN DETERMINATION
T4 FILES: BASE2.DWG, BASE2.DAT
T4 STARTING WSE = NORMAL DEPTH
T4 SUBCRITICAL RUN

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
		2			0.01			5500	1930	

J2	NPROF	IPLOT	PRFVS	XSECV	XSECH	FN	ALLDC	IBW	CHNIM	ITRACE
	-1		-1				-2	-6		

VARIABLE CODES FOR SUMMARY PRINTOUT

100 150

[illegible]	0.035	0.035	0.03	0.1	0.3					
XT	10	32	1220.49	1306.65						
GR	1935.1	1000	1934	1049.49	1932	1095.06	1930	1144.27	1928.13	1220.49
[illegible]	1928	1220.83	1926	1228.41	1924	1235.7	1923.35	1237.99	1922	1249.9
[illegible]	1921.7	1252.38	1922	1254.61	1924	1271.01	1924.23	1272.95	1925.54	1279.8
GR	1926	1285.65	1928	1306.65	1930	1322.46	1931.03	1329.96	1932	1344.12
[illegible]	1934	1372.27	1936	1402.27	1936.46	1409.32	1936.88	1418.36	1938	1426.01
[illegible]	1939	1436.49	1940	1496.07	1940.85	1580.86	1942	1671.03	1942.26	1677.54
GR	1942.4	1685.16	1944	1718.9						
[illegible]	0.035	0.035	0.03							
XT	20	35	1227.96	1305.87	314.44	275.67	297.76			
GR	1936	1000	1935.65	1006.11	1934	1064.7	1932	1208.86	1931.19	1227.96
[illegible]	1930	1233.9	1928	1243.73	1926	1253.48	1925.75	1254.71	1924.4	1278.37
[illegible]	1925.1	1284.64	1926	1286.28	1928	1290.47	1930	1294.74	1931.66	1298.29
[illegible]R	1932	1305.87	1934	1329.91	1936	1346.51	1938	1362.32	1940	1377.32
[illegible]	1940.2	1379.3	1940.6	1458.06	1940	1497.53	1939.68	1514.53	1939.62	1517.34
[illegible]	1939.5	1549.95	1939.75	1574.13	1940	1575.86	1941.16	1586.4	1942	1601.6
R	1942.2	1603.5	1944	1614.3	1945.22	1621.6	1945.43	1765.27	1946	1766.42
C	0.025	0.025	0.015							
1	30	28	1130.52	1218.84	407.19	429.8	417.8			
R	1941.1	1000	1941.1	1090.06	1940.79	1103.29	1940	1130.52	1938	1133.35
R	1936	1135.91	1934	1138.18	1932	1140.33	1930	1142.47	1929.61	1142.75
R	1929.4	1159.96	1928.83	1167.49	1930	1172.19	1930.19	1173.44	1930.28	1191.06
R	1930	1194.2	1929.29	1201.75	1930	1203.16	1932	1207.08	1934	1211

1936	1214.92	1938	1218.84	1939.89	1222.54	1940	1224.83	1941.2	1249.47

GR	1942	1260.06	1942.66	1268.85	1944	1274.05				
	0.025	0.025	0.015							
	40	12	1133.81	1184.19	10	10	10			
X3	0			1133.81	1942	1184.19	1942			
	1941.3	1000	1941.45	1090.13	1941.22	1104.02	1940	1133.81	1933.6	1133.81
	1933.6	1184.19	1940	1184.19	1940	1206.88	1941.22	1232.32	1942	1242.6
GR	1942.6	1251.47	1944	1256.84						
	0.025	0.025	0.015							
SB	0.9	1.56	2.6	170	50.38	2.38	240	0	1934.6	1933.6
X1	50	12	1184.49	1234.87	112.85	117.18	115.08			
			1	1939.599	1943.13			1.33		
	0			1184.49	1945	1234.87	1945			
GR	1942.5	1000	1943.06	1093.5	1942.65	1100.84	1942.61	1115.98	1942	1129.89
	1942	1184.49	1934.6	1184.49	1934.6	1234.87	1943	1234.87	1943	1239.96
	1943.2	1254.01	1943.64	1350.42						
NC	0.025	0.025	0.015							
	1	5300								
X1	60	27	1059.71	1149.4	375.8	397.17	387.41			
GR	1949.4	1000	1948	1015.95	1947.88	1017.39	1946.17	1047.07	1946	1049.22
	1945.2	1059.71	1944	1062.77	1942	1067.82	1940	1072.95	1939.77	1073.57
	1939.5	1090.82	1938	1094.84	1936.76	1097.96	1936.87	1110.33	1938	1113.23
GR	1939.2	1116.15	1939.37	1137.83	1940	1138.84	1942	1142.41	1944	1145.9
	1946	1149.4	1947.75	1152.54	1948	1155.14	1949.08	1165.1	1949.24	1192.51
	1950	1202.7	1950.32	1206.97						
NC	0.025	0.025	0.015							
	70	23	1062.67	1154.22	427.31	406.33	417.23			
	1952	1000	1951.01	1048.35	1950	1062.67	1949.99	1063.36	1948	1067.18
GR	1946	1070.79	1944	1074.17	1942.83	1076	1943.1	1084.29	1942	1099.07
	1941.8	1099.92	1941.57	1112.55	1942	1115.39	1943.17	1121.4	1943.35	1139.21
	1944	1140.31	1946	1143.61	1948	1146.85	1950	1149.96	1951.72	1152.28
GR	1952	1154.22	1953.75	1165.11	1953.84	1194.64				
	0.025	0.025	0.015							
X1	80	19	1056.35	1140.68	1	1	1			
GR	1952	1000	1952	1002.13	1951.45	1036.88	1950.33	1056.35	1950	1056.92
	1948	1060.33	1946	1063.74	1944	1067.15	1942.6	1068.83	1942.6	1132.22
	1944	1132.98	1946	1136.05	1948	1138.66	1950	1140.68	1951.88	1142.98
GR	1952	1143.96	1954	1156.72	1954	1157.77	1954.38	1201.02		
	0.025	0.025	0.015							
X1	90	23	1052.98	1113.6	53.02	56.59	51.93			
GR	1955.2	1000	1954	1006.02	1953.68	1007.66	1952.47	1022.15	1952	1035.65
	1951.6	1045.56	1951.07	1052.98	1950	1054.57	1948	1057.59	1946	1060.63
GR	1944	1063.71	1943.1	1065.06	1943.1	1105.06	1944	1109.3	1946	1110.15
GR	1948	1110.99	1950	1111.87	1952	1112.94	1953.03	1113.6	1954	1119.02
	1954.3	1121.63	1954	1145.66	1953.67	1187.07				

NC	0.025	0.025	0.015							
	100	27	1068.7	1129.14	346.14	339.84	342.73			
	1958.9	1000	1959.19	1057.4	1958.29	1068.55	1958	1068.7	1956	1070.39
GR	1954	1071.98	1952	1073.58	1950	1075.17	1948	1076.75	1946	1078.32
GR	1944.7	1079	1944.7	1119	1946	1119.77	1948	1121.07	1950	1122.37
	1952	1123.68	1954	1124.99	1956	1126.31	1956.84	1126.86	1958	1129.14
GR	1960	1133.08	1961.7	1136.43	1962	1161.01	1962	1164.12	1962	1169.92
GR	1962.1	1180.79	1963.48	1218.41						
	0.025	0.025	0.015							
X1	110	25	1070.23	1130.3	1	1	1			
	1958	1000	1959.26	1058.72	1958.52	1069.8	1958	1070.23	1956	1071.86
	1954	1073.49	1952	1075.13	1950	1076.77	1948	1078.41	1947.23	1079.37
GR	1947.2	1119.37	1948	1122.31	1950	1123.63	1952	1124.96	1954	1126.29
GR	1956	1127.61	1956.94	1128.23	1958	1130.3	1960	1134.23	1961.78	1137.72
	1962	1156.11	1962	1162.57	1962	1167.55	1962.22	1180.81	1963.53	1218.4
NC	0.025	0.025	0.015							
	120	27	1082.95	1140.72	25.32	22.42	24.78			
	1959.7	1000	1960	1034.06	1960.7	1069.3	1960	1077.37	1959.54	1081.8
GR	1958	1082.95	1956	1084.44	1954	1085.94	1952	1087.44	1950	1088.93
	1948	1090.43	1947.5	1090.88	1947.5	1130.88	1948	1133.47	1950	1134.85
	1952	1136.24	1954	1137.62	1956	1138.99	1957.22	1139.81	1958	1140.72
GR	1960	1142.7	1962	1144.46	1962.02	1148.81	1962	1152.73	1962	1157.77
GR	1962.4	1185.25	1963.78	1223.58						
	0.025	0.025	0.015							
X1	130	24	1091.34	1145.53	125.29	125.61	125.31			
	1963	1000	1962	1082.33	1960	1086.89	1958.57	1090.09	1958	1091.34
	1956	1092.89	1954	1094.44	1952	1095.99	1950	1097.54	1948	1099.5
GR	1948	1139.5	1950	1141.65	1952	1142.63	1954	1143.6	1956	1144.57
GR	1958	1145.53	1960	1147.33	1961.39	1148.78	1962	1151.72	1962.83	1155.18
	1964	1156.8	1964.47	1157.37	1965.16	1174.08	1965.71	1213.65		
NC	0.025	0.025	0.015							
X1	140	25	1123.53	1181.8	57.23	56.76	55.76			
	1965.1	1000	1964	1109.48	1964.09	1112.94	1962	1117.49	1960	1121.87
GR	1959.2	1123.53	1958	1124.74	1956	1126.67	1954	1128.54	1952	1130.26
	1950	1131.84	1948.5	1132.5	1948.5	1172.5	1950	1175.19	1952	1176.29
	1954	1177.52	1956	1178.95	1958	1180.42	1959.86	1181.8	1960	1182.12
GR	1962	1186.57	1964	1191.03	1966	1195.47	1966.85	1197.34	1966.36	1258.33
	0.025	0.025	0.015							
X1	150	24	1135	1193.6	1	1	1			
GR	1965.4	1000	1964.25	1124.53	1964	1124.8	1962	1129.47	1960	1133.87
	1959.5	1135	1958	1136.46	1956	1138.43	1954	1140.4	1952	1142.4
	1950.5	1143.5	1950.5	1183.5	1952	1187.45	1954	1189.03	1956	1190.57
GR	1958	1192.09	1959.99	1193.6	1960	1193.68	1962	1198.04	1964	1202.42
	1966	1206.72	1966.89	1208.61	1967.17	1222.54	1966.39	1280.29		

NC	0.025	0.025	0.015							
	160	21	1022.9	1081.97	119.51	110.97	114.85			
	1964	1000	1962	1020.85	1961.14	1022.9	1960	1024.28	1958	1026.68
GR	1956	1029.05	1954	1031.39	1952	1033.69	1951.76	1033.96	1951.77	1074.55
GR	1952	1074.73	1954	1076.3	1956	1077.86	1958	1079.44	1960	1081.05
	1961.1	1081.97	1962	1085.8	1964	1091.98	1966	1097.23	1966.68	1098.86
GR	1967.1	1124.37								
	0.025	0.025	0.015							
	170	24	1021.94	1098.85	98.31	96.38	97.13			
GR	1967	1000	1966	1012.58	1965.99	1012.86	1964	1017.32	1962	1021.94
	1961.3	1023.53	1960	1025.98	1958	1029.63	1956	1033.27	1954	1036.91
	1952.3	1039.96	1952.49	1078.78	1952.8	1090.15	1954	1091.24	1956	1093.09
GR	1958	1094.94	1960	1096.8	1961.88	1098.54	1962	1098.85	1964	1103.45
GR	1966	1107.87	1968	1112.15	1968.22	1112.6	1968.32	1119.73		
NC	0.03	0.03	0.025							
X1	180	37	1105.54	1192.93	358.08	374.39	363.91			
	1970	1000	1969.41	1028.94	1968.36	1064.62	1968.63	1086	1970	1087.29
	1970.1	1087.42	1970	1100.03	1969.97	1105.54	1968	1109.38	1966	1113.23
GR	1964	1117.01	1962	1120.79	1960	1124.58	1958	1128.36	1956.15	1131.88
GR	1956.8	1143	1956	1147.31	1955.07	1152.03	1956	1170.74	1955.93	1170.74
	1958	1176.71	1959.49	1180.23	1960	1180.82	1962	1183.17	1964	1185.58
GR	1966	1188.01	1968	1190.47	1970	1192.93	1972	1195.38	1974	1197.84
GR	1975.3	1199.53	1976	1202.18	1976.53	1204.15	1978	1230.41	1978.06	1230.73
	1979.6	1268.21	1980	1278.63						
NC	0.03	0.03	0.025							
X	190	42	1045.63	1134.18	349.99	362.07	356.25			
	1980	1000	1979.83	1002.64	1978.63	1026.03	1978	1042.24	1977.86	1045.63
GR	1976	1048.01	1974.65	1049.5	1974	1051.69	1972.2	1057.64	1972	1057.83
GR	1970	1059.68	1968	1061.56	1966	1063.46	1964	1065.36	1962	1067.28
	1960.4	1068.9	1960.4	1079.82	1960	1081.62	1958	1090.14	1957.64	1091.57
GR	1957.9	1101.67	1958	1101.76	1960	1106.43	1960.85	1108.4	1962	1111.96
GR	1963.3	1116.18	1964	1117.03	1966	1119.5	1968	1121.97	1970	1124.43
	1972	1126.89	1974	1129.33	1976	1131.76	1978	1134.18	1980	1136.59
	1980.8	1137.6	1981.5	1143.92	1982	1150.97	1982.99	1166.12	1984	1176.63
GR	1984.3	1179.97	1984.45	1222.66						
N	0.03	0.03	0.025							
X1	200	35	1081.17	1169.9	344.1	367.63	357.38			
GR	1979.8	1000	1979.18	1029.49	1979.12	1052.59	1978.6	1067.43	1978	1077.24
	1977.7	1081.17	1976	1083.12	1974	1085.36	1972	1087.6	1970	1089.84
GR	1968	1092.07	1966	1094.26	1964	1096.33	1963.25	1097.1	1962.44	1108.96
GR	1963.4	1118.36	1963.2	1132.05	1964	1134.42	1965.81	1139.65	1966	1140.91
	1968	1152.85	1968.07	1153.21	1970	1155.03	1972	1156.9	1974	1158.74
	1976	1160.58	1978	1162.42	1980	1164.26	1982	1166.1	1984	1167.93
GR	1986	1169.8	1986.14	1169.9	1985.91	1175.55	1988	1199.66	1988.33	1203.15

NC	0.025	0.025	0.015							
	210	28	1020.72	1112.24	218.28	223.05	220.26			
	1984	1000	1984.02	1005.21	1982.67	1015.97	1982	1020.72	1980	1024.38
GR	1978	1026.77	1976	1029.13	1974	1031.45	1972	1033.74	1970	1036.02
	1968	1038.3	1966	1040.57	1965.48	1041.23	1965.56	1087.58	1966	1088.46
	1968	1090.47	1970	1092.59	1972	1094.71	1974	1096.83	1976	1098.95
GR	1978	1101.07	1980	1103.2	1982	1105.33	1984	1107.49	1986	1109.84
GR	1986.9	1112.24	1987.25	1118.07	1988	1138.44				
	0.025	0.025	0.015							
X1	220	7	1044.15	1104.44	96.67	97.77	95.38			
	0			1044.15	1987	1104.44	1987			
	1986.2	1000	1986.57	1044.15	1968.66	1044.15	1968.66	1094.4	1986	1094.4
GR	1986.8	1104.44	1986.9	1141.04						
	0.025	0.025	0.015							
SB	0.9	1.56	2.6	115	50.25	2.25	576	0	1969.76	1968.66
X1	230	6	1059.76	1110.01	105.83	104.98	106.05			
			1	1981.76	1987.6			1.33		
	0			1059.76	1987.2	1110.01	1987.2			
GR	1987.1	1000	1987.1	1059.76	1969.76	1059.76	1969.76	1110.01	1987.1	1110.01
	1987.1	1161.77								
NC	0.025	0.025	0.025							
X1	240	24	1023.48	1114.49	100.09	99.49	98.95			
	1986	1000	1985.03	1014.57	1984.8	1023.48	1984	1025.31	1982	1030.02
GR	1980	1034.87	1978	1039.77	1976	1044.7	1975.59	1045.71	1975.71	1065.01
GR	1975.9	1076.65	1976	1079.47	1976.57	1085.82	1978	1090.42	1980	1094.27
	1982	1098.12	1984	1101.96	1986	1105.8	1988	1109.64	1990	1113.5
	1990.5	1114.49	1992.03	1119.47	1992	1119.74	1992.15	1125.82		
	0.025	0.025	0.025							
	250	29	1057.08	1169.75	483.82	467.47	478.12			
GR	1997.3	1000	1996	1025.03	1994	1057.08	1993.84	1059.01	1992	1061.82
GR	1990	1064.74	1988	1067.62	1986	1070.5	1984.57	1072.52	1984.32	1091.51
	1984	1092.06	1982	1095.54	1980	1099.12	1978.65	1101.59	1979.52	1114.22
	1980	1115.21	1982	1119.32	1982.68	1120.71	1982.27	1141.82	1984	1145.49
GR	1986	1149.77	1988	1154.11	1990	1158.51	1992	1162.95	1994	1167.41
	1995	1169.75	1994.48	1179.68	1996	1217.96	1998	1250.87		
NC	0.025	0.025	0.025							
	260	32	1125.84	1217.45	458.42	414.37	437.75			
	2002	1000	2000	1099.97	1999.98	1125.84	1998	1129.08	1996	1132.43
GR	1994	1135.78	1992	1139.14	1990.39	1141.83	1990.13	1157.45	1990	1157.66
GR	1988	1160.93	1986	1164.19	1984	1167.44	1982.24	1170.27	1982.12	1181.56
	1984	1184.35	1984.49	1185.06	1986	1192.93	1986.42	1195.31	1986.94	1204.85
	1988	1205.87	1990	1207.79	1992	1209.67	1994	1211.5	1996	1213.28
GR	1998	1214.99	2000	1216.64	2001.02	1217.45	2002	1230.77	2002.83	1241.5
	2002.6	1268.79	2003.91	1441.11						

NC	0.025	0.025	0.02							
	270	16	1119.93	1157.26	213.44	213.44	213.69			
	0			1119.93	1999	1157.26	1999			
GR	1998.6	1000	1998.21	1067.08	1998	1077.71	1997.87	1089.69	1998	1095.71
	1998.1	1098.35	1998	1119.93	1983.4	1119.93	1983.4	1157.26	1998	1157.26
	2000	1175.33	2000.38	1176.08	2002	1184.44	2002.72	1188.02	2002.76	1209.37
GR	2004	1230.11								
	0.025	0.025	0.02							
	0.9	1.56	2.6	94	37.33	1.33	360	0	1984.3	1983.4
X1	280	17	1088.14	1124.47	110.45	115.15	110.04			
			1	1994.3	1997.3			1.33		
	0			1088.14	1999	1124.47	1999			
GR	2006	1000	2005.55	1016.53	2004	1023.84	2002	1033.33	2000.41	1040.84
	2000	1045.99	1999.38	1053.66	1998	1071.53	1997.96	1088.14	1984.3	1088.14
	1984.3	1124.47	1997.88	1124.47	1998	1130.07	1998.01	1135.33	1998	1135.45
GR	1997.3	1158.85	1998	1171.46						
	0.025	0.025	0.025							
	1	3900								
X1	290	27	1087.68	1216.15	402.5	479.38	451.82			
	2012.9	1000	2012.48	1087.68	2012	1088.64	2010	1092.64	2008	1096.63
	2006	1100.61	2004	1104.6	2002	1108.58	2000.01	1112.53	2000	1112.78
GR	1999.1	1129	1998	1131.23	1996	1134.95	1994	1138.62	1993.63	1139.29
	1993.7	1156.13	1994	1156.77	1996	1161.74	1998	1166.26	1998.4	1167.13
	2000	1187.26	2001.03	1198.95	2002	1203.24	2004	1211.29	2005.27	1216.15
GR	2006	1237.37	2006	1253.12						
	0.025	0.025	0.025							
	300	38	1101.61	1253.69	445.34	406.87	430.29			
GR	2022	1000	2023.2	1052.04	2023.19	1099.68	2022	1101.61	2020	1104.85
	2018	1108.13	2016	1111.46	2014	1114.82	2012	1118.18	2010.62	1120.51
	2010.6	1138.37	2010	1139.8	2008	1144.21	2006	1148.61	2004	1153
GR	2003.1	1154.97	2002	1161.54	2001.94	1161.9	2002	1162.1	2003.16	1166.76
GR	2004	1168.39	2006	1172.05	2008	1175.68	2010	1179.14	2012	1182.49
	2012.8	1183.85	2012.62	1222.77	2013.26	1227.82	2014	1230.57	2016	1238.32
	2016.5	1240.47	2018	1243.56	2020	1247.79	2022	1252.02	2022.49	1253.69
GR	2022.9	1271	2024	1310.6	2024.22	1318.33				
	0.025	0.025	0.015							
X1	310	9	1036.87	1067.87	360.41	351.83	353.38			
	0			1036.87	2020	1067.87	2020			
	2020.2	1000	2020	1012.51	2019.76	1026.57	2018	1036.87	2008	1036.87
GR	2008	1067.87	2018	1067.87	2018.74	1089.14	2020	1105.23		
	0.025	0.025	0.015							
	0.9	1.56	2.6	58	31	1	210	0	2008.4	2008
X1	320	6	1074.88	1105.88	89.08	89.25	86.84			
			1	2015.4	2020.2			1.33		
	0			1074.88	2021	1105.88	2021			
GR	2022	1000	2020	1074.88	2008.4	1074.88	2008.4	1105.88	2020	1105.88
	2020.4	1120.7								

NC	0.035	0.035	0.03							
	330	32	1073.22	1159.42	407.14	409.75	409.02			
	2028.2	1000	2028	1028.29	2027.94	1033.37	2026.74	1044.04	2028	1061.85
GR	2028.6	1070.03	2028	1073.22	2027.23	1077.02	2026	1081.25	2024	1088.07
	2022	1094.83	2020	1101.57	2019.81	1102.13	2018	1104.59	2016	1107.4
	2015.2	1108.46	2014.22	1116.23	2015.11	1124.64	2016	1126.01	2018	1129.12
GR	2020	1132.3	2020.97	1133.92	2021.77	1151.67	2022	1152.07	2024	1155.53
GR	2026	1158.82	2026.16	1159.42	2026.49	1168.36	2026.56	1198.52	2028	1224.16
	2028	1226.25	2028	1243.69						
NC	0.035	0.035	0.03							
	340	23	1056.91	1165.92	416.01	411.16	414.66			
	2034	1000	2033.54	1041.15	2032.89	1056.91	2032	1071.73	2031.99	1071.84
GR	2030	1076.76	2028	1081.57	2026	1086.12	2024	1090.12	2023.05	1093.65
GR	2022	1113.5	2021.92	1114.5	2022	1115.38	2022.98	1128.04	2024	1134.12
	2025.2	1141.02	2026	1143.48	2028	1149.7	2030	1155.88	2031.85	1161.5
GR	2032	1165.92	2032.4	1227.24	2032.47	1306.6				
	0.025	0.025	0.015							
	350	8	1014	1077.2	391.21	407.9	400.22			
X3	0			1014	2036	1077.2	2036			
	2035.1	1000	2034	1014	2025.9	1014	2025.9	1077.2	2034	1077.2
	2036	1086.37	2036.2	1094.88	2036.44	1095.33				
NC	0.025	0.025	0.015							
	0.9	1.56	2.6	70	63.2	3.2	480	0	2025.9	2025.9
	360	8	1023.92	1087.12	69.15	67.58	69.23			
X2			1	2033.9	2036.06			1.33		
	0			1023.92	2037	1087.12	2037			
	2036	1000	2036.27	1011.98	2036	1023.92	2025.9	1023.92	2025.9	1087.12
GR	2036	1087.12	2036.11	1091.98	2036.81	1114.07				
	0.025	0.025	0.015							
X1	370	23	1037.84	1109.55	67.22	66.57	66.95			
GR	2039.2	1000	2039.54	1028.04	2038	1035.22	2037.44	1037.84	2036	1044.09
	2034	1048.46	2032	1052.89	2030	1057.17	2028	1060.8	2028	1064.5
GR	2028	1081.98	2028	1089.63	2028	1099.06	2028	1106.03	2030	1106.68
GR	2032	1107.62	2034	1108.62	2035.81	1109.55	2036	1112.07	2036.77	1118.39
	2037.6	1131.72	2038	1190.66	2038	1190.72				
NC	0.025	0.025	0.015							
	380	17	1037.66	1118.27	1	1	1			
	2039.3	1000	2039.67	1028.22	2038	1035.96	2037.63	1037.66	2036	1043.96
GR	2034	1049.96	2032	1055.19	2030	1060.04	2030	1066.79	2030	1104.28
GR	2032	1106.78	2034	1108.4	2035.83	1109.57	2036	1111.36	2036.85	1118.27
	2037.7	1131.66	2038	1190.48						
NC	0.035	0.035	0.03							
	390	28	1040.49	1129.17	384.6	427.73	409.92			
	2043.5	1000	2043.12	1008.96	2044	1038.32	2044.06	1040.22	2044	1040.49
GR	2043.9	1040.61	2044	1040.96	2044.44	1044.41	2044	1045.36	2042	1049.72
GR	2040	1054.05	2038	1058.31	2036	1062.53	2034	1066.73	2033.2	1068.42
	2033.1	1081	2032.17	1087.19	2033.73	1092.76	2033.91	1107.36	2034	1107.55

[redacted]	2036	1112.48	2038	1117.34	2040	1122.11	2042	1126.83	2042.99	1129.17
GR	2042	1141.02	2042.83	1171.51	2042.75	1213.88				
[redacted]	0.025	0.025	0.015							
X1	400	26	1023.26	1125.1	427.56	379.77	400.26			
[redacted]	2043.4	1000	2044	1008.84	2044.48	1016.77	2044.6	1018.87	2044.76	1023.26
[redacted]	2044	1029.09	2043.84	1030.28	2042	1035.42	2040	1041	2038	1046.59
[redacted]	2036	1052.17	2034.55	1056.13	2034	1071.56	2033.36	1076.02	2034	1078.19
GR	2034.8	1081.88	2035.08	1097.23	2036	1100.89	2036.84	1104.16	2038	1107.49
[redacted]	2040	1113.12	2042	1118.75	2043.92	1124.26	2044	1125.1	2046	1147.4
[redacted]	2048	1170.4								
[redacted]	0.025	0.025	0.015							
[redacted]	410	27	1023.15	1123.94	1	1	1			
GR	2043.5	1000	2044	1007.48	2044.57	1016.63	2044.79	1018.64	2044.89	1023.15
[redacted]	2044	1030.2	2044.01	1030.29	2042	1035.51	2040	1040.71	2038	1045.88
[redacted]	2036	1051.03	2035.83	1051.5	2034.27	1053.8	2034	1065.18	2033.41	1076.18
[redacted]	2033.8	1083.76	2034	1088.34	2034.44	1098.59	2035.86	1100.44	2036	1101.24
GR	2038	1106.68	2040	1112.44	2042	1118.2	2043.99	1123.94	2044	1124.08
[redacted]	2046	1146.2	2048	1169.51						
NC	0.025	0.025	0.015							
[redacted]	420	24	1043.78	1135.75	57.42	58.75	57.86			
[redacted]	2044.5	1000	2044.02	1013.17	2045.14	1029.1	2045.24	1031.49	2045.15	1043.78
GR	2044	1044.56	2042	1045.39	2040	1046.21	2038	1047.01	2036	1047.78
[redacted]	2034.3	1048.4	2034	1070.27	2033.65	1090.96	2034	1102.69	2034.75	1134.3
[redacted]	2036	1134.46	2038	1134.73	2040	1135	2042	1135.29	2044	1135.59
[redacted]	2045	1135.75	2046	1151.17	2048	1177.91	2048.44	1184.02		
[redacted]	0.025	0.025	0.015							
[redacted]	430	11	1060.08	1090.66	208.31	211.94	208.45			
X3	0			1060.08	2048	1090.66	2048			
[redacted]	2049	1000	2048	1009.5	2047.54	1017.61	2046.6	1060.08	2034.15	1060.08
[redacted]	2034.1	1090.66	2046.6	1090.66	2046.27	1095.89	2046.88	1121.19	2047.37	1136.94
GR	2047.3	1157.66								
[redacted]	0.025	0.025	0.015							
[redacted]	1.25	1.56	2.6	31.5	30.58	0.58	300	0	2048.53	2034.15
X1	440	15	1046.07	1076.65	1470.06	1457.21	1463.68			
[redacted]			1	2058.53	2060.53			2		
[redacted]	0			1046.07	2060	1076.65	2060			
GR	2058.6	1000	2059.32	1015.39	2058.81	1046.07	2048.53	1046.07	2048.53	1076.65
[redacted]	2058.8	1076.65	2060	1087.37	2062	1090.99	2064	1094.51	2065.63	1098.52
[redacted]	2066	1100.87	2066.3	1103.82	2066	1113.26	2065.91	1115.86	2065.96	1135.4
NC	0.025	0.025	0.015							
[redacted]	450	21	1069.16	1100.27	388.92	404.9	397.95			
[redacted]	2063.1	1000	2062.46	1062.1	2062.1	1069.08	2062	1069.16	2060	1070.84
GR	2058	1072.51	2056	1074.19	2054	1075.87	2052.22	1077.38	2052.71	1098.84
[redacted]	2054	1099.01	2056	1099.27	2058	1099.53	2060	1099.79	2062	1100.06
[redacted]	2062.4	1100.27	2062.24	1102.13	2064	1106.77	2065.41	1110.3	2066	1138.35
GR	2068	1229.16								

NC	0.025	0.025	0.015							
[illegible]	460	23	1069.93	1105.01	393.56	408.01	401.61			
[illegible]	2067.7	1000	2067.03	1064.15	2068	1069.93	2068.18	1070.53	2068	1070.67
GR	2066	1072.3	2064	1073.93	2062	1075.55	2060	1077.18	2058	1078.81
GR	2057.4	1079.29	2057.56	1100.18	2058	1100.27	2060	1100.7	2062	1101.09
[illegible]	2064	1101.46	2066	1101.81	2066.59	1101.91	2068	1105.01	2068.95	1107
GR	2070	1116.39	2070.87	1124.41	2070	1214.9				
[illegible]	0.025	0.025	0.015							
[illegible]	470	21	1076.93	1115.33	402.75	394.14	398.77			
GR	2073.8	1000	2072.77	1065.9	2073.13	1076.93	2072	1077.24	2070	1078.56
[illegible]	2068	1079.79	2066	1080.99	2064	1082.22	2062.67	1083.04	2062.71	1107.09
[illegible]	2064	1107.31	2066	1107.65	2068	1108.01	2070	1108.51	2071.42	1108.98
GR	2072	1110.03	2074	1114.41	2074.36	1115.33	2074	1124.29	2073.8	1135.27
GR	2074	1315.22								
NC	0.025	0.025	0.015							
X1	480	21	1026.66	1163.79	213.66	185.9	192.99			
[illegible]	0			1026.66	2076	1163.79	2076			
[illegible]	2073.6	1000	2073.75	1014.61	2074	1017.95	2074.97	1026.66	2074	1030.55
GR	2072	1042.8	2070	1054.27	2068	1065.84	2066	1074.47	2064.18	1079.6
[illegible]	2064.2	1126.09	2066	1130.87	2068	1136.31	2070	1145.62	2072	1154.99
[illegible]	2073.1	1163.79	2073.64	1179.89	2074	1182.32	2074	1184.45	2073.75	1196.44
GR	2073.7	1218.52								
[illegible]	0.1	0.1	0.016							
[illegible]	5	0.1	1078.9	0.016	1133.91	0.1	1380	0.016	1473.5	0.1
NH	1592.8									
[illegible]	1	1950								
[illegible]	490	26	1380	1473.5	137.94	134.7	133.56			
X3	0			1380	2077	1473.5	2077			
GR	2076.2	1000	2076	1070.44	2075.7	1078.9	2075.65	1093.59	2074.77	1095.59
[illegible]	2075.1	1113.21	2074.62	1131.24	2075.52	1133.91	2075.42	1139.4	2074.8	1147.24
GR	2074.6	1237.96	2074.44	1262.26	2075.25	1380	2074	1384.16	2072.88	1388.18
GR	2073.4	1392.2	2072.56	1396.28	2072.65	1422.63	2072.87	1453.13	2073.88	1455.88
[illegible]	2074	1460.2	2074.02	1460.41	2075.24	1473.5	2076	1489.31	2076.27	1548.19
GR	2076.6	1592.8								
[illegible]	0.1	0.1	0.016							
[illegible]	5	0.1	1085.11	0.016	1149.87	0.1	1383.37	0.016	1469.12	0.1
NH	1584.8									
[illegible]	500	29	1383.37	1469.12	201.63	205.58	201.53			
[illegible]	0			1383.37	2079	1469.12	2079			
GR	2077.9	1000	2078	1079.54	2078.04	1084.64	2078	1085.11	2077.79	1096.49
GR	2077	1098.93	2076.88	1117.48	2076.69	1135.33	2077.46	1137.07	2076.9	1141.08
[illegible]	2078	1148.66	2078.19	1149.87	2078	1161.08	2077.06	1239.92	2076.66	1266.66
GR	2076	1383.37	2076	1383.6	2075.41	1391.31	2075.55	1394.62	2074.64	1397.49
GR	2074.8	1425.39	2074.83	1456.48	2075.69	1459.45	2075.8	1463.28	2076	1464.24
[illegible]	2076.8	1469.12	2077.99	1555.71	2078	1559.68	2078	1584.8		

NC	0.1	0.1	0.016							
	5	0.1	1084.93	0.016	1136.15	0.1	1383.68	0.016	1470.61	0.1
	1543.7									
X1	510	28	1383.68	1470.61	200.34	198.87	199.21			
	0			1383.68	2081	1470.61	2081			
	2080.5	1000	2080	1069.72	2079.8	1084.93	2079.47	1096.82	2078.88	1098.95
GR	2079.3	1116.36	2078.64	1134.53	2079.78	1136.15	2079.18	1140.94	2079.36	1149.29
GR	2080	1183.52	2080	1201.45	2078.71	1236.9	2078.59	1265.15	2079.65	1292.21
	2078.4	1383.68	2078	1386.37	2077.43	1390	2077.38	1394.06	2076.69	1397.95
	2076.7	1425.28	2076.58	1455.81	2077.08	1458.62	2077.38	1463.12	2078	1465.32
GR	2079.5	1470.61	2080	1485.7	2080.44	1543.7				
	0.1	0.1	0.016							
NH	5	0.1	1084.05	0.016	1123.94	0.1	1366.83	0.016	1457.45	0.1
	1523									
	520	29	1366.83	1457.45	198.12	199.29	199.24			
X5	0			1366.83	2082	1457.45	2082			
GR	2081.5	1000	2081.42	1074.05	2081.73	1084.05	2080.98	1087.47	2081.18	1103.48
	2081	1121.11	2081.86	1123.94	2081.43	1128.1	2082.01	1134.95	2081.95	1146.76
	2082	1147.04	2082	1203.66	2081.83	1213.57	2081.16	1228.52	2080.95	1263.15
GR	2080.5	1366.83	2080	1370.04	2078.47	1378.27	2079.13	1381.53	2078.01	1385.19
	2078	1386.82	2078	1398.81	2078.24	1413.06	2078.26	1444.5	2079.01	1446.85
	2079.4	1450.39	2080	1453.11	2080.92	1457.45	2081.93	1523		
NC	0.1	0.1	0.016							
	5	0.1	1082.96	0.016	1123.08	0.1	1346.74	0.016	1431.3	0.1
NH	1601									
X1	530	22	1346.74	1431.3	210.23	241.33	227.48			
	0			1346.74	2084	1431.3	2084			
	2083.2	1000	2083.7	1072.53	2083.71	1082.96	2082.35	1086.89	2082.9	1102.27
GR	2082.6	1119.01	2083.62	1123.08	2083.29	1128.26	2083.02	1136.13	2083.01	1241.73
	2082.6	1346.74	2082	1350.59	2080.52	1359.41	2081.3	1362.33	2079.98	1367.32
	2080.1	1393.44	2080.61	1421.98	2081.51	1425.57	2081.9	1430.88	2082	1431.3
GR	2084	1513.51	2084	1601						
	0.1	0.1	0.016							
NH	5	0.1	1034.63	0.016	1082.12	0.1	1155.7	0.016	1242.61	0.1
NH	1662.5									
	540	30	1155.7	1235.18	173.09	201.13	189.3			
	0			1155.7	2085	1235.18	2085			
GR	2085.3	1000	2084.14	1027.87	2084.28	1034.63	2084	1036.59	2083.69	1038.99
	2083.3	1056.98	2083.17	1073.21	2084	1074.74	2084.32	1075.3	2084	1077.59
	2083.7	1080.12	2084	1081.27	2084.31	1082.12	2084.15	1103.24	2084	1125.27
GR	2083	1155.7	2082.23	1161.51	2082.99	1165.34	2082.14	1167.92	2082	1174.17
GR	2081.4	1199.23	2082	1213.92	2082.61	1230.67	2083.48	1235.18	2083.43	1242.61
	2084	1265.06	2083.87	1279.58	2084	1288.94	2086	1635.3	2086.16	1662.5
NC	0.1	0.1	0.016							
	550	11	1113.83	1286.4	237.87	248.39	244.36			
	0			1113.83	2087	1286.4	2087			
GR	2086	1000	2086	1006.83	2085.22	1113.83	2084.16	1169.33	2084.02	1177.67
GR	2084	1177.78	2084	1240.62	2084.59	1242.98	2084.41	1250.04	2086	1277.72
	2086.6	1286.4								

NC	0.016	0.016	0.015							
	1	3900								
	560	19	1011.29	1090.36	63.57	64.65	67.51			
GR	2090.9	1009.62	2084.97	1009.62	2084	1011.29	2082	1014.16	2080	1017.23
	2078	1020.53	2077.65	1021.06	2076	1034.43	2076	1048.77	2076.12	1053.14
	2078	1053.74	2080	1054.61	2082	1055.47	2083.53	1056.15	2083.54	1085.21
GR	2084	1086.7	2085.15	1090.36	2085.23	1098.87	2088.23	1098.87		

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

ROF 1

CRITICAL DEPTH TO BE CALCULATED AT ALL CROSS SECTIONS
LOWABLE ERROR FOR CRITICAL DEPTH DETERMINATION (ALLDC) = 2.000 PERCENT OF THE DEPTH

CCHV= .100 CEHV= .300
ECNO 10.000
20 CRITICAL DEPTH ASSUMED

10.000	8.50	1930.20	1930.20	1930.00	1931.98	1.78	.00	.00	1928.13
5500.0	291.9	5142.0	66.1	87.1	466.3	19.1	.0	.0	1928.00
.00	3.35	11.03	3.45	.035	.030	.035	.000	1921.70	1139.32
.005307	0.	0.	0.	0	8	5	.00	184.60	1323.92

ECNO 20.000
7185 MINIMUM SPECIFIC ENERGY
20 CRITICAL DEPTH ASSUMED

20.000	8.92	1933.32	1933.32	.00	1935.22	1.90	1.56	.04	1931.19
5500.0	290.5	5185.3	24.2	95.9	456.1	10.5	3.9	1.4	1932.00
.01	3.03	11.37	2.31	.035	.030	.035	.000	1924.40	1113.63
.005174	314.	298.	276.	0	8	0	.00	208.12	1321.75

ECNO 30.000

3301 HV CHANGED MORE THAN HVINS

5 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

30.000	6.93	1935.76	1935.76	.00	1938.47	2.71	1.29	.24	1940.00
5500.0	.0	5500.0	.0	.0	416.7	.0	8.6	2.7	1938.00
.02	.00	13.20	.00	.000	.015	.000	.000	1928.83	1136.18
.002049	407.	418.	430.	0	15	0	.00	78.28	1214.46

*SECNO 40.000

1 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
20 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 1133.8 1184.2 TYPE= 1 TARGET= 50.380

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST
ENCL= 1942.00 ELENCR= 1942.00									
40.000	7.15	1940.75	1940.75	.00	1944.37	3.62	.02	.27	1940.00
5500.0	.0	5500.0	.0	.0	360.4	.0	8.7	2.7	1942.00
.02	.00	15.26	.00	.000	.015	.000	.000	1933.60	1133.81
.002365	10.	10.	10.	0	8	0	.00	50.38	1184.19

SPECIAL BRIDGE

5 7 DOWNSTREAM ELEV IS 1939.65 , NOT 1940.75 HYDRAULIC JUMP OCCURS DOWNSTREAM (IF LOW FLOW CONTROLS)

SB XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
.90	1.56	2.60	170.00	50.38	2.38	240.00	.00	1934.60	1933.60

*SECNO 50.000

3 1 HV CHANGED MORE THAN HVINS

3 2 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.42

PRESSURE AND WEIR FLOW, Weir Submergence Based on TRAPEZOIDAL Shape

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
1953.48	1947.40	.00	2011.	3490.	240.	240.	1939.60	1943.13	170.

3470 ENCROACHMENT STATIONS= 1184.5 1234.9 TYPE= 1 TARGET= 50.380
ELENCL= 1945.00 ELENCR= 1945.00

50.000	8.98	1943.58	.00	.00	1945.88	2.29	1.51	.00	1942.00
5500.0	.0	5500.0	.0	.0	452.5	.0	9.8	2.9	1945.00
.02	.00	12.16	.00	.000	.015	.000	.000	1934.60	1184.49
.001174	113.	115.	117.	5	0	4	.00	50.38	1234.87

*SECNO 60.000

7 5 MINIMUM SPECIFIC ENERGY

3 0 CRITICAL DEPTH ASSUMED

60.000	7.62	1944.38	1944.38	.00	1946.90	2.51	.59	.07	1945.20
5300.0	.0	5300.0	.0	.0	416.6	.0	13.6	3.5	1946.00
.03	.00	12.72	.00	.000	.015	.000	.000	1936.76	1061.80
.002073	376.	387.	397.	0	15	0	.00	84.77	1146.57

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

ECNO 70.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

70.000	6.80	1948.37	1948.37	.00	1950.94	2.58	.86	.02	1950.00
5300.0	.0	5300.0	.0	.0	411.4	.0	17.6	4.3	1952.00
.04	.00	12.88	.00	.000	.015	.000	.000	1941.57	1066.48
.002036	427.	417.	406.	0	11	0	.00	80.94	1147.42

*SECNO 80.000
85 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

80.000	5.79	1948.39	1948.39	.00	1950.98	2.59	.00	.00	1950.33
5300.0	.0	5300.0	.0	.0	410.2	.0	17.6	4.3	1950.00
.04	.00	12.92	.00	.000	.015	.000	.000	1942.60	1059.66
.002032	1.	1.	1.	0	11	0	.00	79.40	1139.06

*SECNO 90.000

01 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
20 CRITICAL DEPTH ASSUMED

90.000	7.27	1950.37	1950.37	.00	1953.58	3.21	.11	.19	1951.07
5300.0	.0	5300.0	.0	.0	368.4	.0	18.1	4.4	1953.03
.04	.00	14.39	.00	.000	.015	.000	.000	1943.10	1054.03
.002065	53.	52.	57.	0	11	0	.00	58.04	1112.07

ECNO 100.000
85 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

100.000	7.80	1952.50	1952.50	.00	1956.01	3.51	.72	.09	1958.00
5300.0	.0	5300.0	.0	.0	352.6	.0	20.9	4.8	1958.00
.04	.00	15.03	.00	.000	.015	.000	.000	1944.70	1073.18
.002123	346.	343.	340.	0	8	0	.00	50.82	1124.01

*SECNO 110.000
85 MINIMUM SPECIFIC ENERGY
20 CRITICAL DEPTH ASSUMED

110.000	7.50	1954.70	1954.70	.00	1958.06	3.35	.00	.02	1958.00
5300.0	.0	5300.0	.0	.0	360.6	.0	20.9	4.8	1958.00
.04	.00	14.70	.00	.000	.015	.000	.000	1947.20	1072.92
.002059	1.	1.	1.	0	8	0	.00	53.84	1126.76

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

ECNO 120.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

120.000	7.52	1955.02	1955.02	.00	1958.42	3.40	.05	.01	1958.00
5300.0	.0	5300.0	.0	.0	358.3	.0	21.1	4.8	1958.00
.04	.00	14.79	.00	.000	.015	.000	.000	1947.50	1085.18
.002086	25.	25.	22.	0	5	0	.00	53.14	1138.32

*ECNO 130.000
85 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

130.000	7.65	1955.65	1955.65	.00	1959.14	3.49	.26	.03	1958.00
5300.0	.0	5300.0	.0	.0	353.6	.0	22.1	5.0	1958.00
.05	.00	14.99	.00	.000	.015	.000	.000	1948.00	1093.16
.002111	125.	125.	126.	0	8	0	.00	51.24	1144.40

*SECNO 140.000
7185 MINIMUM SPECIFIC ENERGY
20 CRITICAL DEPTH ASSUMED

140.000	7.67	1956.17	1956.17	.00	1959.59	3.42	.12	.01	1959.20
5300.0	.0	5300.0	.0	.0	357.0	.0	22.6	5.0	1959.86
.05	.00	14.85	.00	.000	.015	.000	.000	1948.50	1126.51
.002091	57.	56.	57.	0	5	0	.00	52.57	1179.07

ECNO 150.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

150.000	7.47	1957.97	1957.97	.00	1961.26	3.29	.00	.01	1959.50
5300.0	.0	5300.0	.0	.0	364.1	.0	22.6	5.0	1959.99
.05	.00	14.56	.00	.000	.015	.000	.000	1950.50	1136.49
.002038	1.	1.	1.	0	8	0	.00	55.57	1192.06

*ECNO 160.000
85 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

160.000	7.60	1959.36	1959.36	.00	1962.64	3.29	.23	.00	1961.14
5300.0	.0	5300.0	.0	.0	364.3	.0	23.6	5.2	1961.10
.05	.00	14.55	.00	.000	.015	.000	.000	1951.76	1025.05
.002033	120.	115.	111.	0	5	0	.00	55.48	1080.53

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

ECNO 170.000

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.78

170.000	9.32	1961.62	1959.03	.00	1962.94	1.32	.10	.20	1962.00
5300.0	.0	5300.0	.0	.0	575.2	.0	24.6	5.3	1962.00
.05	.00	9.21	.00	.000	.015	.000	.000	1952.30	1022.79
.000641	98.	97.	96.	5	11	0	.00	75.51	1098.30

ECNO 180.000

3301 HV CHANGED MORE THAN HVINS

85 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

180.000	8.00	1963.07	1963.07	.00	1966.04	2.97	.52	.49	1969.97
5300.0	.0	5300.0	.0	.0	383.5	.0	28.6	5.9	1970.00
.06	.00	13.82	.00	.000	.025	.000	.000	1955.07	1118.76
.005561	358.	364.	374.	0	15	0	.00	65.70	1184.46

*SECNO 190.000
7185 MINIMUM SPECIFIC ENERGY
7220 CRITICAL DEPTH ASSUMED

190.000	9.21	1966.85	1966.85	.00	1970.05	3.20	1.98	.07	1977.86
5300.0	.0	5300.0	.0	.0	369.4	.0	31.7	6.4	1978.00
.07	.00	14.35	.00	.000	.025	.000	.000	1957.64	1062.65
.005536	350.	356.	362.	0	8	0	.00	57.91	1120.55

ECNO 200.000
7185 MINIMUM SPECIFIC ENERGY
7220 CRITICAL DEPTH ASSUMED

200.000	8.06	1970.50	1970.50	.00	1973.44	2.93	1.99	.03	1977.70
5300.0	.0	5300.0	.0	.0	385.6	.0	34.8	6.9	1986.14
.07	.00	13.74	.00	.000	.025	.000	.000	1962.44	1089.27
.005582	344.	357.	368.	0	11	0	.00	66.23	1155.50

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 210.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

210.000	6.98	1972.46	1972.46	.00	1975.53	3.07	.69	.04	1982.00
5300.0	.0	5300.0	.0	.0	377.2	.0	36.7	7.3	1986.90
.08	.00	14.05	.00	.000	.015	.000	.000	1965.48	1033.21
.002020	218.	220.	223.	0	11	0	.00	61.98	1095.20

*SECNO 220.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3710 ENCROACHMENT STATIONS= 1044.2 1104.4 TYPE= 1 TARGET= 60.290
ELENCL= 1987.00 ELENCR= 1987.00

220.000	7.00	1975.66	1975.66	.00	1979.19	3.53	.21	.14	1986.57
5300.0	.0	5300.0	.0	.0	351.7	.0	37.5	7.4	1987.00
.08	.00	15.07	.00	.000	.015	.000	.000	1968.66	1044.15
.002397	97.	95.	98.	0	5	0	.00	50.25	1094.40

SPECIAL BRIDGE

5207 DOWNSTREAM ELEV IS 1974.60 , NOT 1975.66 HYDRAULIC JUMP OCCURS DOWNSTREAM (IF LOW FLOW CONTROLS)

SK	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	.90	1.56	2.60	115.00	50.25	2.25	576.00	.00	1969.76	1968.66

*SECNO 230.000

3501 HV CHANGED MORE THAN HVINS

3712 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.41

CLASS B LOW FLOW

3420 BRIDGE W.S.= 1976.44 BRIDGE VELOCITY= 15.27 CALCULATED CHANNEL AREA= 321.

PRS	EGLWC	H3	QWEIR	QLOW	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
.00	1980.78	.00	0.	5300.	576.	576.	1981.76	1987.60	0.

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IOC	ICONT	CORAR	TOPWID	ENDST

3470 ENCROACHMENT STATIONS= 1059.8 1110.0 TYPE= 1 TARGET= 50.250
ELENCL= 1987.20 ELENCR= 1987.20

230.000	8.77	1978.53	.00	.00	1980.78	2.24	1.59	.00	1987.10
5300.0	.0	5300.0	.0	.0	440.9	.0	38.5	7.5	1987.20
.08	.00	12.02	.00	.000	.015	.000	.000	1969.76	1059.76
.001213	106.	106.	105.	0	0	0	.00	50.25	1110.01

*SECNO 240.000

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

240.000	7.26	1982.85	1982.85	.00	1985.65	2.79	.22	.16	1984.80
5300.0	.0	5300.0	.0	.0	395.2	.0	39.4	7.6	1990.50
.09	.00	13.41	.00	.000	.025	.000	.000	1975.59	1028.01
.005513	100.	99.	99.	0	15	0	.00	71.75	1099.76

*SECNO 250.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

250.000	8.94	1987.59	1987.59	.00	1990.11	2.52	2.73	.03	1994.00
5300.0	.0	5300.0	.0	.0	415.8	.0	43.9	8.5	1995.00
.10	.00	12.75	.00	.000	.025	.000	.000	1978.65	1068.21
.005924	484.	478.	467.	0	11	0	.00	85.01	1153.22

*SECNO 260.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

260.000	10.17	1992.29	1992.29	.00	1995.08	2.79	2.56	.08	1999.98
5300.0	.0	5300.0	.0	.0	395.7	.0	48.0	9.3	2001.02
.10	.00	13.40	.00	.000	.025	.000	.000	1982.12	1138.65
.005753	458.	438.	414.	0	8	0	.00	71.29	1209.94

*SECNO 270.000

3301 HV CHANGED MORE THAN HVINS

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

3470 ENCROACHMENT STATIONS= 1119.9 1157.3 TYPE= 1 TARGET= 37.330
ELENCL= 1999.00 ELENCR= 1999.00

270.000	9.27	1992.67	1991.95	.00	1996.31	3.64	.98	.26	1998.00
5300.0	.0	5300.0	.0	.0	346.2	.0	49.8	9.6	1999.00
.11	.00	15.31	.00	.000	.020	.000	.000	1983.40	1119.93
.003731	213.	214.	213.	3	11	0	.00	37.33	1157.26

SPECIAL BRIDGE

5227 DOWNSTREAM ELEV IS 1990.77 , NOT 1992.67 HYDRAULIC JUMP OCCURS DOWNSTREAM (IF LOW FLOW CONTROLS)

XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
.90	1.56	2.60	94.00	37.33	1.33	360.00	.00	1984.30	1983.40

*SECNO 280.000

3301 HV CHANGED MORE THAN HVINS

PRESSURE AND WEIR FLOW, Weir Submergence Based on TRAPEZOIDAL Shape

SPRS	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
1997.92	1997.77	.00	75.	5214.	360.	360.	1994.30	1997.30	94.

3470 ENCROACHMENT STATIONS= 1088.1 1124.5 TYPE= 1 TARGET= 36.330
ELENCL= 1999.00 ELENCR= 1999.00

280.000	10.40	1994.70	.00	.00	1997.75	3.05	1.44	.00	1997.96
5300.0	.0	5300.0	.0	.0	378.0	.0	50.7	9.6	1999.00
.11	.00	14.02	.00	.000	.020	.000	.000	1984.30	1088.14
.002868	110.	110.	115.	4	0	2	.00	36.33	1124.47

*SECNO 290.000

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3470 CRITICAL DEPTH ASSUMED

290.000	7.98	2001.61	2001.61	.00	2003.57	1.96	1.75	.11	2012.48
3900.0	.0	3900.0	.0	.0	347.0	.0	54.4	10.3	2005.27
.12	.00	11.24	.00	.000	.025	.000	.000	1993.63	1109.36
.006359	403.	452.	479.	0	19	0	.00	92.14	1201.50

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

ECNO 300.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

300.000	10.59	2012.53	2012.53	.00	2014.71	2.18	2.46	.07	2022.00
3900.0	.0	3900.0	.0	.0	328.9	.0	57.8	11.1	2022.49
.13	.00	11.86	.00	.000	.025	.000	.000	2001.94	1117.29
.005150	445.	430.	407.	0	10	0	.00	66.10	1183.39

*ECNO 310.000

3301 HV CHANGED MORE THAN HVINS

5 MINIMUM SPECIFIC ENERGY
0 CRITICAL DEPTH ASSUMED

0 ENCROACHMENT STATIONS= 1036.9 1067.9 TYPE= 1 TARGET= 31.000
ENCL= 2020.00 ELENCR= 2020.00

310.000	7.87	2015.87	2015.87	.00	2019.84	3.97	1.33	.54	2018.00
3900.0	.0	3900.0	.0	.0	244.0	.0	60.1	11.5	2020.00
.14	.00	15.99	.00	.000	.015	.000	.000	2008.00	1036.87
.002875	360.	353.	352.	0	15	0	.00	31.00	1067.87

SPECIAL BRIDGE

7 DOWNSTREAM ELEV IS 2014.87 , NOT 2015.87 HYDRAULIC JUMP OCCURS DOWNSTREAM (IF LOW FLOW CONTROLS)

SB XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
.90	1.56	2.60	58.00	31.00	1.00	210.00	.00	2008.40	2008.00

*SECNO 320.000
0 CROSS SECTION 320.00 EXTENDED .31 FEET

1 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.89

PRESSURE AND WEIR FLOW, Weir Submergence Based on TRAPEZOIDAL Shape

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
2024.22	2020.63	.00	468.	3429.	210.	210.	2015.40	2020.20	58.

3[illegible]0 ENCROACHMENT STATIONS= 1074.9 1105.9 TYPE= 1 TARGET= 31.000
ELENCL= 2021.00 ELENCR= 2021.00

320.000	12.31	2020.71	.00	.00	2022.33	1.62	2.49	.00	2020.00
3900.0	.0	3900.0	.0	.0	381.4	.0	60.7	11.6	2021.00
.14	.00	10.22	.00	.000	.015	.000	.000	2008.40	1074.88
.000803	89.	87.	89.	3	0	2	.00	31.00	1105.88

*SECNO 330.000

3[illegible]1 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3[illegible]0 CRITICAL DEPTH ASSUMED

330.000	9.55	2023.77	2023.77	.00	2026.20	2.43	.78	.24	2028.00
3900.0	.0	3900.0	.0	.0	311.7	.0	64.0	12.0	2026.16
.15	.00	12.51	.00	.000	.030	.000	.000	2014.22	1088.84
.008833	407.	409.	410.	0	19	0	.00	66.29	1155.13

*[illegible]CNO 340.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

340.000	6.59	2028.51	2028.51	.00	2030.81	2.30	3.56	.01	2032.89
3900.0	.0	3900.0	.0	.0	320.4	.0	67.0	12.7	2032.00
.16	.00	12.17	.00	.000	.030	.000	.000	2021.92	1080.35
.008371	416.	415.	411.	0	19	0	.00	70.92	1151.27

*[illegible]CNO 350.000
7[illegible]5 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3[illegible]0 ENCROACHMENT STATIONS= 1014.0 1077.2 TYPE= 1 TARGET= 63.200
[illegible]ENCL= 2036.00 ELENCR= 2036.00

350.000	4.89	2030.79	2030.79	.00	2033.26	2.47	1.61	.05	2034.00
3900.0	.0	3900.0	.0	.0	309.3	.0	69.9	13.3	2036.00
.17	.00	12.61	.00	.000	.015	.000	.000	2025.90	1014.00
.002362	391.	400.	408.	0	15	0	.00	63.20	1077.20

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

SPECIAL BRIDGE

27 DOWNSTREAM ELEV IS 2030.01 , NOT 2030.79 HYDRAULIC JUMP OCCURS DOWNSTREAM (IF LOW FLOW CONTROLS)

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	.90	1.56	2.60	70.00	63.20	3.20	480.00	.00	2025.90	2025.90

*SECNO 360.000

01 HV CHANGED MORE THAN HVINS

02 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.46

CLASS B LOW FLOW

20 BRIDGE W.S.= 2030.98 BRIDGE VELOCITY= 12.79 CALCULATED CHANNEL AREA= 305.

EGPRS	EGLWC	H3	QWEIR	QLOW	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
.00	2033.65	.00	0.	3900.	480.	480.	2033.90	2036.06	0.

3470 ENCROACHMENT STATIONS= 1023.9 1087.1 TYPE= 1 TARGET= 63.200
LENCL= 2037.00 ELENCR= 2037.00

360.000	6.23	2032.13	.00	.00	2033.65	1.52	.39	.00	2036.00
3900.0	.0	3900.0	.0	.0	393.7	.0	70.4	13.4	2037.00
.17	.00	9.91	.00	.000	.015	.000	.000	2025.90	1023.92
.001109	69.	69.	68.	0	0	0	.00	63.20	1087.12

ECNO 370.000

3301 HV CHANGED MORE THAN HVINS

35 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

370.000	5.82	2033.82	2033.82	.00	2036.39	2.57	.10	.31	2037.44
3900.0	.0	3900.0	.0	.0	303.2	.0	71.0	13.5	2035.81
.17	.00	12.86	.00	.000	.015	.000	.000	2028.00	1048.85
.002156	67.	67.	67.	0	11	0	.00	59.68	1108.53

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

ECNO 380.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

380.000	5.71	2035.71	2035.71	.00	2038.15	2.44	.00	.01	2037.63
3900.0	.0	3900.0	.0	.0	311.4	.0	71.0	13.5	2036.85
.17	.00	12.52	.00	.000	.015	.000	.000	2030.00	1044.82
.002114	1.	1.	1.	0	8	0	.00	64.68	1109.50

*ECNO 390.000
5 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

390.000	7.17	2039.34	2039.34	.00	2041.78	2.44	1.54	.00	2044.00
3900.0	.0	3900.0	.0	.0	311.3	.0	73.9	14.1	2042.99
.18	.00	12.53	.00	.000	.030	.000	.000	2032.17	1055.45
.008386	385.	410.	428.	0	11	0	.00	65.09	1120.54

*SECNO 400.000

1 HV CHANGED MORE THAN HVINS

2 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 2.91

400.000	8.08	2041.44	2040.16	.00	2042.77	1.33	.88	.11	2044.76
3900.0	.0	3900.0	.0	.0	421.7	.0	77.3	14.8	2044.00
.19	.00	9.25	.00	.000	.015	.000	.000	2033.36	1036.98
.000992	428.	400.	380.	3	11	0	.00	80.20	1117.18

*ECNO 410.000

410.000	8.34	2041.75	2039.71	.00	2042.80	1.05	.00	.03	2044.89
3900.0	.0	3900.0	.0	.0	474.1	.0	77.3	14.8	2043.99
.19	.00	8.23	.00	.000	.015	.000	.000	2033.41	1036.15
.000691	1.	1.	1.	2	15	0	.00	81.34	1117.49

*SECNO 420.000

1 HV CHANGED MORE THAN HVINS

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.82

420.000	8.79	2042.44	2038.08	.00	2042.88	.44	.02	.06	2045.15
3900.0	.0	3900.0	.0	.0	732.6	.0	78.1	14.9	2045.00
.20	.00	5.32	.00	.000	.015	.000	.000	2033.65	1045.21
.000210	57.	58.	59.	2	11	0	.00	90.15	1135.36

*SECNO 430.000

3301 HV CHANGED MORE THAN HVINS

3385 MINIMUM SPECIFIC ENERGY
3420 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 1060.1 1090.7 TYPE= 1 TARGET= 30.580
ELENCL= 2048.00 ELENCR= 2048.00

430.000	7.96	2042.06	2042.06	.00	2046.07	4.01	.11	1.07	2046.60
3900.0	.0	3900.0	.0	.0	242.6	.0	80.4	15.2	2048.00
.20	.00	16.08	.00	.000	.015	.000	.000	2034.10	1060.08
.002906	208.	208.	212.	0	11	0	.00	30.58	1090.66

SPECIAL BRIDGE

5427 DOWNSTREAM ELEV IS 2041.29 , NOT 2042.06 HYDRAULIC JUMP OCCURS DOWNSTREAM (IF LOW FLOW CONTROLS)

SB XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
1.25	1.56	2.60	31.50	30.58	.58	300.00	.00	2048.53	2034.15

*SECNO 440.000
4490 POSSIBLE INVALID SOLUTION 20 TRIALS OF EG NOT ENOUGH
FINAL QWEIR + QPR = 8287. DOES NOT EQUAL ACTUAL Q = 3900.

3301 HV CHANGED MORE THAN HVINS

PRESSURE AND WEIR FLOW, Weir Submergence Based on TRAPEZOIDAL Shape

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
2046.15	2060.72	.01	0.	8287.	300.	300.	2058.53	2060.53	32.

370 ENCROACHMENT STATIONS= 1046.1 1076.7 TYPE= 1 TARGET= 30.580
ELENCL= 2060.00 ELENCR= 2060.00

440.000	8.59	2057.12	.00	.00	2060.54	3.42	14.47	.00	2058.81
3900.0	.0	3900.0	.0	.0	262.6	.0	88.9	16.2	2060.00
.23	.00	14.85	.00	.000	.015	.000	.000	2048.53	1046.07
.002315	1470.	1464.	1457.	5	0	20	.00	30.58	1076.65

*SECNO 450.000

371 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

450.000	9.49	2061.71	2061.71	.00	2065.76	4.05	.99	.19	2062.00
3900.0	.0	3900.0	.0	.0	241.6	.0	91.2	16.5	2062.40
.23	.00	16.15	.00	.000	.015	.000	.000	2052.22	1069.41
.002654	389.	398.	405.	0	8	0	.00	30.62	1100.02

*SECNO 460.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

460.000	9.36	2066.76	2066.76	.00	2070.93	4.17	1.09	.04	2068.00
3900.0	.0	3900.0	.0	.0	237.9	.0	93.4	16.7	2068.00
.24	.00	16.39	.00	.000	.015	.000	.000	2057.40	1071.68
.002759	394.	402.	408.	0	8	0	.00	30.60	1102.28

*SECNO 470.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

470.000	8.95	2071.62	2071.62	.00	2075.50	3.88	1.06	.03	2073.13
3900.0	.0	3900.0	.0	.0	246.9	.0	95.7	17.0	2074.36
.25	.00	15.80	.00	.000	.015	.000	.000	2062.67	1077.49
.002545	403.	399.	394.	0	8	0	.00	31.85	1109.34

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

ECNO 480.000
3280 CROSS SECTION 480.00 EXTENDED 2.00 FEET

3501 HV CHANGED MORE THAN HVINS

3502 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 5.24

3470 ENCROACHMENT STATIONS= 1026.7 1163.8 TYPE= 1 TARGET= 137.130
ELENCL= 2076.00 ELENCR= 2076.00

480.000	11.53	2075.71	2069.57	.00	2075.91	.21	.05	.37	2074.97
3900.0	.0	3900.0	.0	.0	1066.1	.0	98.6	17.4	2076.00
.26	.00	3.66	.00	.000	.015	.000	.000	2064.18	1026.66
.000093	214.	193.	186.	3	14	0	.00	137.13	1163.79

1490 NH CARD USED
*SECNO 490.000

3501 HV CHANGED MORE THAN HVINS

3485 MINIMUM SPECIFIC ENERGY
3520 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 1380.0 1473.5 TYPE= 1 TARGET= 93.500
ELENCL= 2077.00 ELENCR= 2077.00

490.000	3.00	2075.56	2075.56	.00	2076.76	1.20	.02	.30	2075.25
1950.0	.0	1950.0	.0	.0	221.4	.0	100.5	17.8	2077.00
.27	.00	8.81	.00	.000	.016	.000	.000	2072.56	1380.00
.002891	138.	134.	135.	0	14	0	.00	93.50	1473.50

1490 NH CARD USED
*SECNO 500.000
3485 MINIMUM SPECIFIC ENERGY
3520 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 1383.4 1469.1 TYPE= 1 TARGET= 85.750
ELENCL= 2079.00 ELENCR= 2079.00

500.000	2.94	2077.58	2077.58	.00	2078.85	1.27	.57	.02	2076.00
1950.0	.0	1950.0	.0	.0	215.8	.0	101.5	18.2	2079.00
.27	.00	9.03	.00	.000	.016	.000	.000	2074.64	1383.37
.002814	202.	202.	206.	0	8	0	.00	85.75	1469.12

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

90 NH CARD USED
*SECNO 510.000
7185 MINIMUM SPECIFIC ENERGY
20 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 1383.7 1470.6 TYPE= 1 TARGET= 86.930
LENCL= 2081.00 ELENCR= 2081.00

510.000	2.90	2079.48	2079.48	.00	2080.75	1.27	.56	.00	2078.40
1950.0	.0	1950.0	.0	.0	216.0	.0	102.5	18.6	2081.00
.28	.00	9.03	.00	.000	.016	.000	.000	2076.58	1383.68
.002823	200.	199.	199.	0	5	0	.00	86.86	1470.54

90 NH CARD USED
ECNO 520.000
7185 MINIMUM SPECIFIC ENERGY
20 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 1366.8 1457.4 TYPE= 1 TARGET= 90.620
LENCL= 2082.00 ELENCR= 2082.00

520.000	3.00	2081.00	2081.00	.00	2082.23	1.23	.57	.00	2080.50
1950.0	.0	1950.0	.0	.0	219.3	.0	103.5	19.0	2082.00
.28	.00	8.89	.00	.000	.016	.000	.000	2078.00	1366.83
.002856	198.	199.	199.	0	8	0	.00	90.62	1457.45

90 NH CARD USED
ECNO 530.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 1346.7 1431.3 TYPE= 1 TARGET= 84.560
ELENCL= 2084.00 ELENCR= 2084.00

530.000	3.15	2083.13	2083.13	.00	2084.42	1.29	.65	.02	2082.60
1950.0	.0	1950.0	.0	.0	214.0	.0	104.7	19.4	2084.00
.29	.00	9.11	.00	.000	.016	.000	.000	2079.98	1346.74
.002865	210.	227.	241.	0	8	0	.00	84.56	1431.30

1490 NH CARD USED
ECNO 540.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

3470 ENCROACHMENT STATIONS= 1155.7 1235.2 TYPE= 1 TARGET= 79.480
ELENCL= 2085.00 ELENCR= 2085.00

540.000	3.28	2084.68	2084.68	.00	2086.05	1.37	.55	.03	2083.00
1950.0	.0	1950.0	.0	.0	207.3	.0	105.6	19.8	2085.00
.30	.00	9.40	.00	.000	.016	.000	.000	2081.40	1155.70
.002931	173.	189.	201.	0	8	0	.00	79.48	1235.18

*CNO 550.000

3301 HV CHANGED MORE THAN HVINS

7 5 MINIMUM SPECIFIC ENERGY
3 0 CRITICAL DEPTH ASSUMED

3 0 ENCROACHMENT STATIONS= 1113.8 1286.4 TYPE= 1 TARGET= 172.570
ENCL= 2087.00 ELENCR= 2087.00

550.000	2.10	2086.10	2086.10	.00	2086.92	.82	.75	.05	2085.22
1950.0	.0	1950.0	.0	.0	267.8	.0	106.9	20.5	2087.00
.31	.00	7.28	.00	.000	.016	.000	.000	2084.00	1113.83
.003237	238.	244.	248.	0	14	0	.00	165.35	1279.18

•CNO 560.000

3 2 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 4.04

560.000	9.98	2085.98	2084.29	.00	2087.09	1.11	.08	.09	2084.00
3900.0	5.9	3879.9	14.2	2.5	457.5	6.7	107.5	20.7	2085.15
.31	2.34	8.48	2.11	.016	.015	.016	.000	2076.00	1009.62
.000793	64.	68.	65.	2	23	0	.00	89.25	1098.87

THIS RUN EXECUTED 18FEB98 09:39:59

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HEC-2 WATER SURFACE PROFILES

Version 4.6.2; May 1991
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NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

FLOODPLAIN DETERMINATION

SUMMARY PRINTOUT TABLE 100

	SECNO	EGLWC	ELLC	EGPRS	ELTRD	QPR	QWEIR	CLASS	H3	DEPTH	CWSEL	VCH	EG
*	50.000	1947.40	1939.60	1953.48	1943.13	3489.83	2011.25	30.00	.00	8.98	1943.58	12.16	1945.88
*	230.000	1980.78	1981.76	.00	1987.60	5300.00	.00	2.00	.00	8.77	1978.53	12.02	1980.78
*	280.000	1997.77	1994.30	1997.92	1997.30	5214.18	74.70	30.00	.00	10.40	1994.70	14.02	1997.75
*	320.000	2020.63	2015.40	2024.22	2020.20	3428.95	468.26	30.00	.00	12.31	2020.71	10.22	2022.33
*	360.000	2033.65	2033.90	.00	2036.06	3900.00	.00	2.00	.00	6.23	2032.13	9.91	2033.65
*	440.000	2060.72	2058.53	2046.15	2060.53	8286.56	.08	30.00	.01	8.59	2057.12	14.85	2060.54

FLOODPLAIN DETERMINATION

SUMMARY PRINTOUT TABLE 150

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH	AREA	.01K
*	10.000	.00	.00	.00	1921.70	5500.00	1930.20	1930.20	1931.98	53.07	11.03	572.50	754.96
*	20.000	297.76	.00	.00	1924.40	5500.00	1933.32	1933.32	1935.22	51.74	11.37	562.50	764.65
*	30.000	417.80	.00	.00	1928.83	5500.00	1935.76	1935.76	1938.47	20.49	13.20	416.67	1215.16
*	40.000	10.00	.00	.00	1933.60	5500.00	1940.75	1940.75	1944.37	23.65	15.26	360.42	1131.07
*	50.000	115.08	1943.13	1939.60	1934.60	5500.00	1943.58	.00	1945.88	11.74	12.16	452.47	1605.42
*	60.000	387.41	.00	.00	1936.76	5300.00	1944.38	1944.38	1946.90	20.73	12.72	416.57	1164.04
*	70.000	417.23	.00	.00	1941.57	5300.00	1948.37	1948.37	1950.94	20.36	12.88	411.36	1174.59
*	80.000	1.00	.00	.00	1942.60	5300.00	1948.39	1948.39	1950.98	20.32	12.92	410.21	1175.72
*	90.000	51.93	.00	.00	1943.10	5300.00	1950.37	1950.37	1953.58	20.65	14.39	368.37	1166.20
*	100.000	342.73	.00	.00	1944.70	5300.00	1952.50	1952.50	1956.01	21.23	15.03	352.64	1150.38
*	110.000	1.00	.00	.00	1947.20	5300.00	1954.70	1954.70	1958.06	20.59	14.70	360.59	1168.07
*	120.000	24.78	.00	.00	1947.50	5300.00	1955.02	1955.02	1958.42	20.86	14.79	358.25	1160.36
*	130.000	125.31	.00	.00	1948.00	5300.00	1955.65	1955.65	1959.14	21.11	14.99	353.61	1153.64
*	140.000	55.76	.00	.00	1948.50	5300.00	1956.17	1956.17	1959.59	20.91	14.85	356.98	1159.00
*	150.000	1.00	.00	.00	1950.50	5300.00	1957.97	1957.97	1961.26	20.38	14.56	364.11	1173.91
*	160.000	114.85	.00	.00	1951.76	5300.00	1959.36	1959.36	1962.64	20.33	14.55	364.28	1175.60
*	170.000	97.13	.00	.00	1952.30	5300.00	1961.62	1959.03	1962.94	6.41	9.21	575.23	2092.60
*	180.000	363.91	.00	.00	1955.07	5300.00	1963.07	1963.07	1966.04	55.61	13.82	383.48	710.71
*	190.000	356.25	.00	.00	1957.64	5300.00	1966.85	1966.85	1970.05	55.36	14.35	369.42	712.34
*	200.000	357.38	.00	.00	1962.44	5300.00	1970.50	1970.50	1973.44	55.82	13.74	385.61	709.39
*	210.000	220.26	.00	.00	1965.48	5300.00	1972.46	1972.46	1975.53	20.20	14.05	377.22	1179.25
*	220.000	95.38	.00	.00	1968.66	5300.00	1975.66	1975.66	1979.19	23.97	15.07	351.74	1082.44
*	230.000	106.05	1987.60	1981.76	1969.76	5300.00	1978.53	.00	1980.78	12.13	12.02	440.93	1522.04
*	240.000	98.95	.00	.00	1975.59	5300.00	1982.85	1982.85	1985.65	55.13	13.41	395.19	713.82

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH	AREA	.01K
	250.000	478.12	.00	.00	1978.65	5300.00	1987.59	1987.59	1990.11	59.24	12.75	415.75	688.58
*	260.000	437.75	.00	.00	1982.12	5300.00	1992.29	1992.29	1995.08	57.53	13.40	395.67	698.76
	270.000	213.69	.00	.00	1983.40	5300.00	1992.67	1991.95	1996.31	37.31	15.31	346.17	867.66
*	280.000	110.04	1997.30	1994.30	1984.30	5300.00	1994.70	.00	1997.75	28.68	14.02	377.95	989.64
*	290.000	451.82	.00	.00	1993.63	3900.00	2001.61	2001.61	2003.57	63.59	11.24	347.01	489.07
	300.000	430.29	.00	.00	2001.94	3900.00	2012.53	2012.53	2014.71	51.50	11.86	328.87	543.47
*	310.000	353.38	.00	.00	2008.00	3900.00	2015.87	2015.87	2019.84	28.75	15.99	243.96	727.29
	320.000	86.84	2020.20	2015.40	2008.40	3900.00	2020.71	.00	2022.33	8.03	10.22	381.45	1375.97
*	330.000	409.02	.00	.00	2014.22	3900.00	2023.77	2023.77	2026.20	88.33	12.51	311.67	414.98
*	340.000	414.66	.00	.00	2021.92	3900.00	2028.51	2028.51	2030.81	83.71	12.17	320.45	426.26
	350.000	400.22	.00	.00	2025.90	3900.00	2030.79	2030.79	2033.26	23.62	12.61	309.28	802.39
*	360.000	69.23	2036.06	2033.90	2025.90	3900.00	2032.13	.00	2033.65	11.09	9.91	393.70	1171.27
	370.000	66.95	.00	.00	2028.00	3900.00	2033.82	2033.82	2036.39	21.56	12.86	303.25	839.87
*	380.000	1.00	.00	.00	2030.00	3900.00	2035.71	2035.71	2038.15	21.14	12.52	311.43	848.26
*	390.000	409.92	.00	.00	2032.17	3900.00	2039.34	2039.34	2041.78	83.86	12.53	311.30	425.87
	400.000	400.26	.00	.00	2033.36	3900.00	2041.44	2040.16	2042.77	9.92	9.25	421.69	1238.16
	410.000	1.00	.00	.00	2033.41	3900.00	2041.75	2039.71	2042.80	6.91	8.23	474.09	1483.61
	420.000	57.86	.00	.00	2033.65	3900.00	2042.44	2038.08	2042.88	2.10	5.32	732.59	2694.15
*	430.000	208.45	.00	.00	2034.10	3900.00	2042.06	2042.06	2046.07	29.06	16.08	242.59	723.52
	440.000	1463.68	2060.53	2058.53	2048.53	3900.00	2057.12	.00	2060.54	23.15	14.85	262.62	810.62
	450.000	397.95	.00	.00	2052.22	3900.00	2061.71	2061.71	2065.76	26.54	16.15	241.55	757.01
*	460.000	401.61	.00	.00	2057.40	3900.00	2066.76	2066.76	2070.93	27.59	16.39	237.91	742.42
	470.000	398.77	.00	.00	2062.67	3900.00	2071.62	2071.62	2075.50	25.45	15.80	246.87	773.14
*	480.000	192.99	.00	.00	2064.18	3900.00	2075.71	2069.57	2075.91	.93	3.66	1066.10	4048.35
	490.000	133.56	.00	.00	2072.56	1950.00	2075.56	2075.56	2076.76	28.91	8.81	221.40	362.69
	500.000	201.53	.00	.00	2074.64	1950.00	2077.58	2077.58	2078.85	28.14	9.03	215.83	367.62

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH	AREA	.01K
*	510.000	199.21	.00	.00	2076.58	1950.00	2079.48	2079.48	2080.75	28.23	9.03	216.04	366.99
*	520.000	199.24	.00	.00	2078.00	1950.00	2081.00	2081.00	2082.23	28.56	8.89	219.25	364.87
*	530.000	227.48	.00	.00	2079.98	1950.00	2083.13	2083.13	2084.42	28.65	9.11	214.05	364.33
*	540.000	189.30	.00	.00	2081.40	1950.00	2084.68	2084.68	2086.05	29.31	9.40	207.34	360.18
*	550.000	244.36	.00	.00	2084.00	1950.00	2086.10	2086.10	2086.92	32.37	7.28	267.76	342.74
*	560.000	67.51	.00	.00	2076.00	3900.00	2085.98	2084.29	2087.09	7.93	8.48	466.68	1384.97

FLOODPLAIN DETERMINATION

UMMARY PRINTOUT TABLE 150

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
*	10.000	5500.00	1930.20	.00	.00	.20	184.60	.00
	20.000	5500.00	1933.32	.00	3.12	.00	208.12	297.76
*	30.000	5500.00	1935.76	.00	2.44	.00	78.28	417.80
	40.000	5500.00	1940.75	.00	4.99	.00	50.38	10.00
*	50.000	5500.00	1943.58	.00	2.83	.00	50.38	115.08
*	60.000	5300.00	1944.38	.00	.80	.00	84.77	387.41
	70.000	5300.00	1948.37	.00	3.99	.00	80.94	417.23
•	80.000	5300.00	1948.39	.00	.03	.00	79.40	1.00
	90.000	5300.00	1950.37	.00	1.97	.00	58.04	51.93
*	100.000	5300.00	1952.50	.00	2.13	.00	50.82	342.73
*	110.000	5300.00	1954.70	.00	2.21	.00	53.84	1.00
*	120.000	5300.00	1955.02	.00	.31	.00	53.14	24.78
*	130.000	5300.00	1955.65	.00	.63	.00	51.24	125.31
*	140.000	5300.00	1956.17	.00	.52	.00	52.57	55.76
*	150.000	5300.00	1957.97	.00	1.80	.00	55.57	1.00
*	160.000	5300.00	1959.36	.00	1.39	.00	55.48	114.85
*	170.000	5300.00	1961.62	.00	2.27	.00	75.51	97.13
*	180.000	5300.00	1963.07	.00	1.45	.00	65.70	363.91
*	190.000	5300.00	1966.85	.00	3.78	.00	57.91	356.25
*	200.000	5300.00	1970.50	.00	3.65	.00	66.23	357.38
*	210.000	5300.00	1972.46	.00	1.96	.00	61.98	220.26
*	220.000	5300.00	1975.66	.00	3.20	.00	50.25	95.38
*	230.000	5300.00	1978.53	.00	2.88	.00	50.25	106.05
*	240.000	5300.00	1982.85	.00	4.32	.00	71.75	98.95

SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
250.000	5300.00	1987.59	.00	4.74	.00	85.01	478.12
260.000	5300.00	1992.29	.00	4.70	.00	71.29	437.75
270.000	5300.00	1992.67	.00	.38	.00	37.33	213.69
280.000	5300.00	1994.70	.00	2.03	.00	36.33	110.04
290.000	3900.00	2001.61	.00	6.91	.00	92.14	451.82
300.000	3900.00	2012.53	.00	10.92	.00	66.10	430.29
310.000	3900.00	2015.87	.00	3.34	.00	31.00	353.38
320.000	3900.00	2020.71	.00	4.84	.00	31.00	86.84
330.000	3900.00	2023.77	.00	3.07	.00	66.29	409.02
340.000	3900.00	2028.51	.00	4.74	.00	70.92	414.66
350.000	3900.00	2030.79	.00	2.29	.00	63.20	400.22
360.000	3900.00	2032.13	.00	1.34	.00	63.20	69.23
370.000	3900.00	2033.82	.00	1.69	.00	59.68	66.95
380.000	3900.00	2035.71	.00	1.89	.00	64.68	1.00
390.000	3900.00	2039.34	.00	3.63	.00	65.09	409.92
400.000	3900.00	2041.44	.00	2.10	.00	80.20	400.26
410.000	3900.00	2041.75	.00	.31	.00	81.34	1.00
420.000	3900.00	2042.44	.00	.69	.00	90.15	57.86
430.000	3900.00	2042.06	.00	-.38	.00	30.58	208.45
440.000	3900.00	2057.12	.00	15.06	.00	30.58	1463.68
450.000	3900.00	2061.71	.00	4.59	.00	30.62	397.95
460.000	3900.00	2066.76	.00	5.05	.00	30.60	401.61
470.000	3900.00	2071.62	.00	4.86	.00	31.85	398.77
480.000	3900.00	2075.71	.00	4.08	.00	137.13	192.99
490.000	1950.00	2075.56	.00	-.15	.00	93.50	133.56
500.000	1950.00	2077.58	.00	2.02	.00	85.75	201.53

SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
510.000	1950.00	2079.48	.00	1.90	.00	86.86	199.21
520.000	1950.00	2081.00	.00	1.52	.00	90.62	199.24
530.000	1950.00	2083.13	.00	2.13	.00	84.56	227.48
540.000	1950.00	2084.68	.00	1.55	.00	79.48	189.30
550.000	1950.00	2086.10	.00	1.42	.00	165.35	244.36
560.000	3900.00	2085.98	.00	-.12	.00	89.25	67.51

SUMMARY OF ERRORS AND SPECIAL NOTES

CAUTION SECNO= 10.000 PROFILE= 1 CRITICAL DEPTH ASSUMED

CAUTION SECNO= 20.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 20.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 30.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 30.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 40.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 40.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 50.000 PROFILE= 1 HYDRAULIC JUMP D.S.
WARNING SECNO= 50.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO= 60.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 60.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

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CAUTION SECNO= 70.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

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WARNING SECNO= 400.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 420.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

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CAUTION SECNO= 430.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 440.000 PROFILE= 1 HYDRAULIC JUMP D.S.
CAUTION SECNO= 440.000 PROFILE= 1 20 TRIALS OF EG NOT ENOUGH

CAUTION SECNO= 450.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 450.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

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CAUTION SECNO= 470.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
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WARNING SECNO= 480.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

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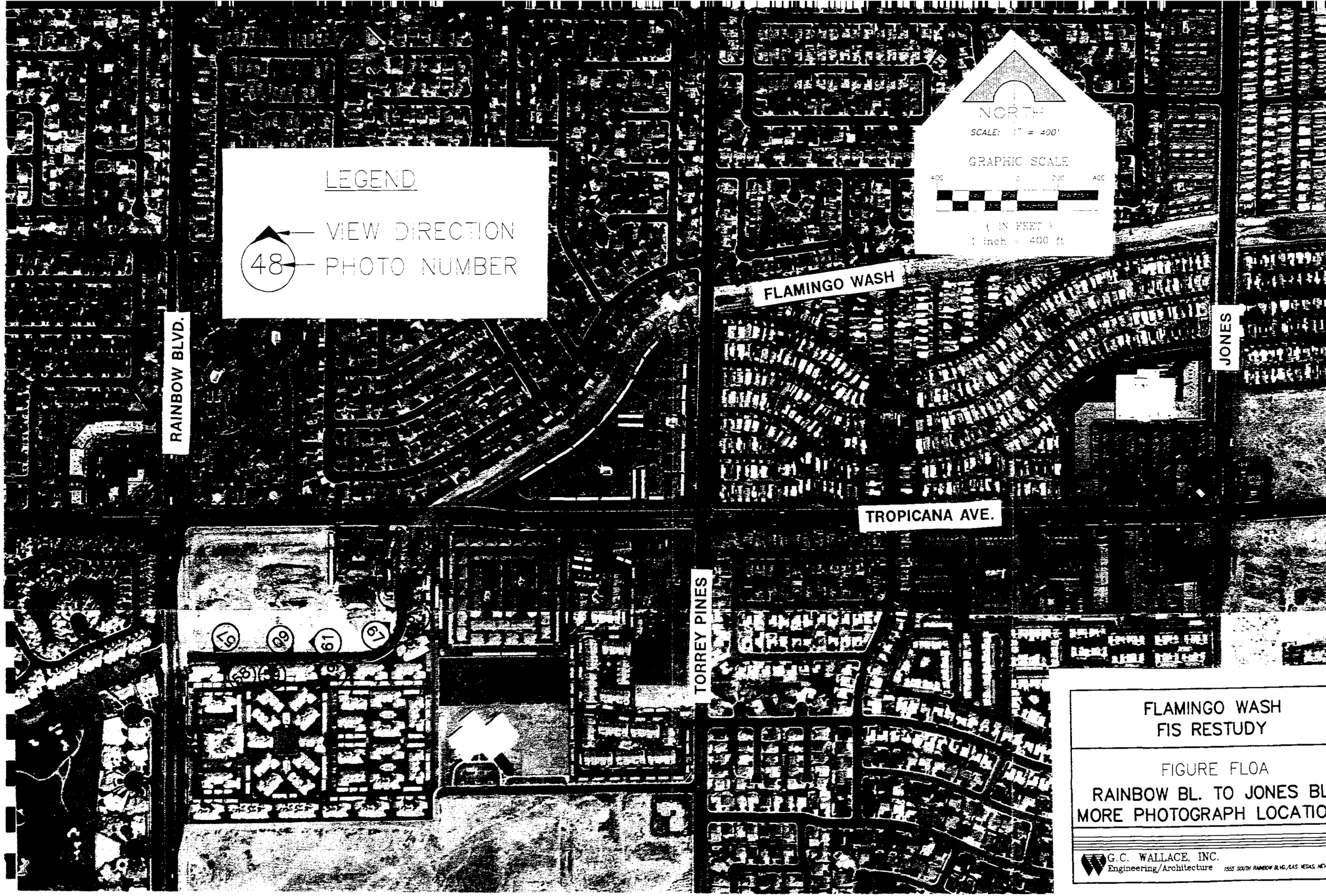
ATTACHMENT 3

AERIAL PHOTOGRAPHS

DATED FEBRUARY 21, 1978

ATTACHMENT 4

SUPPLEMENTAL PHOTOGRAPHS

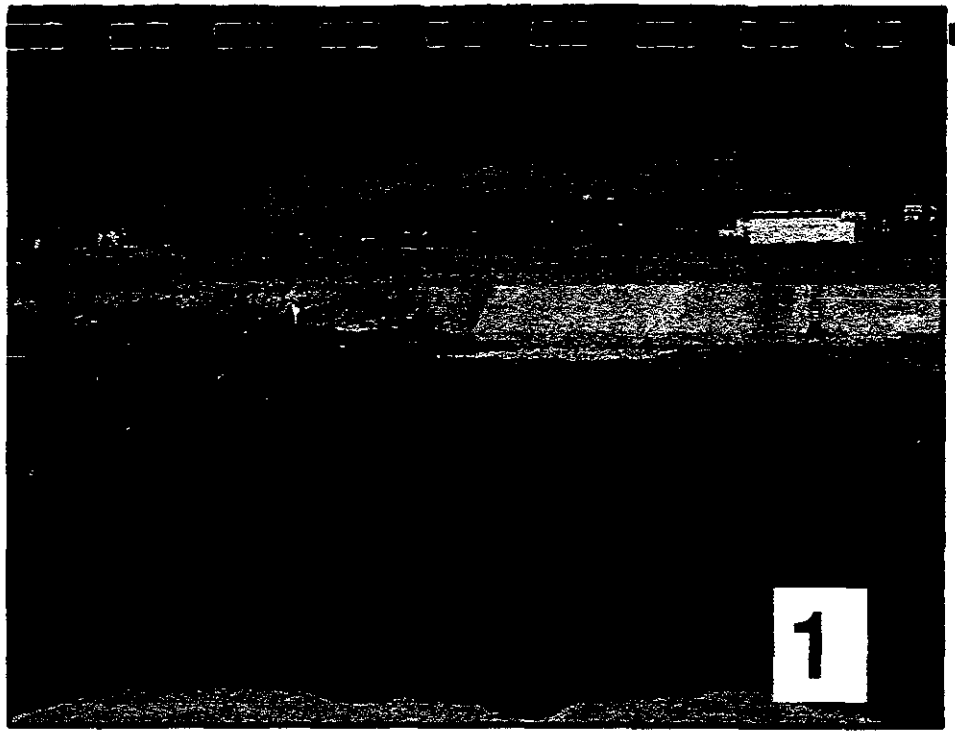


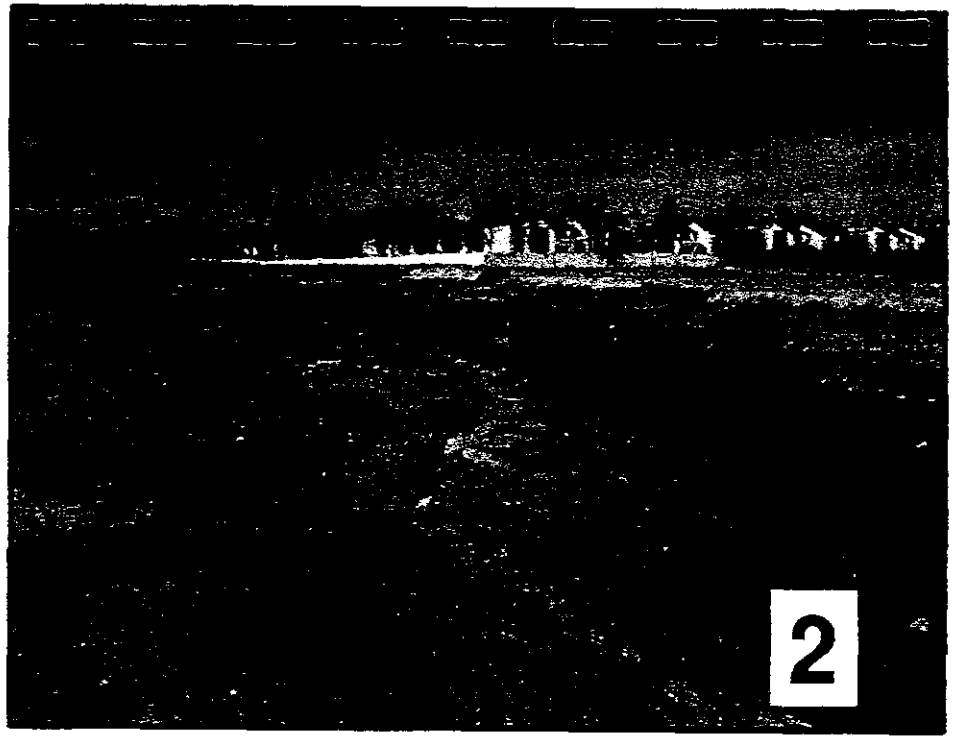
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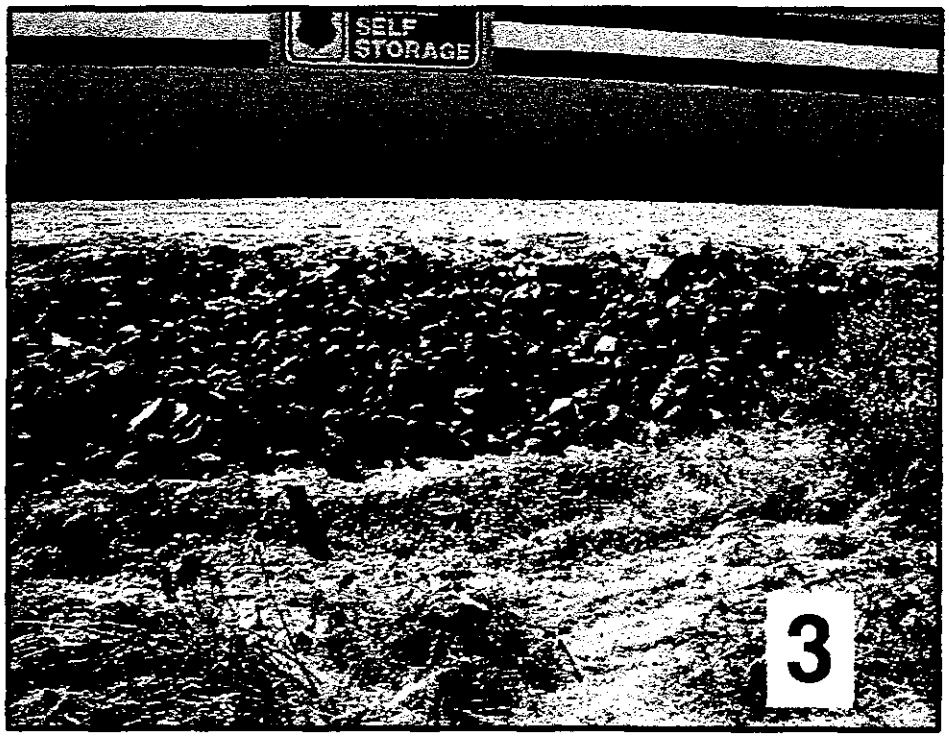
FIGURE FLOA

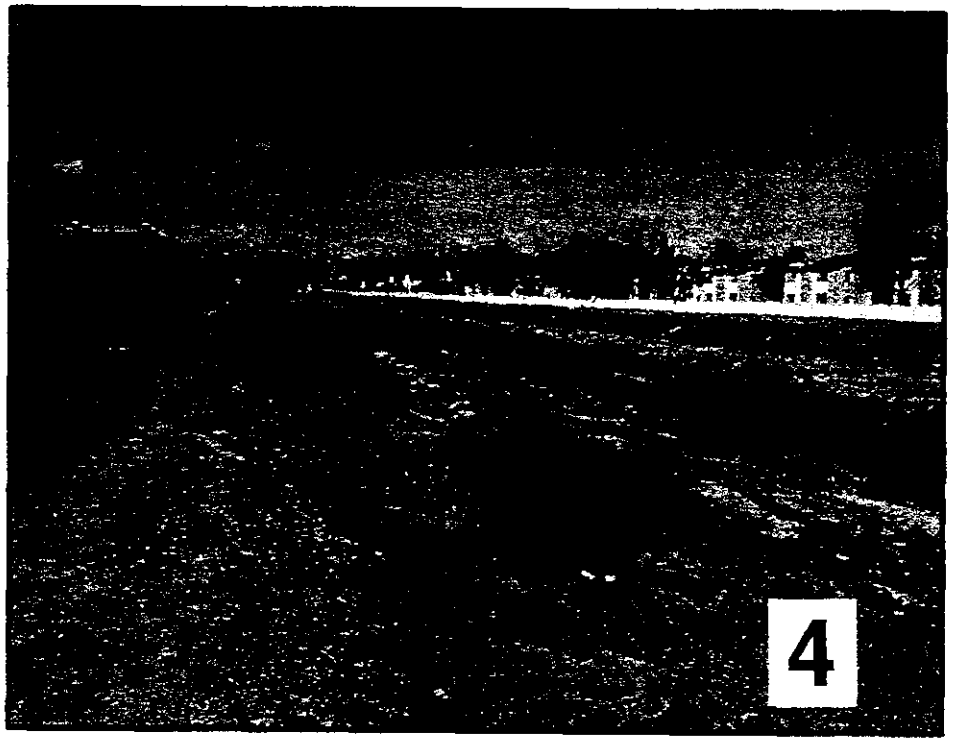
RAINBOW BL. TO JONES BL.
MORE PHOTOGRAPH LOCATION

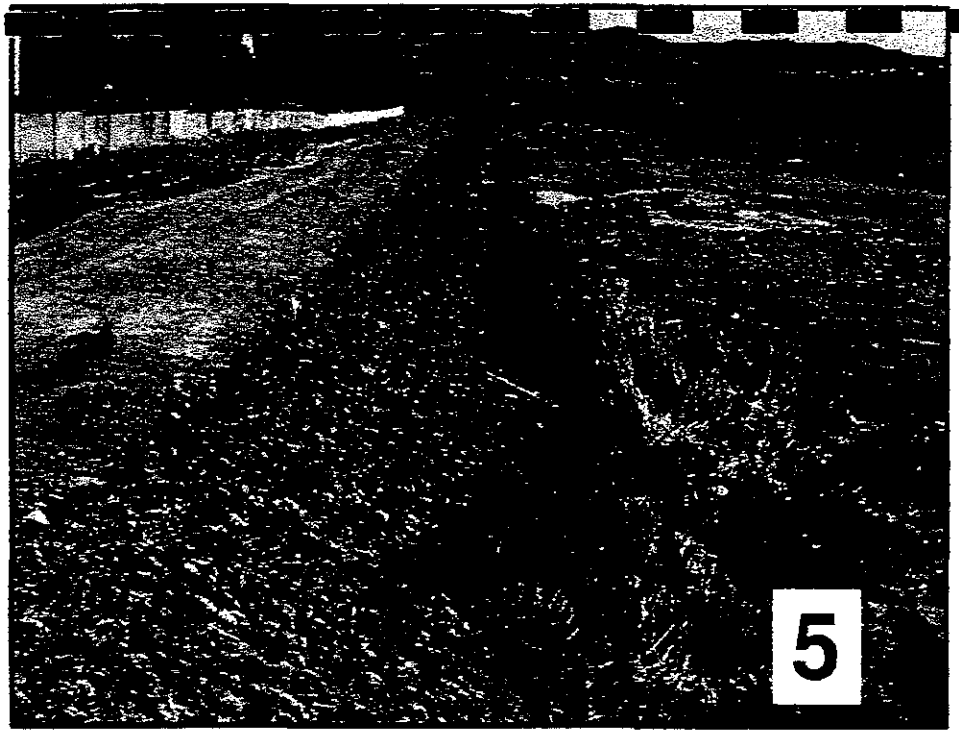
G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA

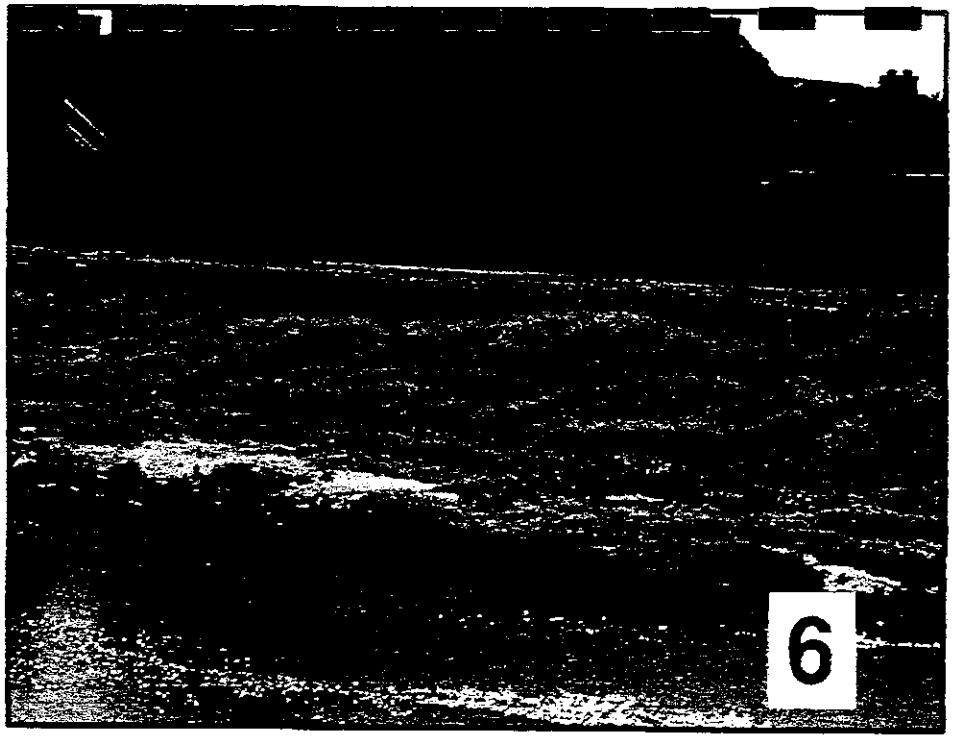

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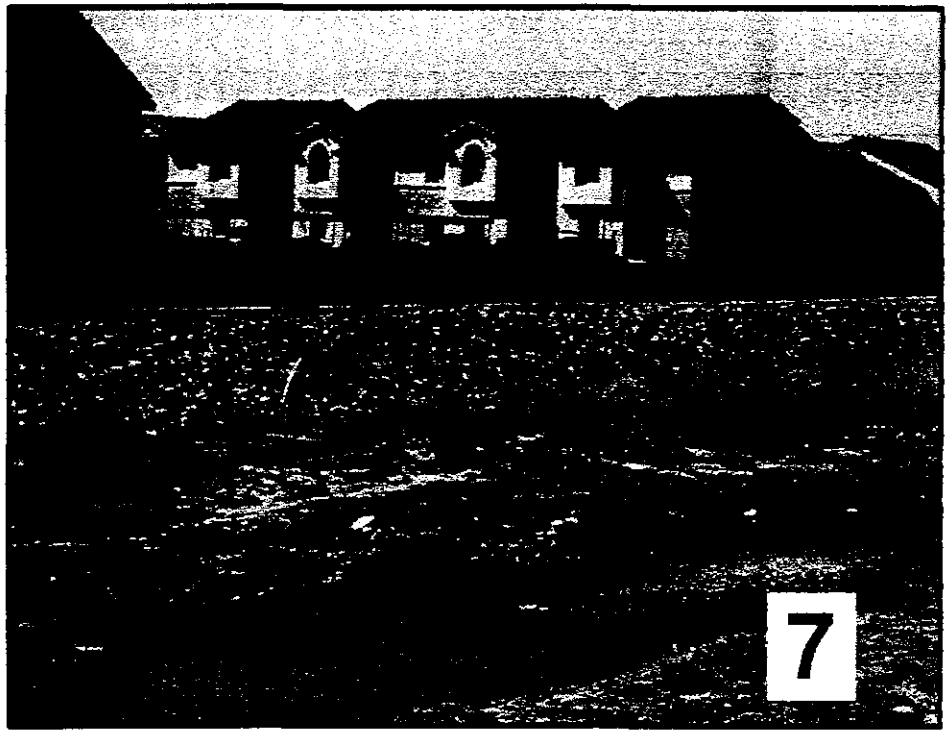

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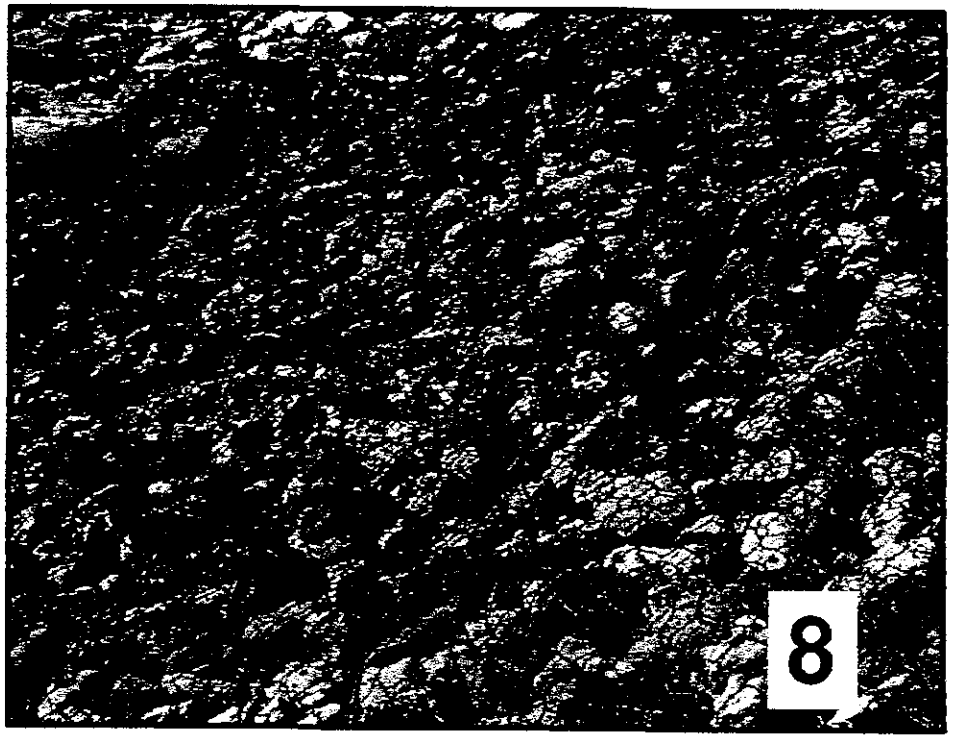

SELF
STORAGE
3

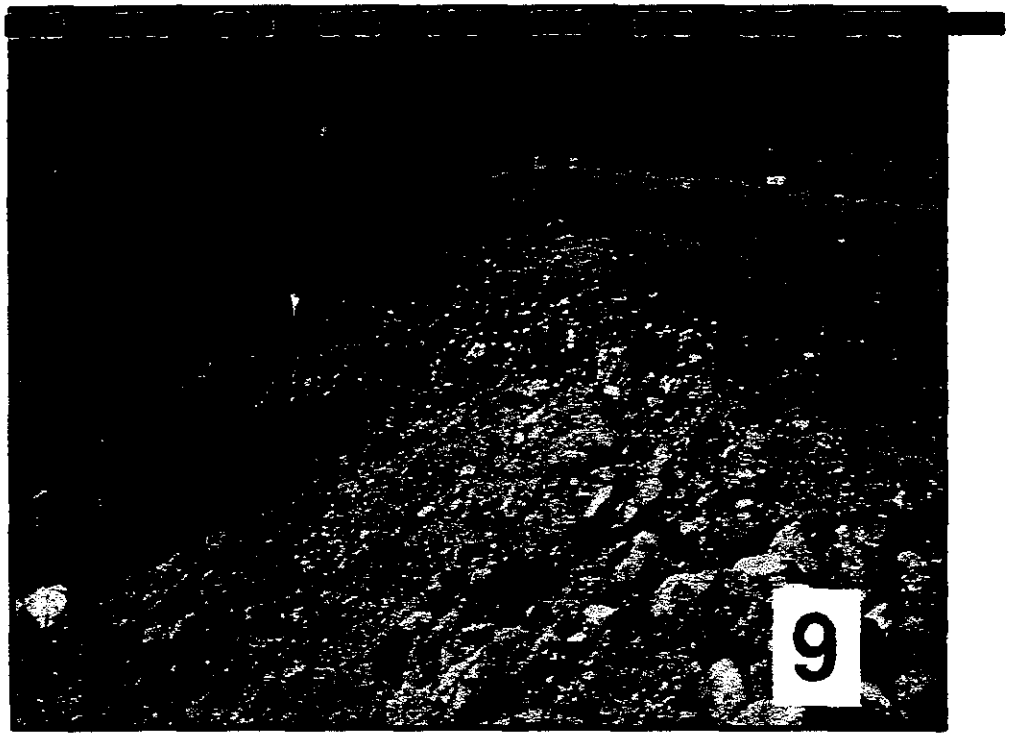

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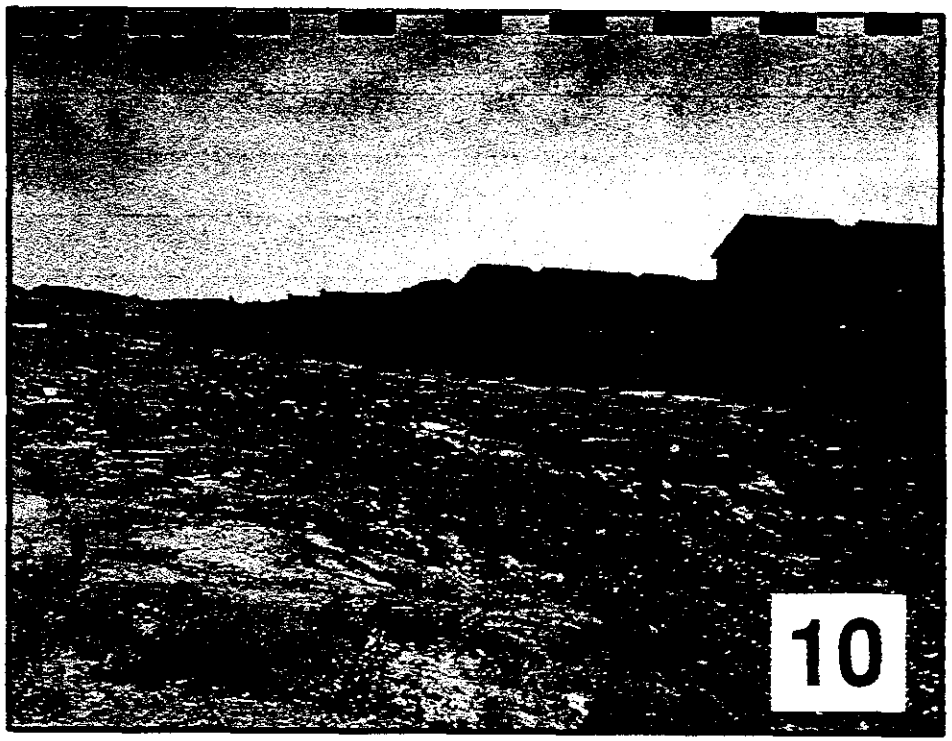

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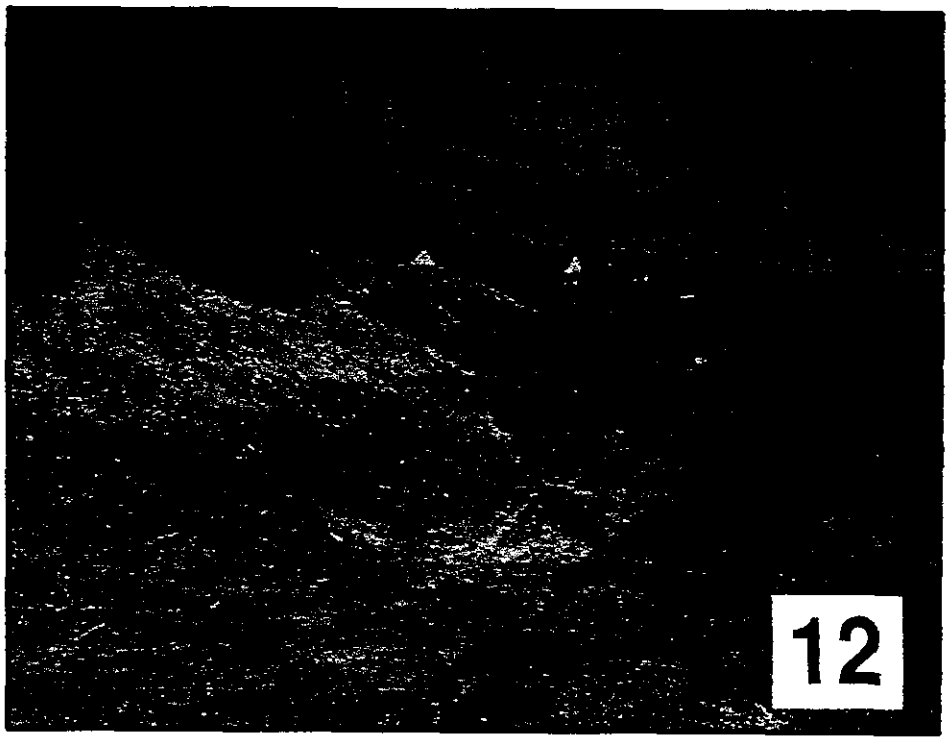

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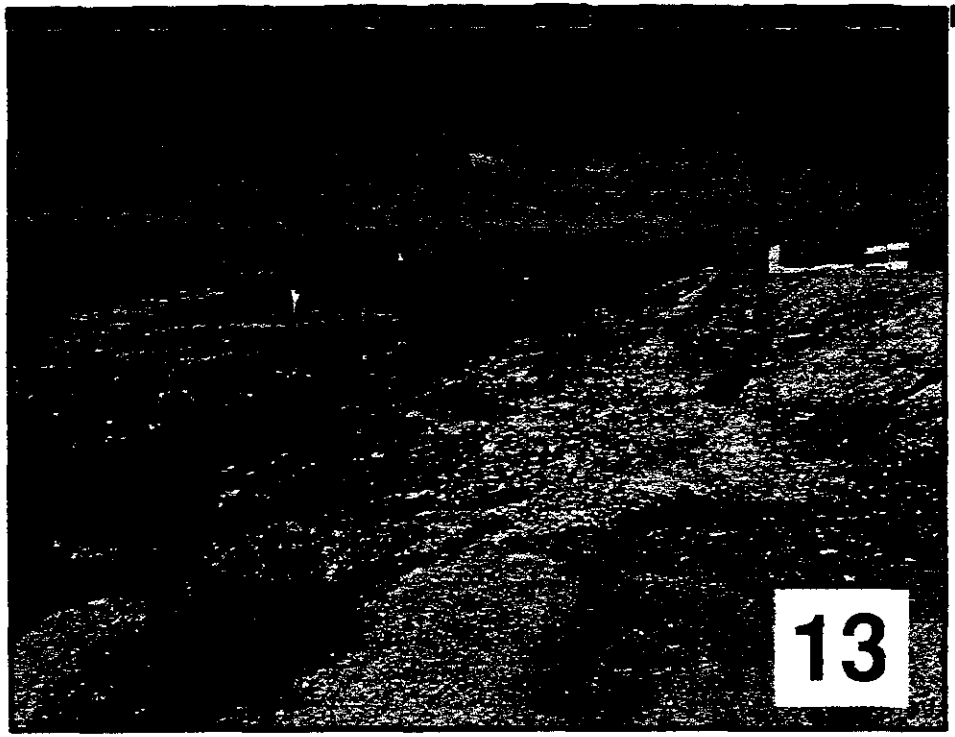

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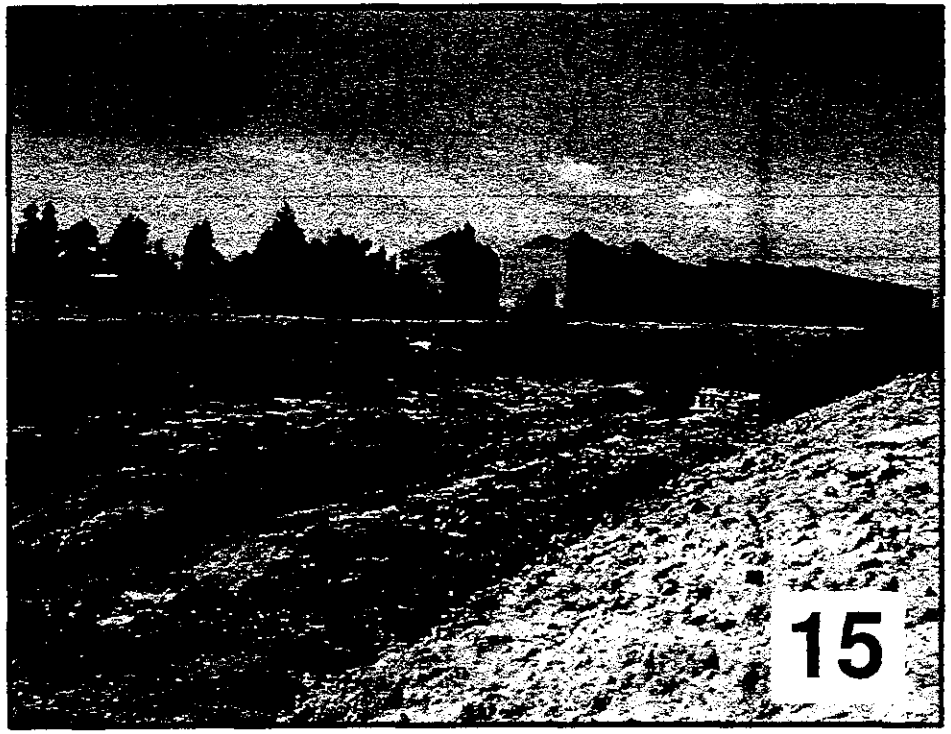

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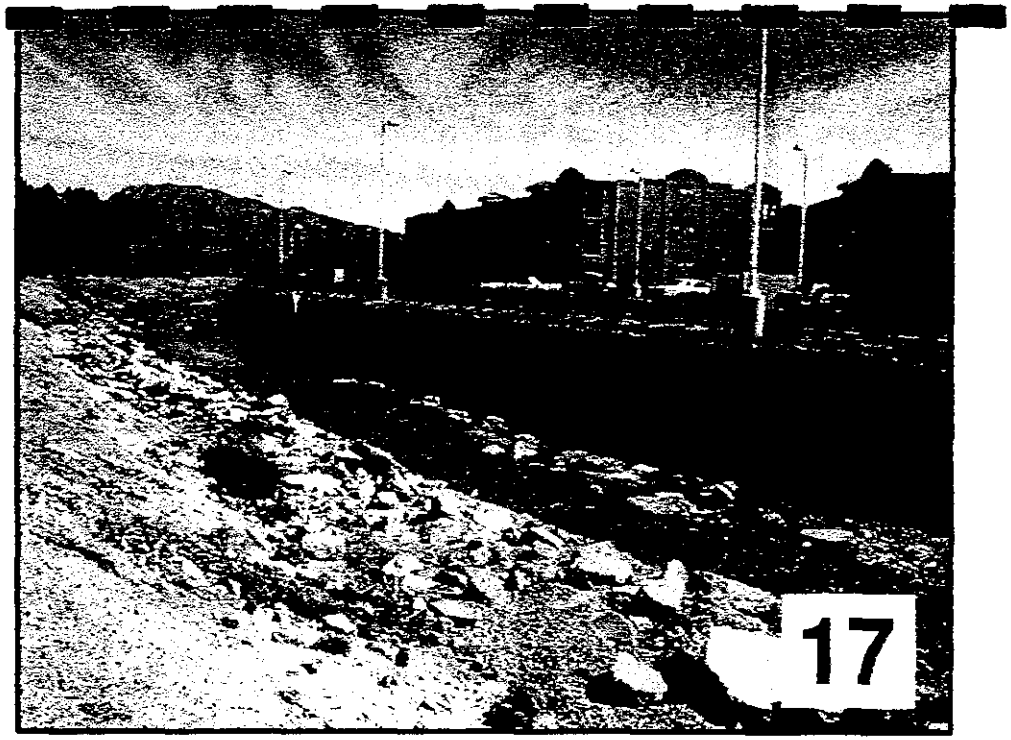

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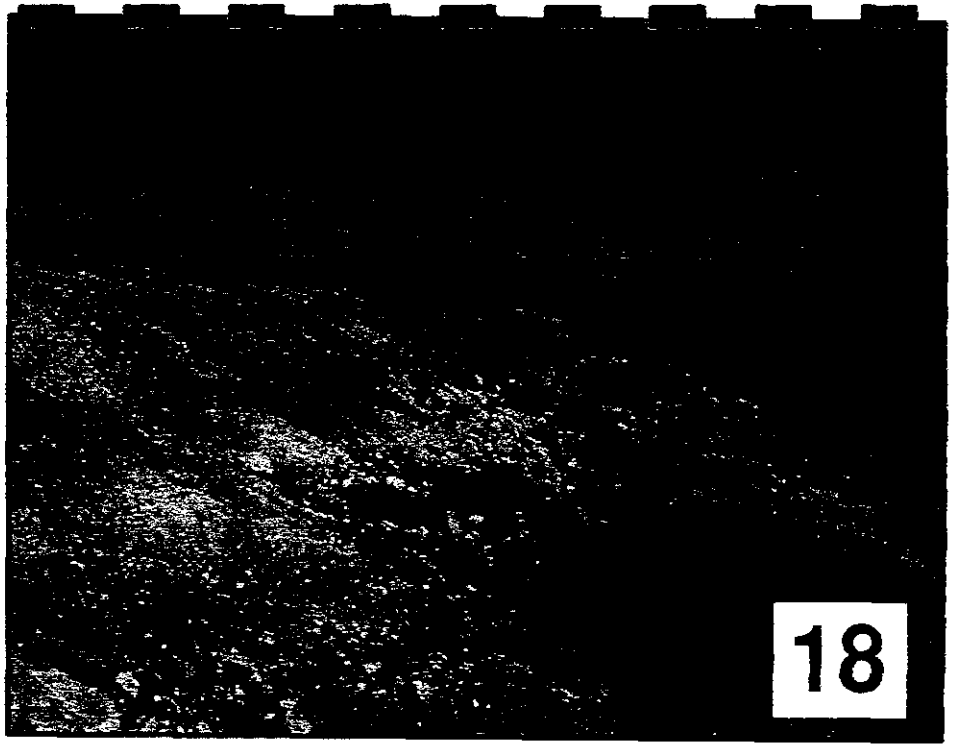

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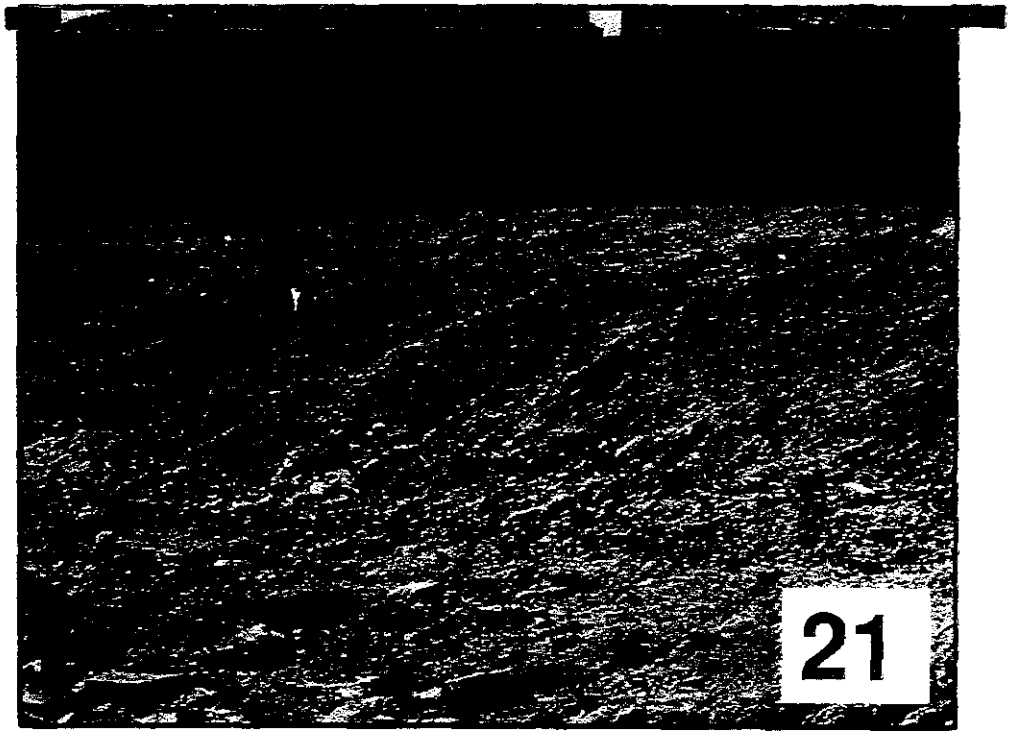

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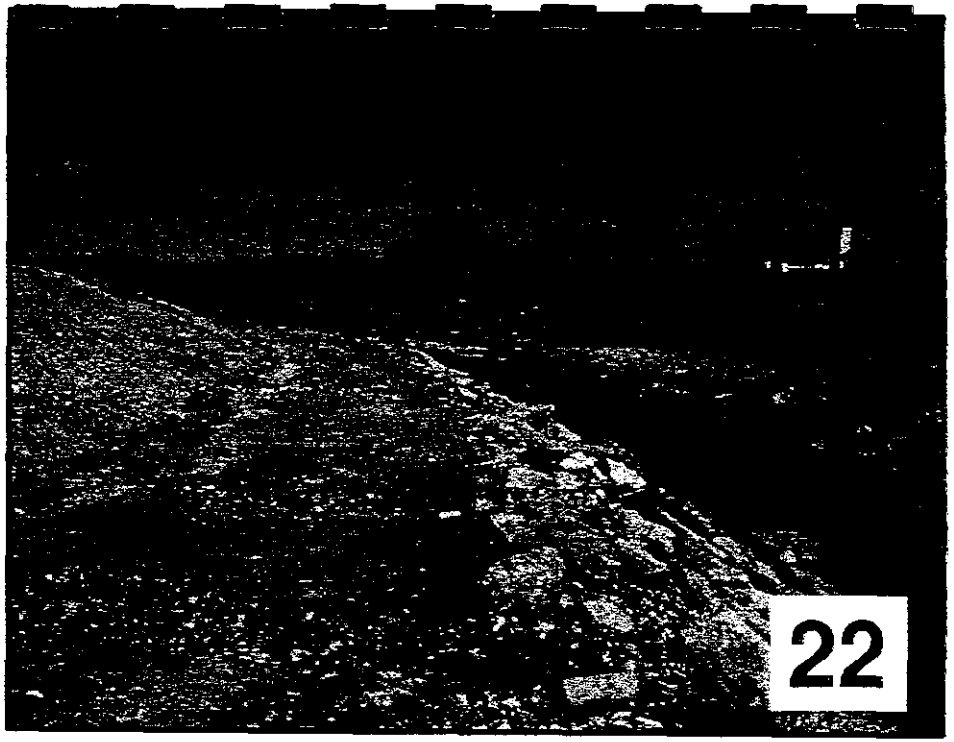

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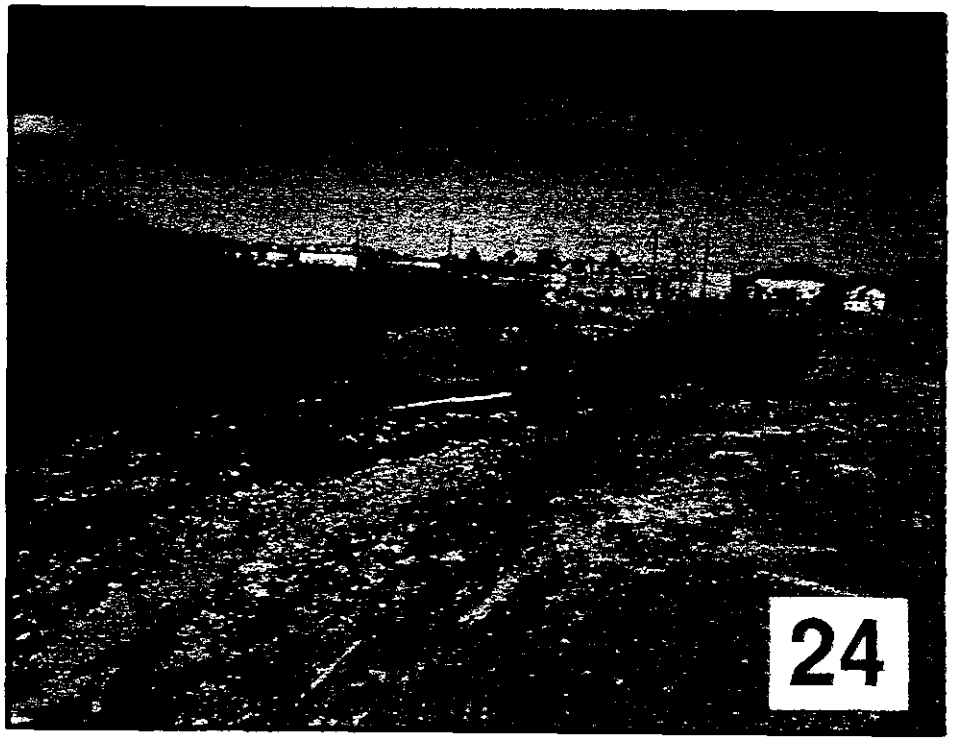

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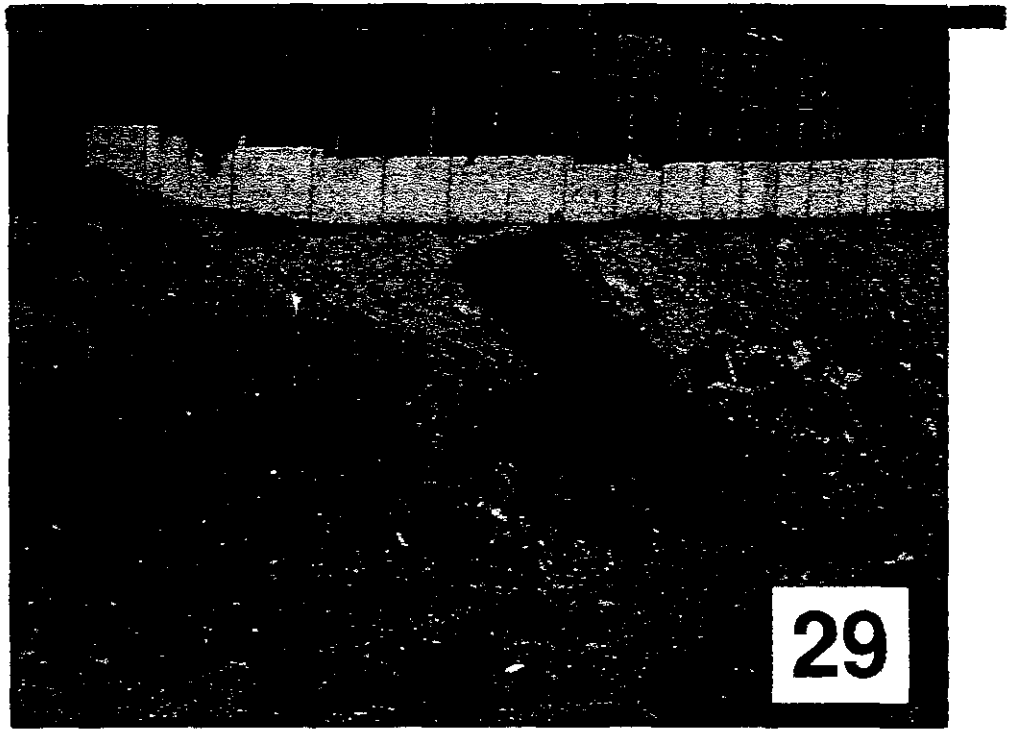

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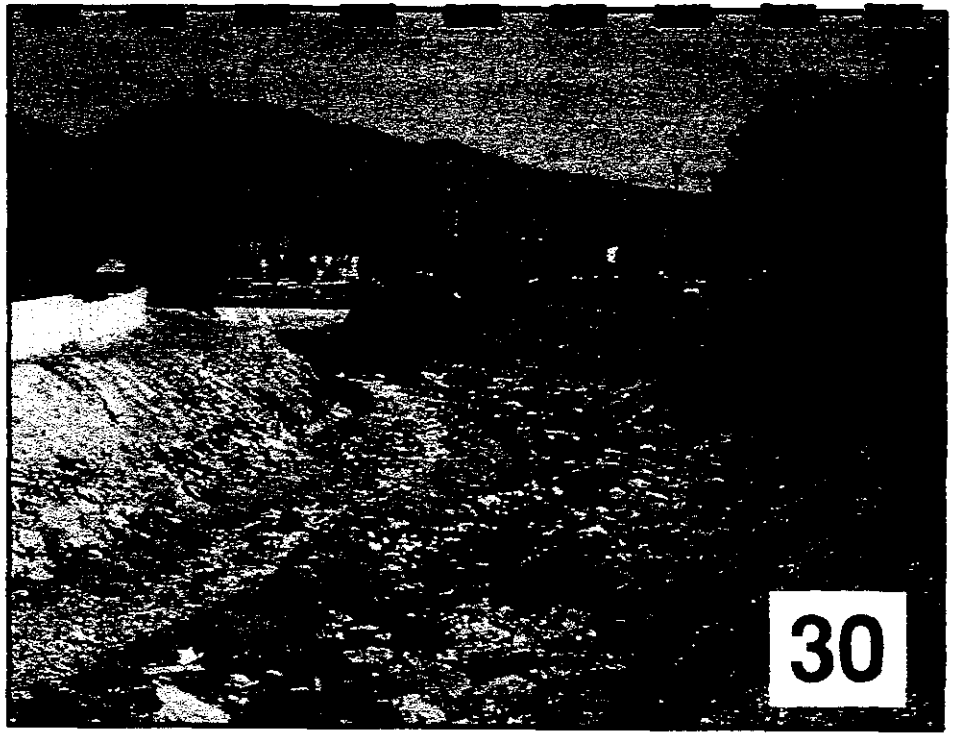

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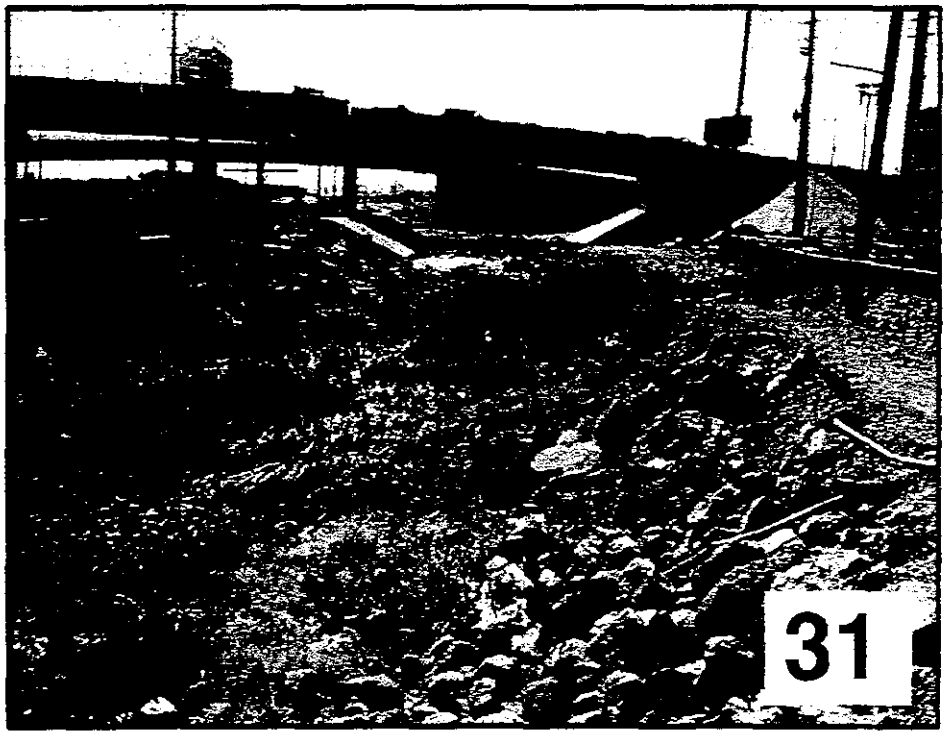

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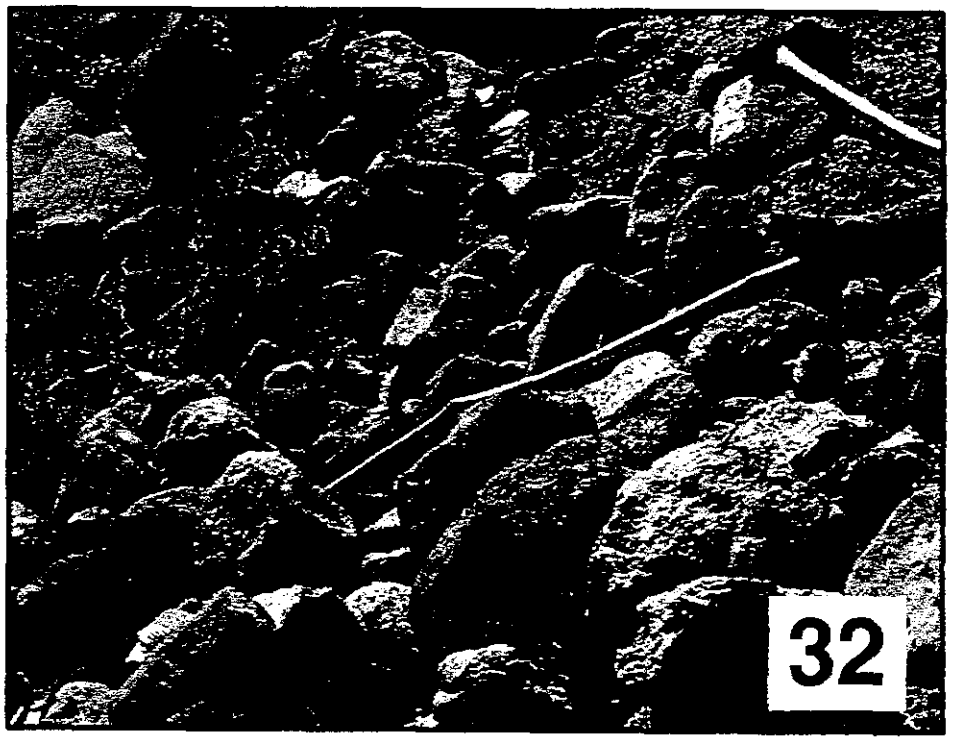

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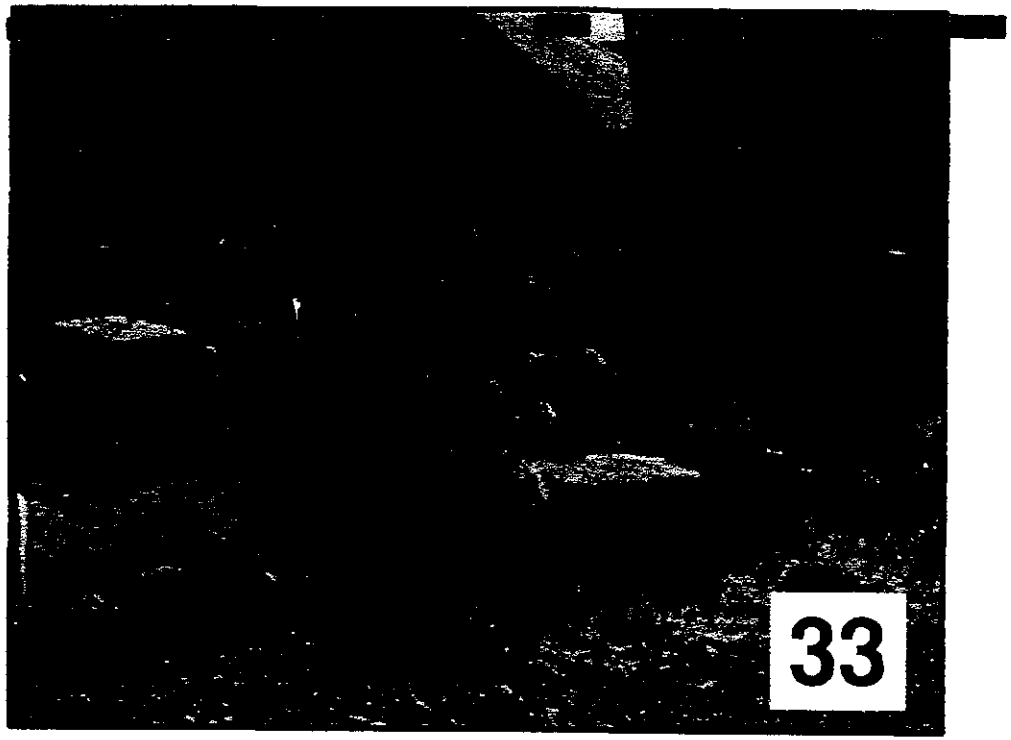

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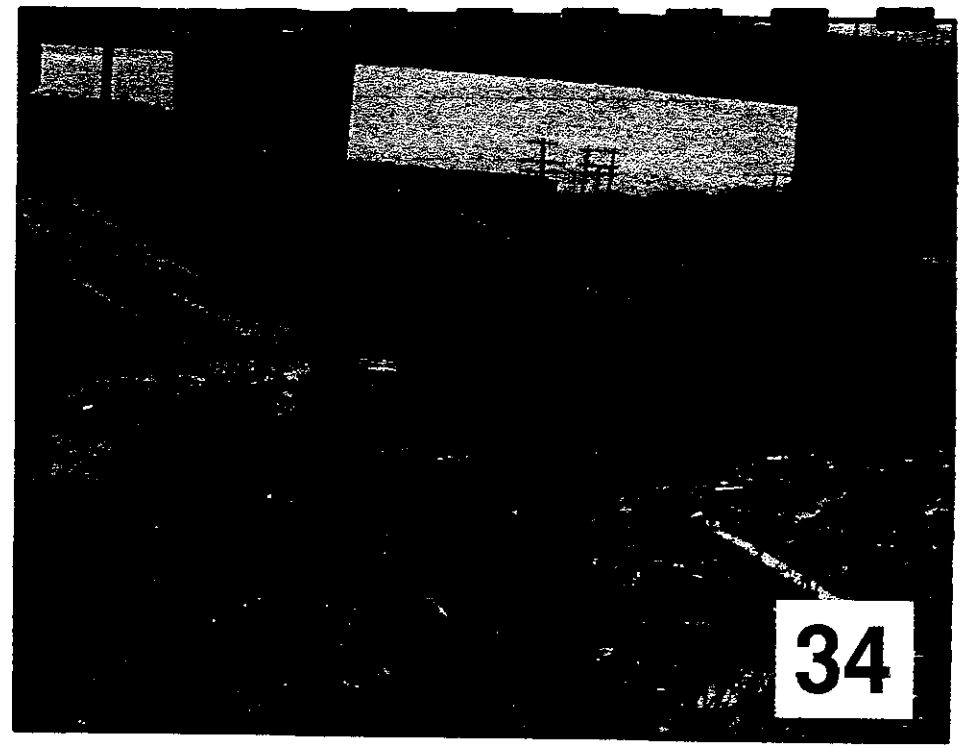

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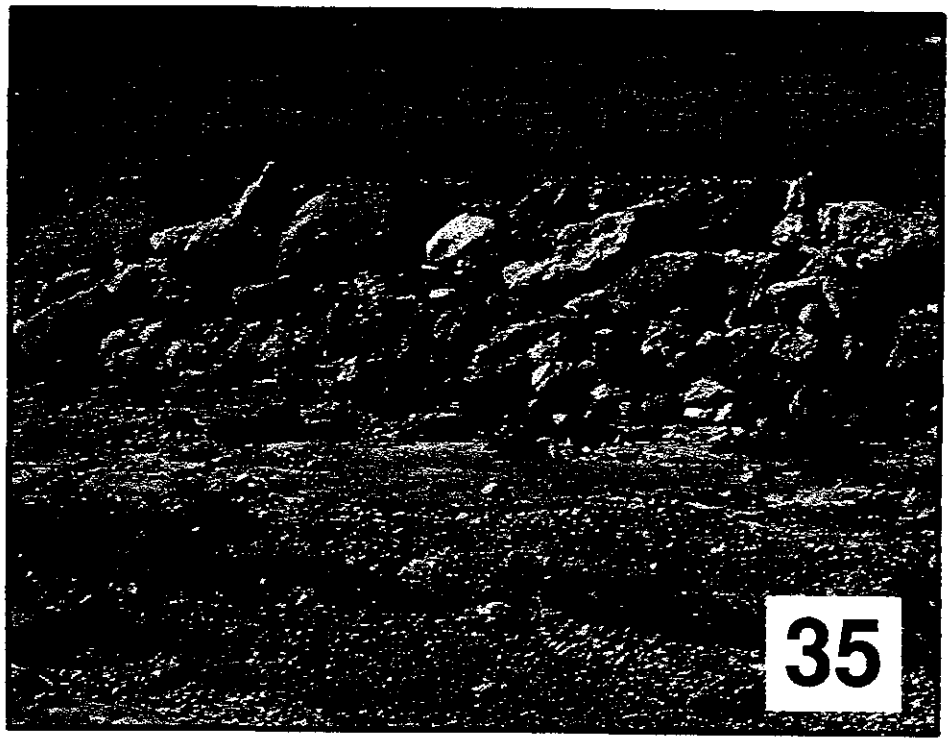

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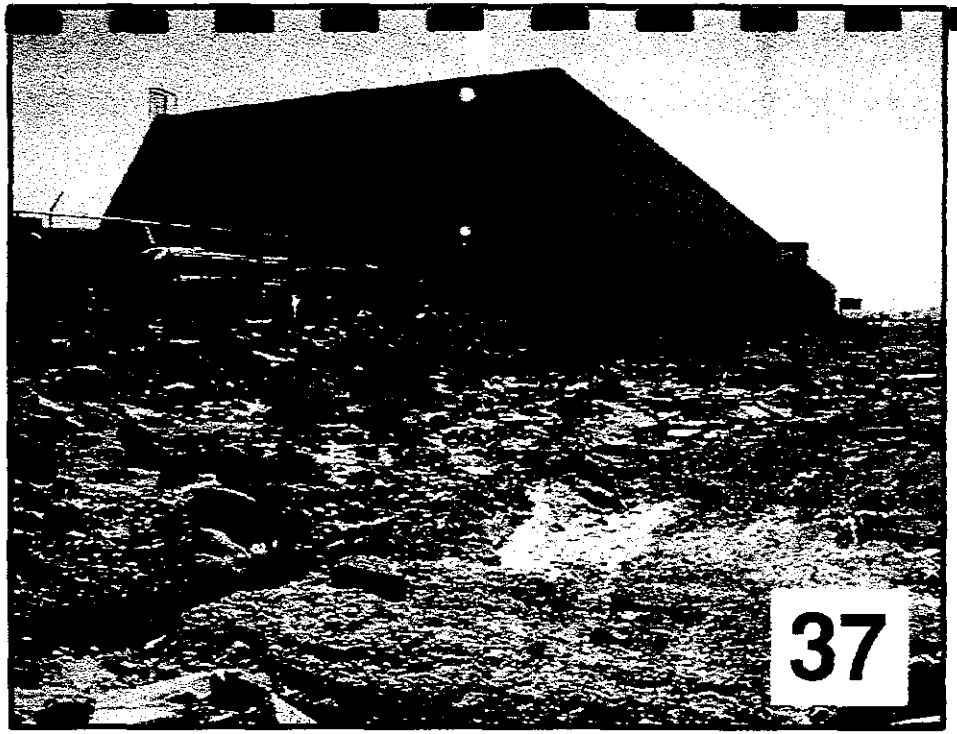

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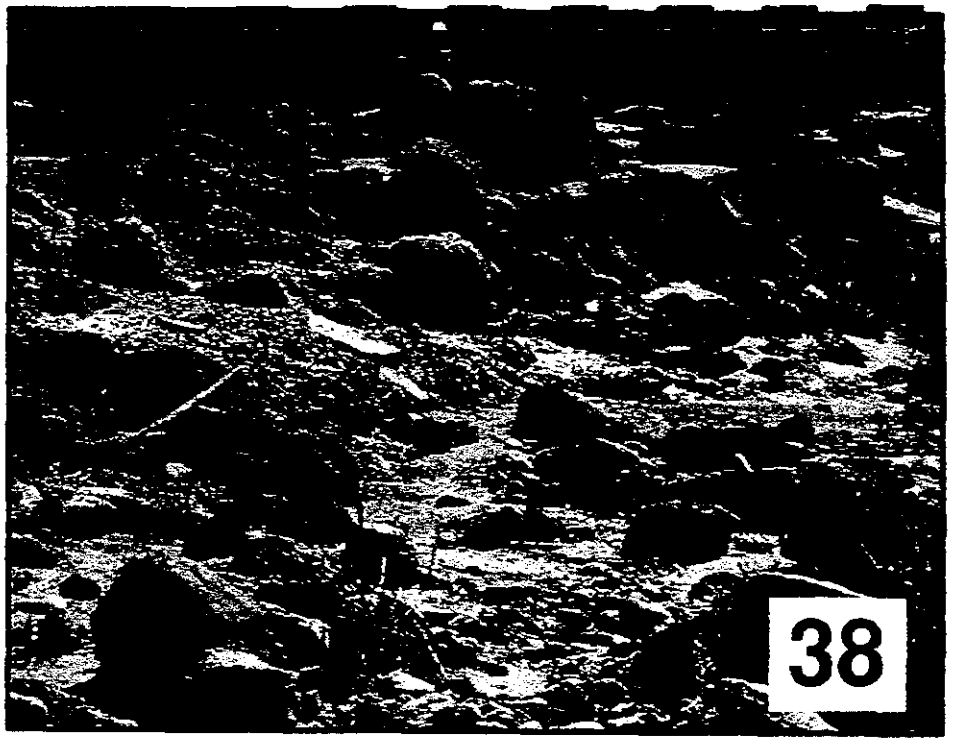

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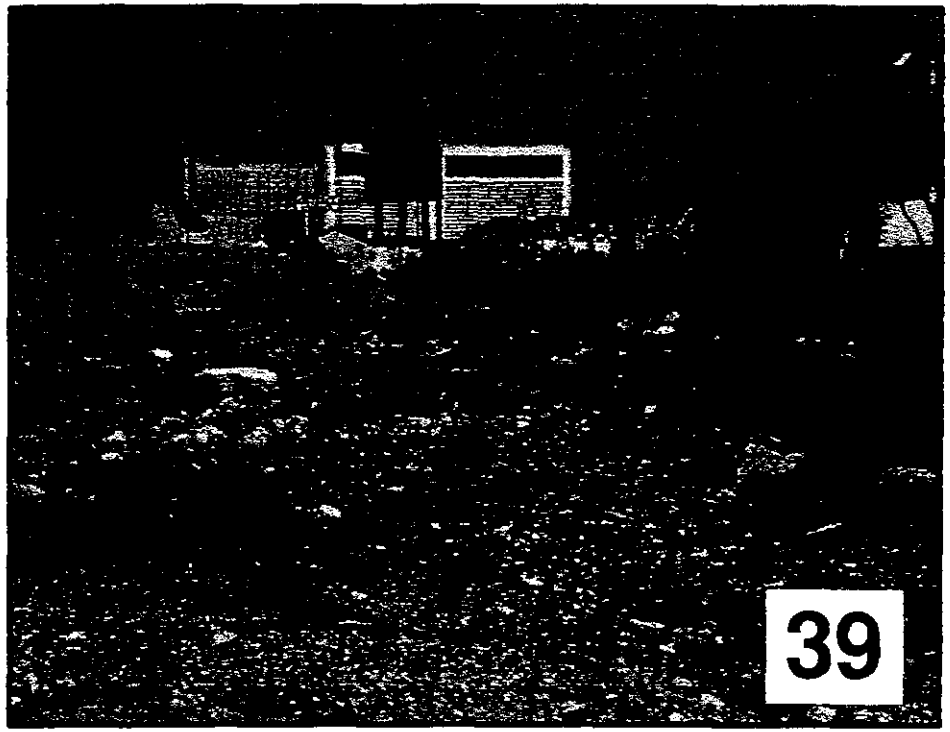

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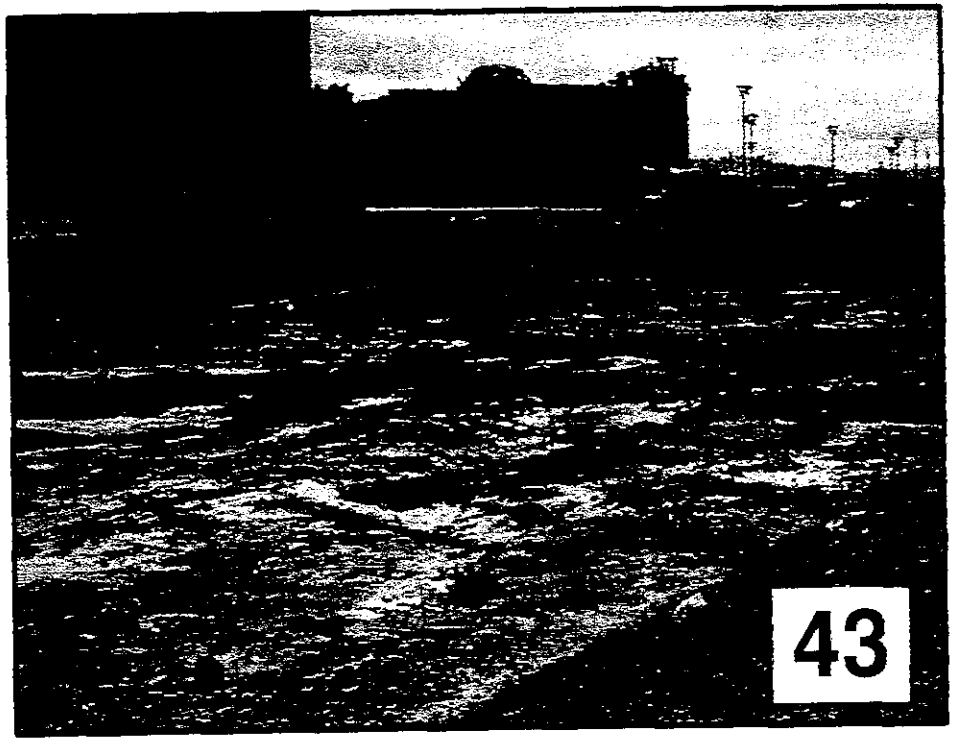

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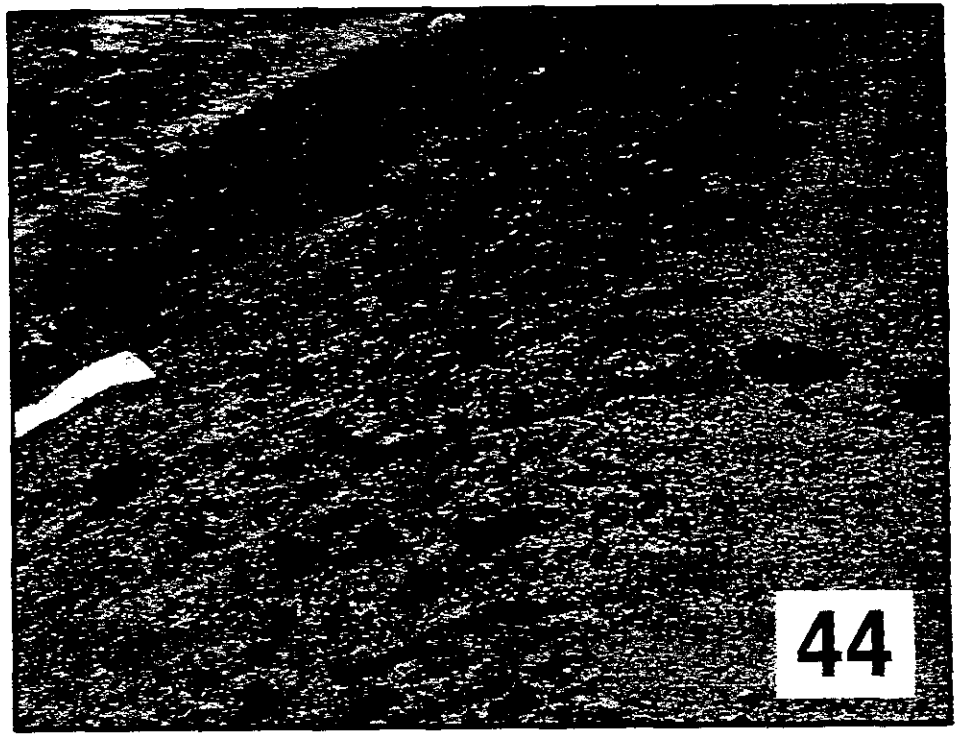

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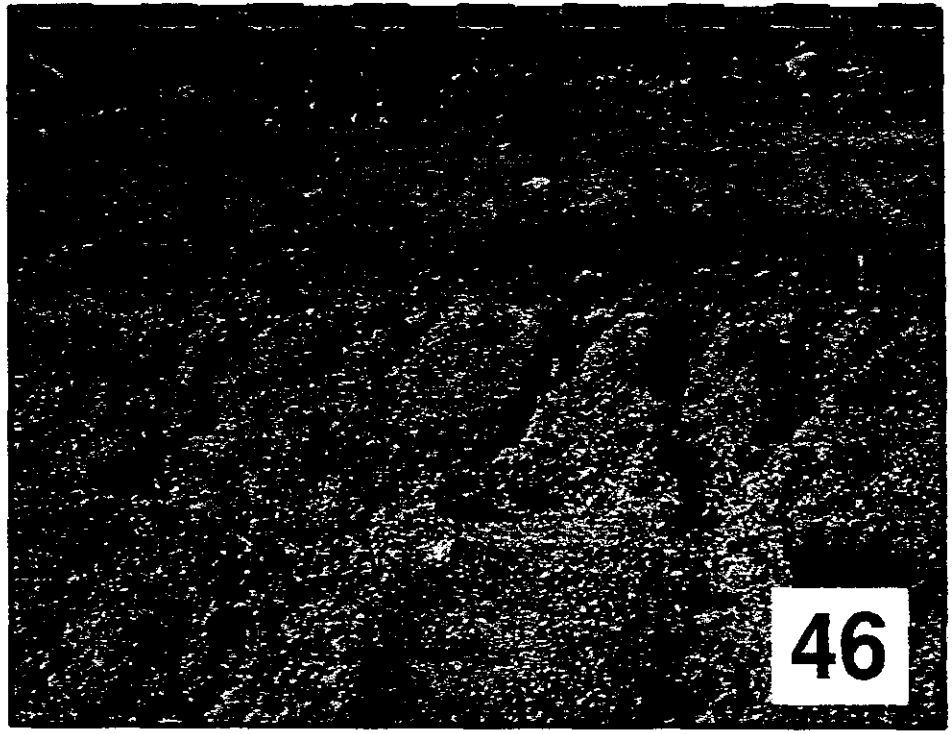

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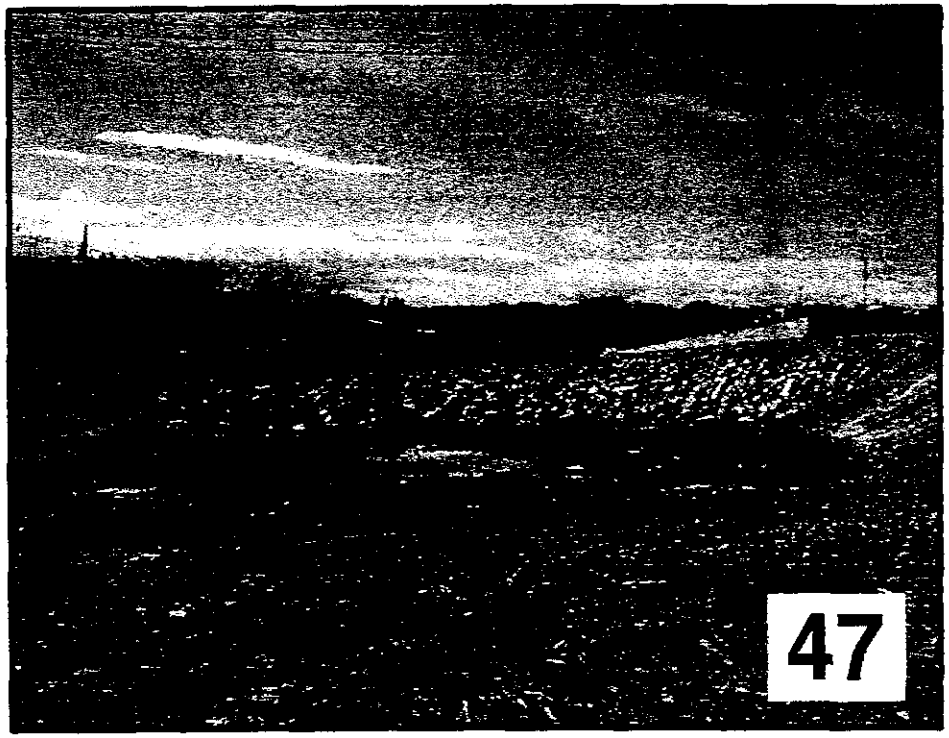

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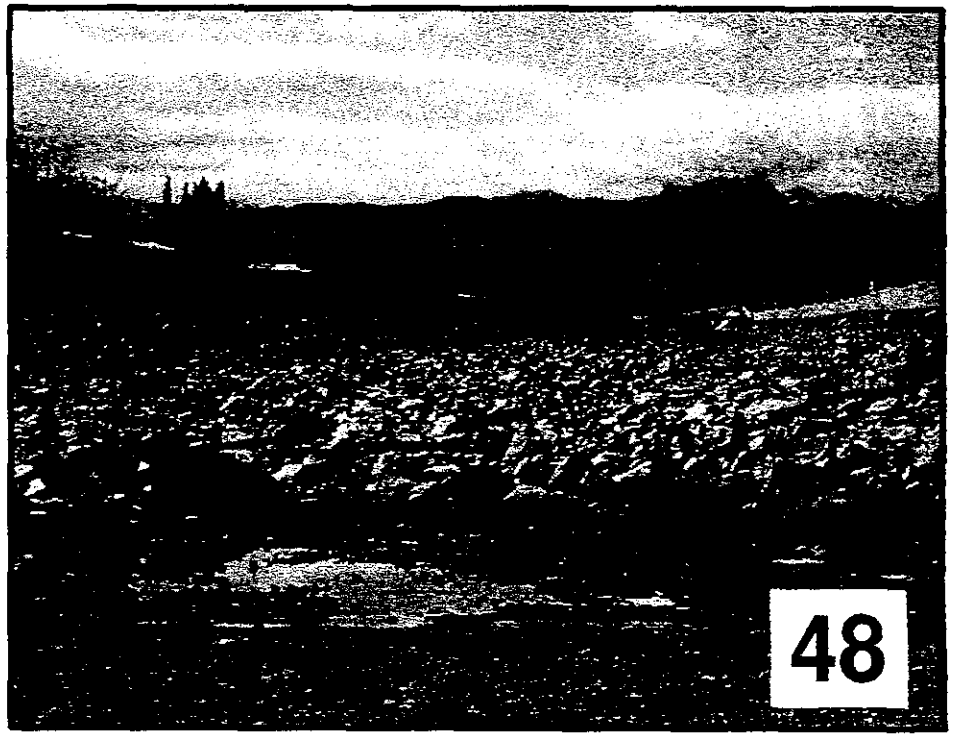

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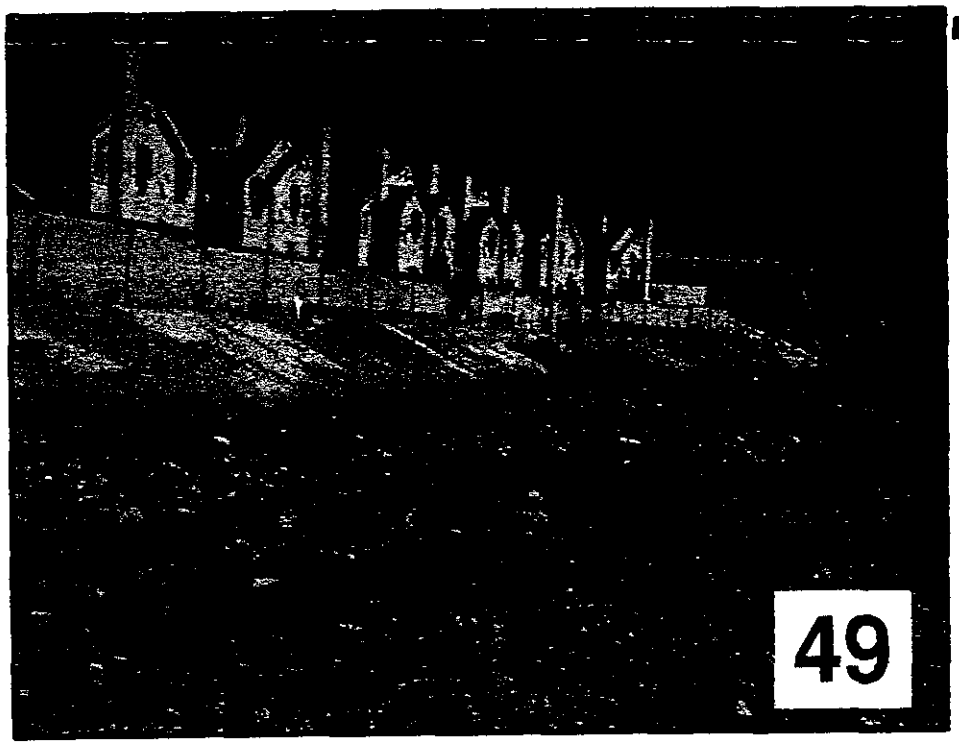

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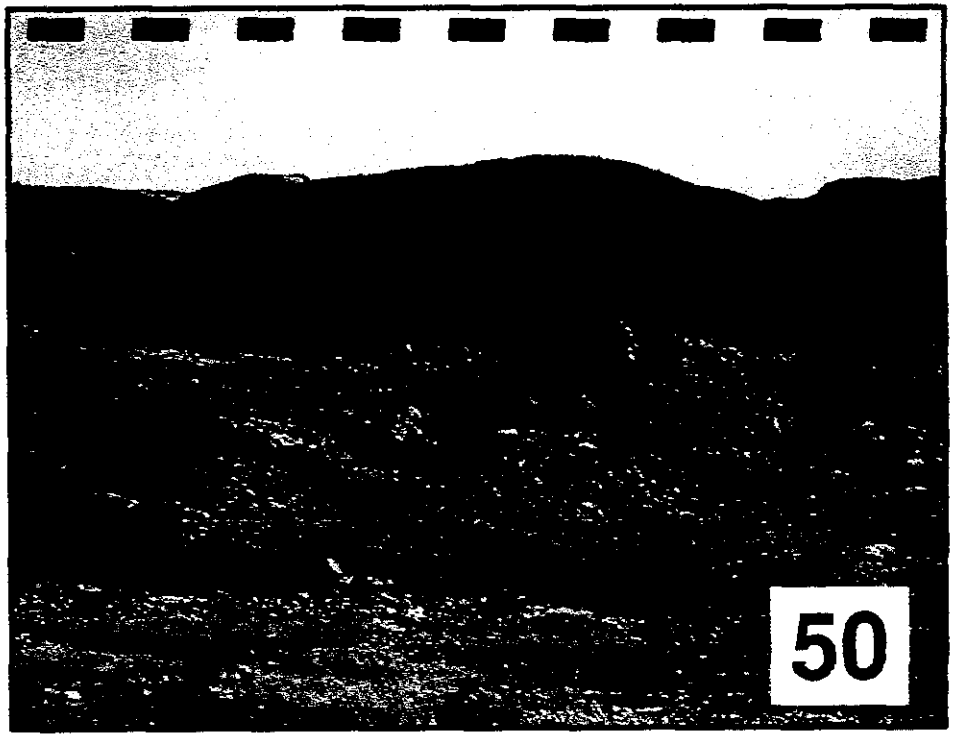

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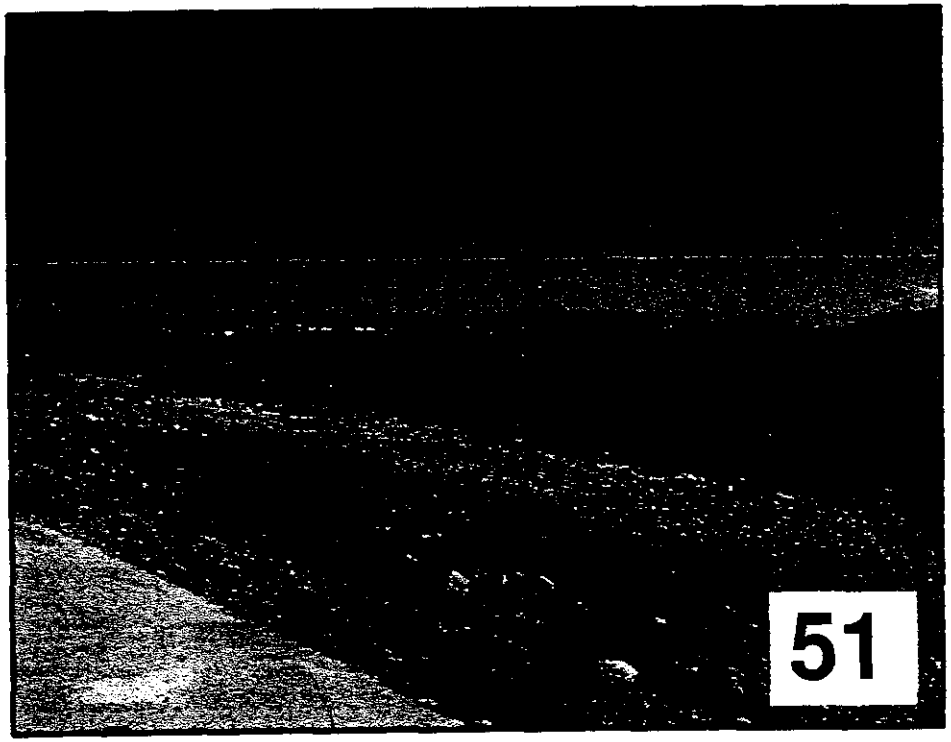

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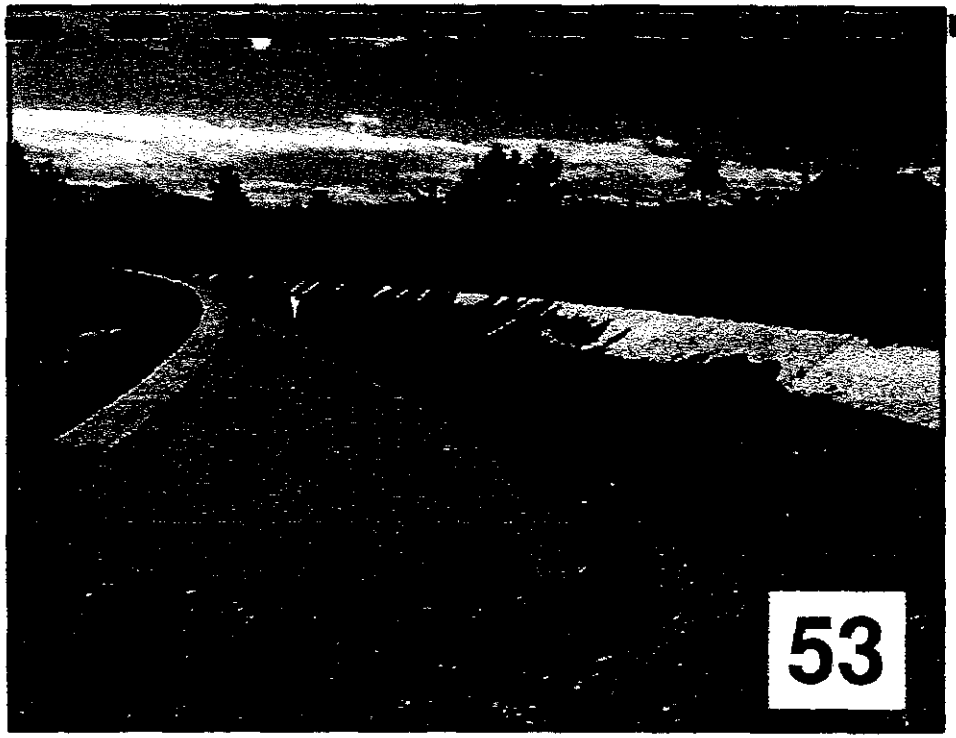

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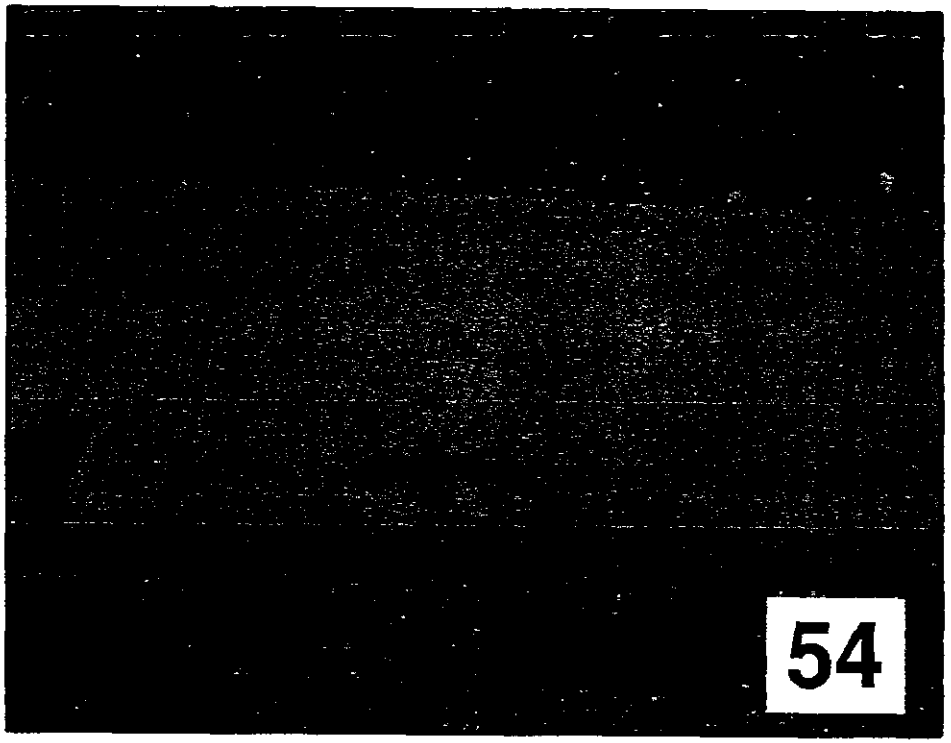

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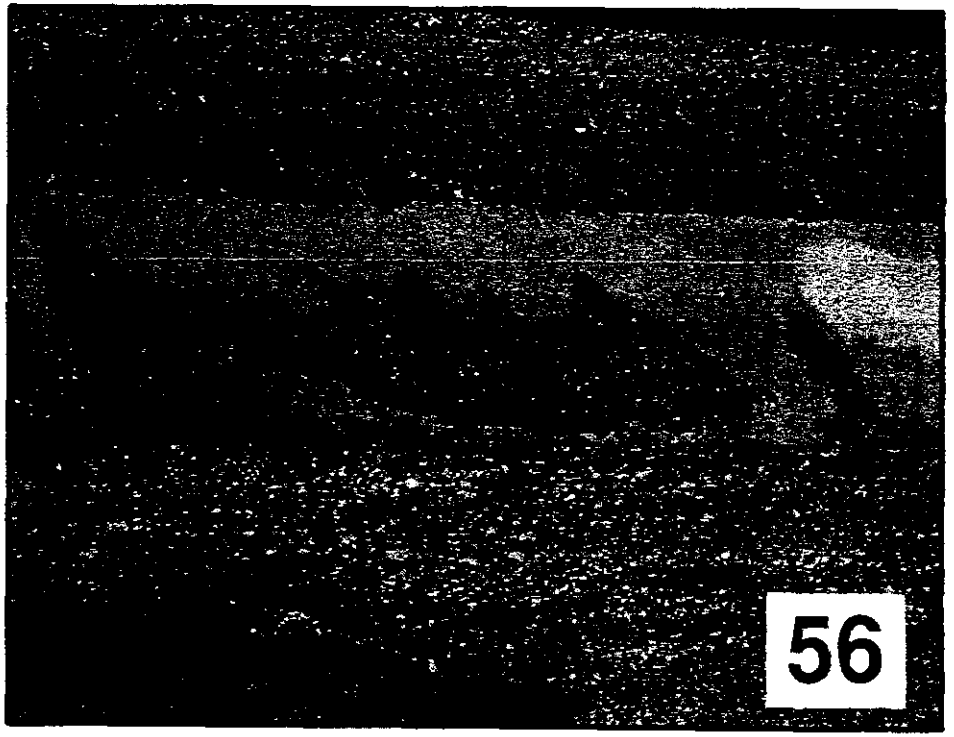

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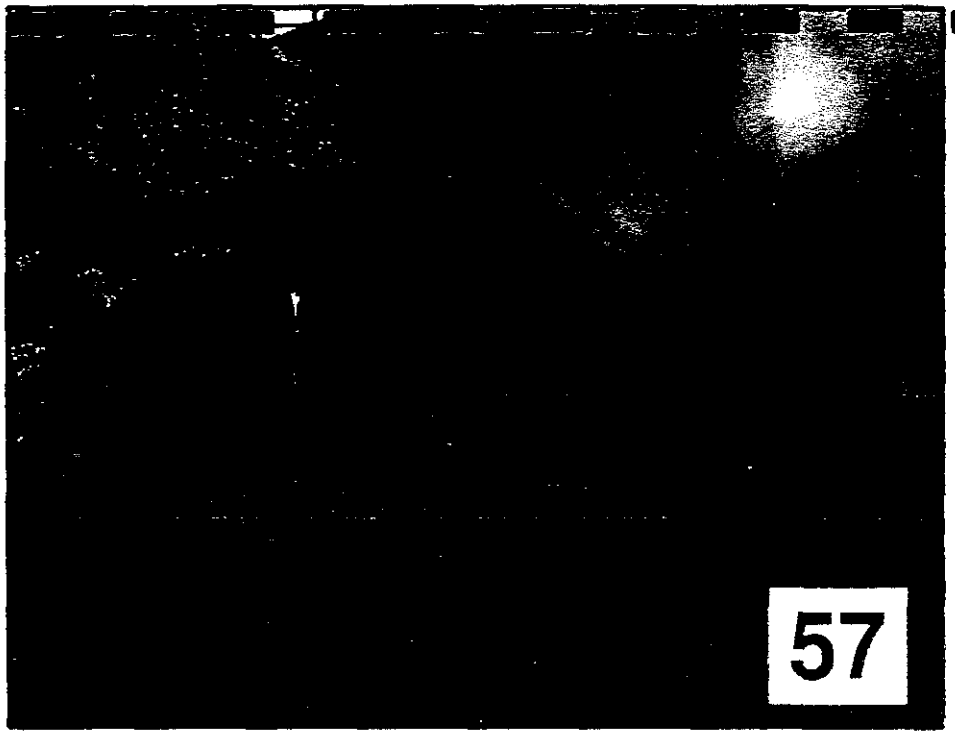

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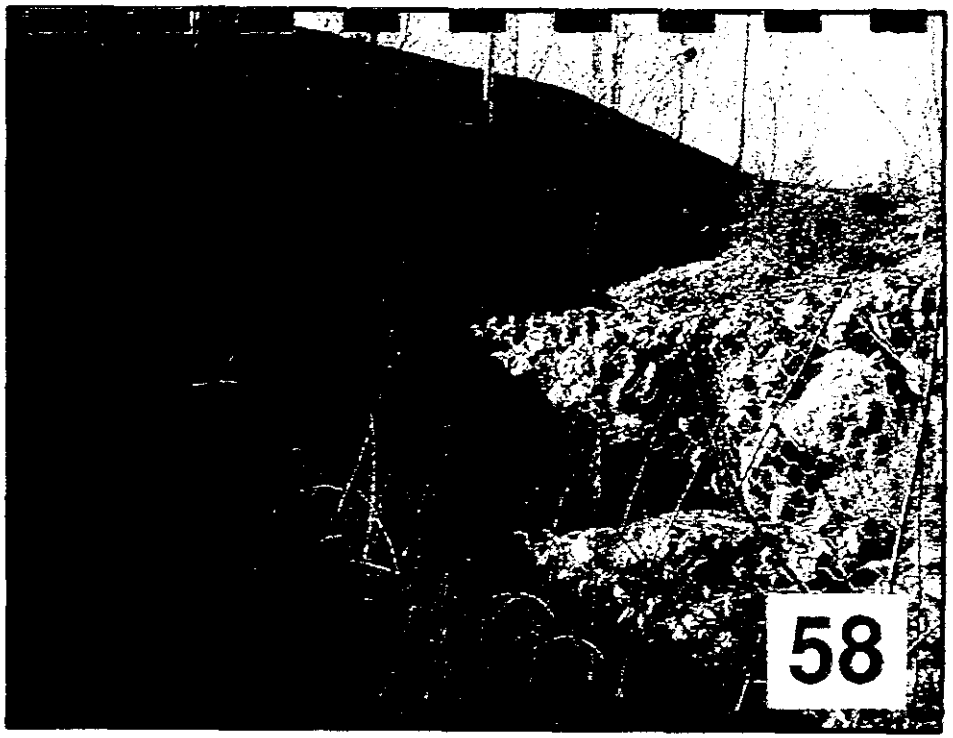

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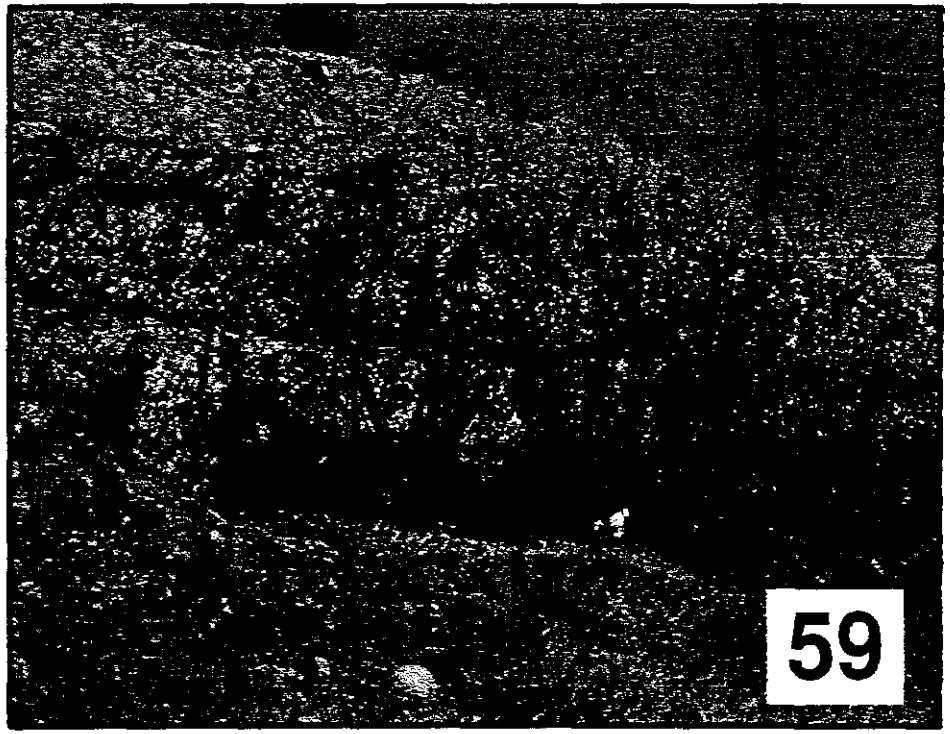

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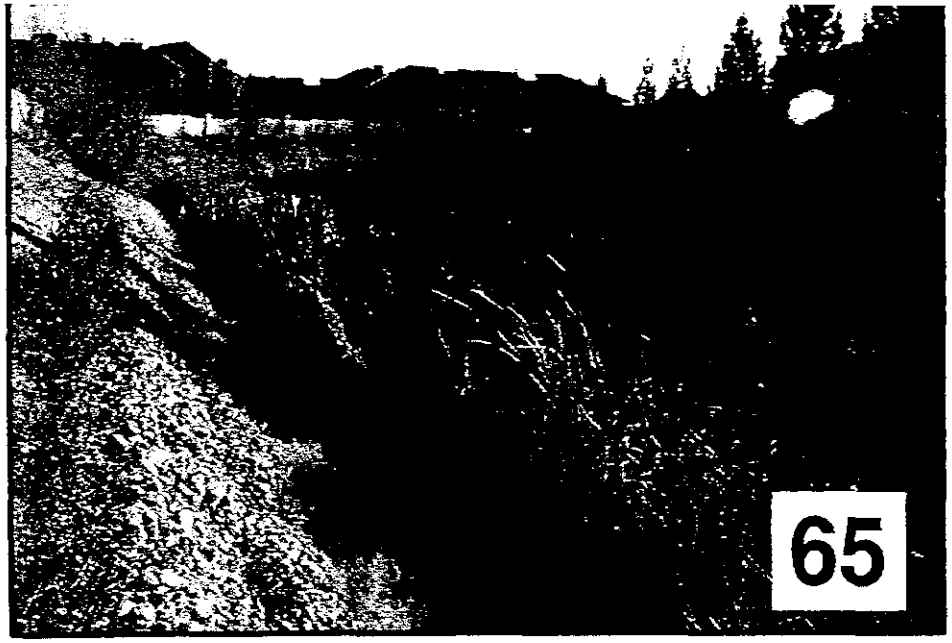

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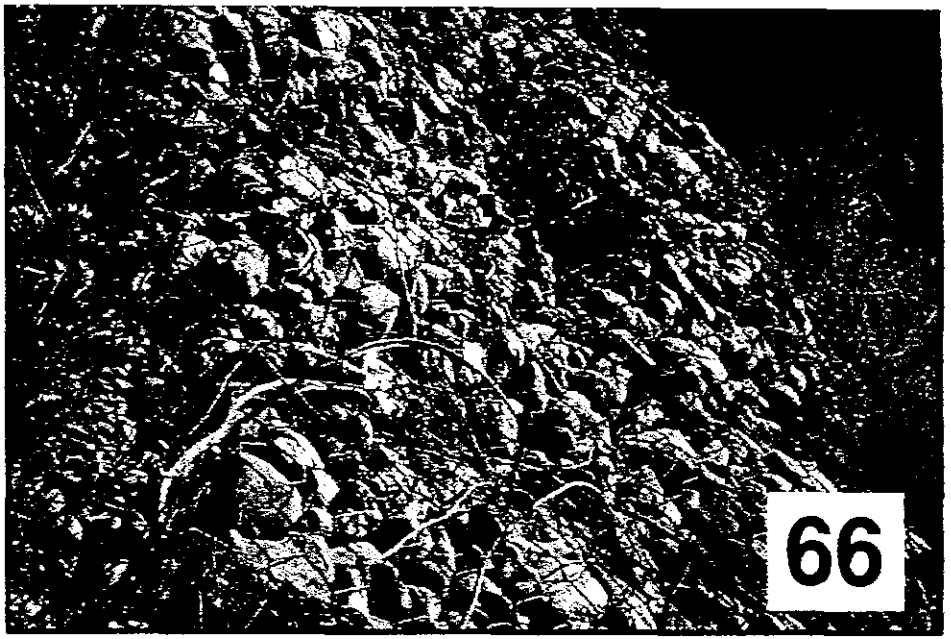

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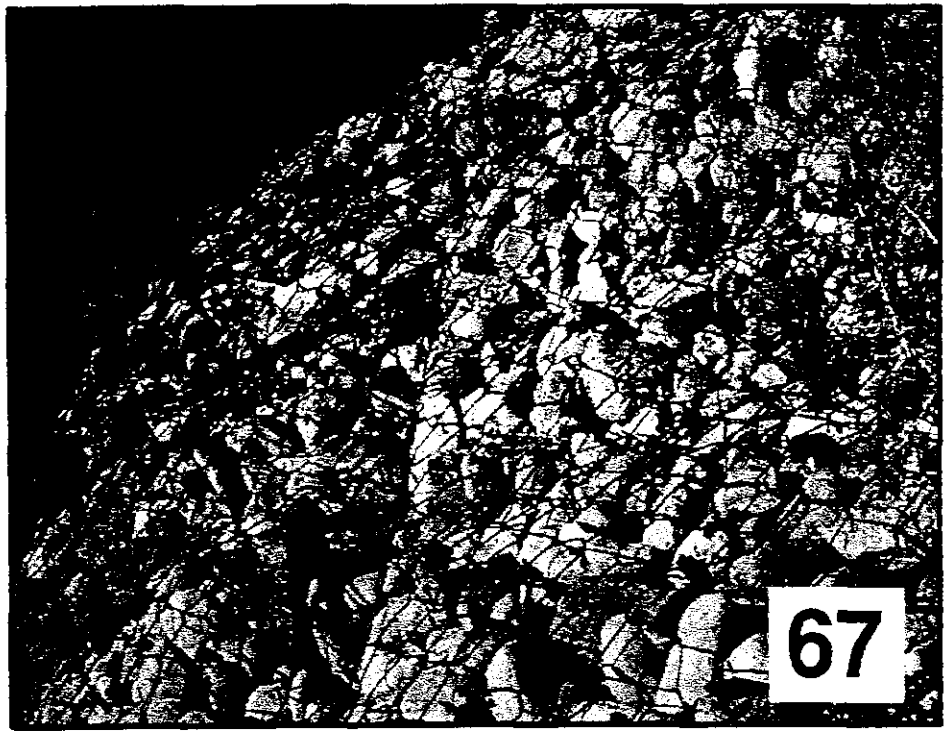

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ATTACHMENT 5

AS-BUILT 1993 IMPROVEMENTS

FOR THE FLAMINGO WASH/WINNICK AVENUE

STORM DRAIN

SEE PLAN TUBE

ATTACHMENT 6

"FLAMINGO WASH/WINNICK AVENUE HYDRAULIC MODEL" VIDEO TAPE

DATED JANUARY 29, 1993

SEE BOX

ATTACHMENT 7

"WINNICK AVENUE INLET REVISION WITHOUT RAMP" VIDEO TAPE

SEE BOX

ATTACHMENT 8

MARKED-UP BASE MAPS

SHOWING FLAMINGO WASH LINING

NORTH

SCALE: 1" = 400'

GRAPHIC SCALE

400 0 400 800

(IN FEET)

1 inch = 400 ft.

RAINBOW BLVD.

FLAMINGO WASH

JONES

TROPICANA BLVD.

TORREY PINES

GABIONS

FLAMINGO WASH

FLAMINGO WASH FIS RE-STUDY

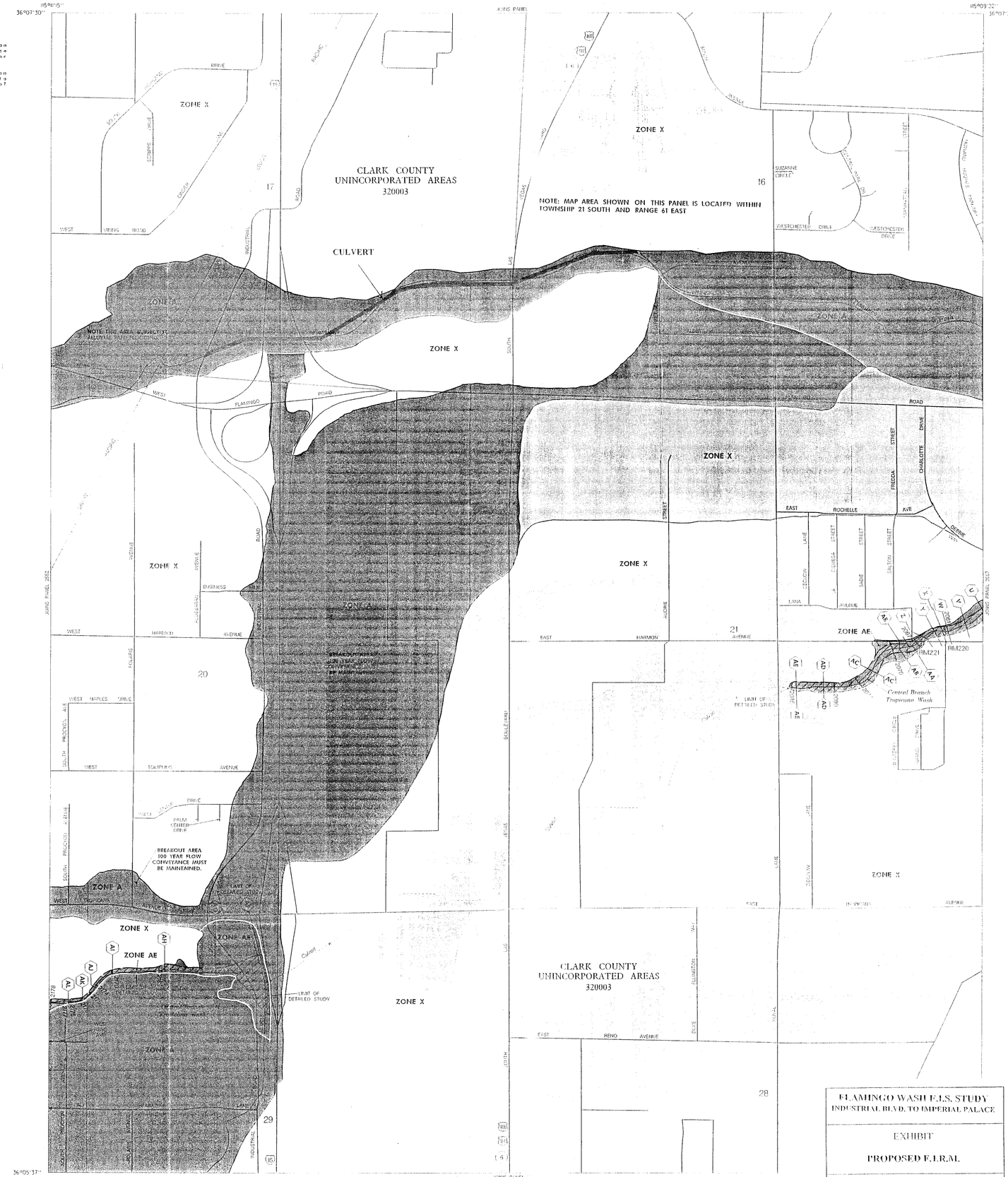
FIGURE FLO

RAINBOW BL. TO JONES BL. BASE MAP

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102

ELEVATION REFERENCE MARKS

REFERENCE MARK	ELEVATION (FEET NGVD)	DESCRIPTION OF LOCATION
RM220	2064.50	Chiseled X on north side of Harmon Avenue, 1,450 feet west of Paradise Road, and on east side of Harbor Island Apartments.
RM221	2065.62	Chiseled X on south side of Harmon Avenue on bridge opposite to Kirschner, and 2,135 feet west of Paradise Road.



LEGEND

SPECIAL FLOOD HAZARD AREAS INUNDATED BY 100-YEAR FLOOD

- **ZONE A** No base flood elevations determined.
- **ZONE AE** Base flood elevations determined.
- **ZONE AH** Flood depths of 1 to 3 feet (usually areas of ponding); base flood elevations determined.
- **ZONE AO** Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined; for areas of alluvial fan flooding, velocities also determined.
- **ZONE A99** To be protected from 100-year flood by Federal flood protection system under construction; no base flood elevations determined.
- **ZONE V** Coastal flood with velocity hazard (wave action); no base flood elevations determined.
- **ZONE VE** Coastal flood with velocity hazard (wave action); base flood elevations determined.

FLOODWAY AREAS IN ZONE AE

OTHER FLOOD AREAS

- **ZONE X** Areas of 500-year flood; areas of 100-year flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 100-year flood.

OTHER AREAS

- **ZONE X** Areas determined to be outside 500-year floodplain.
- **ZONE D** Areas in which flood hazards are undetermined.

UNDEVELOPED COASTAL BARRIERS

Identified (with) | Identified (free) | Otherwise Protected Area

Coastal barrier areas are not especially hazardous areas as mapped by Special Flood Hazard Areas.

- 513 — Base Flood Elevation Line; Elevation in Feet. See Map Index for Elevation Datum.
- D — D — Cross Section Line
- (EL 987) — Base Flood Elevation in Feet Where Uniform Within Zone. See Map Index for Elevation Datum.
- RM7 — Elevation Reference Mark.
- M5 — River Mile
- 97°07'30", 32°22'30" — Horizontal Coordinates Based on North American Datum of 1927 (NAD 27) Projection.

NOTES

This map is for use in administering the National Flood Insurance Program; it does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size, or all planimetric features outside Special Flood Hazard Areas.

Coastal base flood elevations apply only landward of 0.0 (NGVD), and include the effects of wave action. These elevations may also differ significantly from those developed by the National Weather Service for hurricane evacuation planning.

Areas of Special Flood Hazard (100-year flood) include Zones A, AE, AH, AO, A99, V, and VE.

Certain areas not in special flood hazard areas may be protected by flood control structures.

Boundaries of the floodways were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the Federal Emergency Management Agency.

Floodway widths in some areas may be too narrow to show to scale. Floodway widths are provided in the Flood Insurance Study Report.

This map may incorporate approximate boundaries of Coastal Barrier Resource System Units and/or Otherwise Protected Areas established under the Coastal Barrier Improvement Act of 1990 (PL 101-591).

Corporate limits shown are current as of the date of this map. The user should contact appropriate community officials to determine if corporate limits have changed subsequent to the issuance of this map.

For community map revision history prior to countywide mapping, see Section 6.0 of the Flood Insurance Study Report.

For adjoining map panels and base map source see separately printed Map Index.

MAP REPOSITORY
Refer to Repository Listing on Map Index

EFFECTIVE DATE OF
COUNTYWIDE FLOOD INSURANCE RATE MAP:
AUGUST 16,1995

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL:

Refer to the FLOOD INSURANCE RATE MAP (FIRM) LOG DATE shown on this map to determine when actuarial rates apply to structures in zones where two sets of depths have been established.

To determine if flood insurance is available, contact an insurance agent or call the National Flood Insurance Program at (800) 638-6620.

APPROXIMATE SCALE IN FEET
500 0 500

NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP

CLARK COUNTY,
NEVADA AND
INCORPORATED AREAS

PANEL 2556 OF 4090
(SEE MAP INDEX FOR PANELS NOT PRINTED)

CONTAINS COMMUNITY	NUMBER	PANEL	SUFFIX
CLARK COUNTY UNINCORPORATED AREAS	320003	2556	D

MAP NUMBER
32003C2556 D

EFFECTIVE DATE:
AUGUST 16,1995

Federal Emergency Management Agency

FLAMINGO WASH F.L.S. STUDY
INDUSTRIAL BLVD. TO IMPERIAL PALACE

EXHIBIT

PROPOSED F.L.R.M.

G.C. WALLACE, INC.
Engineering Architecture

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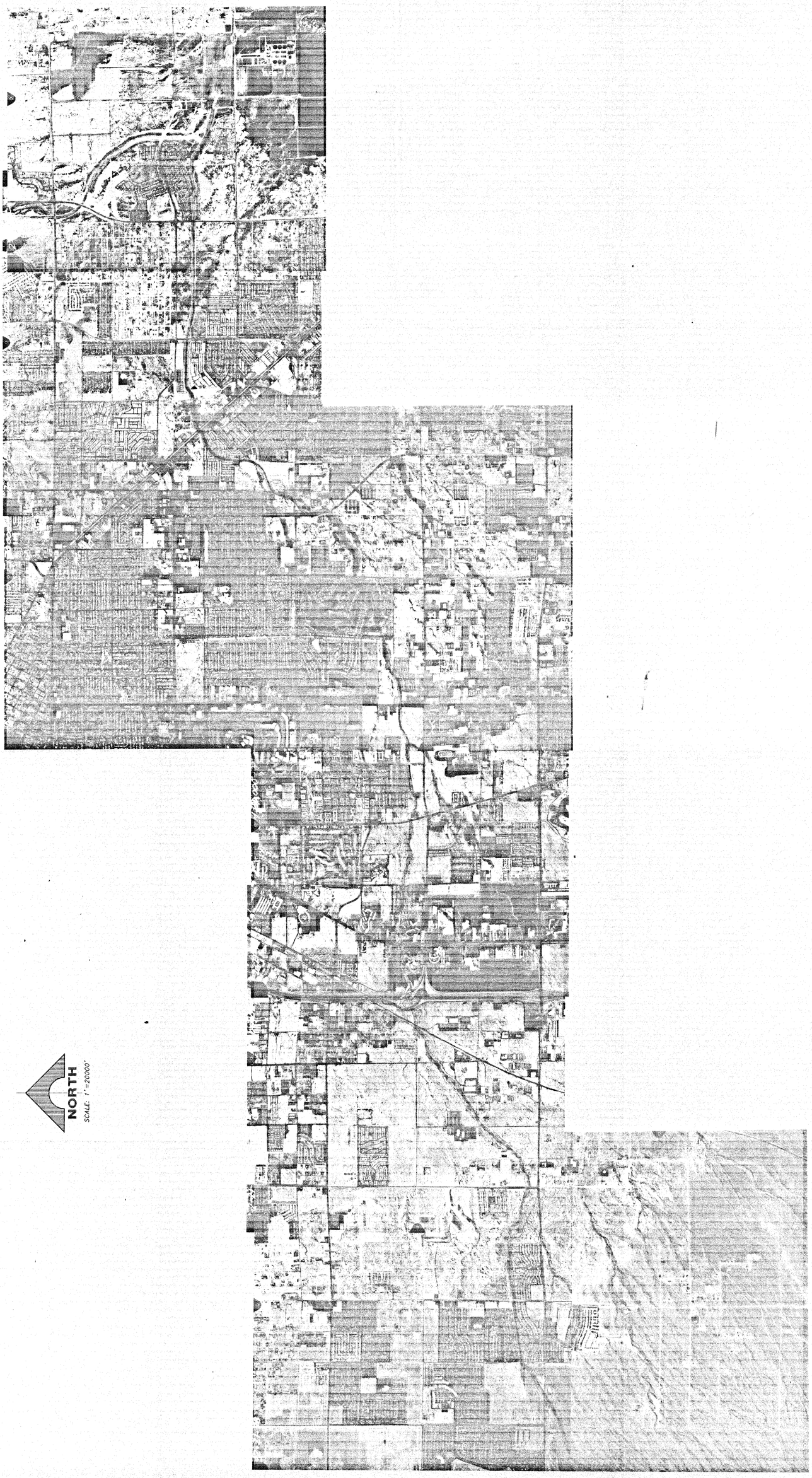
RECOMMENDED

RPE NO DATE

G.C. WALLACE, INC.
Engineering/Architecture 1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102

FLAMINGO WASH
FIS RE-STUDY
AERIAL PHOTOGRAPH
DATED 2/21/78

SHEET 1 OF 1



NORTH

SCALE: 1"=2000'

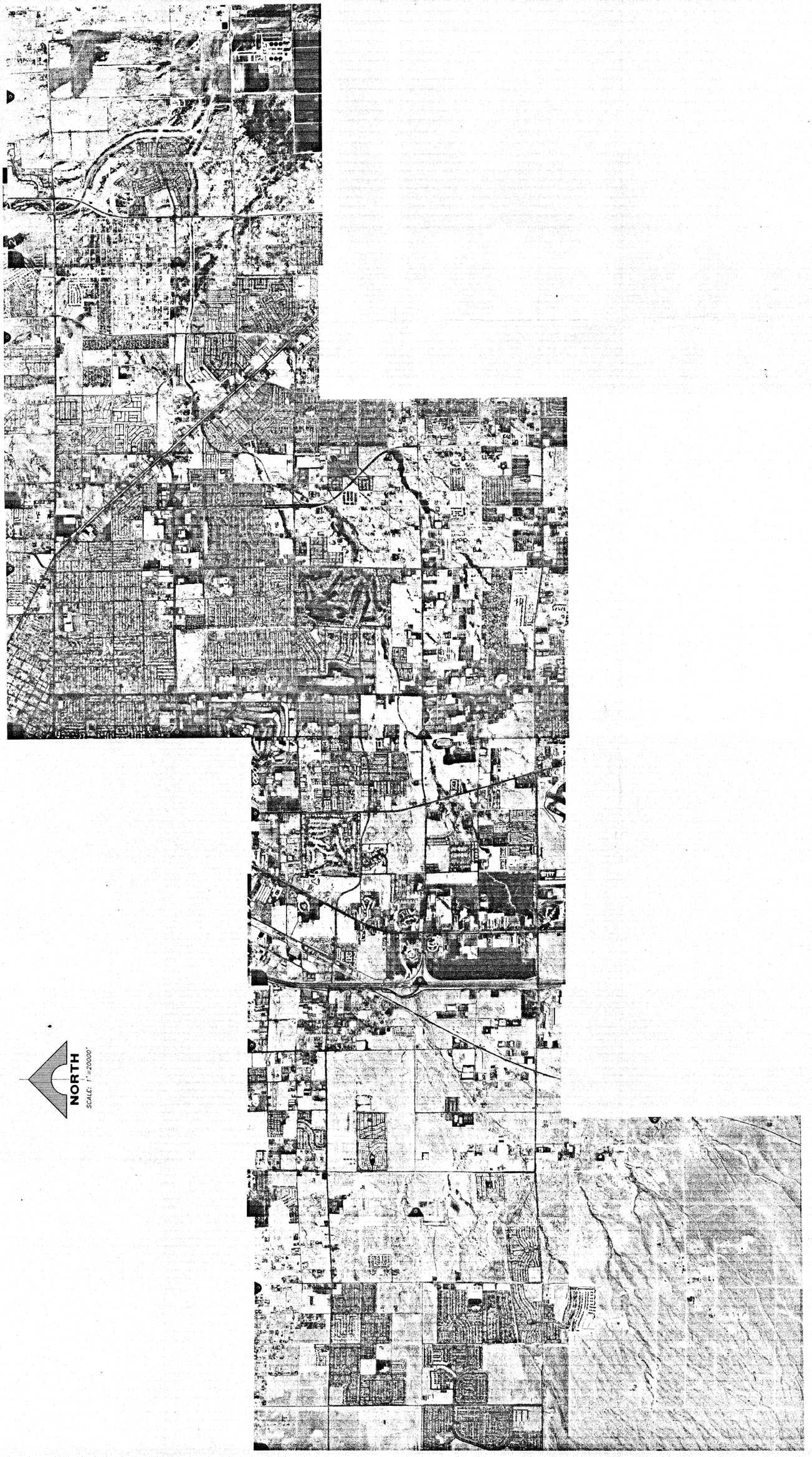
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AERIAL PHOTOGRAPH
DATED 2/21/78

G.C. WALLACE, INC.
Engineering/Architecture 1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102

RECOMMENDED						APPROVAL	
RPE NO	DATE	REV	DATE	DESCRIPTION		DATE	



NORTH
SCALE: 1"=2000'

JOB NO. 660.033

ELEVATION REFERENCE MARKS

REFERENCE MARK	ELEVATION (FEET NGVD)	DESCRIPTION OF LOCATION
1002	2301.58	2-in dome head brass cap reference monument on top of curb, northeast corner of Jones Blvd. and Harmon Ave.
1003	2245.10	Rivet and square aluminun plate in top of curb, northeast corner of Tropicana Ave. and Decatur Blvd. near the pc of Tropicana Ave.
1004	2175.57	Rivet and square aluminun plate in top of curb, northeast corner of Tropicana Ave. and Valley View Blvd. near the pc of Tropicana Ave.
1005	2176.60	Rivet and square aluminun plate in top of curb, northeast corner of Wynn Rd. and Harmon Ave., east of the westerly driveway going into 4050 Harmon Ave.
1006	2152.90	Rivet and square aluminun plate in top of curb, northwest corner of Flamingo Rd. and Valley View Blvd. near the pc of Flamingo Rd.
1027	2141.40	USC&GS brass cap, in southeast headwall of railroad bridge, 325 ft. north of Flamingo Rd. overpass at tracks.

NOTES

MAP BASED ON 1"=400' TOPOGRAPHIC MAPPING PREPARED BY NEVADA AERIAL MAPPING FROM PHOTOGRAPHS TAKEN IN JANUARY 22, 1997.

VERTICAL CONTROL IS BASED ON THE NGVD 1929 HORIZONTAL CONTROL IS BASED ON NAD 1983, UTILIZING CLARK COUNTY MONUMENTS.

PANEL AFFECTS FIRMS 32003C2551 D, 32003C2552 D, & 32003C2556 D DATED AUGUST 16, 1995.

FLOODING SOURCE: FLAMINGO WASH

CONTOUR INTERVAL 4 FEET

FILE: FL1-WMP.DWG

CLARK COUNTY, NEVADA

NORTH

GRAPHIC SCALE

400 0 200 400 800 1600

(IN FEET)
1 inch = 400 ft.

LEGEND

VIEW DIRECTION

48 PHOTO NUMBER

ELEVATION REFERENCE MARK

JOINS PANEL FLO

100-YEAR FLOOD CONTAINED IN CULVERT WHICH EXTENDS TO THE IMPERIAL PALACE HOTEL AND CASINO

CONFLUENCE OF NORTH FORK OF FLAMINGO WASH

LIMIT OF STUDY

CONFLUENCE OF RAILROAD CHANNEL

1002 2301.58 CCBM 7C10 24W4

1003 2245.10 CCBM 7C11 19SWS

1004 2175.57 CCBM 6C11 20SWS

1005 2176.60 CCBM 7C11 19E6

1006 2152.90 CCBM 7C11 18SES

1027 2141.40 USC&GS BM N-566

PANEL INDEX

FL1 FL2 FL3 FL4

550.033
PLOTTED:

DESCRIPTION	DATE	REV

11902
P.E. NO. DATE

RECOMMENDED
JERRY E. PRUITT

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102

FLAMINGO WASH
FIS RE-STUDY
JONES BLVD. TO INDUSTRIAL RD.
MORE PHOTOGRAPH LOCATIONS

SHEET
FL1A
OF 4 SHEETS

ELEVATION REFERENCE MARKS

REFERENCE MARK	ELEVATION (FEET NGVD)	DESCRIPTION OF LOCATION
1007	2048.60	Rivet and square aluminum plate in top of curb, northeast corner of Paradise Rd. and driveway going into 3900 Paradise Rd. near the pc of Paradise Rd. 1/4 mile south of Sands Dr.-Twain Ave.
1008	2046.27	Rivet and square aluminum plate in top of curb, northeast corner of Paradise Rd. and Edison Ave., near the pc of Paradise Rd.
1009	2046.43	Rivet and square aluminum plate in top of curb, east side of Paradise Rd. at Tropicana Wash box, just north of south driveway into Villa De Paradise Apartments, at a light pole.
1011	2006.68	Rivet and square aluminum plate in top of curb, northeast corner of Maryland Pkwy. and Rochelle Ave. near the pc of Maryland Pkwy.
1012	1985.51	Rivet and square aluminum plate in top of curb, northeast corner of Maryland Pkwy. and Sierra Dr. near the pc of Maryland Pkwy.
1030	1986.23	Rivet and square aluminum plate in top of curb, east side of Maryland Pkwy. at the north side of Flamingo Wash.

NOTES

MAP BASED ON 1'=400' TOPOGRAPHIC MAPPING PREPARED BY NEVADA AERIAL MAPPING FROM PHOTOGRAPHS TAKEN IN JANUARY 22, 1997.

VERTICAL CONTROL IS BASED ON THE NGVD 1929 HORIZONTAL CONTROL IS BASED ON NAD 1983, UTILIZING CLARK COUNTY MONUMENTS.

PANEL AFFECTS FIRMS 32003C2556 D & 32003C2557 D DATED AUGUST 16, 1995.

FLOODING SOURCE: FLAMINGO WASH

CONTOUR INTERVAL 4 FEET

FILE: FL2-WMP.DWG

CLARK COUNTY, NEVADA

NORTH

GRAPHIC SCALE

400 0 200 400 800 1600

(IN FEET)
1 inch = 400 ft.

LEGEND

- 48 — VIEW DIRECTION / PHOTO NUMBER
- ELEVATION REFERENCE MARK

1008 ☐ 2046.27 CCBM 6C11 15NWW6

1007 ☐ 2048.90 CCBM 6C11 15SWW6

1009 ☐ 2046.43 CCBM 6C11 22NWW6

1011 ☐ 2006.68 CCBM 6C11 23NWW6

1012 ☐ 1985.51 CCBM 6C11 14NWW6

SFHA TO REMAIN

SFHA TO BE REMOVED

LIMIT OF STUDY

CONFLUENCE OF TROPICANA WASH BREAKOUT

CONFLUENCE OF TROPICANA WASH

PANEL INDEX: FL1, FL2, FL3, FL4

REV	DATE	DESCRIPTION

RECOMMENDED JERRY E. PRUITT DATE

P.E. NO. 11902

G.C. WALLACE, INC. Engineering/Architecture 1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102

FLAMINGO WASH
FIS RE-STUDY
IMPERIAL PALACE TO SPENCER ST.
MORE PHOTOGRAPH LOCATIONS

SHEET FL2A OF 4 SHEETS

550.033
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sgracia

ELEVATION REFERENCE MARKS

REFERENCE MARK	ELEVATION (FEET NGVD)	DESCRIPTION OF LOCATION
1020	1814.92	Rivet and square aluminum plate in top of curb, east side of Boulder Hwy. at north property line of 3745 Boulder Hwy., at projected centerline of Sandhill Rd.
1021	1804.74	Rivet and square aluminum plate in base of fire hydrant, east of Boulder Hwy., south of Bathart St. and north of Flamingo Wash.
1022	1825.38	Rivet and square aluminum plate in top of curb, southeast corner of Desert Inn Rd. and Sandhill Rd. just east of wheel chair ramp.
1023	1895.32	Rivet and square aluminum plate in top of curb, northeast corner of Twain Ave. and Pecos-McLeod Interconnect, near the pc of Pecos-McLeod Interconnect.
1029	1889.46	Rivet and square aluminum plate in top of curb, southeast corner of Pecos-McLeod Interconnect and the bridge at the Flamingo Wash.

NOTES

MAP BASED ON 1"=400' TOPOGRAPHIC MAPPING PREPARED BY NEVADA AERIAL MAPPING FROM PHOTOGRAPHS TAKEN IN JANUARY 22, 1997.

VERTICAL CONTROL IS BASED ON THE NGVD 1929 HORIZONTAL CONTROL IS BASED ON NAD 1983, UTILIZING CLARK COUNTY MONUMENTS.

PANEL AFFECTS FIRMS 32003C2580 D & 32003C2190 D DATED AUGUST 16, 1995.

FLOODING SOURCE: FLAMINGO WASH

CONTOUR INTERVAL 4 FEET

FILE: FL3-WMP.DWG CLARK COUNTY, NEVADA

LEGEND

48 — VIEW DIRECTION, PHOTO NUMBER

ELEVATION REFERENCE MARK

NORTH

GRAPHIC SCALE

400 0 200 400 800 1600

(IN FEET)
1 inch = 400 ft.

E 94,000 E 96,000 E 98,000 E 100,000 E 102,000 E 104,000 E 106,000 E 108,000 E 110,000 E 112,000 E 114,000

N 260,000 N 262,000 N 256,000

JOINS PANEL FL3A

FL1 FL2 FL3 FL4

1018 ◻ 1777.46 CCBM 7C12 8NWW6

1017 ◻ 1727.38 CCBM 7C12 2NWW5

1016 ◻ 1728.73 CCBM 6C12 4SWS

1015 ◻ 1720.66 CCBM 6C12 9W4

SFHA TO BE REMOVED

SFHA TO REMAIN

CONFLUENCE OF LAS VEGAS WASH & DUCK CREEK

PANEL INDEX

BOSTON, PATTERSON, BALTIMORE, CLEVELAND, WELTER, CINCINNATI, SAHARA, BRANDONKANE, AMBERLEIGH, SWANDALE, RIDGEDALE, OAKDALE, PALMDALE, ROSEDALE, LINDALE, HAPPY VALLEY, WOODLAND, VEGAS VALLEY, TWINVIEW, CY CLIFFVIEW, CARRIAGE PARK, MACHER, KAREN, TRACYLYNN, LEANN, KISS LOUISE, BALBOA, PERDIDO, PLACITA, PUENTA, ESCUELA, PEPE, ESPANITA, PESO, EL SEGUNDO, LADRON, VILLAGE, RENAULT, CITROEN, HILLMAN, CARAVELLE, CASCADE, CONSUL, FERRARI, CORTINA, CLEEK, ABARTH, BRASSY, SEAHURST, BOWSTRING, SLICE, BENTLEY, ALFA, WINTERWOOD, ANGLIA, CHAMPIONS, SAHARA, TEE, GOLFERS, LINKS, MASTERS, CLUB HOUSE, CORAL VINE, WALTON HEATH, SPYGLASS HILL, SPEARMINT, AUSTRALIAN, CHINA ASTER, ENGLISH DAISY, IRISH MOSS, SESAME, POPPYSEED, GLOVE BUD, SAFFRON, NUNSWOOD, JUNIPER HILLS, QUAKER RIDGE, GULLANE, FORGET ME NOT, PLAINFIELD, BEACONFALLS, SANDYFALLS, TAHOE, MESA VERDE, TETONA, EVERGLADE, GREEN TREE, ALDAMA, PETACA, TRES PIEDRAS, RIO ARRIBA, OTERO, CABANA, LA BRISA, SEVILLA, TULAROSA, COMPTON, GAYLAN, ST LOUIS, NELLIS, MINER, LAMB, LOUISE, MARION, ARDEN, LAMONT, FRANK, WALNUT, GRANNIS, SHIFTON, PRECINCT BORY, WHEELWRIGHT, MOUNTAIN VISTA, GARDENDALE, LAWNDALE, MONTDALE, CLOVERDALE, HILLDALE, FERNDALE, PARKDALE, GREENDALE, PALMDALE, ALOHA

RECOMMENDED
JERRY E. PRUITT
P.E. NO. 11902 DATE

REV.	DATE	DESCRIPTION

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102

FLAMINGO WASH
FIS RE-STUDY
US 95 TO LAS VEGAS WASH
MORE PHOTOGRAPHIC LOCATIONS

SHEET
FL4A
OF 4 SHEETS

550.033
PLOTTED:

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ELEVATION REFERENCE MARKS

REFERENCE MARK	ELEVATION (FEET NGVD)	DESCRIPTION OF LOCATION
1020	1814.92	Rivet and square aluminum plate in top of curb, east side of Boulder Hwy. at north property line of 3745 Boulder Hwy., at projected centerline of Sandhill Rd.
1021	1804.74	Rivet and square aluminum plate in base of fire hydrant, east of Boulder Hwy., south of Dalhart St. and north of Flamingo Wash.
1022	1825.38	Rivet and square aluminum plate in top of curb, southeast corner of Desert Inn Rd. and Sandhill Rd. just east of wheel chair ramp.
1023	1895.32	Rivet and square aluminum plate in top of curb, northeast corner of Twain Ave. and Pecos-Mcleod interconnect, near the pc of Pecos-Mcleod interconnect.
1029	1889.46	Rivet and square aluminum plate in top of curb, southeast corner of Pecos-Mcleod interconnect and the bridge at the Flamingo Wash.

NOTES

MAP BASED ON 1"=400' TOPOGRAPHIC MAPPING PREPARED BY NEVADA AERIAL MAPPING FROM PHOTOGRAPHS TAKEN IN JANUARY 22, 1997.

VERTICAL CONTROL IS BASED ON THE NGVD 1929 HORIZONTAL CONTROL IS BASED ON NAD 1983, UTILIZING CLARK COUNTY MONUMENTS.

PANEL AFFECTS FIRMS 32003C2580 D & 32003C2190 D DATED AUGUST 16, 1995.

FLOODING SOURCE: FLAMINGO WASH

CONTOUR INTERVAL 4 FEET

FILE: FL3-WMP.DWG

CLARK COUNTY, NEVADA

NORTH

GRAPHIC SCALE

400 0 200 400 800 1600

(IN FEET)

1 inch = 400 ft.

1020
1814.92
CCBM 6C12 7C4

1022
1825.38
CCBM 6C12 18N4

1029
1889.46
CCBM 6C11 13N6

1023
1895.32
CCBM 6C11 13E6

SFHA TO BE ADDED

SFHA TO BE REMOVED

SFHA TO REMAIN

LIMIT OF STUDY

LEGEND

48 — VIEW DIRECTION, PHOTO NUMBER

ELEVATION REFERENCE MARK

PANEL INDEX

FL1 FL2 FL3 FL4

REV	DATE	DESCRIPTION

RECOMMENDED

JERRY E. PRUITT DATE

P.E. NO. 11902

G.C. WALLACE, INC. Engineering/Architecture 1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102

FLAMINGO WASH
FIS RE-STUDY
EASTERN AVE. TO US 95
MORE PHOTOGRAPHIC LOCATIONS

SHEET FL3A OF 4 SHEETS

550.033
PLOTTED:

ELEVATION REFERENCE MARKS

REFERENCE MARK	ELEVATION (FEET NGVD)	DESCRIPTION OF LOCATION
1007	2048.60	Rivet and square aluminum plate in top of curb, northeast corner of Paradise Rd. and driveway going into 3900 Paradise Rd. near the pc of Paradise Rd. 1/4 mile south of Sands Dr.-Twain Ave.
1008	2046.27	Rivet and square aluminum plate in top of curb, northeast corner of Paradise Rd. and Edison Ave. near the pc of Paradise Rd.
1009	2046.43	Rivet and square aluminum plate in top of curb, east side of Paradise Rd. at Tropicana Wash box, just north of south driveway into Villa De Paradise Apartments, at a light pole.
1011	2006.68	Rivet and square aluminum plate in top of curb, northeast corner of Maryland Pkwy. and Rochelle Ave. near the pc of Maryland Pkwy.
1012	1985.51	Rivet and square aluminum plate in top of curb, northeast corner of Maryland Pkwy. and Sierra Dr. near the pc of Maryland Pkwy.
1030	1986.23	Rivet and square aluminum plate in top of curb, east side of Maryland Pkwy. at the north side of Flamingo Wash.

NOTES

MAP BASED ON 1'=400' TOPOGRAPHIC MAPPING PREPARED BY NEVADA AERIAL MAPPING FROM PHOTOGRAPHS TAKEN IN JANUARY 22, 1997.

VERTICAL CONTROL IS BASED ON THE NGVD 1929 HORIZONTAL CONTROL IS BASED ON NAD 1983, UTILIZING CLARK COUNTY MONUMENTS.

PANEL AFFECTS FIRMS 32003C2556 D & 32003C2557 D DATED AUGUST 16, 1995.

FLOODING SOURCE: FLAMINGO WASH

CONTOUR INTERVAL 4 FEET

FILE: FL2-BMP.DWG

CLARK COUNTY, NEVADA

NORTH

GRAPHIC SCALE

400 0 200 400 800 1600

(IN FEET)
1 inch = 400 ft.

LEGEND

ELEVATION REFERENCE MARK

1012
1985.51
CCBM 6C11 14NWW6

1008
2046.27
CCBM 6C11 15NWW6

1007
2048.90
CCBM 6C11 15SWW6

1009
2046.43
CCBM 6C11 22NWW6

1011
2006.68
CCBM 6C11 23NWW6

1030
1986.23
CCBM 6C11 14SWW6

N 258,000
N 256,000
N 254,000
N 252,000
N 250,000
E 80,000
E 82,000
E 84,000
E 86,000
E 88,000
E 90,000
E 92,000

BURBANK
SANDS
TWAIN
ELM
ROYAL CREST
PARADISE COUNTRY CLUB
PALOS VERDES
MANHATTAN
SUZANNE
CENTRAL PARK
WESTCHESTER
FIRST INTERSTATE
CORPORATE
PARADISE
PRECINCT BDRY
NORTH
KOLSON
CALCATERRA
CENTERAMA
MCKELLAR
ALBERT
HAZELWOOD
DAISY
MARK
NORTHROP
CAMBRIDGE
SWENSON
HARMON
FLAMINGO
CHEROKEE
MARICOPA
SENECA
OTTAWA
ALGONQUIN
SPENCER
KATIE
VIKING
ROXFORD
ROXBURY
KIMBEN
CONCRETE
GABIONS
RIPRAP
GOLF COURSE
GRASS
FLAMINGO WASH
LIMIT OF STUDY
21
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14
ROCHELLE
LANA
TROP WASH
AUDRIE
KOVAL
DECKOW
LA CIENEGA
SADIE
SALTON
KISHNER
LA MAR
FREDDA
CHARLOTTE
PARADISE
SWENSON
CLAYMONT
MARYLAND
GROVE
COTTAGE GROVE
UNIVERSITY BOUNDARY
ESCONDIDO
HAVASU
NEVSO
BROOK
UNIVERSITY
ASCOT
HIALEAH
LIVING DESERT
TRAVOIS
SANTA ANITA
SPENCER
CARNEGIE

PANEL INDEX
FL1 FL2 FL3 FL4

550.032
PLOTTED: September 22, 1997 - FL2-BMP.DWG

DESCRIPTION	DATE	REV

11902
P.E. NO. DATE

RECOMMENDED
JERRY E. PRUITT

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102

FLAMINGO WASH
FIS RE-STUDY
IMPERIAL PALACE TO SPENCER ST.
BASE MAP

SHEET
FL2
OF 4 SHEETS

ELEVATION REFERENCE MARKS

REFERENCE MARK	ELEVATION (FEET NGVD)	DESCRIPTION OF LOCATION
1002	2301.58	2-in dome head brass cap reference monument on top of curb, northeast corner of Jones Blvd. and Harmon Ave.
1003	2245.10	Rivet and square aluminum plate in top of curb, northeast corner of Tropicana Ave. and Decatur Blvd. near the pc of Tropicana Ave.
1004	2175.57	Rivet and square aluminum plate in top of curb, northeast corner of Tropicana Ave. and Valley View Blvd. near the pc of Tropicana Ave.
1005	2176.60	Rivet and square aluminum plate in top of curb, northeast corner of Wynn Rd. and Harmon Ave, east of the westerly driveway going into 4050 Harmon Ave.
1006	2152.90	Rivet and square aluminum plate in top of curb, northeast corner of Flamingo Rd. and Valley View Blvd. near the pc of Flamingo Rd.
1027	2141.40	USC&GS brass cap, in southeast headwall of railroad bridge, 325 ft. north of Flamingo Rd. overpass at tracks.

NOTES

MAP BASED ON 1'=400' TOPOGRAPHIC MAPPING PREPARED BY NEVADA AERIAL MAPPING FROM PHOTOGRAPHS TAKEN IN JANUARY 22, 1997.

VERTICAL CONTROL IS BASED ON THE NGVD 1929 HORIZONTAL CONTROL IS BASED ON NAD 1983, UTILIZING CLARK COUNTY MONUMENTS.

PANEL AFFECTS FIRMS 32003C2551 D, 32003C2552 D, & 32003C2556 D DATED AUGUST 16, 1995.

FLOODING SOURCE: FLAMINGO WASH

CONTOUR INTERVAL 4 FEET

FILE: FL1-BMP.DWG

CLARK COUNTY, NEVADA

NORTH

GRAPHIC SCALE

400 0 200 400 800 1600

(IN FEET)
1 inch = 400 ft.

LEGEND

ELEVATION REFERENCE MARK

1002 2301.58 CCBM 7C10 24W4

1003 2245.10 CCBM 7C11 19SWS

1004 2175.57 CCBM 6C11 20SWS

1005 2176.60 CCBM 7C11 19E6

1006 2152.90 CCBM 7C11 18SES

2141.40 USC&GS BM N 366

JONES PANEL FLO

LIMIT OF STUDY

RIPRAP

CONCRETE

BEDROCK

GABIONS

FLAMINGO WASH CHANNEL

FLAMINGO WASH OVERFLOW CHANNEL

PANEL INDEX

FL1 FL2 FL3 FL4

REV	DATE	DESCRIPTION

RECOMMENDED JERRY E. PRUITT DATE

P.E. NO. 11902

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102

FLAMINGO WASH
FIS RE-STUDY
JONES BLVD. TO INDUSTRIAL RD.
BASE MAP

SHEET FL1 OF 4 SHEETS

550.032
PLOTTED: September 22, 1997 - FL1-BMP.DWG

ELEVATION REFERENCE MARKS

REFERENCE MARK	ELEVATION (FEET NGVD)	DESCRIPTION OF LOCATION
1020	1814.92	Rivet and square aluminum plate in top of curb, east side of Boulder Hwy. at north property line of 3745 Boulder Hwy., at projected centerline of Sandhill Rd.
1021	1804.74	Rivet and square aluminum plate in base of fire hydrant, east of Boulder Hwy., south of Dalhart St. and north of Flamingo Wash.
1022	1825.38	Rivet and square aluminum plate in top of curb, southeast corner of Desert Inn Rd. and Sandhill Rd. just east of wheel chair ramp.
1023	1895.32	Rivet and square aluminum plate in top of curb, northeast corner of Twain Ave. and Pecos-McLeod interconnect, near the pc of Pecos-McLeod interconnect.
1029	1889.46	Rivet and square aluminum plate in top of curb, southeast corner of Pecos-McLeod interconnect and the bridge at the Flamingo Wash.

NOTES

MAP BASED ON 1"=400' TOPOGRAPHIC MAPPING PREPARED BY NEVADA AERIAL MAPPING FROM PHOTOGRAPHS TAKEN IN JANUARY 22, 1997.

VERTICAL CONTROL IS BASED ON THE NGVD 1929 HORIZONTAL CONTROL IS BASED ON NAD 1983, UTILIZING CLARK COUNTY MONUMENTS.

PANEL AFFECTS FIRMS 32003C2580 D & 32003C2190 D DATED AUGUST 16, 1995.

FLOODING SOURCE: FLAMINGO WASH

CONTOUR INTERVAL 4 FEET

FILE: FL3-BMP.DWG

CLARK COUNTY, NEVADA

NORTH

GRAPHIC SCALE

400 0 200 400 800 1600

(IN FEET)
1 inch = 400 ft.

LOMR CASE NO. 97-09-137P DATED MARCH 25, 1997

JOINS PANEL FL4

LEGEND

ELEVATION REFERENCE MARK

PANEL INDEX

FL1 FL2 FL3 FL4

REV	DATE	DESCRIPTION

RECOMMENDED

JERRY E. PRUITT

11902
P.E. NO. DATE

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102

FLAMINGO WASH
FIS RE-STUDY
EASTERN AVE. TO US 95
BASE MAP

SHEET
FL3
OF 4 SHEETS

550.032
PLOTTED: September 22, 1997 — FL3-BMP.DWG

ELEVATION REFERENCE MARKS

REFERENCE MARK	ELEVATION (FEET NGVD)	DESCRIPTION OF LOCATION
1015	1720.66	Rivet and square aluminum plate in top of curb, northeast corner of Nellis Blvd. and Vegas Valley Dr. near the pc of Nellis Blvd.
1016	1728.73	Rivet and square aluminum plate in top of curb, northeast corner of Nellis Blvd. and Sahara Ave. near the pc of Nellis Blvd.
1017	1727.38	Rivet and square aluminum plate in top of curb, east side of Nellis Blvd. at third street light pole, 250 Ft. south of centerline of Flamingo Wash, at Desert Rose Golf Course.
1018	1777.46	Rivet and square aluminum plate in top of curb, northeast corner of Lamb Blvd. and Karen Ave. near the pc of Lamb Blvd.

NOTES

MAP BASED ON 1"=400' TOPOGRAPHIC MAPPING PREPARED BY NEVADA AERIAL MAPPING FROM PHOTOGRAPHS TAKEN IN JANUARY 22, 1997.

VERTICAL CONTROL IS BASED ON THE NGVD 1929 HORIZONTAL CONTROL IS BASED ON NAD 1983, UTILIZING CLARK COUNTY MONUMENTS.

PANEL AFFECTS FIRMS 32003C2190 D & 32003C2200 D DATED AUGUST 16, 1995.

FLOODING SOURCE: FLAMINGO WASH

CONTOUR INTERVAL 4 FEET

FILE: FL4-BMP.DWG

CLARK COUNTY, NEVADA

NORTH

GRAPHIC SCALE

400 0 200 400 800 1600

(IN FEET)
1 inch = 400 ft.

JOINS PANEL FL3

N 266,000 E 104,000 E 106,000 E 108,000 E 110,000 E 112,000 E 114,000

N 264,000 N 262,000 N 260,000

BOSTON PATTERSON BALTIMORE CLEVELAND WELTER CINCINNATI SAHARA

MINER LAMB LOUISE MARION ARDEN LAMONT FRANK NELLIS WALNUT GRANNIS SWITTON

RENAULT VILLAGE HILLMAN CASCADE CASABELLE CITROEN CONSUL CLEEK CORTINA FERRARI ABARTH BRASSY SEAHURST BOWSTRING SLICE BENTLEY ALFA WINTERWOOD ANGLIA CHAMPIONS

CONCRETE RIPRAP GABIONS CONCRETE GRASS

FLAMINGO WASH

1016 ◻ 1728.73 CCBM 6C12 4SWS

1017 ◻ 1727.38 CCBM 7C12 8NWW6

1018 ◻ 1777.46 CCBM 7C12 8NWW6

1015 ◻ 1720.66 CCBM 6G12 9W4

LIMIT OF STUDY

EL SEGUNDO JADRON BALBOA ESPANITA PESO PLACITA PUENTA ESCUELA PERDIDO PEPE VEGAS VALLEY

CY CLIFFVIEW TWINVIEW MARION MACHER CARRIAGE PARK WHEELWRIGHT PRECINCT BURY BRANDONKANE AMBERLEIGH AARONDAVID KAREN

SWANDALE RIDGEDALE OAKDALE PALMDALE ROSEDALE LINDALE HAPPY VALLEY WOODLAND MOUNTAIN VISTA LAWNDALE QUARENDALE MONTDALE CLOVERDALE HILLDALE FERNDALE PARKDALE GREENDALE PALMDALE ALPHA

SPEARMINT CHINA ASTER ENGLISH DAISY SESAME POPPYSEED GLOVE BUD SAFFRON IRISH MOSS BLUEGRASS JUNIPER HILLS SPYGLASS HILL QUAKER RIDGE FORGET ME NOT GULLANE PLAINFIELD BEACONFALLS SANDYFALLS AUSTRALIAN TAHOE MESA VERDE TETONIA EVERGLADE GREEN TREE

ALDAMA PETACA TRES PIEDRAS RIO ARRIBA OTERO CABANA LA BARCA BELLAVISTA CHIMAYO TULAROSA COMPTAN GAVILAN

LEGEND

◻ ELEVATION REFERENCE MARK

FL1 FL2 FL3 FL4

PANEL INDEX

RECOMMENDED JERRY E. PRUITT P.E. NO. 11902 DATE

REV	DATE	DESCRIPTION

G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH RAINBOW BLVD., LAS VEGAS, NEVADA 89102

FLAMINGO WASH
FIS RE-STUDY
US 95 TO LAS VEGAS WASH
BASE MAP

SHEET FL4 OF 4 SHEETS

550.032
PLOTTED: September 22, 1997 — FL4-BMP.DWG

TECHNICAL SUPPORT DATA NOTEBOOK

For

Clark County, Nevada

(COMMUNITY NAME AND STATE)

FLOOD INSURANCE STUDY

SUBMITTED BY: G. C. Wallace, Inc.

Study Contractor

DATE SUBMITTED OCTOBER 1997

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FLOOD INSURANCE STUDY SPR INDEX

Clark County, Nevada

(COMMUNITY NAME, STATE)

FLOOD INSURANCE STUDY

SPR DATE	SPR TITLE	EXHIBIT NO.
OCTOBER 1, 1997	TECHNICAL COORD.	ENCLOSED

SPECIAL PROBLEM REPORT
FLOOD INSURANCE STUDIES

Date: OCTOBER 1, 1997

Contract Number: _____

Name of Community: Clark County, Nevada

Study Contractor: G. C. Wallace, Inc.

PROBLEM AREA

TECHNICAL COORDINATION	☒
UNRESOLVED	☐
DISCREPANCIES	☐
UNREALISTIC SCHEDULE	☐
OTHER	☐

DETAILED EXPLANATION THE 1991 FIS HEC-1 MODEL WOULD NOT RUN ON THE SEPTEMBER 1990 VERSION, SO THE 1985 VERSION WAS USED FOR PRELIMINARY DISCHARGES. WHEN MODIFICATIONS TO THE HEC-1 MODEL WERE MADE TO ALLOW IT TO RUN ON THE SEPTEMBER 1990 VERSION, HIGHER DISCHARGES RESULTED.

PROPOSED SOLUTION USE THE HIGHER DISCHARGES FROM THE HEC-1 MODELS RUN ON THE SEPTEMBER 1990 VERSION IN THE HEC-2 MODELS.

SPECIAL PROBLEM REPORT
FLOOD INSURANCE STUDIES

Date: _____

Contract Number: _____

Name of Community: Clark County, Nevada

Study Contractor: G. C. Wallace, Inc.

PROBLEM AREA

TECHNICAL COORDINATION	☐
UNRESOLVED	☐
DISCREPANCIES	☐
UNREALISTIC SCHEDULE	☐
OTHER	☐

DETAILED EXPLANATION

PROPOSED SOLUTION

CONTACT (TELEPHONE CONVERSATION) REPORTS INDEX

Clark County, Nevada
(COMMUNITY NAME, STATE)

FLOOD INSURANCE STUDY

CONTACT REPORT DATE	FIRM/AGENCY CONTACTED

MEETING MINUTES/REPORTS INDEX

Clark County, Nevada
(COMMUNITY NAME, STATE)

FLOOD INSURANCE STUDY

MINUTES/REPORT DATE	MEETING DATE	MEETING TYPE
SEPTEMBER 16, 1997	SEPTEMBER 16, 1997	PROGRESS
AUGUST 13, 1997	AUGUST 13, 1997	PROGRESS
JULY 11, 1997	JULY 11, 1997	PROGRESS
JUNE 11, 1997	JUNE 11, 1997	PROGRESS
APRIL 9, 1997	APRIL 9, 1997	PROGRESS
MARCH 12, 1997	MARCH 12, 1997	PROGRESS
FEBRUARY 19, 1997	FEBRUARY 19, 1997	PROGRESS
JANUARY 8, 1997	JANUARY 8, 1997	PROGRESS
DECEMBER 3, 1996	DECEMBER 3, 1996	PROGRESS

550.030

FLAMINGO WASH FLOOD INSURANCE STUDY RESTUDY

Monthly Meeting Minutes
September 16, 1997

BY: Jerry Pruitt

PLACE: Clark County Regional Flood Control District

TIME: 10:00 AM

ATTENDING: Kevin Eubanks, CCRFCD; Noel Laughlin, GCW; Jerry Pruitt, GCW; Steve Parrish, CCPW

1. Reviewed the Draft Technical Support Data Notebook. Kevin wants two (2) copies of the draft for review by the next progress meeting October 8, 1997.

2. Reviewed the Draft Work Maps. Kevin wants proposed tie-ins to be shown on the work maps. Discussed making Panel FL0 more legible. Discussed Cameron Street overflow hydraulic analysis. More pictures can be taken in this area if needed. Also, discussed the floodplain delineations at areas near Winnick Avenue, Mojave Road, and Boulder Highway.

3. Discussed Principle Flood Problems. Kevin will provide copies of the Event Reports and Steve will provide photographs of past major flooding events.

4. Discussed Flood Protection Measures. The bridges and culverts are the only facilities other than the Flamingo Wash itself which is represented by the aerial topography.

5. Reviewed FEMA Forms for CCRFCD concurrence. Kevin informed GCW that new FEMA Forms are out and should be available in digital format. Kevin also gave us a hard copy of the new forms.

6. Next meeting scheduled for October 8, 1997 at 10:00 AM at the CCRFCD office.

550.030

FLAMINGO WASH FLOOD INSURANCE STUDY RESTUDY

Monthly Meeting Minutes
August 13, 1997

BY: Jerry Pruitt

PLACE: Clark County Regional Flood Control District

TIME: 10:00 AM

ATTENDING: Kevin Eubanks, CCRFCD; Calvin Black, GCW; Jerry Pruitt, GCW; Allan Fajardo, GCW

1. Reviewed the Summary Memorandum. Kevin was concerned that waiting for the recommended Flamingo Wash maintenance would hold up the project submittal date. GCW will coordinate with CCPW's staff concerning these maintenance issues. Also, GCW will look at what kind of engineering effort it would take to model the problem areas as is.

2. Discussed the Cameron Street Bridge capacity and breakout. More detailed topography is required for the analysis of the breakout flows to Harmon Avenue. GCW will talk to Nevada Aerial Mapping (NAM) to see if they can provide the additional topography and how much it would cost. Also, Kevin requested the digital files for the bridge modelling.

3. Discussed the Winnick Avenue Storm Drain capacity and breakout. More detailed topography is required for the analysis of the breakout flows to Ida Avenue. GCW feels the additional detail could be picked up by a minimal amount of survey work. Also, the decision was made to use 50 percent interception at the inlet structure (i.e. 1750 cfs).

4. Provided rating curves and supporting information for the requested bridge locations.

5. Discussed the SFHA tie-ins to the confluences at the Tropicana Wash breakout which hits along Winnick Avenue and the Tropicana Wash itself which hits at Cambridge Street. These confluence areas will be labeled "Limit of Study."

6. Discussed the project budget. Calvin mentioned some shuffling of money between tasks may be necessary. Kevin stated that internal shuffling is O.K. as long as the project total does not change.

7. Next meeting scheduled for September 10, 1997 at 10:00 AM at the CCRFCD office.

FLAMINGO WASH FLOOD INSURANCE STUDY RESTUDY
AGENDA FOR JULY 11, 1997 MEETING

1. Review previous meeting.

2. Review draft work maps. Input of bridge as-built data in progress.

3. Review tie-in for Zone A from breakout from the Tropicana Wash.

4. TSDN preparation in progress.

5. Discuss schedule.

550.030

FLAMINGO WASH FLOOD INSURANCE STUDY RESTUDY

Monthly Meeting Minutes
June 11, 1997

BY: Noel Laughlin

PLACE: Clark County Regional Flood Control District

TIME: 10:00 AM

ATTENDING:

Kevin Eubanks, CCRFCD	Jerry Pruitt, GCW
Steve Parrish, CCPW	Noel Laughlin, GCW

1. Reviewed previous meeting held on April 9, 1997. No meeting was held in May.

2. HEC-2 models in progress. Not all field survey data of bridges has been completed. Bridges being input into model from design drawings and will be refined based on "as-built" data when available

3. Kevin relayed that project for Clark County for frontage road on east side of I-15 will close the gap between the I-15 culvert and the Caesars Palace culvert. GCW will coordinate with CC's engineer.

4. The decision was made to use the higher flow value calculated at the confluence of the Flamingo and Tropicana Washes for the reach of the Flamingo Wash between the north fork and the Tropicana Wash instead of using the flow adjusted by the DARF from the north fork.

5. Discussed the modeling of the culvert at the Orleans casino and the transition from the old culvert at Cameron.

6. The Winnick Ave. storm drain inlet will be modeled using the remaining surface flow above the capacity of the inlet as determined by the physical model prepared by the BOR.

7. Next meeting scheduled for August 13, 1997 at 10:00 AM at the CCRFCD office.

FLAMINGO WASH FLOOD INSURANCE STUDY RESTUDY
AGENDA FOR APRIL 9, 1997 MEETING

CURRENT AND UPCOMING WORK PLAN

1. DATA COLLECTION AND REVIEW

   A) GCW continuing with field survey of existing bridges. Discuss additional structures at Flamingo\Industrial Connector and tennis court between Maryland Parkway and Spencer.

   B) Field reconnaissance conducted on March 31 and April 1. Discuss findings of field recon.

   C) Collection of existing improvement plans in progress.

2. TOPOGRAPHY

   A) GCW has requested 2-foot contour interval and break lines for HEC-2 modeling purposes.

3. BASE MAPS

   A) Base maps have been set up.

4. WORK MAPS

   A) Discuss hydrology tie-ins
   B) Discuss hydraulic tie-ins
   C) HEC-2 modeling in progress

FLAMINGO WASH FLOOD INSURANCE STUDY RESTUDY
AGENDA FOR MARCH 12, 1997 MEETING

1. Review minutes from previous meeting.

2. GCW completed survey control for detailed bridge surveys on March 11, 1997. Field survey to begin March 17, 1997. Duration of field survey is estimated to be 30 days.

3. Site visit has been delayed to March 17 in order to coincide with the start of the bridge surveys.

4. As of March 5, 1997, GCW has received all the aerial topographic mapping. Digital files will be checked for errors.

5. GCW is begining to develop cross section data for hydraulic models.

6. Review results of hydraulic modeling for the UFWDB outfall channel with higher outflow.

550.030

FLAMINGO WASH FLOOD INSURANCE STUDY RESTUDY

Monthly Meeting Minutes
February 19, 1997

BY: Noel Laughlin

PLACE: Clark County Regional Flood Control District

TIME: 10:00 AM

ATTENDING:

Kevin Eubanks, CCRFCD	Calvin Black, GCW
Steve Parrish, CCPW	Noel Laughlin, GCW

1. Reviewed modified HEC 1 results without the tributary area to the Red Rock Detention Basin to simulate the USACOE expansion. The change in the DARF without the Red Rock area resulted in a change in the inflow to the Upper Flamingo Wash Detention Basin from 6660 cfs (from the B & V LOMR) to 7794 cfs. This also results in an increase in the outflow from 2579 cfs to 3806 cfs.

   Kevin requested that the B & V HEC 2 model for the outfall channel be run with both flows to estimate the impacts on the channel and surrounding area.

2. Reviewed revised HEC 1 model results with various storm centerings. A summary of the results is attached.

3. Nevada Aerial Mapping is scheduled to begin delivery of topo by February 21, 1997 and should complete by March 7, 1997.

4. Next meeting scheduled for March 12, 1997 at 10:00 AM at the CCRFCD office.

550.030

FLAMINGO WASH FIS RESTUDY
AGENDA FOR JANUARY 1997
PROGRESS MEETING

To: Kevin Eubanks, CCRFCD
Robert Thompson, CCPW
Denis Cederberg, CCPW

The monthly progress meeting will be held at 10:00 AM on January 8, 1997 at the Clark County Regional Flood Control District office. Subsequent meetings to be held on the 2nd Wednesday of each month at the time and place listed above, unless otherwise noted.

DISCUSSION ITEMS

Past Meeting

1. Meeting held on December 3, 1996 at GCW's office. See the attached meeting minutes.

Current and Upcoming Work Plan

1. **Data Collection and Review**

   a) Completed review of TSDN for Upper Flamingo Wash Detention Basin Letter of Map Revision.
   b) Discuss hydrology for Upper Flamingo Detention Basin. Discuss storm centerings with and without the Red Rock watershed included.
   c) Need hydrology from the Red Rock Detention Basin Expansion, if available, for inclusion in TSDN.
   d) Discuss Las Vegas Valley FIS hydrology versus 1996 MPU hydrology.
   e) Field reconnaissance - schedule dates.
   f) GPS Ground control for aerial mapping underway. All panels have been set. Anticipate submitting control data to Nevada Aerial Mapping (NAM) the week of January 20th.
   g) NAM scheduled to fly the project area on January 9, 1997, weather permitting. Aerial topographic mapping to be complete within 25 days from receipt of ground control.
   h) Begin field survey of specified bridges and hydraulic structures.

G.C. WALLACE, INC.

CONFERENCE NOTES BY: Noel Laughlin JOB NO. 550.030

SUBJECT: Flamingo Wash FIS Restudy			
PLACE: G. C. Wallace, Inc.			
TIME: 4:00 PM		DATE: December 3, 1996	
ATTENDING:	Kevin Eubanks, CCRFCD Robert Thompson, CCPW	Calvin Black, GCW Noel Laughlin, GCW	

1. Reviewed areas to be mapped by Nevada Aerial Mapping with CCPW and CCRFCD.

2. GCW will include the portion of the Flamingo Wash previously modeled by Willdan & Associates for CCPW.

3. GCW will use the HEC-1 model from the Upper Flamingo Wash Detention Basin LOMR request with the tributary areas to the Red Rock Detention Basin deleted.

4. Progress meeting will be held at 10:00 AM on the second Wednesday of the month at the CCRFCD office.

NCL:sjl

CLARK COUNTY
REGIONAL FLOOD CONTROL DISTRICT



Gale Wm. Fraser, II, P.E.
General Manager / Chief Engineer

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Clark County

November 17, 1997

Federal Emergency Management Agency
Federal Insurance Administration
Office of Risk Assessment
500 C Street, SW
Washington, DC 20472
Attn: Mr. Karl Mohr

Request for Letter of Map Revision
Flamingo Wash Study Area

Dear Mr. Mohr:

On November 14, 1996, the Clark County Regional Flood Control District Board approved and authorized the Chairman to sign an Agreement for Professional Services between the District and G.C. Wallace, Inc. to prepare a flood insurance restudy of the Flamingo Wash from Rainbow Boulevard to the confluence with the Las Vegas wash. A committee consisting of staff members from the District and Clark County worked with G.C. Wallace, Inc. to prepare the enclosed study documents. The committee has had the opportunity to review and comment on the study results throughout its development and is in agreement with the study findings.

This study is based in part on the construction of the Red Rock Detention Basin and Upper Flamingo Detention Basin. These projects were funded by the District and will continue to maintained by Clark County with District funds.

Please accept the enclosed study to support this request for Letter of Map Revision. If you should need further information, Please call.

Sincerely,

Kevin Eubanks, P.E.
Assistant General Manager

Enclosure

cc: Robert Thompson, Clark County Public Works w/o enclosure
Les Sakumoto, FEMA Region IX w/o enclosure

KLE:csm

File: Flamingo Wash FIS

301 E. Clark Avenue, Suite 301 • Las Vegas, Nevada 89101
(702) 455-3139 • FAX: (702) 455-3870

G.C. WALLACE, INC.

MEMORANDUM

550.030

To: Kevin Eubanks, P.E.
Assistant General Manager

From: Jerry E. Pruitt, P.E. JEP

Date: November 3, 1997

Subject: **Flamingo Wash FIS Restudy**
100-Year Storm Flows at Cameron Street

The Effective FIS Model has been revised to reflect the Red Rock Detention Basin Expansion and the Upper Flamingo Wash Detention Basin LOMR. In effect, the Red Rock Detention Basin Expansion reduces the tributary watershed to the Flamingo Wash. However, the reduction in runoff due to the decrease in area is somewhat offset by the associated increase in the Depth Area Reduction Factor (DARF). The Upper Flamingo Wash Detention Basin LOMR increased the volume of the detention basin, which further reduces the downstream peak flows.

The resultant 100-year peak storm flow in the Flamingo Wash at Cameron Street is approximately 3,900 cfs. This memorandum supersedes the August 8, 1997 memorandum. If any further refinement of the hydrology is performed, the CCRFCD will be notified.

If you have any questions, please do not hesitate to call me at 363-1200 ext. 129.

pc: Calvin Black, GCW
Noel Laughlin, GCW
John Martinez, Martin & Martin
John Shields, Summit Engineering

G.C. WALLACE, INC.

MEMORANDUM

550.030

To: Kevin Eubanks, P.E.
Assistant General Manager

From: Jerry Pruitt, P.E. JP

Date: August 8, 1997

Subject: **FLAMINGO WASH FIS RESTUDY**
100-YEAR STORM FLOWS AT CAMERON STREET

The Effective FIS Model has been revised to reflect the Red Rock Detention Basin Expansion and the Upper Flamingo Wash Detention Basin LOMR. In effect, the Red Rock Detention Basin Expansion reduces the tributary watershed to the Flamingo Wash. However, the reduction in runoff due to the decrease in area is somewhat offset by the associated increase in the Depth Area Reduction Factor (DARF). The Upper Flamingo Wash Detention Basin LOMR increased the volume of the detention basin, which further reduces the downstream peak flows.

The resultant 100-year peak storm flow at Cameron Street is approximately 3500 cfs. This hydrology is preliminary and may be revised further in the future. If any further refinement of the hydrology is performed, the CCRFCD will be notified.

If you have any questions, please do not hesitate to call me at 363-1200 ext. 129.

pc: Calvin Black, GCW
Noel Laughlin, GCW
John Martinez, Martin & Martin

CLARK COUNTY
REGIONAL FLOOD CONTROL DISTRICT



Zale Wm. Fraser, II, P.E.
General Manager / Chief Engineer

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TELECOPIER COVER SHEET

DATE: 3/31/97

PAGE: 1 OF 4

TO: CALVIN / NOEL

G.C. WALLACE

TELECOPIER NUMBER:

FROM: KEVIN EUBANKS

OFFICE: CCRFCD FAX: (702)-455-3870

Comments

FYI

Thank You.

301 E. Clark Avenue, Suite 301 • Las Vegas, Nevada 89101
(702) 455-3139 • FAX: (702) 455-3870

31 MAR 97 11:27 -CCRFCO-

Federal Emergency Management Agency

Washington, D.C. 20472

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

IN REPLY REFER TO:
Case No.: 97-09-137P

The Honorable Yvonne Atkinson Gates
Chairperson, Clark County Board
of Commissioners
225 East Bridger Avenue, Sixth Floor
Las Vegas, Nevada 89155

Community: Clark County, Nevada
Community No.: 320003
Panel Affected: 32003C2190 D
Effective Date of
This Revision: MAR 25 1997

102-D

Dear Ms. Atkinson Gates:

This responds to a request that the Federal Emergency Management Agency (FEMA) revise the effective Flood Insurance Rate Map (FIRM) for Clark County, Nevada and Incorporated Areas, in accordance with Part 65 of the National Flood Insurance Program (NFIP) regulations. In a letter dated October 22, 1996, Mr. Tim S. Moreno, P.E., Supervising Engineer, Willdan Associates, requested that FEMA revise the FIRM to show the effects of development of Woodland Park South Tracts A and B; Metropolitan's Woodland Park Subdivision; Greenbriar Tract 7-B; the construction of a culvert under South Mojave Road; and channelization along Flamingo Wash from South Mojave Road to approximately 2,500 feet downstream of South Mojave Road.

All data required to complete our review of this request were submitted with letters from Mr. Moreno, and Mr. Chris O. Stone, P.E., Associate Engineer, Willdan Associates.

We have completed our review of the submitted data and the flood data shown on the effective FIRM. We have revised the FIRM to modify the floodplain boundary delineations of the flood having a 1-percent chance of being equaled or exceeded in any given year (base flood) along Flamingo Wash from South Mojave Road to approximately 2,500 feet downstream of South Mojave Road. As a result of the modifications, the width of the Special Flood Hazard Area (SFHA), the area that would be inundated by the base flood, for Flamingo Wash along the revised reach, decreased. The modifications are shown on the enclosed annotated copy of FIRM Panel(s) 32003C2190 D. This Letter of Map Revision (LOMR) hereby revises the above-referenced panel(s) of the effective FIRM dated August 16, 1995.

The modifications are effective as of the date shown above. The map panel(s) as listed above and as modified by this letter will be used for all flood insurance policies and renewals issued for your community.

A review of the determination made by this LOMR and any requests to alter this determination should be made within 30 days. Any request to alter the determination must be based on scientific or technical data.

We will not physically revise and republish the FIRM and Flood Insurance Study (FIS) report for your community to reflect the modifications made by this LOMR at this time. When changes to the previously cited FIRM panel(s) and FIS report warrant physical revision and republication in the future, we will incorporate the modifications made by this LOMR at that time.

This LOMR is based on minimum floodplain management criteria established under the NFIP. Your community is responsible for approving all floodplain development, and for ensuring all necessary permits required by Federal or State law have been received. State, county, and community officials, based on knowledge of local conditions and in the interest of safety, may set higher standards for construction in the SFHA. If the State, county, or community has adopted more restrictive or comprehensive floodplain management criteria, these criteria take precedence over the minimum NFIP criteria.

The basis of this LOMR is, in whole or in part, a channel-modification/culvert project. NFIP regulations, as cited in Paragraph 60.3(b)(7), require that communities assure that the flood-carrying capacity within the altered or relocated portion of any watercourse is maintained. This provision is incorporated into your community's existing floodplain management regulations. Consequently, the ultimate responsibility for maintenance of the modified channel and culvert rests with your community.

Because this LOMR will not be printed and distributed to primary users, such as local insurance agents and mortgage lenders, your community will serve as a repository for these new data. We encourage you to disseminate the information reflected by this LOMR throughout the community, so that interested persons, such as property owners, local insurance agents, and mortgage lenders, may benefit from the information. We also encourage you to prepare an article for publication in your community's local newspaper. This article should describe the changes that have been made and the assistance that officials of your community will give to interested persons by providing these data and interpreting the NFIP maps.

This determination has been made pursuant to Section 206 of the Flood Disaster Protection Act of 1973 (Public Law 93-234) and is in accordance with the National Flood Insurance Act of 1968, as amended (Title XIII of the Housing and Urban Development Act of 1968, Public Law 90-448), 42 U.S.C. 4001-4128, and 44 CFR Part 65. Pursuant to Section 1361 of the National Flood Insurance Act of 1968, as amended, communities participating in the NFIP are required to adopt and enforce floodplain management regulations that meet or exceed NFIP criteria. These criteria are the minimum requirements and do not supersede any State or local requirements of a more stringent nature. This includes adoption of the effective FIRM and FIS report to which the regulations apply and the modifications described in this LOMR.

If you have any questions regarding floodplain management regulations for your community or the NFIP in general, please contact the Consultation Coordination Officer (CCO) for your community. Information on the CCO for your community may be obtained by contacting the Director, Mitigation Division of FEMA in San Francisco, California, at (415) 923-7177. If you have any technical questions regarding this LOMR, please contact Mr. Karl Mohr of our staff in Washington, DC, either by telephone at (202) 646-2770 or by facsimile at (202) 646-4596.

Sincerely,

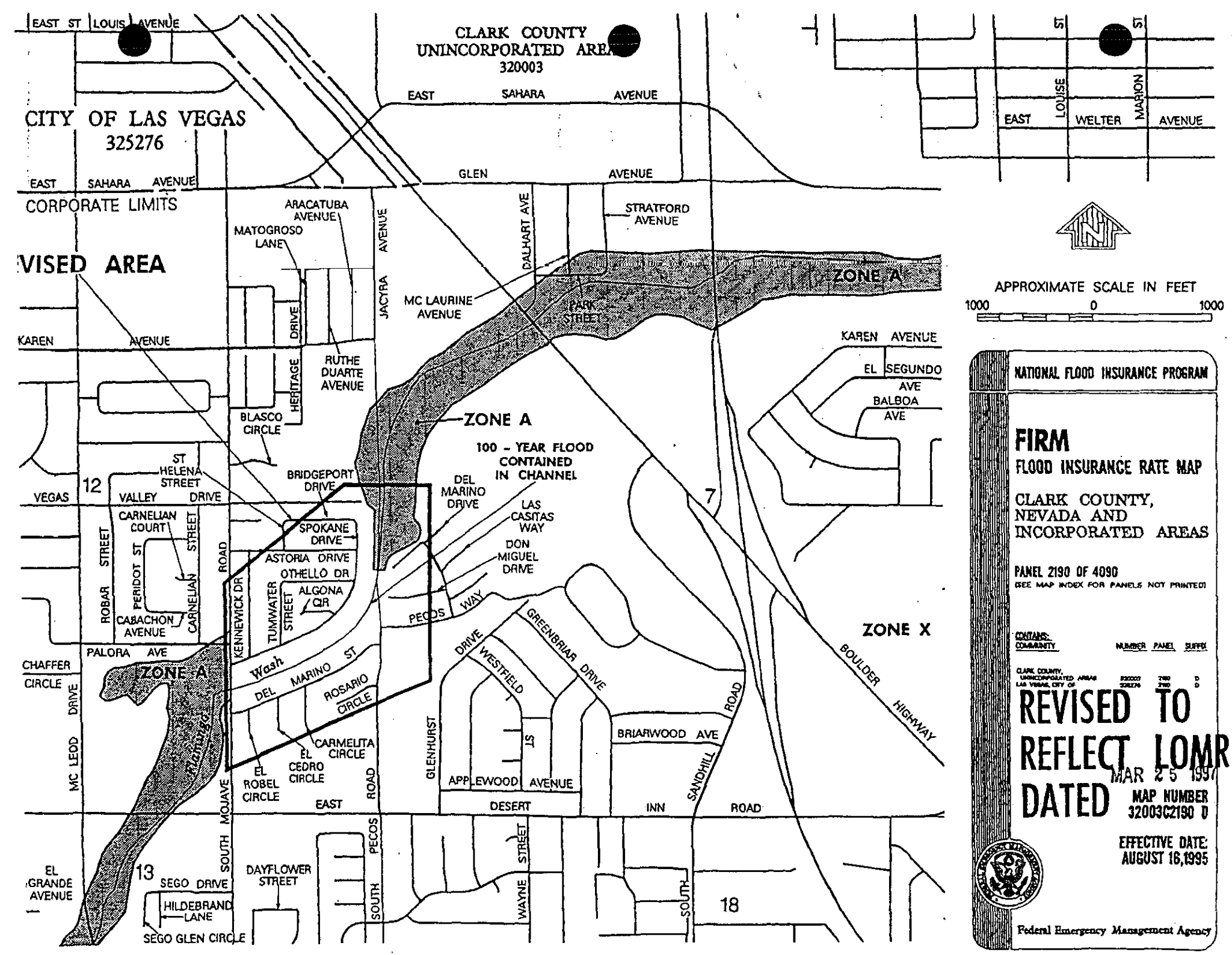
Frederick H. Sharrocks, Jr., Chief
Hazard Identification Branch
Mitigation Directorate

Enclosure(s)

cc: Mr. Kevin L. Eubanks, P.E.
Assistant General Manager
Clark County Regional Flood
Control District

Mr. Robert B. Thompson, P.E.
Civil Engineer III
Clark County Department of Public Works

Mr. Chris O. Stone
Associate Engineer
Willdan Associates


CLARK COUNTY
UNINCORPORATED AREA
320003
CITY OF LAS VEGAS
325276
CORPORATE LIMITS
VISED AREA
EAST ST LOUIS AVENUE
EAST SAHARA AVENUE
GLEN AVENUE
EAST LOUISE ST
EAST WELTER ST
MARION AVENUE
ARACATUBA AVENUE
MATOGROSO LANE
JACYRA AVENUE
CALHART AVE
STRATFORD AVENUE
MC LAURINE AVENUE
PARK STREET
ZONE A
KAREN AVENUE
DRIVE
HERITAGE
RUTHE DUARTE AVENUE
BLASCO CIRCLE
EL SEGUNDO AVE
BALBOA AVE
ZONE A
100 - YEAR FLOOD CONTAINED IN CHANNEL
ST HELENA STREET
BRIDGEPORT DRIVE
VALLEY DRIVE
DEL MARINO DRIVE
LAS CASITAS WAY
DON MIGUEL DRIVE
CARNELIAN COURT
SPOKANE DRIVE
ASTORIA DRIVE
OTHELLO DR
ALGONA CIR
PERIDOT ST
CARNELIAN STREET
ROBAR STREET
CABACHON AVENUE
KENNEWICK DR
TUMWATER STREET
PECOS WAY
PALORA AVE
CHAFFER CIRCLE
ZONE A
Wash
DEL MARINO ST
ROSARIO CIRCLE
CARMELITA CIRCLE
EL CEDRO CIRCLE
EL ROBEL CIRCLE
MC LEOD DRIVE
SOUTH MOJAVE ROAD
EAST DRIVE
WESTFIELD ST
GREENBRIAR DRIVE
GLENHURST
APPLEWOOD AVENUE
BRIARWOOD AVE
SANDHILL ROAD
DESERT INN ROAD
ZONE X
BOULDER HIGHWAY
EL GRANDE AVENUE
SEGO DRIVE
HILDEBRAND LANE
SEGO GLEN CIRCLE
DAYFLOWER STREET
SOUTH PECOS ROAD
WAYNE STREET
SOUTH
12
13
7
18
APPROXIMATE SCALE IN FEET
1000 0 1000
NATIONAL FLOOD INSURANCE PROGRAM
FIRM
FLOOD INSURANCE RATE MAP
CLARK COUNTY, NEVADA AND INCORPORATED AREAS
PANEL 2190 OF 4090
(SEE MAP INDEX FOR PANELS NOT PRINTED)
CONTAINS:
COMMUNITY
NUMBER
PANEL
SUFFIX
CLARK COUNTY, UNINCORPORATED AREAS
LAS VEGAS, CITY OF
320003
325276
2190
2190
D
D
REVISED TO REFLECT LOMR DATED
MAR 25 1997
MAP NUMBER
32003C2190 D
EFFECTIVE DATE:
AUGUST 16,1995
Federal Emergency Management Agency

CLARK COUNTY
REGIONAL FLOOD CONTROL DISTRICT

Gale Wm. Fraser, II, P.E.
General Manager / Chief Engineer

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December 2, 1996

Calvin Black, P.E.
G. C. Wallace, Inc.
1555 S Rainbow Blvd
Las Vegas, NV 89102

Dear Mr. Black:

Enclosed please find an executed copy of the Agreement for Professional Services to prepare a Master Plan Update for the Flamingo Wash in Clark County Flood Insurance Restudy, dated November 14, 1996.

This letter will serve as the notice to proceed with the services described in the Agreement. Please coordinate your efforts with Kevin Eubanks of this office who will serve as the District's representative for the services.

Thank you for submitting the Agreement and Scope of Services in such a timely manner. We look forward to working with G. C. Wallace, Inc. Please don't hesitate to contact me if you have any questions or require additional information.

Sincerely,

for

Gale Wm. Fraser, II, P.E.
General Manager/Chief Engineer

Enclosure

GWF:mak

File: FLAM.FIS

301 E. Clark Avenue, Suite 301 • Las Vegas, Nevada 89101
(702) 455-3139 • FAX: (702) 455-3870

AGREEMENT FOR PROFESSIONAL SERVICES

CLARK COUNTY REGIONAL FLOOD CONTROL DISTRICT

AND

G. C. Wallace, Inc.

THIS AGREEMENT is made and entered into this 14th day of November, 1996, by and between the CLARK COUNTY REGIONAL FLOOD CONTROL DISTRICT (hereinafter referred to as "DISTRICT") and G. C. Wallace, Inc. (hereinafter referred to as "GCW" or "CONSULTANT"), for the Flamingo Wash Flood Insurance Study Restudy (hereinafter referred to as the "PROJECT").

WITNESSETH

WHEREAS, the DISTRICT desires to complete a Flood Insurance Study (FIS) restudy for the PROJECT, and

WHEREAS, the CONSULTANT is experienced and is knowledgeable in the completion of such works, and

WHEREAS, the CONSULTANT and the DISTRICT recognize the need to coordinate the PROJECT with the Clark County Technical Review Committee established by the DISTRICT for this project, and

WHEREAS, the CONSULTANT represents that it is properly registered and qualified in accordance with the Nevada Revised Statutes and has the personnel and facilities necessary to accomplish the PROJECT with the required time, and

WHEREAS, the parties desire to set forth the responsibilities, terms, and conditions of completing the PROJECT,

NOW, THEREFORE, in consideration of the premises and terms contained herein, the parties agree as follows:

Section I

RESPONSIBILITY OF CONSULTANT

A. The CONSULTANT shall be responsible for the professional quality, technical accuracy, timely completion, and coordination of all services furnished by the CONSULTANT, its subcontractors and subconsultants and its and their principals, officers, employees, and agents under this AGREEMENT. In performing the specified services, CONSULTANT shall follow practices consistent with generally accepted current professional and technical engineering standards.

B. It shall be the duty of CONSULTANT to assure that all work products are technically sound and in conformance with all pertinent and current federal, State, and local statutes, codes ordinances, resolutions, and other regulations -- in particular, the federal Endangered Species Act. If, during the term of this contract, there are any changes or new laws, ordinances, statutes, rules or regulations not known or foreseeable at the time of signing this contract which become effective and which affect the cost or time of performance of the contract, CONSULTANT shall immediately notify DISTRICT in writing and submit detailed documentation of such effect in terms of both time and cost of performing the contract. Upon concurrence by DISTRICT as to the effect of such changes, and adjustment in time of performance and/or compensation for an increase or decrease in labor, materials, and equipment directly required to be in compliance will be made. Except for an extension of time, no payment or compensation of any kind shall be made to CONSULTANT for damages caused by such changes or new laws, ordinances, statutes, rules or regulations, including, but not limited to, those which may arise due to delay, disruption, acceleration, or inefficiency. If any discrepancy or inconsistency should be discovered between this contract and any law, ordinance, regulation, order, or decree, CONSULTANT shall immediately report the same in writing to DISTRICT, who will issue such instruction as may be necessary. The

CONSULTANT shall, without additional compensation, correct or revise any errors or deficiencies in its recommended plans, policies, designs, drawings, and other sections of the PROJECT. It is also understood and agreed by both parties that if any variation in measurements, calculations, or observations of a quantity due to mistakes, hereinafter referred to as "erroneous work" is found, the CONSULTANT will expeditiously perform the necessary work, at no expense to the DISTRICT, to correct the erroneous work. The reviewing process by the DISTRICT during the progress of the PROJECT will not relieve the CONSULTANT's obligation for erroneous work in the preparation of the different sections of the PROJECT. Any revisions or updates of the PROJECT after submittal would be considered outside the scope of services for this AGREEMENT.

C. The CONSULTANT will be responsible for holding monthly progress meetings with the DISTRICT. Minutes of these meetings and a summary of the PROJECT status will be submitted by the CONSULTANT to the DISTRICT with each monthly invoice for professional services.

D. It is agreed that any and all documents prepared and submitted by the CONSULTANT to the DISTRICT, and all information required of the CONSULTANT by the AGREEMENT, become the property of the DISTRICT. The CONSULTANT may retain copies and reproducible copies of all documents produced as a result of the PROJECT. In the event of the termination of the AGREEMENT, all documents produced shall be and become the property of the DISTRICT. The CONSULTANT agrees to surrender all such documents to the DISTRICT.

E. The CONSULTANT agrees that its officers and employees will cooperate with the DISTRICT in the performance of services under this AGREEMENT and will be available for consultation with the DISTRICT at such reasonable times and with advance notice so as to not conflict with their other responsibilities.

F. The rights and remedies of the DISTRICT provided for under this section are in addition to any other rights and remedies provided by law or under other sections of the AGREEMENT.

Section II
DISTRICT'S RESPONSIBILITY

A. The DISTRICT agrees that its officers and employees will cooperate with CONSULTANT in performance of services under this AGREEMENT and will be available for consultation with CONSULTANT at such reasonable times with advance notice as to not conflict with their other responsibilities.

B. The services performed by CONSULTANT under this AGREEMENT shall be subject to review and approval by DISTRICT General Manager. The DISTRICT General Manager may delegate any or all of the General Manager's responsibilities under this AGREEMENT to appropriate staff members, and shall so inform CONSULTANT by written notice before the effective date of each such delegation.

C. The services to be performed by the CONSULTANT under this AGREEMENT shall be subject to periodic review by DISTRICT's General Manager. The review comments of DISTRICT's General Manager shall be reported in writing to the CONSULTANT by the DISTRICT's General Manager. To prevent an unreasonable delay in the CONSULTANT's work, the DISTRICT's General Manager will endeavor to examine all documents and will make authorizations in writing to the CONSULTANT to proceed with work within 10 working days of receipt of such documents. It is understood that the DISTRICT's representative's review comments do not relieve the CONSULTANT from the responsibility for professional and technical accuracy of all work delivered under this AGREEMENT.

D. DISTRICT shall, without charge, furnish to or make available for examination or use by the CONSULTANT as it may request, any relevant data which the DISTRICT has available, including as examples only and not as a limitation:

1. Copies of reports, maps, plans, surveys, records, and other documents pertinent to flooding, flood control facilities, public properties, property developments, and other physical features related to the PROJECT.

2. Copies of previously prepared reports, publications, design hydrologic and hydraulic data, flooding information, flooding data, rainfall/runoff data, representative local drainage requirements (i.e., subdivision, planning and zoning regulations, ordinances, codes criteria, and special agreements or procedures), analyses, and computation manuals, computer programs, other documents and information related to the PROJECT and services specified by this AGREEMENT. CONSULTANT shall return original data provided by the DISTRICT.

E. Upon written request from the CONSULTANT, the DISTRICT shall reasonably assist CONSULTANT in obtaining data and documents from public officers or agencies and from private citizens and business firms whenever the DISTRICT determines that such material is necessary for the completion of the services specified by the AGREEMENT. DISTRICT shall provide the CONSULTANT with a list of names of individuals, agencies, or any other parties that should receive written communication related to the PROJECT from the CONSULTANT.

F. CONSULTANT will not be responsible for accuracy of information or data supplied by the DISTRICT or other sources, but will use such data to the extent such information or data would be relied upon by a reasonably prudent professional engineer.

Section III

SCOPE OF WORK

A. The CONSULTANT shall perform Tasks 1 through 4 including services discussed in the project description as specified in Exhibit A, which is attached hereto, and by this reference made a part of this AGREEMENT. In addition, the CONSULTANT will perform Task 5, "Supplemental Services" described in Exhibit A if, as, and when requested in writing by the General Manager. Exhibit B attached hereto and by this reference is also made a part of this agreement.

B. The DISTRICT may at any time, by written order, make changes within the general scope of this AGREEMENT and in the services or work to be performed by the CONSULTANT. If such changes cause an increase or decrease in the CONSULTANT's cost or time required for performance of any services under this AGREEMENT, an equitable adjustment shall be made and this AGREEMENT shall be modified in writing accordingly. Any claim of the CONSULTANT for adjustment under this clause must be asserted in writing within 30 days from the date of receipt by the CONSULTANT of notification of changes unless the DISTRICT grants a further period of time before the date of final payment under this AGREEMENT.

C. No services for which an additional compensation will be charged by the CONSULTANT shall be furnished without the written authorization of the DISTRICT.

Section IV

COMPENSATION AND TERMS OF PAYMENT

A. Once each month, the DISTRICT shall pay the CONSULTANT for services performed under Section III, Scope of Work. Invoices are prepared and submitted on a monthly basis and are due upon receipt. Payment is past due thirty (30) days from the invoice date. In the event the DISTRICT fails to make any payments, the CONSULTANT may cease work immediately until payment for the invoice and service charge is made. An additional charge at the rate of 1 1/2 percent per month will be charged against invoices which are past due.

B. Compensation and Method of Payment for Engineering Services are:

1. The DISTRICT shall pay the CONSULTANT on a time and materials basis under the CONSULTANT'S fee schedule, which is attached hereto as Exhibit D and by this reference made a part of this AGREEMENT.

2. The maximum cost to the DISTRICT for Task 1 through Task 4 including services discussed in Project Description accomplished under this AGREEMENT shall not exceed $184,822.00 unless the DISTRICT receives a written request, with justification, and the DISTRICT approves a change in scope and an increase in compensation. If approved, a supplement to this AGREEMENT must be executed. An estimated cost based on a detailed breakdown of the cost by tasks, and direct costs is shown on Exhibit B, which is attached hereto and by this reference made a part of this AGREEMENT. While the maximum cost to the District shall not exceed $184,822.00, the cost figures presented in Exhibit B are only estimates, and are not intended to limit the compensation to be paid for an individual task. Payments will be made to the CONSULTANT on a monthly basis upon receipt of a progress report and itemized invoices for work accomplished.

3. Supplemental services will be performed only upon written authorization by the General Manager and at the discretion of the General Manager. Payment for Supplemental Services will be made according to the terms described in this section for basic professional services. The maximum cost to the DISTRICT for Supplemental Services accomplished under this AGREEMENT shall not exceed $28,644.00. An estimated cost based on a detailed breakdown of the cost by tasks, and direct costs in shown on Exhibit B, which is attached hereto and by this reference made a part of this AGREEMENT. While the maximum cost to the District for supplemental services shall not exceed $28,644.00, the cost figures presented in Exhibit B are only estimates and are not intended to limit the compensation to be paid for an individual task. Payments will be made to the CONSULTANT on a monthly basis upon receipt of a progress report and itemized invoices for work accomplished.

Section V

TIME AND PERFORMANCE

A. The Project Time Schedule for work under this AGREEMENT is attached as Exhibit C and by this reference made a part of this AGREEMENT. The CONSULTANT will perform the work in accordance with said Project Time Schedule, and will provide the DISTRICT's representative a progress report in conjunction with the monthly invoice describing changes in schedule.

Work shall begin immediately upon receipt by the CONSULTANT of the Notice to Proceed by General Manager. All work necessary to prepare the project deliverables for submittal to the Federal Emergency Management Agency (FEMA) for review and publication shall be completed 270 calendar days from notice to proceed. Services required to coordinate with FEMA during the review and approval process will continue as required for up to 365 calendar days from notice to proceed. Supplemental services, if requested by the General Manager, will be completed within 270 calendar days from notice to proceed.

B. The DISTRICT and CONSULTANT recognize the scope of work as detailed in Exhibit A - SCOPE OF SERVICES and as outlined in Exhibit C - PROJECT TIME SCHEDULE can be altered by unforeseen events which may occur. Therefore, a supplement to this AGREEMENT will be prepared, negotiated, and executed when the CONSULTANT establishes, and the DISTRICT agrees, that there has been, or is to be a significant change, including but not limited to:

1. Scope, complexity, or character of the services to be performed such as additional meetings and coordination over those identified in Exhibit A, analysis of additional alternatives, or preparation of additional reports.

2. Conditions under which the work is required to be performed, such as a change in standards or a change in available base data which would require additional work.

3. Duration of work if the time period for completion of the work warrants such adjustment.

C. An alteration required by the DISTRICT which results in changes in the scope of work will also be specified in a supplemental AGREEMENT which will set forth the nature and scope thereof and payment therefor.

D. Neither party shall be considered in default in the performance of its obligations hereunder, or any of them, to the extent that performance of such obligations, or any of them is prevented or delayed by any cause, existing or future, which is beyond the reasonable control of such party. Delays arising from the actions or inactions of one or more of CONSULTANT's principals, officers, employees, agents, subcontractors, subconsultants, vendors, or suppliers are expressly recognized to be within the CONSULTANT's control.

Section VI

MISCELLANEOUS PROVISIONS

A. The CONSULTANT and its subconsultant(s) shall maintain all books, documents, papers, accounting reports, and other evidence pertaining to costs incurred and/or work performed and that such evidence shall be made available for inspection by the DISTRICT at all reasonable times during the AGREEMENT period for three (3) years from the date of final payment.

B. The DISTRICT has the right to terminate this AGREEMENT upon seven (7) days written notice to the CONSULTANT. This AGREEMENT may also be terminated by either party be seven (7) calendars days' written notice in the event of substantial failure to perform in accordance with the terms hereof by the one party through no fault of the other party. If said termination occurs prior to completion of the PROJECT, the CONSULTANT shall deliver to the DISTRICT all documents, calculations, and all other work performed whether complete or incomplete. Thereafter, the DISTRICT will reimburse the CONSULTANT for all services performed prior to such notice, provided the services performed are satisfactory to the DISTRICT. Termination shall be by written notice, which will be sent by certified mail or hand delivered. Such notice will be deemed effective after the third business day of the mailing post date, or hand delivered, in which case such notice will be deemed effective upon receipt of the written termination to the CONSULTANT or the DISTRICT.

C. The CONSULTANT does hereby agree to indemnify, defend, and save harmless the DISTRICT from loss, damage, liability, costs, or expense to the proportionate extent caused by the CONSULTANT, its employees, agents, or consultants and/or consultants arising out of its performance of this AGREEMENT, including, but not limited to the negligent acts, errors, omissions, or intentional misconduct of the CONSULTANT, its employees, agents or consultants and/or subconsultants in connection with this AGREEMENT.

D. During the life of this AGREEMENT, the CONSULTANT shall not engage the services of any person or persons who are currently employed by the DISTRICT without the DISTRICT's prior approval.

E. The CONSULTANT shall at all times maintain control over and have complete responsibility for all work performed under the AGREEMENT. Any attempted assignment of rights or delegation of duties under this AGREEMENT, without the written consent of the DISTRICT, shall be void.

F. The CONSULTANT shall submit for review and documentation purposes copies of all subconsultant agreements.

G. The CONSULTANT shall place his professional engineer stamp on the final FIS report substantiating that the work has been accomplished under the direct supervision of a professional engineer and in accordance with acceptable professional standards.

H. The CONSULTANT, at is own expense, shall obtain and maintain, for the duration of the Contract, insurance against claims for injuries to persons or damages to property or other losses which may arise from or in connection with CONSULTANT sole negligence or fault in the performance of work hereunder of the CONSULTANT, his agents, representatives, employees or subcontractors of any tier.

The CONSULTANT will provide the DISTRICT with certificates of insurance for coverage as listed below and endorsements, establishing coverage required by the Contract within ten (10) calendar days after approval of this Agreement by the DISTRICT's Board. The certificate of endorsements for each insurance policy are to be signed by a person authorized by the insurer and licensed by the State of Nevada.

The CONSULTANT will:

1. Maintain commercial general liability coverage at limits of no less than $1,000,000 combined single limit per occurrence and $1,000,000 annual aggregate for bodily injury (including death), personal injury and property damages. The coverage shall be on an "occurrence" basis only and not on a "claims made" basis; and the coverage must be provided on ISO commercial liability or on ISO broad form comprehensive general liability forms with not exceptions to the coverage for bodily injury, personal injury, broad form property damages, premises operations, severability of interest, products and completed operations, contractual and independent contractors. The DISTRICT, its officers, and employees must be expressly covered as additional insureds.

2. Maintain automobile coverage at limits of no less than $1,000,000 combined single limit "per accident" for bodily injury and property damage for all owned automobiles, non-owned automobiles, hired automobiles, or any automobile. The DISTRICT, its officers and employees must be expressly covered as additional insureds.

3. Maintain professional liability insurance at limits of no less that $1,000,000 per claim and $1,000,000 annual aggregate to insure against claims for losses arising out of the services rendered by the CONSULTANT, it agents, representatives or employees pursuant to the CONSULTANT's Contract with the DISTRICT. "Claims made" insurance coverage will continue for a period of three (3) years beyond the term of the Contract if available and affordable. Any retroactive date must coincide with or predate the date of the Contract and may not be advanced without the DISTRICT's consent. The CONSULTANT's professional liability insurance must provide coverage for the CONSULTANT's subcontractor if the subcontractor does not maintain

professional liability insurance in the same amounts and manner as required for the CONSULTANT.

All deductibles and self-insured retention shall be fully disclosed in the certificate of insurance. No deductible of self-insured retention may exceed $250,000 without the written approval of the DISTRICT. If aggregate limits are imposed on bodily injury and property damage, then the amount of such limits must not be less than twice the amount of the limits required herein. All aggregate must be fully disclosed and the amount entered on the required certificate of insurance. Any notice given to the CONSULTANT with respect to exhaustion of limits of insurance shall also be sent to the DISTRICT. the adequacy of the insurance supplied by the CONSULTANT, including the rating and financial health of each insurance company providing coverage, is subject to the approval of the DISTRICT.

4. Maintain Nevada Industrial Insurance and occupational Disease Acts; such insurance will protect it and the DISTRICT from claims made by the CONSULTANT due to work-related injuries.

5. The CONSULTANT's insurance shall be primary as respects to the DISTRICT, its officers, employees, and volunteers. Any other coverage available to the DISTRICT, its officers and employees shall be excess over the insurance required of the CONSULTANT.

The insurance requirements specified herein do not relieve the CONSULTANT of its responsibility or limit the amount of its liability to the DISTRICT or other persons, and the CONSULTANT is encouraged to purchase such additional insurance as it deems necessary.

6. The insurance certificate supplied by the CONSULTANT must provide for a 30-day notice to the DISTRICT before the implementation of a proposal to cancel the required insurance coverage. This notice requirement does not waive the insurance requirements contained herein. In addition, CONSULTANT shall notify DISTRICT within thirty (30) days of any reduction in coverage or limits.

7. If the CONSULTANT fails to maintain any of the insurance coverage required herein, then the DISTRICT will have the option to either terminate the Contract; declare the CONSULTANT in breach; purchase replacement insurance; or pay the premiums that are due on existing policies in order that the required coverage may be maintained. The CONSULTANT is responsible for any expenses paid by the DISTRICT to maintain such insurance, and the DISTRICT may collect the same from the CONSULTANT or deduct the amount paid from any sums due the CONSULTANT under this Contract.

I. Project Staffing

CONSULTANT shall provide the DISTRICT with a list of CONSULTANT's employees who will be performing work on the PROJECT. This list shall indicate the employee's name, classification, and hourly billing rate. This list will be used by the DISTRICT in reviewing and evaluating changes as a result of CONSULTANT's fiscal year increases (decreases).

J. Governing Law

Nevada law shall govern the interpretation of this AGREEMENT.

K. Notice

Any notice required to be given hereunder shall be deemed to have been given when received by the party to whom is directed by personal service, hand delivery, or U.S. mail at the following addresses:

To DISTRICT: Clark County Regional Flood Control District
301 East Clark Avenue, Suite 300
Las Vegas, Nevada 89101

To CONSULTANT: G. C. Wallace, Inc.
1555 South Rainbow Boulevard
Las Vegas, Nevada 89102
Attention: Calvin L. Black
Senior Vice President

IN WITNESS WHEREOF, the parties have caused this AGREEMENT to be executed the day and year first above written.

CLARK COUNTY REGIONAL FLOOD CONTROL DISTRICT

By: _____ Date: 11/14/96
Iris Bletsch
Chairman

G. C. Wallace, Inc.

By: _____ Date: 11-5-96
Calvin L. Black
Senior Vice President

ATTEST:

By: Deanna Lefko Date: 11/14/96

Deanna Lefko

Secretary

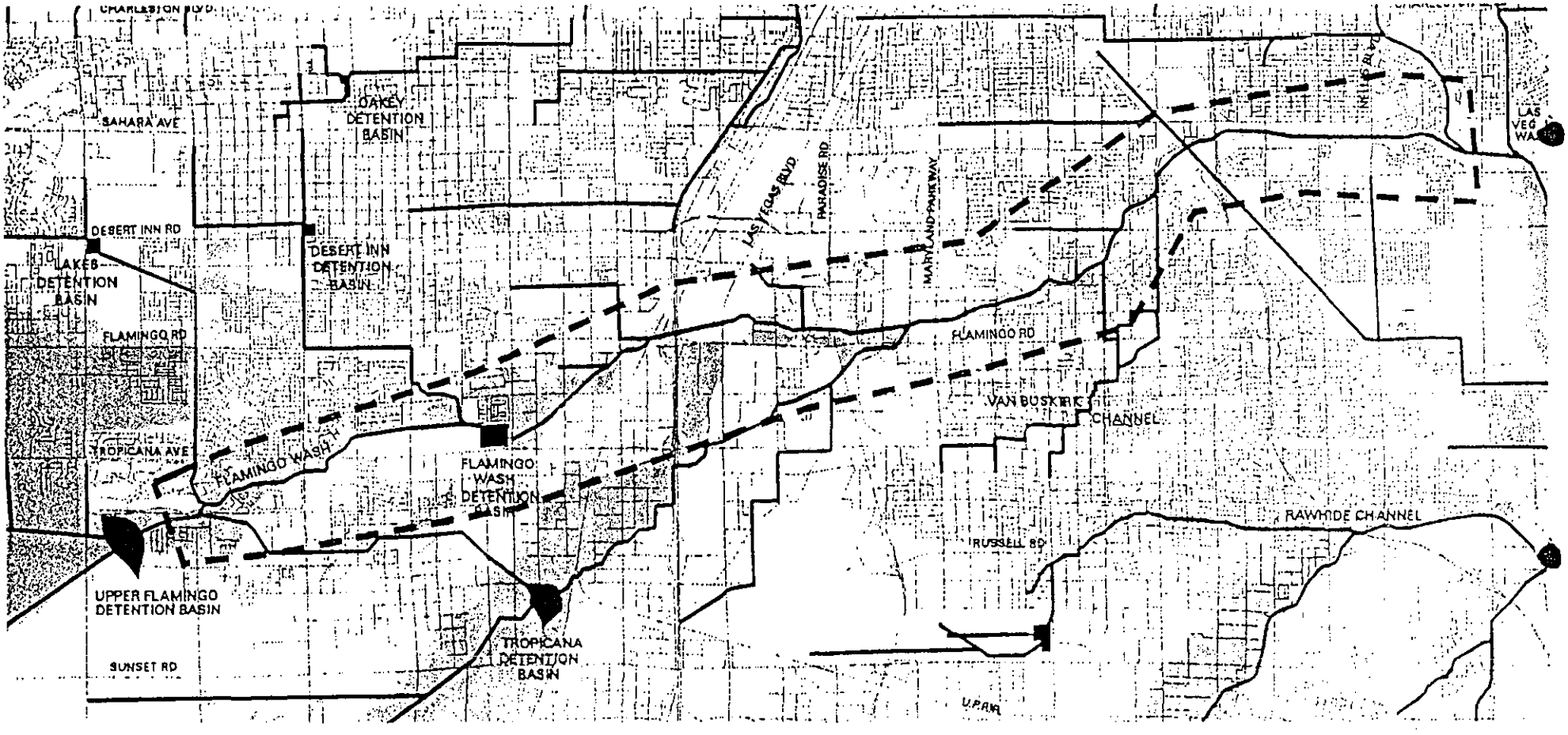
APPROVED AS TO LEGALITY ONLY:

By: Christopher D. Figgins Date: Nov 14, 96

Christopher D. Figgins

Deputy District Attorney

FLAMINGO WASH FIS STUDY AREA



LEGEND

CONVEYANCES — CENTERLINE — STUDY AREA — BASINS — FLOOD ZONES

FLAMINGO

1:7686

July 1990

EXHIBIT A
SCOPE OF SERVICES
FLAMINGO WASH - FLOOD INSURANCE STUDY RESTUDY

Project Description

The study includes an investigation to delineate floodplains and floodways and to determine base flood elevations for approximately 10.5 miles of the Flamingo Wash from the Las Vegas Wash to the Upper Flamingo Wash Detention Basin. Also included will be an investigation of the affects of the recently completed Red Rock Detention Basin Expansion on the 100-year flow for Upper Flamingo Wash Detention Basin and the Flamingo Wash. Shallow flooding delineations will be prepared for areas downstream and adjacent to the Upper Flamingo Wash Detention Basin which are associated with small tributary washes to the Flamingo Wash system.

G. C. Wallace (GCW, Consultant), in professional association with Nevada Aerial Mapping (NAM), will prepare new topographic maps for specific portions of the study area using the NGVD 29 vertical datum. GCW will convert the ground control to the NAVD 88 and Clark County vertical datum. The aerial mapping and ground control surveys will be performed in accordance with FEMA Document No. 37.

GCW will develop backwater models and supporting calculations for the study reaches to determine floodplain and, if determined necessary by the District, floodway delineations for the 100-year peak flow. The revised floodplain delineations will be reconciled with current applicable flood insurance study delineations. All work will be performed in accordance with FEMA Document No. 37, Flood Insurance Study Guidelines and Specifications for Study Contractors (FEMA Document No. 37), dated January 1995, and other published FEMA guidelines.

Task I Data Collection and Review

1.1 Collect and review studies, construction drawings, reports, mapping, etc. which pertain to the Flamingo Wash watershed to the confluence with the Las Vegas Wash (see Location Map). Sources of such information will include but are not limited to technical reports in support of LOMRs, flood control facility plans and design reports, "as built" plans, hydrologic and hydraulic reports and drainage studies from:

A. Federal agencies- FEMA
B. State Agencies- NDOT
C. County Public Works
   a. As-built certification for Red Rock Detention Basin Expansion
   b. As-built certification Upper Flamingo Wash Detention Basin
   c. Private development flood control improvements
D. Private consultants or developers

The District will furnish a copy of *Las Vegas Valley Flood Insurance Study Hydrology Report* and the *Technical Support Data Notebook for the Upper Flamingo Wash Detention Basin Letter of Map Revision* both with appendices and computer diskettes.

Design hydrology, hydraulics and sediment transport data (on computer diskette when available) for the Red Rock Detention Basin Expansion and Upper Flamingo Detention Basin will be provided by the District and Clark County Public Works. Review data to determine whether any additional calculations are warranted.

As-built certifications have been received and accepted by FEMA for the Red Rock Detention Basin Expansion and the Upper Flamingo Wash Detention Basin in conjunction with previous LOMR requests sponsored by the District.

Review reports to determine whether additional hydrologic calculations are warranted. Determine level of effort required to be performed under Task 5.1.

1.2 Perform a detailed field review of and document with photos:

1.2.1 Major hydraulic structures & bridges
1.2.2 Channel improvements
1.2.3 Natural channels

1.3 GCW will provide field surveys to obtain the physical dimensions of specific hydraulic structures within the study area in accordance with FEMA Document 37. The specific hydraulic structures will include:

- The Nellis Boulevard bridge.
- The Lamb Boulevard bridge.
- Two bridges under US 95.
- The private access bridge between Pecos Road and US 95.
- The Mojave Road bridge.

- The Desert Inn Road bridge.
- The Pecos-McLeod Interconnect bridge.
- The Eastern Avenue bridge.
- The Spencer Street bridge.
- The Maryland Parkway bridge.
- The Cambridge Street bridge.
- The Swenson Street bridge.
- The Palos Verdes Street bridge.
- The Paradise Road bridge.
- The Koval Lane Storm Drain inlet and outlet structures.
- The inlet and outlet structures for the culvert between the Imperial Palace parking garage and I 15.
- The culvert under Industrial Road and I 15.
- The UPRR bridge.
- The Flamingo Road bridge.
- The Valley View Boulevard culvert.
- The Arville Street bridge.
- The culvert through the Orleans parking lot.
- The Cameron Street bridge.
- The Decatur Boulevard bridge.
- The Jones Boulevard bridge.
- The Tropicana Avenue bridge.
- The Rainbow Boulevard bridge.
- The Hacienda Avenue culvert.
- The channelized portion of the Flamingo Wash between Tropicana Avenue and Rainbow Boulevard.

1.4 Prepare written summary of field review and data collection. Include preliminary bibliography for final report.

1.5 Prepare summary memorandum detailing the data summary and review effort, findings, and recommendations.

Task II **Floodplain Delineation**

2.1 GCW will obtain all necessary rights-of-entry for the study area. The District will assist as may be necessary.

2.2 Nevada Aerial Mapping (NAM) will be retained by GCW as part of this contract to perform aerial topographic mapping within specific portions of the restudy area. GCW will cocrdinate the work of NAM to ensure that the specifications of the surveying work are met. Quality control of aerial surveys will be per FEMA Document No. 37, **Flood Insurance Study Guidelines and Specifications for Study Contractors**, dated January 1995.

2.2.1 Prepare topographic mapping with a 4-foot contour interval at a scale of 1-inch = 400-feet. The width of the mapping will generally range from 600 feet to 1000 feet and will include the entire site for the future

Flamingo Wash Detention Basin (Decatur Blvd at Tropicana Ave). The limits of the topographic mapping will be as follows:

- From the confluence with the Las Vegas Wash to Pecos Road.
- From Mojave Road to a point upstream from Eastern Avenue.
- From a point downstream from Spencer Street to the Imperial Palace parking garage.
- From Industrial Road to a point upstream from Jones Boulevard.

2.2.2 Ground Control

a. GCW shall provide survey control using NGVD 29 datum for development of topographic mapping. The ground control will also be converted to NAVD 88 and Clark County vertical datum. Existing Clark County survey control markers will be identified and described for use as elevation reference markers (ERMs). ERM description, location and elevation will be tabulated and submitted with the FIS report.

b. GCW will systematically set panel points and establish horizontal and vertical control throughout the areas to be mapped for use in compilation by NAM. Where readily available, survey will be tied to the State Plane Coordinate System. Field control will use existing documented Clark County survey points where possible, and be of an adequate density and location to meet the requirements of the aerial surveying subcontractor and FEMA Document No. 37.

2.3 Prepare study base map from data gathered in Task 1.1 and Task 2.2.

2.4 Compile data from Task 1.1 and 5.1 to determine design flows for submittal to FEMA to support 100-year flow rates to be used for hydraulic analyses.

2.5 Prepare detailed methods hydraulic analyses.

2.5.1 Base flood elevations, floodplain, floodway and shallow flooding delineations will be based on the U.S. Army Corps of Engineer's HEC-2 backwater model and/or additional detailed and approximate method determinations deemed acceptable by FEMA. These delineations will simulate the effects of floodplain geomorphology, flow rate changes, bridges, culverts, hydraulic roughness, effective flow limitations, split flows, and other considerations to most realistically represent flooding conditions. The consultant will analyze riverine and shallow flooding areas and prepare the study and maps according to the guidelines outlined in FEMA Document No. 37.

2.5.2 GCW will prepare work maps and models of the 100-year floodplain during the course of the hydraulic analysis for review by the District and entities during progress meetings.

2.5.3 Prepare final Technical Data and workmaps.

2.5.4 Complete all applicable FEMA Forms.

2.6 Prepare final floodplain mapping study to include as a minimum the following outline.

I. Introduction
   a. Purpose of Study
   b. Authority for Study
   c. Coordination and Acknowledgements

II. Area Studied
   a. Scope of Study
   b. Community Description
   c. Principal Flood Problems
   d. Flood Protection Measures

III. Engineering Methods
   a. Hydrologic Analysis
   b. Hydraulic Analysis

IV. Insurance Applications

V. Other Studies

VI. Bibliography

VII. Appendices - Supporting Technical Data, FEMA Forms

Task 3 **Coordination**

3.1 GCW will coordinate and participate in regular progress meetings with the District and the impacted communities at least monthly, and at milestones in the development of the study. Consultant will prepare and distribute minutes of all meetings.

3.2 Through the District, GCW will submit maps, reports and technical data to all applicable government agency reviewers.

3.3 Throughout the restudy effort, GCW will coordinate with FEMA and FEMA's Technical Evaluation Contractor (TEC) in order to proceed in the most time efficient manner. GCW will be responsible for responding to and interacting with FEMA's TEC throughout the review and community appeals process as outlined in FEMA Document No. 37.

Task 4 Final Products

4.1 Mapping

4.1.1 GCW will provide the District with permanent non-erasable topographic mylar sheets 24" X 36" at the scale and contour interval specified in Task 2.2. A cover sheet will be provided with project title, date of topography, and sheet index. Each sheet of topography will include at a minimum a north arrow, scale, photo date, section and quarter corners, street names, State Plane Coordinate information, major drainage features, corporate and town boundaries, cross section lines, channel centerline station, 100-year flood limits, description and elevation of control points and ERMs and reference marks used in ground control.

4.1.2 Digital contour and planimetric data developed under Task 2.2 shall be delivered to the District in a digital format acceptable to-FEMA and the District.

a. Available topography identified as acceptable under Task 1.1 and Task 2.2 will be reproduced from their source and delivered to the District in a durable reproducible form acceptable to the District.

b. Additional topographic maps, contact prints, photo mylars, digital data, etc. will be delivered to the District as required by the Supplemental Services Section and authorized per Task 1.4 and developed per Task 5.2.

4.2 Report

a. GCW will produce a final report incorporating all previous comments from the District, FEMA and other reviewers. Six (6) hard copies of the report and appendices will be delivered.

b. Report text in WordPerfect 5.1 format on a 3-1/2 inch, 1.44 Mb diskette compatible with IBM personal computers.

c. Six (6) copies of the Technical Support Data Notebook.

Task 5 Supplemental Services

5.1 GCW shall provide any additional technical analyses deemed necessary under Task 1.5.

5.1.1 Prepare additional hydrologic, hydraulic and sediment transport analyses.

5.2 Submit refinements/revisions to the District for approval. Prepare report for final study.

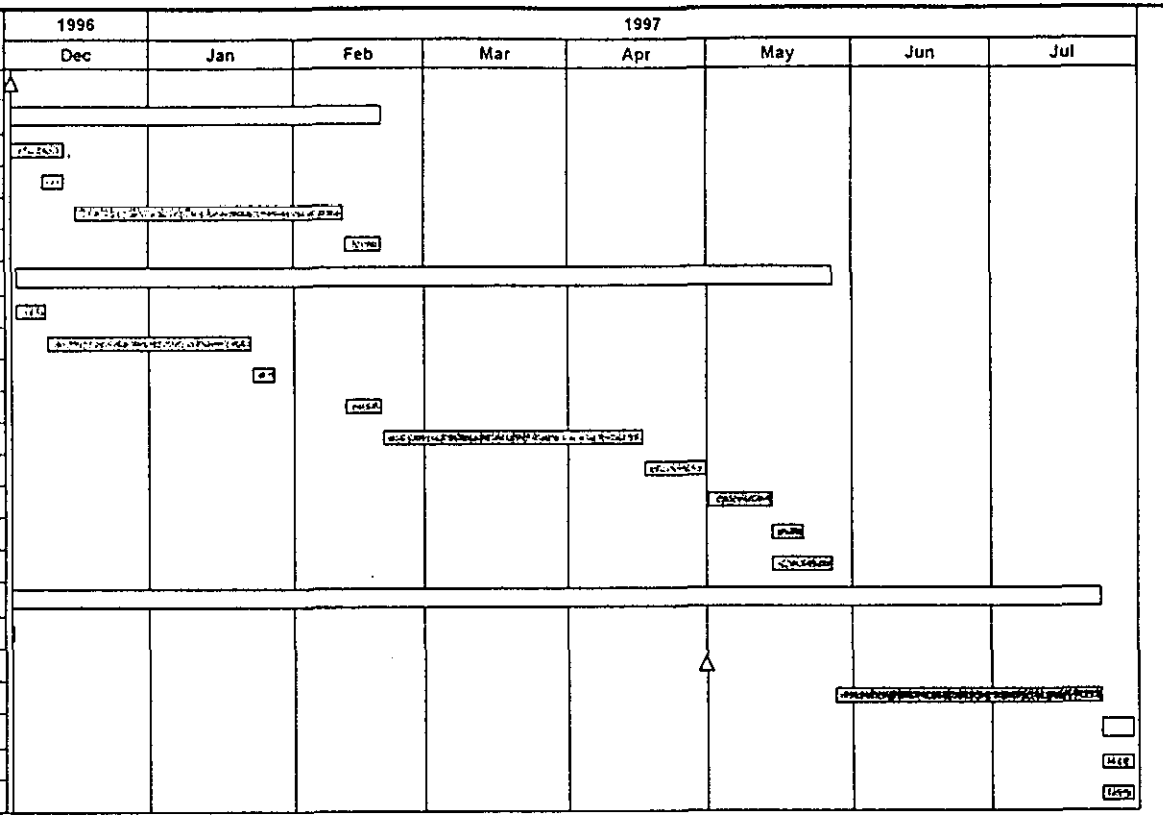
EXHIBIT B
FLAMINGO WASH FLOOD INSURANCE STUDY RESTUDY
ENGINEERING FEE ESTIMATE

TASK	ITEM	ASSOC $120	SR. ENGR $95	ENGR $84	DES/DRA $72	SURVEY $151	COST	OUTSIDE SERVICES	
TASK 1 DATA COLLECTION									
1.1	Collect & Review Exst. Data	8	24	40	60		$10,920		
1.2	Field Recon/Stream Walk/Photo Doc.	0	8	16	16		$3,256	$50	
1.3	Structure/Stream Survey	8	8	24	24	160	$29,624		
1.4	Prep Summary Recon	2	4	12			$1,628		
1.5	Summary Data Review	2	4	8	16		$2,444		
	SUBTOTAL TASK 1	20	48	100	116	160	$47,872	$50	
TASK 2 FLOODPLAIN DELINEATION									
2.1	Rt. of Entry	2	8	8			$1,672		
2.2	Aerial Topo & Ground Control	2	4	4	8	132	$21,464	$15,000	
2.3	Prep. Base Maps	2	4	8	16		$2,444		
2.4	Summary Design Flows	4	8	24	40		$6,136		
2.5.1	Hydraulic Model	40	80	120	120		$31,120		
2.5.2	Wrk Maps for Prog Mtgs	8	16	40	40		$8,720	$100	
2.5.3	Prep TSDN	4	32	60	16		$9,712		
2.5.4	LOMR App.	4	8	24	40		$6,136		
2.6	Final Report	16	24	60	60		$13,560		
	SUBTOTAL TASK 2	80	176	340	340	132	$100,964	$15,100	
TASK 3 COORDINATION									
3.1	Progress Mtgs	40	40				$8,600		
3.2	Data Submittal to Local Entities		4	8	16		$2,204		
3.3	FEMA Coord.	8	12	40	16		$6,612		
	SUBTOTAL TASK 3	48	56	48	32	0	$17,416		
TASK 4 FINAL PRODUCTS									
4.1	Mapping			8	4		$960	$500	
4.2	TSDN & Reports			8	4		$960	$1,000	
	SUBTOTAL TASK 4	0	0	16	8	0	$1,920	$1,500	
						SUBTOTAL BASE CONTRACT	$168,172	$16,650	
						TOTAL BASE CONTRACT	**$184,822**		
TASK 5 SUPPLEMENTAL SERVICES									
5.1	Additional Technical Analysis	8	40	80	80	40	$23,280		
5.2	Submit Refinements to CCRFCD	6	12	28	16		$5,364		
	SUBTOTAL TASK 5	14	52	108	96	40	$28,644	$0	
						TOTAL SUPPLEMENTAL SERVICES	**$28,644**		
						GRAND TOTAL	**$213,466**		

FLAMINGO WASH F.I.S. RESTUDY

EXHIBIT C

Task Name	Start Date	End Date
Notice to Proceed	12/2/96	12/2/96
DATA COLLECTION	12/2/96	2/19/97
Collect & Review exist. data	12/2/96	12/13/96
Field Recon	12/9/96	12/13/96
Recon Summary	12/16/96	2/11/97
Summary Data Review	2/12/97	2/19/97
FLOODPLAIN DELINEATION	12/3/96	5/27/97
Rt. of Entry	12/3/96	12/9/96
Aerial Topographic mapping	12/10/96	1/22/97
Prep. Base Maps	1/23/97	1/27/97
Summary of design flows	2/12/97	2/19/97
Hydraulic model	2/20/97	4/16/97
Work Maps	4/17/97	4/30/97
Prep. TSDN	5/1/97	5/14/97
LOMR application	5/15/97	5/21/97
Final Report	5/15/97	5/27/97
COORDINATION	12/2/96	7/23/97
Progress Meetings	12/2/96	12/2/96
Data submittal to Local Entities	4/30/97	4/30/97
FEMA coordination	5/28/97	7/23/97
FINAL PRODUCTS	7/24/97	7/30/97
Mapping	7/24/97	7/30/97
TSDN & Reports	7/24/97	7/30/97



Printed: 11/4/96
Page 1

Study Contractor: G. C. Wallace, Inc.

HYDROLOGIC ANALYSES INDEX

Clark County, Nevada

(COMMUNITY NAME, STATE)

FLOOD INSURANCE STUDY

HYDROLOGIC ANALYSES INDEX

FLOODING SOURCE/ STREAM NAME	HYDROLOGIC METHOD/ MODEL USED	METHOD/MODEL ANALYSIS DATE	EXHIBIT NO. PAPER COPY	EXHIBIT NO. FLOPPY DISKETTES
FLAMINGO WASH	LOMR 97-09-177P	JANUARY 14, 1997	ENCLOSED	—
FLAMINGO WASH	LOMR 97-09-138P	JANUARY 14, 1997	"	—
FLAMINGO WASH	HYDROLOGIC SUBAREAS	1991	"	—
FLAMINGO WASH	HEC-1/F100.DAT	DECEMBER 12, 1990	"	ENCLOSED
FLAMINGO WASH	HEC-1/F100R.DAT	OCTOBER 6, 1997	"	"
FLAMINGO WASH	HEC-1/F-FL.DAT	"	"	"
FLAMINGO WASH	HEC-1/F-FLC.DAT	"	"	"

Federal Emergency Management Agency

Washington, D.C. 20472

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

IN REPLY REFER TO:
Case No.: 97-09-177P

The Honorable Jan Laverty Jones
Mayor, City of Las Vegas
400 East Stewart Avenue
Las Vegas, Nevada 89101

Community: City of Las Vegas, Nevada
Community No.: 325276
Panels Affected: 32003C2145 D and 2150 D
Effective Date of
This Revision: JAN14 1997

102-D

Dear Mayor Jones:

This responds to a request that the Federal Emergency Management Agency (FEMA) revise the effective Flood Insurance Rate Map (FIRM) for Clark County, Nevada and Incorporated Areas, in accordance with Part 65 of the National Flood Insurance Program (NFIP) regulations. In a letter dated November 6, 1996, Mr. Gale Wm. Fraser II, P.E., General Manager/Chief Engineer, Clark County Regional Flood Control District, requested that FEMA revise the FIRM to show the effects of the modifications to the Red Rock Detention Basin along Red Rock Fan. This request follows up on a Conditional Letter of Map Revision issued on January 13, 1995.

All data required to complete our review of this request were submitted with letters from Mr. Fraser. Because this Letter of Map Revision (LOMR) shows the effects of a publicly sponsored flood-control project that reduces flooding to existing development, fees were not assessed for the review.

We have completed our review of the submitted data and the flood data shown on the effective FIRM. We have revised the FIRM to modify the floodplain boundary delineations and zone designations of the flood having a 1-percent chance of being equaled or exceeded in any given year (base flood) along Red Rock Fan from just upstream of West Desert Inn Road to just downstream of South Hualapai Way. As a result of the modifications, the Special Flood Hazard Area (SFHA), the area that would be inundated by the base flood, for Red Rock Fan was removed along the revised reach. The modifications are shown on the enclosed annotated copies of FIRM Panels 32003C2145 D and 32003C2150 D. This LOMR hereby revises the above-referenced panel(s) of the effective FIRM dated August 16, 1995.

The modifications are effective as of the date of this letter. The map panels as listed above and as modified by this letter will be used for all flood insurance policies and renewals issued for your community.

A review of the determination made by this LOMR and any requests to alter this determination should be made within 30 days. Any request to alter the determination must be based on scientific or technical data.

Because this project also affects the unincorporated areas of Clark County, Nevada, a separate LOMR was issued on the same date as this LOMR for that community.

We will not physically revise and republish the FIRM and FIS report for your community to reflect the modifications made by this LOMR at this time. When changes to the previously cited FIRM panels and FIS report warrant physical revision and republication in the future, we will incorporate the modifications made by this LOMR at that time.

This LOMR is based on minimum floodplain management criteria established under the NFIP. Your community is responsible for approving all floodplain development, and for ensuring all necessary permits required by Federal or State law have been received. State, county, and community officials, based on knowledge of local conditions and in the interest of safety, may set higher standards for construction in the SFHA. If the State, county, or community has adopted more restrictive or comprehensive floodplain management criteria, these criteria take precedence over the minimum NFIP criteria.

The basis of this LOMR is, in whole or in part, a channel-modification project. NFIP regulations, as cited in Paragraph 60.3(b)(7), require that communities assure that the flood-carrying capacity within the altered or relocated portion of any watercourse is maintained. This provision is incorporated into your community's existing floodplain management regulations. Consequently, the ultimate responsibility for maintenance of the modified channel rests with your community.

Because this LOMR will not be printed and distributed to primary users, such as local insurance agents and mortgage lenders, your community will serve as a repository for these new data. We encourage you to disseminate the information reflected by this LOMR throughout the community, so that interested persons, such as property owners, local insurance agents, and mortgage lenders, may benefit from the information. We also encourage you to prepare an article for publication in your community's local newspaper. This article should describe the changes that have been made and the assistance that officials of your community will give to interested persons by providing these data and interpreting the NFIP maps.

This determination has been made pursuant to Section 206 of the Flood Disaster Protection Act of 1973 (Public Law 93-234) and is in accordance with the National Flood Insurance Act of 1968, as amended (Title XIII of the Housing and Urban Development Act of 1968, Public Law 90-448), 42 U.S.C. 4001-4128, and 44 CFR Part 65. Pursuant to Section 1361 of the National Flood Insurance Act of 1968, as amended, communities participating in the NFIP are required to adopt and enforce floodplain management regulations that meet or exceed NFIP criteria. These criteria are the minimum requirements and do not supersede any State or local requirements of a more stringent nature. This includes adoption of the effective FIRM to which the regulations apply and the modifications described in this LOMR.

If you have any questions regarding floodplain management regulations for your community or the NFIP in general, please contact the Consultation Coordination Officer (CCO) for your community. Information on the CCO for your community may be obtained by contacting the Director, Mitigation Division of FEMA in San Francisco, California, at (415) 923-7177. If you have any technical questions regarding this LOMR, please contact Mr. Karl Mohr of our staff in Washington, DC, either by telephone at (202) 646-2770 or by facsimile at (202) 646-4596.

Sincerely,

Frederick H. Sharrocks, Jr., Chief
Hazard Identification Branch
Mitigation Directorate

Enclosures

cc: Mr. Randy L. Fultz, P.E.
Flood Control Project Manager
Department of Public Works
City of Las Vegas

The Honorable Yvonne Atkinson Gates
Chairperson, Clark County Board
of Commissioners

Mr. Gale Wm. Fraser II, P.E.
General Manager/Chief Engineer
Clark County Regional Flood
Control District

Mr. Kevin L. Eubanks, P.E.
Assistant General Manager
Clark County Regional Flood
Control District

LOMR

Federal Emergency Management Agency

Washington, D.C. 20472

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

IN REPLY REFER TO:
Case No.: 97-09-177P

The Honorable Yvonne Atkinson Gates
Chairperson, Clark County
Board of Commissioners
225 Bridger Avenue, Sixth Floor
Las Vegas, Nevada 89155

Community: Clark County, Nevada
Community No.: 320003
Panels Affected: 32003C2145 D, 2150 D, 2535 D, and 2550 D
Effective Date of This Revision: JAN14 1997

102-D

Dear Ms. Gates:

This responds to a request that the Federal Emergency Management Agency (FEMA) revise the effective Flood Insurance Rate Map (FIRM) for Clark County, Nevada and Incorporated Areas in accordance with Part 65 of the National Flood Insurance Program (NFIP) regulations. In a letter dated November 6, 1996, Mr. Gale Wm. Fraser II, P.E., General Manager/Chief Engineer, Clark County Regional Flood Control District, requested that FEMA revise the FIRM to show the effects of the modifications to the Red Rock Detention Basin along Red Rock Fan. This request follows up on a Conditional Letter of Map Revision issued on January 13, 1995.

All data required to complete our review of this request were submitted with letters from Mr. Fraser. Because this Letter of Map Revision (LOMR) shows the effects of a publicly sponsored flood-control project that reduces flooding to existing development, fees were not assessed for the review.

We have completed our review of the submitted data and the flood data shown on the effective FIRM. We have revised the FIRM to modify the floodplain boundary delineations and zone designations of the flood having a 1-percent chance of being equaled or exceeded in any given year (base flood) along Red Rock Fan from just upstream of South Buffalo Drive to just upstream of Red Rock Detention Basin. As a result of the modifications, the Special Flood Hazard Area (SFHA), the area that would be inundated by the base flood, for Red Rock Fan was removed along the revised reach. The modifications are shown on the enclosed annotated copies of FIRM Panels 32003C2145 D, 32003C2150 D, 32003C2535 D, and 32003C2550 D. This LOMR hereby revises the above-referenced panel(s) of the effective FIRM dated August 16, 1995.

The modifications are effective as of the date of this letter. The map panels as listed above and as modified by this letter will be used for all flood insurance policies and renewals issued for your community.

Because this project also affects the City of Las Vegas, Nevada, a separate LOMR was issued on the same date as this LOMR for that community.

A review of the determination made by this LOMR and any requests to alter this determination should be made within 30 days. Any request to alter the determination must be based on scientific or technical data.

We will not physically revise and republish the FIRM and Flood Insurance Study (FIS) report for your community to reflect the modifications made by this LOMR at this time. When changes to the previously cited FIRM panels and FIS report warrant physical revision and republication in the future, we will incorporate the modifications made by this LOMR at that time.

This LOMR is based on minimum floodplain management criteria established under the NFIP. Your community is responsible for approving all floodplain development, and for ensuring all necessary permits required by Federal or State law have been received. State, county, and community officials, based on knowledge of local conditions and in the interest of safety, may set higher standards for construction in the SFHA. If the State, county, or community has adopted more restrictive or comprehensive floodplain management criteria, these criteria take precedence over the minimum NFIP criteria.

The basis of this LOMR is, in whole or in part, a channel-modification project. NFIP regulations, as cited in Paragraph 60.3(b)(7), require that communities assure that the flood-carrying capacity within the altered or relocated portion of any watercourse is maintained. This provision is incorporated into your community's existing floodplain management regulations. Consequently, the ultimate responsibility for maintenance of the modified channel rests with your community.

Because this LOMR will not be printed and distributed to primary users, such as local insurance agents and mortgage lenders, your community will serve as a repository for these new data. We encourage you to disseminate the information reflected by this LOMR throughout the community, so that interested persons, such as property owners, local insurance agents, and mortgage lenders, may benefit from the information. We also encourage you to prepare an article for publication in your community's local newspaper. This article should describe the changes that have been made and the assistance that officials of your community will give to interested persons by providing these data and interpreting the NFIP maps.

This determination has been made pursuant to Section 206 of the Flood Disaster Protection Act of 1973 (Public Law 93-234) and is in accordance with the National Flood Insurance Act of 1968, as amended (Title XIII of the Housing and Urban Development Act of 1968, Public Law 90-448), 42 U.S.C. 4001-4128, and 44 CFR Part 65. Pursuant to Section 1361 of the National Flood Insurance Act of 1968, as amended, communities participating in the NFIP are required to adopt and enforce floodplain management regulations that meet or exceed NFIP criteria. These criteria are the minimum requirements and do not supersede any State or local requirements of a more stringent nature. This includes adoption of the effective FIRM and FIS report to which the regulations apply and the modifications described in this LOMR.

If you have any questions regarding floodplain management regulations for your community or the NFIP in general, please contact the Consultation Coordination Officer (CCO) for your community. Information on the CCO for your community may be obtained by contacting the Director, Mitigation Division of FEMA in San Francisco, California, at (415) 923-7177. If you have any technical questions regarding this LOMR, please contact Mr. Karl Mohr of our staff in Washington, DC, either by telephone at (202) 646-2770 or by facsimile at (202) 646-4596.

Sincerely,

Frederick H. Sharrocks, Jr., Chief
Hazard Identification Branch
Mitigation Directorate

Enclosures

cc: Mr. Gale Wm. Fraser II, P.E.
General Manager/Chief Engineer
Clark County Regional Flood Control District

Mr. Kevin L. Eubanks, P.E.
Assistant General Manager
Clark County Regional Flood Control District

Mr. Robert B. Thompson, P.E.
Civil Engineer III
Clark County Department of Public Works

The Honorable Jan Laverty Jones
Mayor, City of Las Vegas

UPPER FLAMINGO DB

Federal Emergency Management Agency

Washington, D.C. 20472

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

IN REPLY REFER TO:
Case No.: 97-09-138P

The Honorable Yvonne Atkinson Gates
Chairperson, Clark County
Board of Commissioners
225 East Bridger Avenue
Las Vegas, Nevada 89155

Community: Clark County, Nevada
Community No.: 320003
Panel Affected: 32003C2535 D
Effective Date of
This Revision: JAN14 1997

102-I-C

Dear Ms. Gates:

This responds to a request that the Federal Emergency Management Agency (FEMA) revise the effective Flood Insurance Rate Map (FIRM) for Clark County, Nevada and Incorporated Areas in accordance with Part 65 of the National Flood Insurance Program (NFIP) regulations. In a letter dated October 21, 1996, Mr. Kevin L. Eubanks, P.E., Assistant General Manager, Clark County Regional Flood Control District, requested that FEMA revise the FIRM to show the effects of the construction of Upper Flamingo Wash Detention Basin along Flamingo Fan and Flamingo Wash. This request follows up on a Conditional Letter of Map Revision issued on August 27, 1993.

All data required to complete our review of this request were submitted with letters from Mr. Eubanks. Because this Letter of Map Revision (LOMR) shows the effects of a publicly sponsored flood-control project that reduces flooding to existing development, fees were not assessed for the review.

We have completed our review of the submitted data and the flood data shown on the effective FIRM. We have revised the FIRM to modify the floodplain boundary delineations and zone designations of the flood having a 1-percent chance of being equaled or exceeded in any given year (base flood) along Flamingo Fan and Flamingo Wash from just upstream of West Hacienda Avenue to just upstream of Upper Flamingo Detention Basin. As a result of the modifications, the width of the Special Flood Hazard Area (SFHA), the area that would be inundated by the base flood, for Flamingo Fan and Flamingo Wash increased in some areas and decreased in other areas along the revised reach. The modifications are shown on the enclosed annotated copy of FIRM Panel 32003C2535 D. This LOMR hereby revises the above-referenced panel(s) of the effective FIRM dated August 16, 1995.

The modifications are effective as of the date of this letter. The map panel as listed above and as modified by this letter will be used for all flood insurance policies and renewals issued for your community.

A review of the determination made by this LOMR and any requests to alter this determination should be made within 30 days. Any request to alter the determination must be based on scientific or technical data.

We will not physically revise and republish the FIRM and Flood Insurance Study (FIS) report for your community to reflect the modifications made by this LOMR at this time. When changes to the previously cited FIRM panels and FIS report warrant physical revision and republication in the future, we will incorporate the modifications made by this LOMR at that time.

This LOMR is based on minimum floodplain management criteria established under the NFIP. Your community is responsible for approving all floodplain development, and for ensuring all necessary permits required by Federal or State law have been received. State, county, and community officials, based on knowledge of local conditions and in the interest of safety, may set higher standards for construction in the

SFHA. If the State, county, or community has adopted more restrictive or comprehensive floodplain management criteria, these criteria take precedence over the minimum NFIP criteria.

The basis of this LOMR is, in whole or in part, a channel-modification project. NFIP regulations, as cited in Paragraph 60.3(b)(7), require that communities assure that the flood-carrying capacity within the altered or relocated portion of any watercourse is maintained. This provision is incorporated into your community's existing floodplain management regulations. Consequently, the ultimate responsibility for maintenance of the modified channel rests with your community.

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This determination has been made pursuant to Section 206 of the Flood Disaster Protection Act of 1973 (Public Law 93-234) and is in accordance with the National Flood Insurance Act of 1968, as amended (Title XIII of the Housing and Urban Development Act of 1968, Public Law 90-448), 42 U.S.C. 4001-4128, and 44 CFR Part 65. Pursuant to Section 1361 of the National Flood Insurance Act of 1968, as amended, communities participating in the NFIP are required to adopt and enforce floodplain management regulations that meet or exceed NFIP criteria. These criteria are the minimum requirements and do not supersede any State or local requirements of a more stringent nature. This includes adoption of the effective FIRM and FIS report to which the regulations apply and the modifications described in this LOMR.

A Consultation Coordination Officer (CCO) has been designated to assist your community. The CCO will be the primary liaison between your community and FEMA. For information regarding your CCO, please contact:

Ms. Dorothy M. Lacey
Director, Mitigation Division
Federal Emergency Management Agency, Region IX
The Presidio of San Francisco, Building 105
San Francisco, California 94129-1250
(415) 923-7177

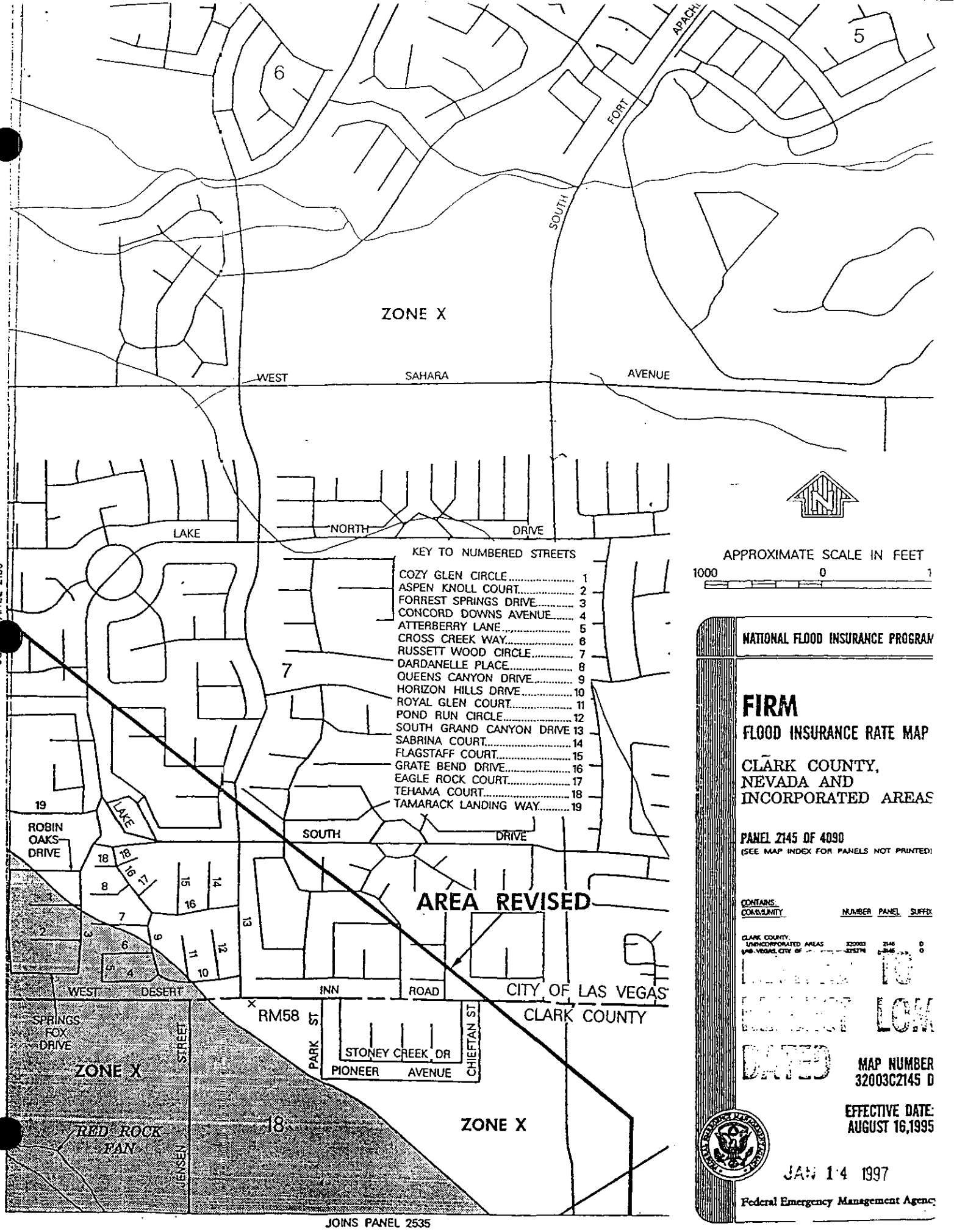
If you have any questions regarding floodplain management regulations for your community or the NFIP in general, please contact the CCO for your community at the telephone number cited above. If you have any technical questions regarding this LOMR, please contact Mr. Karl Mohr of our staff in Washington, DC, either by telephone at (202) 646-2770 or by facsimile at (202) 646-4596.

Sincerely,

Frederick H. Sharrocks, Jr., Chief
Hazard Identification Branch
Mitigation Directorate

Enclosure

cc: Mr. Kevin L. Eubanks, P.E.
Assistant General Manager
Clark County Regional Flood
Control District



APPROXIMATE SCALE IN FEET
1000 0 1

NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP

CLARK COUNTY, NEVADA AND INCORPORATED AREAS

PANEL 2145 OF 4090
(SEE MAP INDEX FOR PANELS NOT PRINTED)

CONTAINS COMMUNITY	NUMBER	PANEL	SUFFIX
CLARK COUNTY, UNINCORPORATED AREAS	320003	2145	D
LAS VEGAS, CITY OF	325276	2145	D

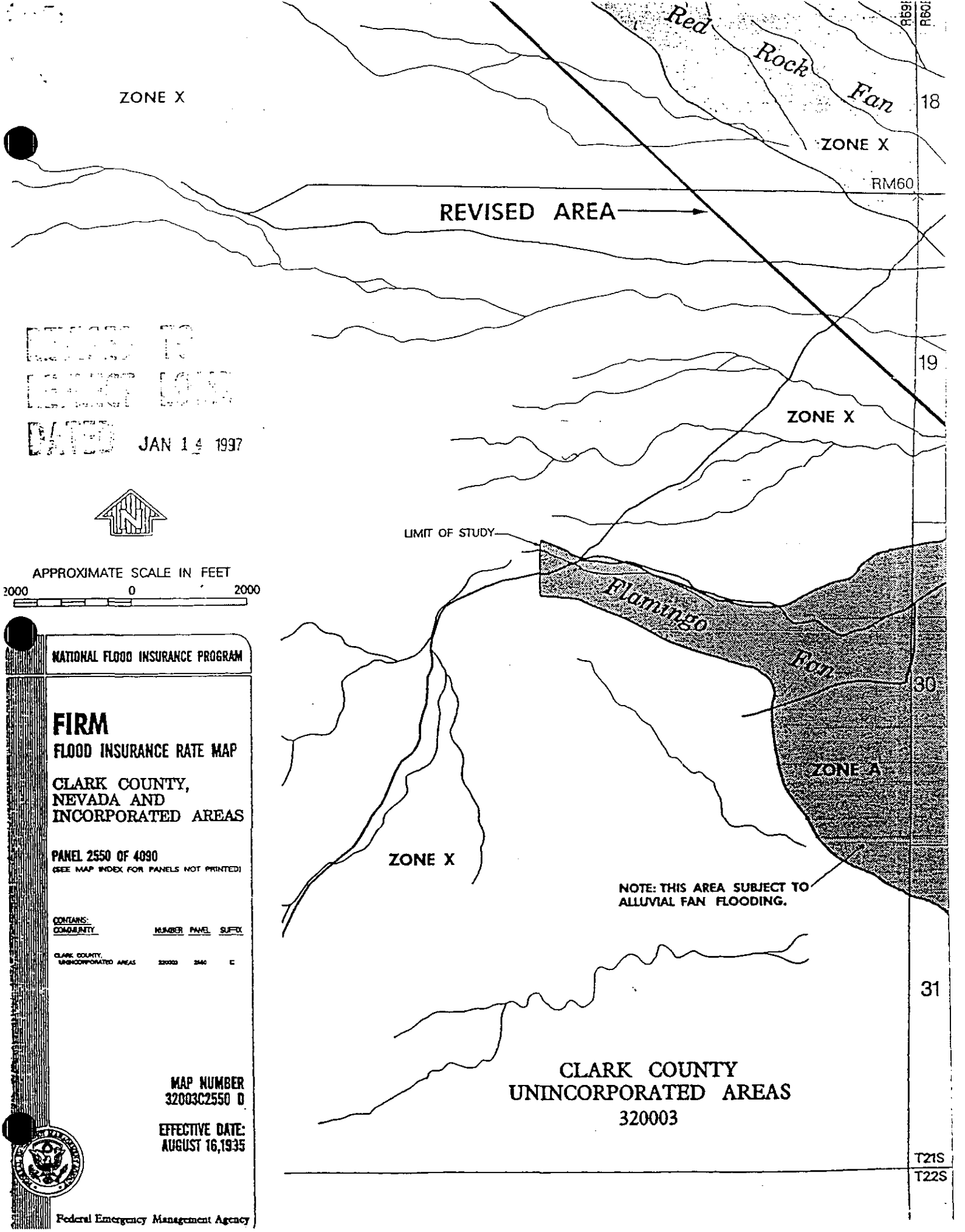
DATED

MAP NUMBER
32003C2145 D

EFFECTIVE DATE:
AUGUST 16,1995

JAN 14 1997

Federal Emergency Management Agency



EFFECTIVE DATE
FLOOD INSURANCE RATE MAP
DATED JAN 14 1997

APPROXIMATE SCALE IN FEET
2000 0 2000

NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP

CLARK COUNTY, NEVADA AND INCORPORATED AREAS

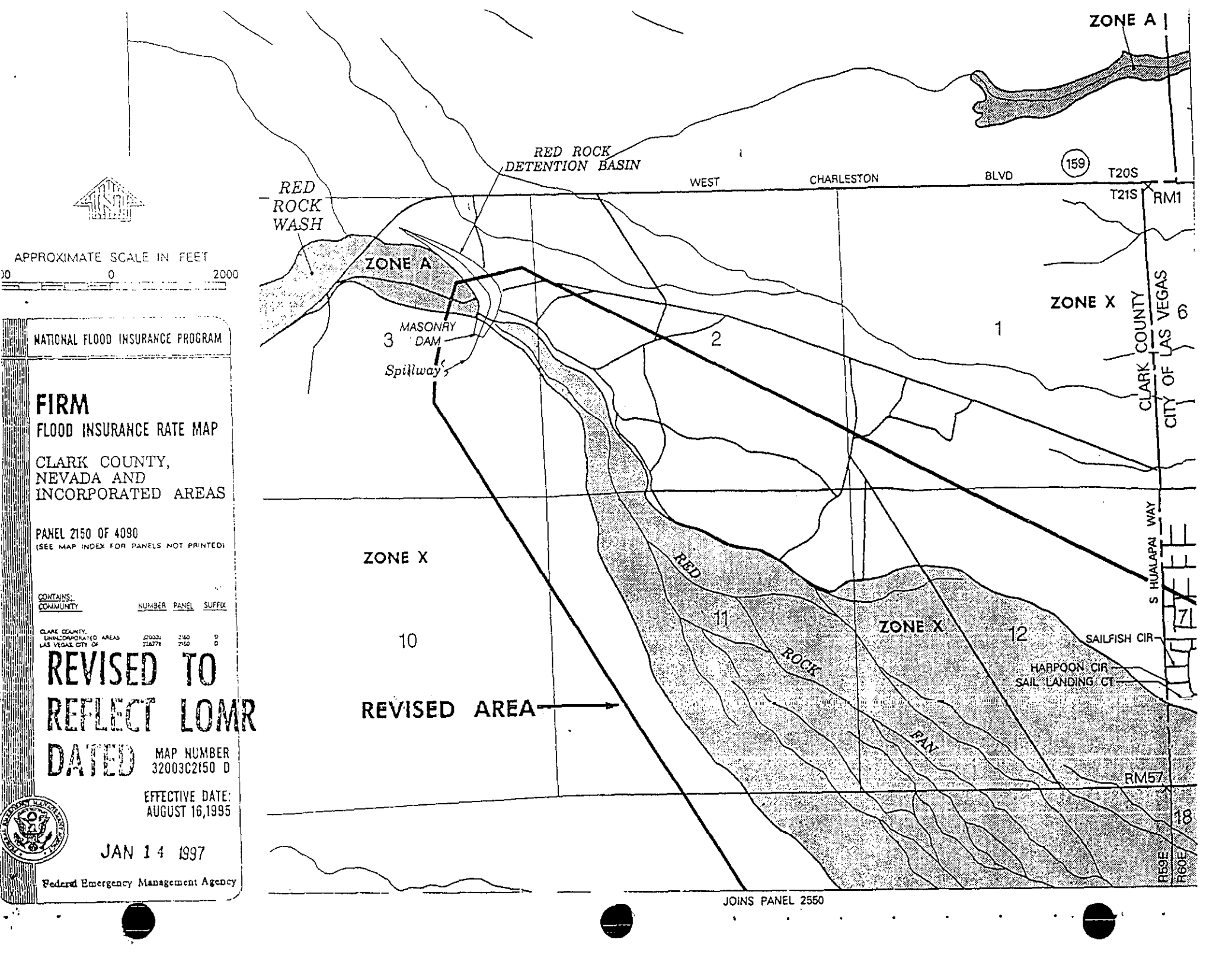
PANEL 2550 OF 4090
(SEE MAP INDEX FOR PANELS NOT PRINTED)

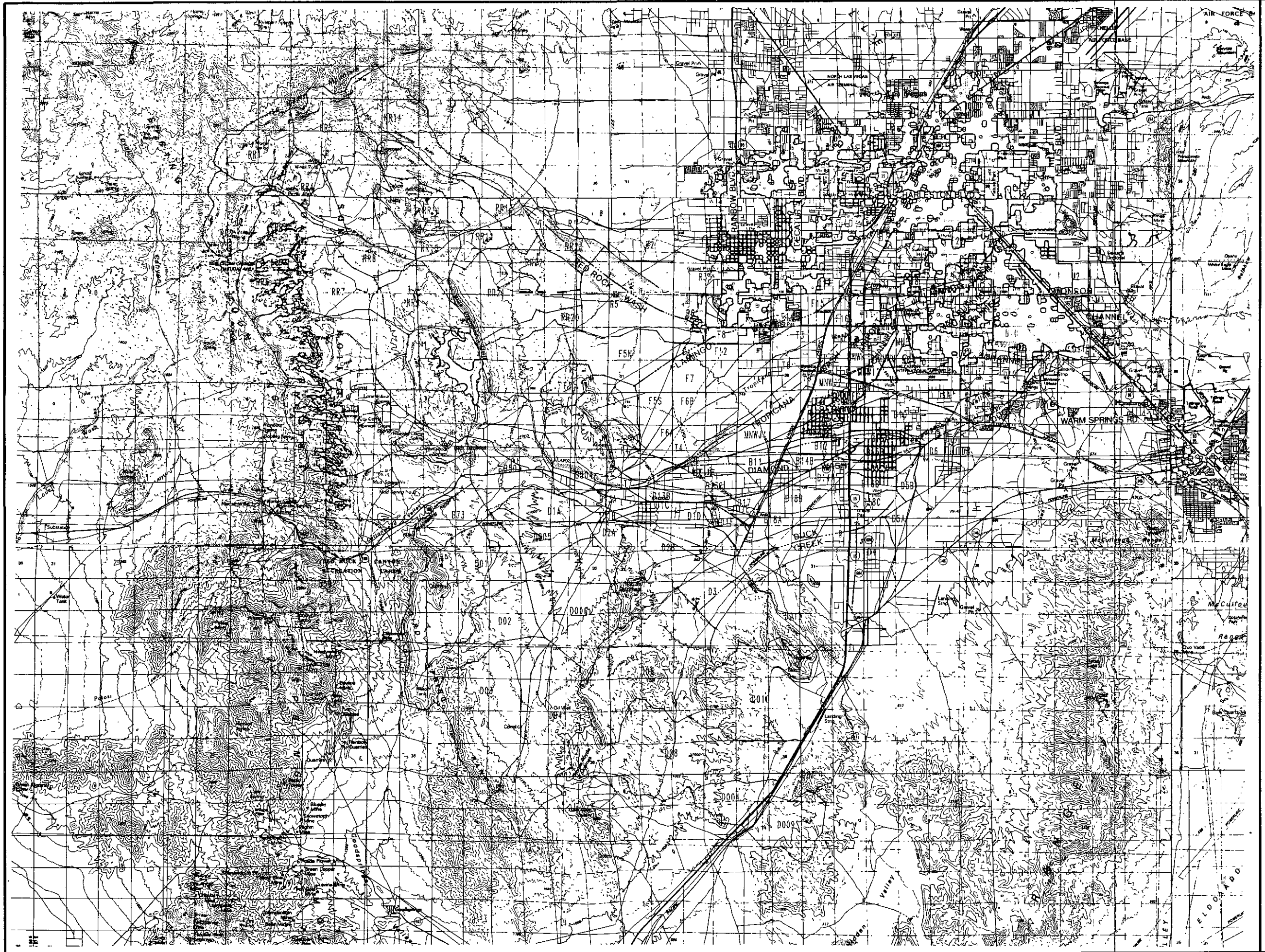
CONTAINS: COMMUNITY	NUMBER	PANEL	SUFFIX
CLARK COUNTY, UNINCORPORATED AREAS	320003	2550	C

MAP NUMBER
32003C2550 D

EFFECTIVE DATE:
AUGUST 16,1995

Federal Emergency Management Agency


ZONE A
RED ROCK DETENTION BASIN
WEST CHARLESTON BLVD
159
T20S
T21S
RM1
RED ROCK WASH
ZONE A
MASONRY DAM
Spillway
3
2
1
ZONE X
CLARK COUNTY
CITY OF LAS VEGAS
6
ZONE X
10
11
12
RED ROCK FAN
S HUALAPAI WAY
7
SAILFISH CIR
HARPOON CIR
SAIL LANDING CT
REVISED AREA
RM57
18
R59E
R60E
JOINS PANEL 2550
APPROXIMATE SCALE IN FEET
0
2000
NATIONAL FLOOD INSURANCE PROGRAM
FIRM
FLOOD INSURANCE RATE MAP
CLARK COUNTY, NEVADA AND INCORPORATED AREAS
PANEL 2150 OF 4090
(SEE MAP INDEX FOR PANELS NOT PRINTED)
CONTAINS:
COMMUNITY
NUMBER
PANEL
SUFFIX
CLARK COUNTY, UNINCORPORATED AREAS
LAS VEGAS, CITY OF
320033
320278
2150
2150
D
D
REVISED TO REFLECT LOMR DATED
MAP NUMBER
32003C2150 D
EFFECTIVE DATE:
AUGUST 16,1995
JAN 14 1997
Federal Emergency Management Agency


AIR FORCE B
NORTH LAS VEGAS AIR TERMINAL
NELLIS AIR FORCE BASE
RAINBOW BLVD
DECATUR BLVD
BOULDER HIGHWAY
CHARLESTON BLVD
RED ROCK WASH
FLAMINGO
TROPICANA
MADISON
CHANNEL
WARM SPRINGS RD
BUCK CREEK
DIAMOND
RED ROCK RECREATION
CANYON
LOVELL
McCULLOUGH
ELDORADO
VALLEY
RR1
RR2
RR3
RR4
RR5
RR6
RR7
RR8
RR14
RR20
R1
R2
R5
R6
F5N
F5S
F6
F7
F8
F12
F15
MNWJ
B11
B14B
B17
B17A
B17C
B18C
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D10R
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D50

ORIGINAL EFFECTIVE FIS HEC-1 MODEL
FILE NAME: F100.DAT

ORIGINAL EFFECTIVE FIS HEC-1 MODEL
AUGUST 1988 VERSION
FILE NAME: F100.DAT

This HEC-1 model was copied directly from the 1991 Las Vegas Valley FIS Hydrology Report for the Flamingo/Tropicana Wash. The purpose of including this model is to show consistency between the August 1988 and the September 1990 versions of HEC-1.

HEC1 S/N: 10905[illegible]4 HMVersion: 5.20 Data File: f100.dat

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*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*          FEBRUARY 1981                *
*         REVISED 02 AUG 88             *
*                                       *
*  RUN DATE  12/12/1990  TIME  11:28:54 *
*                                       *
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*                                       *
*    U.S. ARMY CORPS OF ENGINEERS       *
*  THE HYDROLOGIC ENGINEERING CENTER    *
*         609 SECOND STREET             *
*       DAVIS, CALIFORNIA 95616         *
*                                       *
*                                       *
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X     X  XXXXXXX   XXXXX          X
X     X  X        X     X        XX
X     X  X        X              X
XXXXXXX  XXXX     X        XXXXX  X
X     X  X        X              X
X     X  X        X     X        X
X     X  XXXXXXX   XXXXX         XXX
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:::                                     :::
:::  Full Microcomputer Implementation  :::
:::                 by                  :::
:::        Haestad Methods, Inc.        :::
:::                                     :::
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37 Brookside Road * Waterbury, Connecticut 06708 * (203) 755-1666

THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.
THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION
NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL LOSS RATE:GREEN AND AMPT INFILTRATION
KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM

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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

          *DIAGRAM
    1     ID    INPUT FILE = FLEX100.DAT
    2     ID     CLARK COUNTY FLOOD CONTROL DISTRICT MASTER PLAN UPDATE
    3     ID     RED ROCK/FLAMINGO/TROPICANA WATERSHED
    4     ID     EXISTING DRAINAGE SYSTEM WITH PRESENT DEVELOPMENT
    5     ID     FLAMINGO/TROPICANA STORM (NO UPPER BLUE DIAMOND)- MAIN CHANNEL RUN
    6     ID         100-YEAR 6-HR STORM (SDN #5)
    7     ID         JMM    OCTOBER 1990
    8     ID
    9     ID         BASIC DATA FILE BASED ON COE FILE S10P40X.
   10     ID         MODIFICATIONS ADDED FROM B&V RED ROCK BASIN AND UPPER FLAMINGO
   11     ID         BASIN HEC-1 RUNS; NIMBUS NORTHWEST MCCARRAN AIRPORT HEC-1 RUNS;
   12     ID         AND SUBBASIN MODIFICATIONS DUE TO RECENT DEVELOPMENT.
   13     ID
   14     ID         COE MUSKINGUM ROUTING CONVERTED TO KINEMATIC FOR EXISTING
   15     ID         IMPROVED CHANNELS FROM FACILITY INVENTORY.
   16     ID
   17     ID     PB CARDS CONTAIN POINT PRECIPITATION.  DARF'S FROM CCRFCD MANUAL
   18     ID     BASED ON STORM AREAS FOR CONCENTRATION POINTS AS FOLLOWS:
   19     ID
   20     ID         SUBBASIN          AREA (SQMI)          DARF
   21     ID         --------          -----------          ----
   22     ID          T12,F5            20.8,15.9           0.81
   23     ID            RR14              53                0.68
   24     ID       F7,F14,F16,F16OF     92,103,105           0.60
   25     ID       F17,F20B,F22,F23   127,139,143,145      0.565
   26     ID
   27     ID
   28     IT       5       0       0     200
   29     IO       5
   30     JR    PREC    0.81    0.68    0.60   0.565

   31     KK     RR1 RUNOFF FROM RR1
   32     KM         RR1-RR14 DATA TAKEN FROM B&V TR-20 MODEL FOR UPPER FLAMINGO BASIN
   33     KM         NEW MUSKINGUM ROUTING PARAMETERS, CN'S AND LAGS USED FOR BETTER
   34     KM         AGREEMENT WITH COE FLOWS
   35     BA    3.83
   36     PC    .000    .020    .059    .080    .110    .144    .150    .160    .168    .171
   37     PC    .180    .182    .187    .190    .197    .202    .210    .220    .230    .241
   38     PC    .250    .259    .265    .280    .290    .300    .305    .309    .310    .317
   39     PC    .321    .327    .333    .346    .361    .381    .408    .430    .477    .514
   40     PC    .561    .630    .710    .720    .731    .752    .779    .790    .795    .804
   41     PC    .810    .820    .826    .840    .859    .889    .910    .938    .966    .970
   42     PC    .974    .979    .981    .983    .985    .989    .990    .992    .993    .996
   43     PC    .997    .999    1.00
   44     PB    4.08
   45     LS              84
   46     UD    0.34

   47     KK     RR4 ROUTE RR1 THRU RR4
   48     RM       2    0.36    0.15
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  91      KK     RR7 COMBINE RR6+RR7
  92      HC       2

  93      KK     RR8 ROUTE RR7 THRU RR8
  94      RM       2    0.51    0.15

  95      KK     RR8 RUNOFF FROM RR8
  96      BA    1.75
  97      PB    3.49
  98      LS              81
  99      UD    1.57

 100      KK     RR9 RUNOFF FROM RR9
 101      BA    3.71
 102      PB    3.37
 103      LS              84
 104      UD    0.79

 105      KK     RR8 COMBINE RR4+RR5+RR7+RR8+RR9
 106      HC       5

 107      KK    RR10 ROUTE RR8 THRU RR10
 108      RM       2    0.25    0.15

 109      KK    RR10 RUNOFF FROM RR10
 110      BA    3.30
 111      PB    3.40
 112      LS              81
 113      UD    1.19

 114      KK    RR10 COMBINE RR8+RR10
 115      HC       2

 116      KK    RR12 ROUTE RR10 THRU RR12
 117      RM       2    0.28    0.15

 118      KK    RR11 RUNOFF FROM RR11
 119      BA    3.40
 120      PB    3.46
 121      LS              83
 122      UD     .82

 123      KK    RR12 ROUTE RR11 THRU RR12
 124      RM       2    0.18    0.15

 125      KK    RR12 RUNOFF FROM RR12
 126      BA    4.25
 127      PB    3.43
 128      LS              84
 129      UD     .77
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  130     KK    RR12 COMBINE RR10+RR11+RR12
  131     HC       3

  132     KK    RR13 ROUTE RR12 THRU RR13
  133     RM       2    0.24    0.15

  134     KK    RR13 RUNOFF FROM RR13
  135     BA    2.26
  136     PB    3.32
  137     LS              80
  138     UD    0.51

  139     KK    RR13 COMBINE RR12+RR13
  140     HC       2

  141     KK    RR14 ROUTE RR13 THRU RR14
  142     RM       2     .10     .15

  143     KK    RR14 RUNOFF FROM RR14
  144     BA    6.22
  145     PB    3.60
  146     LS              83
  147     UD    1.53

  148     KK    RR14 COMBINE RR13+RR14
  149     HC       2
          * ******** END OF DATA FROM B&V REPORT *******

  150     KK   RR.DB ROUTE THRU RED ROCK DETENTION BASIN
  151     KM         USE STORAGE-OUTFLOW DATA FROM COE FEASIBILITY REPORT
  152     RS       1    STOR       0
  153     SV       0     150     600    1100    1860    1900    2250    2630    2800
  154     SQ       0     750    1100    1250    1410    1420   22650   72500   97500
  155     SE    3159    3170    3190    3200    3210  3210.5    3215    3220    3222

  156     KK    RR23 ROUTE RED ROCK OUTFLOW THRU RR23
  157     RM       6    0.53    0.15

  158     KK    RR23 RUNOFF FROM RR23
  159     BA    2.03
  160     PB    3.20
  161     LS       0    74.9
  162     UK     500    .025    0.15     100
  163     RK    5500    .025    .030    0.09                        1
  164     RK   15500    .023    .030            TRAP     100       5      NO

  165     KK    RR23 COMBINE RED ROCK OUTFLOW WITH RR23
  166     HC       2
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

 167      KK      R1 RUNOFF FROM R1
 168      BA    1.12
 169      PB    3.17
 170      LS       0    87.7
 171      UD    0.47

 172      KK    RR23 COMBINE R1+RR23
 173      HC       2

 174      KK      R5 ROUTE RR23 THRU R5
 175      RM       5    0.39    0.15

 176      KK    RR20 RUNOFF FROM RR20
 177      BA    1.37
 178      PB    3.22
 179      LS       0      88
 180      UD    0.69

 181      KK      R5 ROUTE RR20 THRU R5
 182      RM       7    0.61    0.15

 183      KK    RR21 RUNOFF FROM RR21
 184      BA    6.27
 185      PB    3.26
 186      LS       0      87
 187      UD    1.00

 188      KK      R5 ROUTE RR21 THRU R5
 189      RM       8    0.64    0.15

 190      KK    RR22 RUNOFF FROM RR22
 191      BA    2.15
 192      PB    3.20
 193      LS       0      87
 194      UD    0.62

 195      KK      R5 ROUTE RR22 THRU R5
 196      RM       8    0.70    0.15

 197      KK      R5 RUNOFF FROM R5
 198      BA    5.77
 199      PB    3.00
 200      LS       0    75.5
 201      UK     600    .025     .15     100
 202      RK    7920    .023    .030     .20                      1
 203      RK   13000    .019    .030             TRAP      40    2

 204      KK      R5 COMBINE R5+RR23+RR22+RR21+RR20
 205      HC       5
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

 206      KK      R6 ROUTE R5 THRU R6
 207      RM       3    0.22    0.15

 208      KK      R6 RUNOFF FROM R6
 209      BA    1.51
 210      PB    2.77
 211      LS       0    73.2
 212      UK     500    .015     .15     100
 213      RK    5200    .016    .030     .13                                  1
 214      RK    8000   .0044    .030             TRAP      40        1       NO

 215      KK      R6 COMBINE R5 WITH R6
 216      HC       2

 217      KK      F1 RUNOFF FROM F1
 218      BA    4.63
 219      PB    3.23
 220      LS       0      88
 221      UD    0.78

 222      KK      F5 ROUTE F1 THRU F5
 223      RM      12    0.99    0.15

 224      KK      F2 RUNOFF FROM F2
 225      BA    1.28
 226      PB    3.19
 227      LS       0      88
 228      UD     .43

 229      KK      F5 ROUTE F2 THRU F5
 230      RM       9    0.76    0.15

 231      KK      F3 RUNOFF FROM F3
 232      BA    2.60
 233      PB    3.09
 234      LS       0      87
 235      UD     .34

 236      KK      F5 ROUTE F3 THRU F5
 237      RM       5    0.40    0.15

 238      KK      F4 RUNOFF FROM F4
 239      BA    1.30
 240      PB    3.03
 241      LS       0      86
 242      UD     .41

 243      KK      F5 ROUTE F4 THRU F5
 244      RM       8    0.69    0.15
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

 245      KK     F5N RUNOFF FROM F5N
 246      BA    4.04
 247      PB    3.00
 248      LS       0      85
 249      UK     300    .025     .15     100
 250      RK    3200    .025    .030     .20                          1
 251      RK   18000    .023    .030             TRAP       70       5       NO

 252      KK     F5S RUNOFF FROM F5S
 253      BA    2.00
 254      PB    2.86
 255      LS       0      85
 256      UK     400    .020     .25     100
 257      RK    3500    .020    .030     .16                          1
 258      RK   14500    .017    .030              TRAP       50       5       NO

 259      KK      F5 COMBINE F5N AND F5S
 260      HC       2

 261      KK      F5 F5 WITH ROUTED F1, F2, F3, AND F4
 262      HC       5

 263      KK  UFL.DB UPPER FLAMINGO DETENTION BASIN
 264      KM         STORAGE-OUTFLOW DATA FROM B&V DESIGN PLANS
 265      RS       1    STOR       0
 266      SV       0      10       25      100      220      560      950     1000     1130     1430
 267      SV    2070
 268      SQ       0      75      300      675      910     1100     1260     1280     5170    20600
 269      SQ   50300
 270      SE    2445  2447.5     2450     2455     2460     2465     2470   2470.5     2472     2475
 271      SE    2480

 272      KK     F5R ROUTE UPPER FLAMINGO DB OUTFLOW THRU OUTFALL CHANNEL
 273      KM         CHANNEL GEOMETRY FROM B&V PREDESIGN MEMORANDUM
 274      RK    3500    .010    .020             TRAP       30       3

 275      KK     F6A RUNOFF FROM F6A
 276      BA     .55
 277      PB    2.86
 278      LS       0      88
 279      UD    0.35

 280      KK     F6B ROUTE F6A THRU F6B
 281      RM       4    0.35    0.15

 282      KK     F6B RUNOFF FROM F6B
 283      BA    0.85
 284      PB    2.77
 285      LS       0      88
 286      UD    0.30
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

 287      KK     F6B COMBINE F6A AND F6B
 288      HC       2

 289      KK      F7 ROUTE F6 THRU F7
 290      RM       3    0.28    0.15

 291      KK      F7 RUNOFF FROM F7
 292      BA    1.50
 293      PB    2.77
 294      LS       0    85.5
 295      UK     700    .015     .15     100
 296      RK    4000   .0114    .030     .65                                1
 297      RK    7500   .0116    .030            TRAP      50       5       NO

 298      KK      F7 COMBINE F7 WITH ROUTED F6
 299      HC       2

 300      KK      F7 COMBINED F7 WITH R6 AND F5R
 301      HC       3

 302      KK     F7R ROUTE F7 THRU F8 (FLWA1267-1335)
 303      RK    5230    .011    .030            TRAP      40       1

 304      KK      F8 RUNOFF FROM F8
 305      BA     .48
 306      LS       0    66.1       0       0      98       0
 307      UK    1500    .014     .28      83
 308      UK      50    .020     .10      17
 309      RK    1800     .01    .020    .048
 310      RK    7200    .010    .030                      30       2       NO

 311      KK      F8 COMBINE F8 AND F7R
 312      HC       2

 313      KK      F9 ROUTE F8 THRU F9 (FLWA1203)
 314      RK    1740   .0138    .015            TRAP      40       2

 315      KK       . (FLWA1152)
 316      RK    2640   .0044    .040            TRAP      50       3

 317      KK      F9 RUNOFF FROM F9
 318      BA     .90
 319      LS       0    63.0       0       0      98       0
 320      UK     500    .010     .25      73
 321      UK      40    .015     .10      27
 322      RK    2400    .007    .020     .35                                1
 323      RK    2300    .008    .020    .015                                1
 324      RK   10800    .013    .023            TRAP      50       3       NO
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

 325      KK      F9 COMBINE F8 WITH F9
 326      HC       2

 327      KK     F14 ROUTE F9 THRU F14
 328      RM       2    0.16    0.20

 329      KK     F10 RUNOFF FROM F10
 330      BA    1.17
 331      LS       0    62.6       0       0      98       0
 332      UK     600    .010     .25      67
 333      UK      40    .015      .10     33
 334      RK    1300    .010    .020    .019                      1
 335      RK    1300    .006     .02    .080    TRAP              1
 336      RK    8200   .0117     .02            TRAP      40      1
          * *** SUBAREAS R2 - R8 NOW ASSUMED TO BE DIVERTED INTO FLAMINGO WASH BY
          *     RAINBOW AND FLAMINGO RD ****

 337      KK      R2 RUNOFF FROM R2
 338      BA    2.01
 339      PB    3.00
 340      LS      0    79.4
 341      UD    0.21

 342      KK      R3 ROUTE R2 THRU R3
 343      RM       5    0.38    0.15

 344      KK      R3 RUNOFF FROM R3
 345      BA    2.63
 346      PB    2.77
 347      LS       0    68.2
 348      UD    0.61

 349      KK      R3 COMBINE R2+R3
 350      HC       2

 351      KK      R3 ROUTE THRU EXISTING GRAVEL PIT
 352      RS       1    STOR     480
 353      SV       0     480    1290    3150    3420
 354      SE       0      20      60     110     120
 355      SQ       0       0    1800    1800   37500

 356      KK      R8 ROUTE R3 THRU R8
 357      RK    2750    .019    .020            TRAP      40      1

 358      KK      R7 RUNOFF FROM R7
 359      BA    1.39
 360      LS       0    79.5
 361      UD    0.51
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  362     KK      R7 DIVERT Q IN EXCESS OF PIPE CAPACITY
  363     KM         LIMITING CAPACITY OF RAINBOW STORM DRAIN = 324 CFS (FLLA0307)
  364     KM         OVERFLOW RUNS DOWN DESERT INN AND EDNA INTO CENTRAL BASIN
  365     DT    R7OF
  366     DI       0     324    1000    5000
  367     DQ       0       0     676    4676

  368     KK      R8 ROUTE R7 THRU R8 (90"-96" RCP IN RAINBOW)
  369     RK    5280    .004    .015            CIRC     8.0

  370     KK      R8 RUNOFF FROM R8
  371     BA     .51
  372     LS       0    73.3
  373     UD    0.37

  374     KK      R8 COMBINE R3+R7+R8
  375     HC       3

  376     KK     F10 ROUTE R8 THRU F10 (114" RCP IN FLAMINGO RD)
  377     RK    5280    .010    .015            CIRC     9.5

  378     KK     F10 COMBINE R8+F10
  379     HC       2

  380     KK     F14 ROUTE F10 THRU F14 (FLLA0000)
  381     RK    4010   .0075    .015            TRAP      20       1

  382     KK     F12 RUNOFF FROM F12
  383     BA     .88
  384     LS       0    87.9
  385     UK     700    .012     .15     100
  386     RK    3500   .0120    .030     .21                      1
  387     RK    8200   .0130    .030             TRAP      10       5      NO

  388     KK    F12R    ROUT     F12    THRU     F13
  389     RM       2    0.20    0.15

  390     KK     F13 RUNOFF FROM F13
  391     BA     .55
  392     LS       0    87.5       0       0      98       0
  393     UK     750    .010     .25      83
  394     UK      50    .015     .10      17
  395     RK    1100     .01    .023     .04                      1
  396     RK    2300     .01    .023     .10                      1
  397     RK    5900    .012    .026             TRAP      40       2      NO

  398     KK     F13 COMBINE     F13     AND     F1R
  399     HC       2
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

400       KK     F14 ROUTE F13 THRU F14 (UNIMPROVED)
401       RM       2    0.15    0.15

402       KK     F14 RUNOFF FROM F14
403       BA     .78
404       LS       0    76.5       0       0      98       0
405       UK     500    .010     .25      86
406       UK     400    .015     .10      12
407       RK    1200   .0090    .023    .024                      1
408       RK    2400   .0075    .025     .12    TRAP      20       1
409       RK    5200   .0090    .033            TRAP      75       4      NO

410       KK     F14 COMBINE F9, F10, F13, AND F14
411       HC       4

412       KK    F14R ROUTE F14 THRU F15 (FLWA0990-1049)
413       RK    3110    .020    .040            TRAP      50       3

414       KK       .  (FLWA0924)
415       RK    3490    .010    .040            TRAP      60       1

416       KK       .  (FLWA0891-0923)
417       RK    1580   .0076    .030            TRAP      90       1

418       KK     F15 RUNOFF FROM F15
419       BA    1.32
420       LS       0    78.0       0       0      98       0
421       UK     640    .013     .15      77
422       UK     400    .014     .10      23
423       RK    2500    .013    .020    0.08                      1
424       RK    4500    .006    .020    0.25                      1
425       RK    8500   0.012    .030            TRAP      40       3      NO

426       KK     F15 COMBINE     F15     AND    F14R
427       HC       2

428       KK   F15OF DIVERT OVERFLOWS
429       KM         DIVERSION RATING CURVE FROM COE FEASIBILITY STUDY
430       DT   F15OF
431       DI       0    4100    7000   10500   35000
432       DQ       0       0    1700    4640   15500

433       KK     F16 RUNOFF FROM F16
434       BA     .52
435       LS       0    75.5       0       0      98       0
436       UK     600    .010    0.15      56
437       UK     400    .015     .10      44
438       RK    1000    .010    .025    .030                      1
439       RK    2400    .015    .025     .10                      1
440       RK    6000    .004    .020                              1
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

 441      KK     F16 COMBINE F15 WITH F16
 442      HC       2

 443      KK    F16OF DIVERT OVERFLOWS
 444      KM          LIMIT FLOW TO 6000 CFS AT CEASARS PALACE/LVB/IMPERIAL PALACE CULVERT
 445      KM          BASED ON COE ASSUMED CAPACITY
 446      DT    F16OF
 447      DI        0    6000   12000   20000
 448      DQ        0       0    6000   14000

 449      KK     F16 ROUT F16 THRU F17 (FLWA0798-0823)
 450      RK    3550    .009    .015            TRAP      48       0

 451      KK        .  (FLWA0773)
 452      RK    1320   .0091    .020            TRAP      80      10

 453      KK        .  (FLWA0648-0798)
 454      RK    7760   .0064    .040            TRAP      30       2

 455      KK     F17 RUNOFF FROM F17
 456      BA     .65
 457      LS       0    75.5       0       0      98       0
 458      UK     900    .057     .15      51
 459      UK     600    .010     .10      49
 460      RK    1000    .010    .025    .040                      1
 461      RK    1500    .010    .027     .09                      1
 462      RK   11400   .0110    .030            TRAP     100       5      NO

 463      KK     F17 COMBINE     F17     AND  F16
 464      HC       2
          *  *** NO CONTRIBUTION FROM UPPER BLUE DIAMOND FOR FLAMINGO/RED ROCK STORM ***

 465      KK      T8 RUNOFF FROM T8
 466      BA    1.22
 467      LS       0    65.6
 468      UK     600    .015    0.15     100
 469      RK    2000    .018    .030     .14                      1
 470      RK   18000   .0161    .030            TRAP      75       5      NO

 471      KK      T9 ROUTE T8 TO T9
 472      RM       2     .52    0.15

 473      KK      T9 RUNOFF FROM T9
 474      BA    0.87
 475      LS       0    73.1
 476      UK     600    .010    0.15     100
 477      RK    4000    .010    .030    0.12                      1
 478      RK   10200   .0134    .030            TRAP      30       5
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

 479      KK      T9 COMBINE T8 AND T9
 480      HC       2

 481      KK    T9OF DIVERT OVERFLOW
 482      DT    T9OF
 483      DI       0    5480   11000   15000
 484      DQ       0       0    2700    2700

 485      KK     T10 ROUTE T9 THRU T10
 486      RM       3    0.21    0.10

 487      KK      T4 RUNOFF FROM T4
 488      BA    3.22
 489      LS       0    87.6
 490      UK     500    .015    0.15     100
 491      RK    2700   .0190    .030    0.25                              1
 492      RK   20000   .0185    .030            TRAP      75        5     NO

 493      KK      T5 ROUTE T4 TO T5
 494      RK    6500    .013    .030            TRAP      30        2

 495      KK      T5 RUNOFF FROM T5
 496      BA    1.00
 497      LS       0    87.0
 498      UK     600    .010    0.15     100
 499      RK    2500    .012    .030    0.21                              1
 500      RK    6500    .013    .030            TRAP      30        2

 501      KK      T5 COMBINE T4 AND T5
 502      HC       2

 503      KK      T6 ROUTE T5 TO T6
 504      RK   10800    .012    .030            TRAP      30        5

 505      KK      T6 RUNOFF FROM T6
 506      BA    1.30
 507      LS       0    86.9
 508      UK     600    .010    0.15     100
 509      RK    6000    .012    .030    .400                              1
 510      RK   10800    .012    .030            TRAP      30        5

 511      KK      T6 COMBINE T5 AND T6
 512      HC       2

 513      KK    T9OF RECALL T9OF
 514      DR    T9OF

 515      KK      T6 ROUTE T9OF THRU T6
 516      RM       3    0.23    0.15
```

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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  556     KK     T10 RUNOFF FROM T10
  557     BA    0.82
  558     LS       0    78.0       0       0      98       0
  559     UK     700    .013    0.15      78
  560     UK     400    .011     .10      22
  561     RK    1100    .012    .020    .120                      1
  562     RK    3000    .008    .020     .50                      1
  563     RK    3500   0.010    .030             TRAP      30      2

  564     KK     T10 COMBINE T3, T6, T9 AND T10
  565     HC       4

  566     KK    T10R ROUT T10 THRU T11 (TRWA0235)
  567     RK    1160    .010    .015             TRAP      32      0

  568     KK       .   (TRWA0145-0218)
  569     RK    4700   .0095    .030             TRAP      90    1.5

  570     KK     T11 RUNOFF FROM T11
  571     BA    1.09
  572     LS       0    68.6       0       0      98       0
  573     UK     800    .010    0.30      61
  574     UK     500    .010    0.10      39
  575     RK    3200   .0080    .020    0.17                      1
  576     RK    5400   .0104    .030             TRAP     100      5      NO

  577     KK     T11 COMBINE T11 AND T10R
  578     HC       2

  579     KK    T11R ROUT  T11 THRU T12 (TRWA0117)
  580     RK    1130   .0088    .015             TRAP     1.5      2

  581     KK       .   (TRWA0000-0034+)
  582     RK    6500    .012    .040             TRAP     100    2.5

  583     KK     T12 RUNOFF FROM T12
  584     BA    0.77
  585     LS       0    74.4       0       0      98       0
  586     UK     500    .008    0.18      65
  587     UK     200    0.01    0.10      35
  588     RK    2200    .008    .023    0.12                      1
  589     RK    3000    .007    .025     .24                 20   2
  590     RK    6600   .0103    .032                         30   5

  591     KK     T12 ADD T12 AND T11R
  592     HC       2

  593     KK    T3OF RECALL DIVERSION FROM T3
  594     DR    T3OF
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

595       KK     T12 ROUTE T3OF TO T12
596       RM      20    1.99    0.10

597       KK     T12 COMBINE T3OF AND T12
598       HC       2
          *  *** DATA FOR SUBAREAS MNW-B THRU MNW-M TAKEN FROM NIMBUS HEC-1 ANALYSIS
          *      FOR NORTHWEST MCCARRAN AIRPORT DRAINAGE STUDY (WITH SMALL MODIFICATIONS)

599       KK   MNW-B RUNOFF FROM B
600       BA    0.68
601       LS              65      10
602       UD    2.4

603       KK    DIVB FLOW SPLIT AT I-15; BCULV IS FLOW CONVEYED BY CULVERT
604       DT   BCULV
605       DI       0       22     100     500
606       DQ       0       22      22      22

607       KK   RDIVB ROUTE DIVB TO CULVERT AT I15 AND C
608       RK     600    .004     .05       0       0       5

609       KK   MNW-C RUNOFF AT C
610       BA    0.69
611       LS              65      17
612       UD    2.0

613       KK   MNW-C COMBINE DIVB+C
614       HC       2

615       KK   MNW-C PONDING STORAGE ROUTING AT I-15
616       RS       1    STOR       0
617       SA       0     .28     .92    2.02    3.19    3.44    5.37    9.09
618       SQ       0       8      25      35      40      78     360    1342
619       SE      54      55      56      57   57.43      58      59      60

620       KK    DIVC FLOW SPLIT AT C THRU AND AROUND CULVERT
621       DT   CCULV
622       DI       0       8      25      35      40      78     360    1342
623       DQ       0       8      25      35      40      45      55      65

624       KK   RDIVC ROUTE DIVC NORTH TO D
625       RK     650    .004     .05       0       0       0      20

626       KK   MNW-D RUNOFF FROM D
627       BA     .05
628       LS              66      10
629       UD    .40

630       KK   MNW-D COMBINE DIVC AND D
631       HC       2
```

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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

 632      KK    DIVD DIVERT FLOW TO NORTH; DCULV CROSSES I-15
 633      DT   DCULV
 634      DI       0      28     100     500
 635      DQ       0      28      28      28

 636      KK   RDIVD ROUTE DIVERTED FLOW NORTH TO E
 637      RK     800    .004     .05       0       0       0      20

 638      KK   MNW-E RUNOFF FROM E
 639      BA    0.05
 640      LS              65      18
 641      UD    0.38

 642      KK   MNW-E COMBINE DIVD + E
 643      HC       2

 644      KK   ECULV DIVIDE FLOW AT I-15 CULVERT; ECULV CROSSES I-15 INTO MNW-I
 645      DT   ECULV
 646      DI       0      28     100     500
 647      DQ       0      28      28      28

 648      KK   RDIVE ROUTE FLOW FROM DIVE NORTH ALONG I-15
 649      RK    1200    .007     .05       0       0       0       4

 650      KK  MNW-FG RUNOFF FROM FG
 651      BA    0.36
 652      LS              66      17
 653      UD    1.24

 654      KK  MNW-FG COMBINE EDIV + FG
 655      HC       2

 656      KK    DIVG DIVERT FLOW NORTH; GCULV CROSSES I-15 INTO SUBAREA I
 657      DT   GCULV
 658      DI       0      50      60     100     150     250
 659      DQ       0      50      60      60      60      60

 660      KK   RDIVG ROUTE DIVG NORTH TO AIRPORT CHANNEL
 661      RK    2200    .009    .040       0       0       0      10

 662      KK  MNW-J1 RUNOFF FROM J1
 663      BA    2.37
 664      LS              70
 665      UD    2.67

 666      KK  MNW-J2 ROUTE J1 TO J2
 667      RK   10000    .012     .04                       10       2

 668      KK  MNW-J2 RUNOFF FROM J2
 669      BA    1.21
 670      LS              70      10
 671      UD    1.22
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

672       KK  MNW-J2 COMBINE J1+J2
673       HC       2

674       KK     CP1 COMBINE J2 + RDIVG
675       HC       2

676       KK    RCP1 ROUTE CP1 TO LAS VEGAS BLVD (CP3)
677       RK    2600    .008     .04       0       0      20       1

678       KK    RTNE RETURN FLOW FROM CULVERT E
679       DR   ECULV

680       KK    RTNE DUMMY SUBAREA TO GET 1988 HEC1 TO RUN (NEEDS NON-ZERO AREA)
681       BA    0.01
682       LS       0      50
683       UD     0.1

684       KK    RTNE COMBINE DIVERSION RECALL WITH DUMMY SUBAREA
685       HC       2

686       KK   RRTNE ROUTE ECULV TO OUTLET OF I
687       RK    3900    .013     .05       0       0       0      50

688       KK    RTNG RETURN FLOW FROM CULVERT G
689       DR   GCULV

690       KK    RTNG DUMMY SUBAREA TO GET 1988 HEC1 TO RUN (NEEDS NON-ZERO AREA)
691       BA    0.01
692       LS       0      50
693       UD     0.1

694       KK    RTNG COMBINE DIVERSION RECALL WITH DUMMY SUBAREA
695       HC       2

696       KK   RRTNG ROUTE GCULV TO OUTLET OF I
697       RK    2500    .013    0.05       0       0       0      50

698       KK  MNW-I1 RUNOFF FROM I1
699       BA    0.25
700       LS              78      15
701       UD    0.58

702       KK     CP2 COMBINE HYDROGRAPHS AT LAS VEGAS BLVD AND UPRR
703       HC       3

704       KK    RCP2 ROUTE CP2 TO AIRPORT CHANNEL AND LAS VEGAS BLVD (CP3)
705       RK    2500    .009     .05       0       0       0       4

706       KK  MNW-I2 RUNOFF FROM I2
707       BA    0.14
708       LS              77       1
709       UD    0.38
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

 710      KK     CP3 COMBINE FLOW FROM B-I2 AT LAS VEGAS BLVD AND AIRPORT CHANNEL
 711      HC       3

 712      KK    RCP3 ROUTE CPE TO OUTLET OF K
 713      RK    7300      .01      .04        0        0        5        2

 714      KK   MNW-K RUNOFF FROM K
 715      BA    1.43
 716      LS                66       25
 717      UD    1.55

 718      KK     CP4 COMBINE HYDROGRAPHS FOR AIRPORT CHANNEL AND TAXIWAY S
 719      HC       2

 720      KK    RCP4 ROUTE FLOW TO TROPICANA BLVD
 721      RK    3300      .01      .03        0        0       20        4

 722      KK   MNW-L RUNOFF FROM L
 723      BA    0.27
 724      LS                77       60
 725      UD    0.42

 726      KK   MNW-M RUNOFF FROM M
 727      BA    0.49
 728      LS                84       56
 729      UD    0.83

 730      KK     CP5 COMBINE ALL HYDROGRAPHS AT OUTLET AT BOX CULVERT AT TROPICANA
 731      HC       3
          *  *** END OF DATA FROM NIMBUS NORTHWEST MCCARRAN HEC-1 DATA ***
          *

 732      KK     T12 ROUTE MNW-L TO T12 (TRMC0009)
 733      RK    2640    .0045     .040             TRAP       18      1.5

 734      KK       .    (TRWA0000-0034)
 735      RK    5000     .012     .040             TRAP      100      2.5

 736      KK     T12 COMBINE MNW-L AND T12
 737      KM         AIRPORT CHANNEL + TROPICANA WASH
 738      HC       2

 739      KK     F17 COMBINE F17 AND T12
 740      KM         FLAMINGO WASH + TROPICANA WASH
 741      HC       2

 742      KK     F18 ROUTE F17 AND T12 THRU F18
 743      KM           (FLWA0593)
 744      RK    1430    .0182     .040             TRAP       50       1
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

 745      KK        .   (FLWA0564+FLWA0620) COMBINED DUE TO RK PROBLEMS WITH NEW HEC1
 746      RK     1695   .0045    .015            TRAP      50       1

 747      KK       R4 RUNOFF FROM R4
 748      BA     2.28
 749      LS        0    86.5
 750      UD     0.34

 751      KK    F15OF RECALL F15 OVERFLOW
 752      DR    F15OF

 753      KK   F15OFR ROUT F15OF THRU R4
 754      RM        3    0.24       0

 755      KK       R4 COMBINE R4 AND F15 OVERFLOW
 756      HC        2

 757      KK    F16OF RECALL F16 OVERFLOW
 758      DR    F16OF

 759      KK   F16OFR ROUT F16OF THRU R4
 760      RM        3    0.24       0

 761      KK       R4 COMBINE R4 AND F16 OVERFLOW
 762      HC        2

 763      KK      F18 ROUT R4 THRU F18
 764      RM       11    0.88    0.10

 765      KK      F18 RUNOFF FROM F18
 766      BA     0.87
 767      LS        0    72.0       0       0      98       0
 768      UK      500    .010    0.20      52
 769      UK      200    .015    0.10      48
 770      RK     1000    .010    .023    .014                      1
 771      RK     1000   .0010    .023    .050                      1
 772      RK    15900   .0090    .020            TRAP      30       1

 773      KK      F18 COMBINE R4 AND F18
 774      HC        2

 775      KK      F24 RUNOFF FROM F24
 776      BA     1.03
 777      LS        0    66.3       0       0      98       0
 778      UK      300    .010    0.20      46
 779      UK      100    .015    0.10      54
 780      RK     1300    .013    .020    .035                      1
 781      RK     3000   .0075    .020    .014                      1
 782      RK     4400    .018    .030            TRAP      50       3      NO
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

 783      KK     F18 COMBINE F18, F24, AND F17
 784      HC       3

 785      KK     F18R ROUT F18 THRU F20A (FLWA0400-0493)
 786      RK     7970   .0065    .040             TRAP      60       2

 787      KK     F20A RUNOFF FROM F20A
 788      BA     0.81
 789      LS       0    70.7       0       0      98       0
 790      UK    1000    .010    0.25      77
 791      UK     250     .02    0.15      23
 792      RK    1900    .001    .020    0.05                        1
 793      RK    2000    .015    .020    0.14
 794      RK    5600   .0108    .033                      40       4

 795      KK     F20A COMBINE F20A AND F18R
 796      HC       2

 797      KK     F20B ROUTE F20A THRU F20B (FLWA0376)
 798      RK    1210   .0148    .040             TRAP      50       1

 799      KK       .   (FLWA0348)
 800      RK    1430    .007    .015             TRAP      60       1

 801      KK     F19 RUNOFF FROM F19
 802      BA    1.54
 803      LS       0    70.8       0       0      98       0
 804      UK     500    .008    0.25      51
 805      UK     100    .015    0.10      49
 806      RK    1300    .010    .020     .04                        1
 807      RK    2500    .010    .020    .019                        1
 808      RK   11400   .0118    .020             TRAP      40       1      NO

 809      KK     F20B ROUTE F19 THRU F20B
 810      RM       2    0.20    0.20

 811      KK     F20B RUNOFF FROM F20B
 812      BA    0.73
 813      LS       0      82
 814      UD    0.25

 815      KK     F20B COMBINE F19 AND F20B
 816      HC       2

 817      KK       VB VAN BUSKIRK DRAINAGE AREA
 818      KM          SINGLE SUBAREA TO SIMULATE RUNOFF FROM ENTIRE VAN BUSKIRK WATERSHED.
 819      KM          CN AND LAG SELECTED TO MATCH PEAK Q AND TIME-TO-PEAK
 820      KM          FROM VAN BUSKIRK PREDESIGN STUDY BY JMM.
 821      BA    4.58
 822      LS             78
 823      UD    0.50
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

824       KK    F20B COMBINE VAN BUSKIRK AREA, F20A AND F20B
825       HC      3

826       KK     F22 ROUTE F20B THRU F22 (FLWA0258-0274)
827       RK    4700   .0110    .030                      70     2.5

828       KK     F21 RUNOFF FROM F21
829       BA    1.27
830       LS       0    77.1       0       0      98       0
831       UK     300    .010    0.25      49
832       UK      60    .020     .10      51
833       RK    1300    .010    .020    .019                      1
834       RK    1750    .008    .020    0.08                      1
835       RK   16000   .0128    .020            TRAP      40     1      NO

836       KK     F21 DIVERT ACROSS BLDR HWY AT OAKEY
837       DT   OAKEY
838       DI       0   10000
839       DQ       0    5000

840       KK     F22 ROUTE F21 THRU F22
841       RM       1    0.06    0.20

842       KK     F22 RUNOFF FROM F22
843       BA    3.43
844       LS       0    74.9       0       0      98       0
845       UK     700    .008    0.25      51
846       UK      60    .015     .10      49
847       RK    1500    .010    .020    .093                      1
848       RK    3000    .008    .020    0.37                      1
849       RK   29500   .0115    .020            TRAP      40     1      NO

850       KK     F22 COMBINE F20B, F21 AND F22
851       HC      3

852       KK     F23 ROUTE F22 THRU F23 (FLWA0228)
853       RK    1430    .014    .040            TRAP      50     1

854       KK       .   (FLWA0175)
855       RK    2690   .0007    .040            TRAP     100     1

856       KK       .   (FLWA0079)
857       RK    5020   .0096    .040            TRAP      50     1

858       KK       .   (FLWA0000)
859       RK    4120   .0049    .040            TRAP     107     2

860       KK     F23 RUNOFF FROM F23
861       BA    1.92
862       LS       0    74.4                      98
863       UK     500     .01    0.25      70
864       UK     100    .015     .10      30
865       RK    2600    .005     .02    .037    TRAP      20     1
866       RK    2200   .0018     .02    0.21    TRAP      40     1
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LINE          ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

 867          RK   13700   .0075    .032            TRAP      50       2      NO

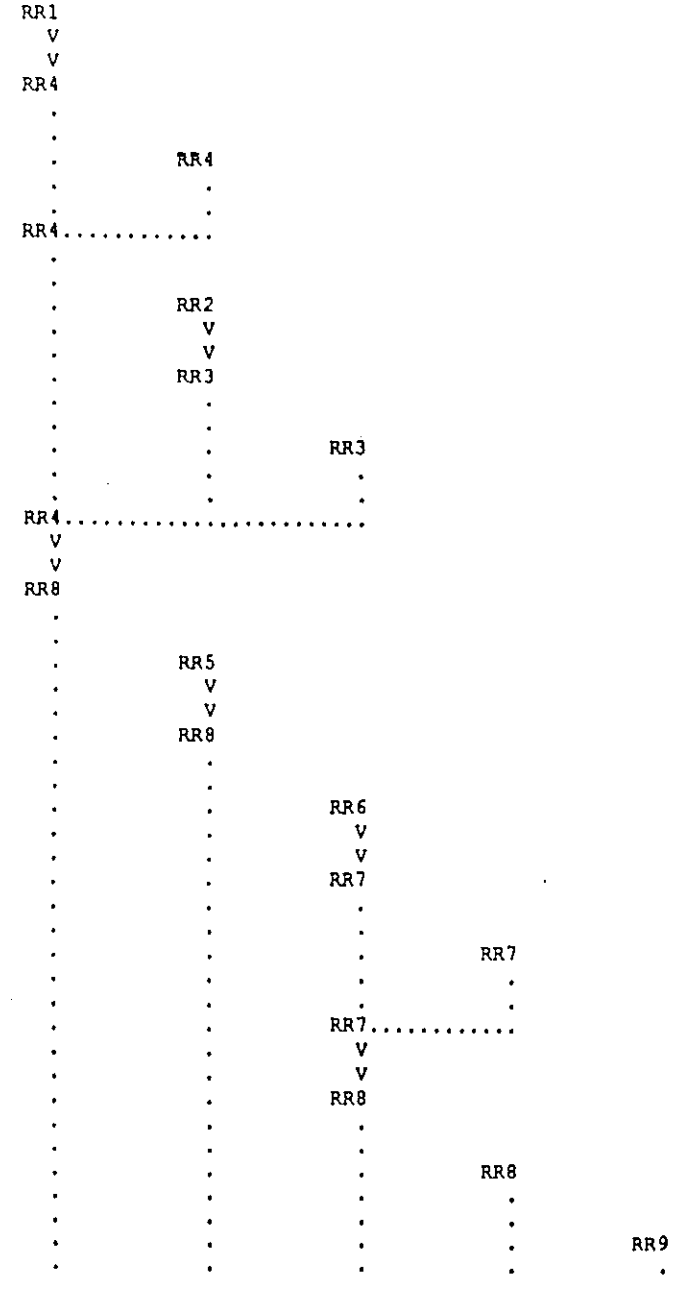
 868          KK     F23 COMBINE F22 AND F23
 869          KM         CONFLUENCE OF FLAMINGO WASH WITH LAS VEGAS WASH
 870          HC       2
 871          ZZ
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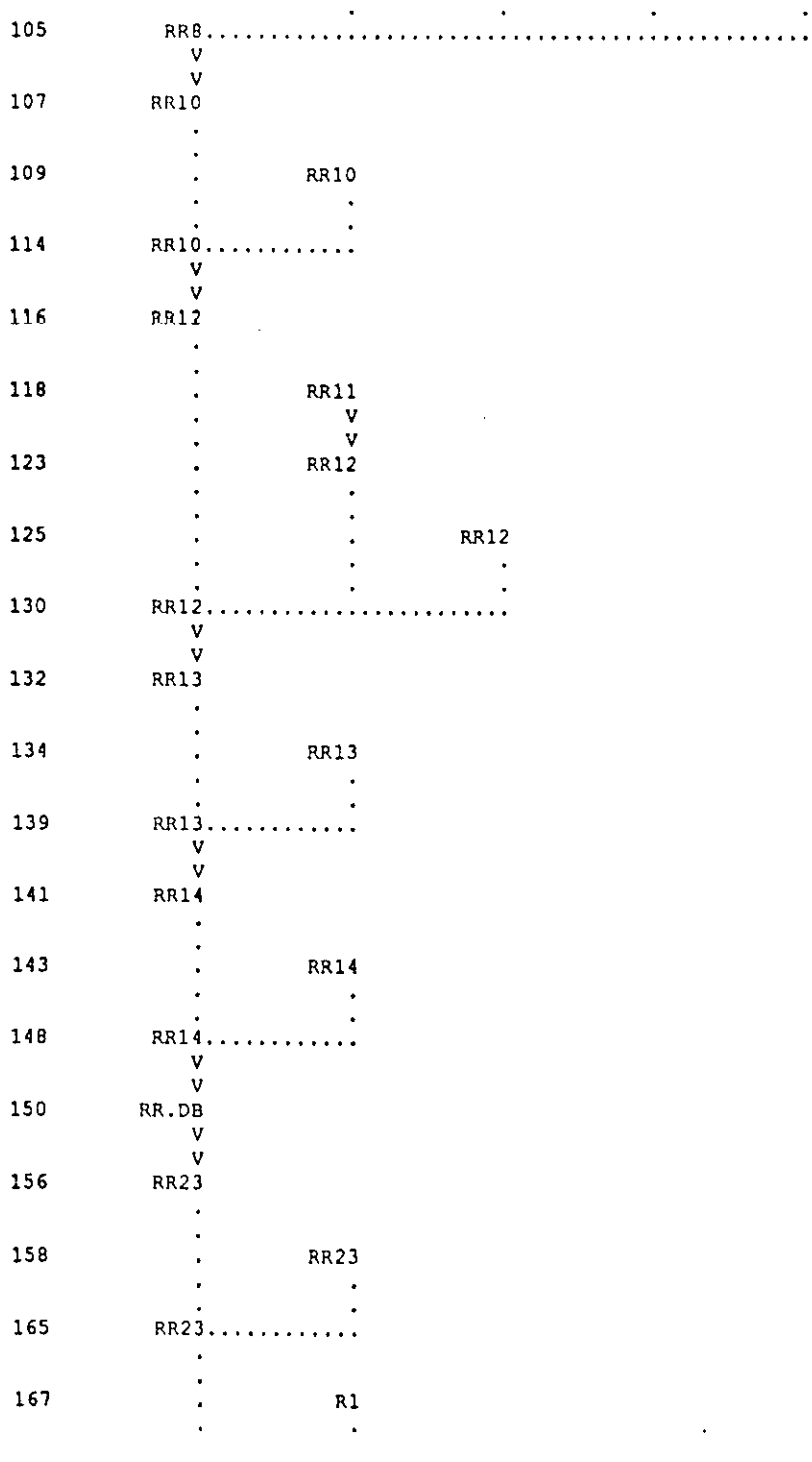
SCHEMATIC DIAGRAM OF STREAM NETWORK

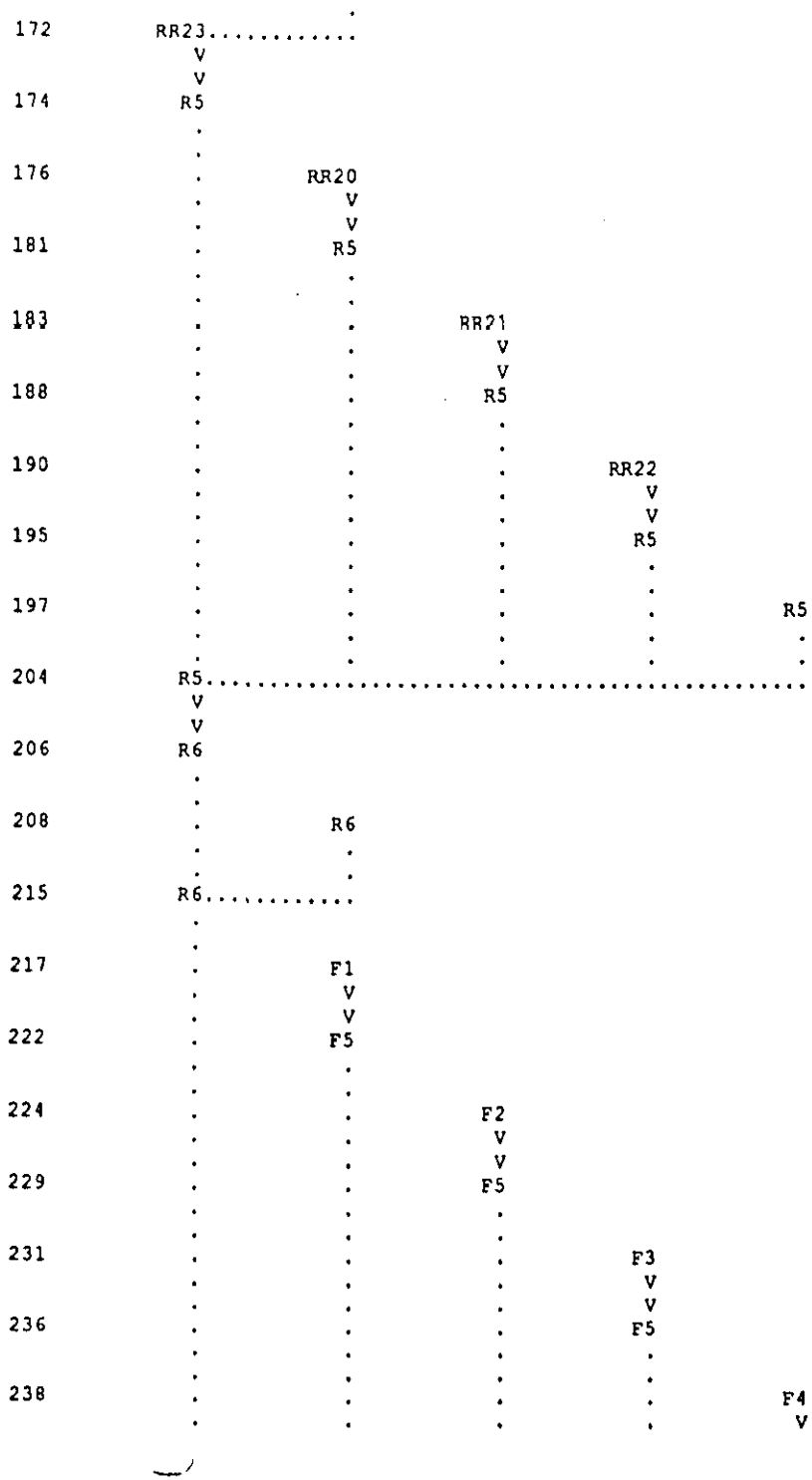
INPUT LINE NO.

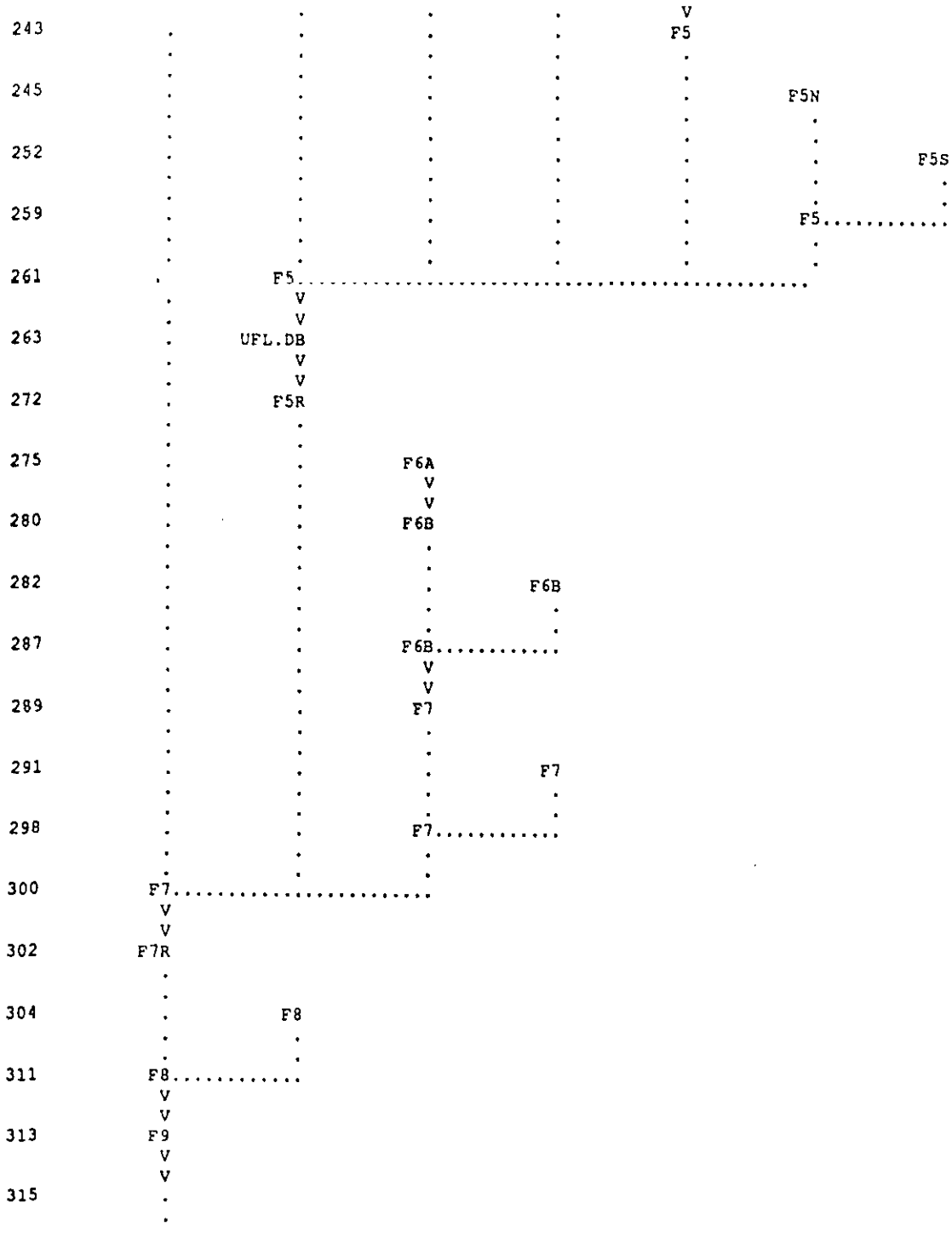
(V) ROUTING (---->) DIVERSION OR PUMP FLOW

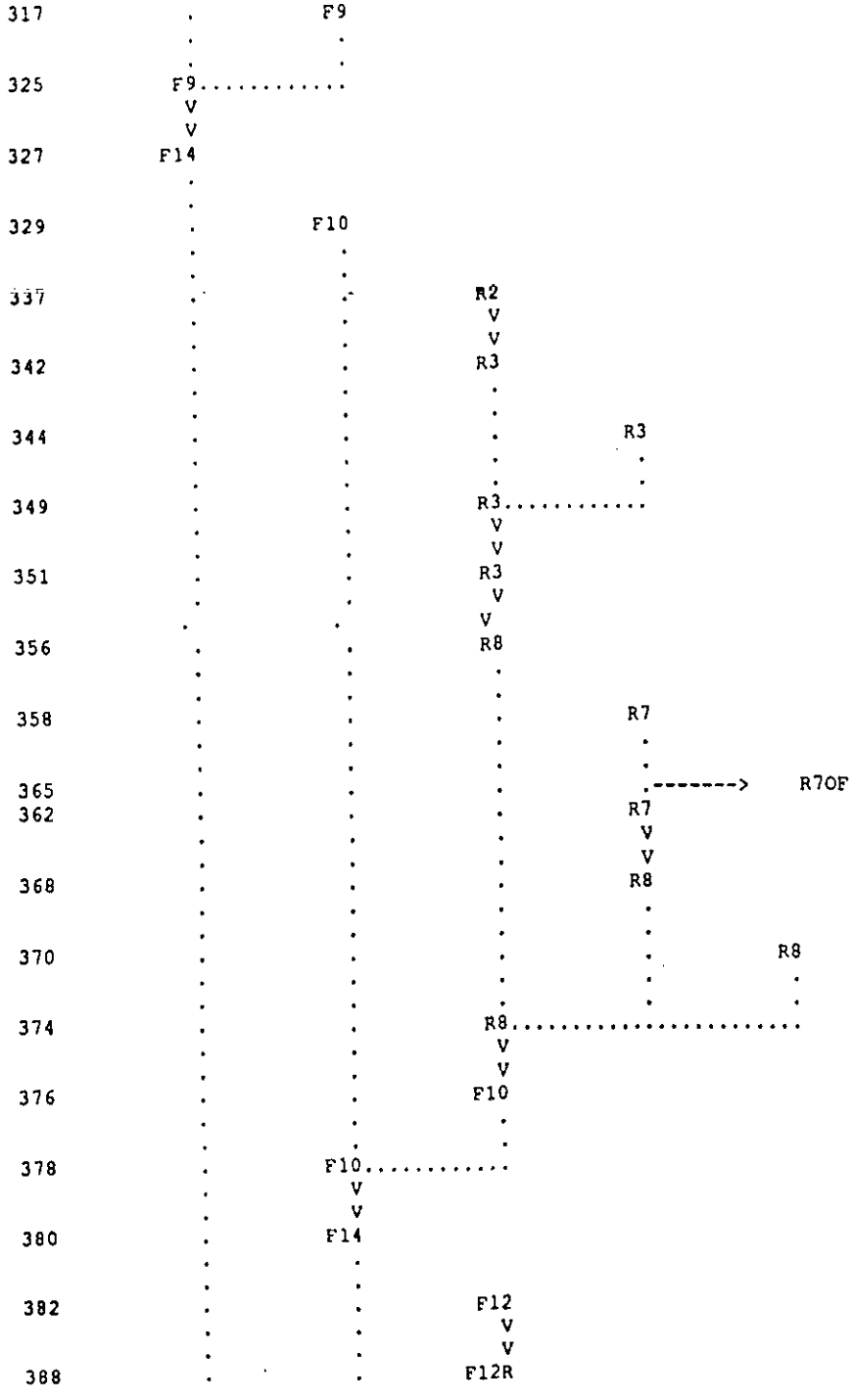
(.) CONNECTOR (<----) RETURN OF DIVERTED OR PUMPED FLOW

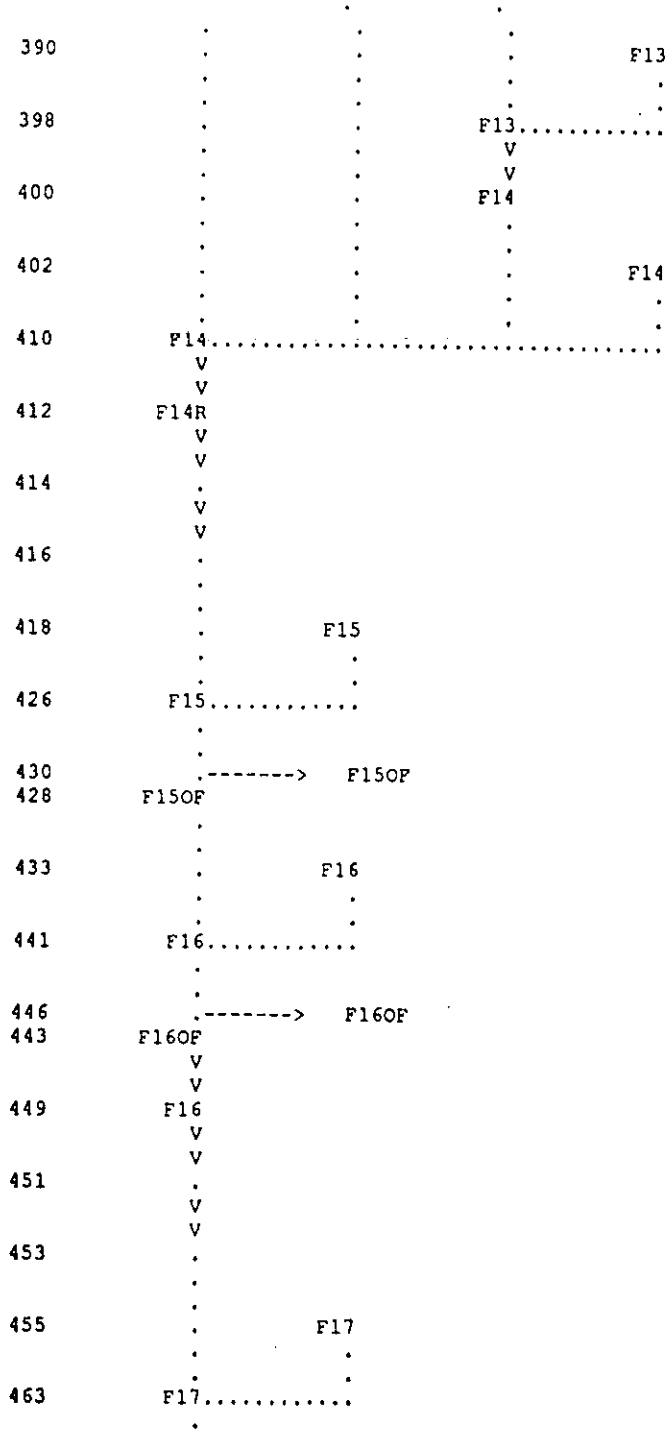


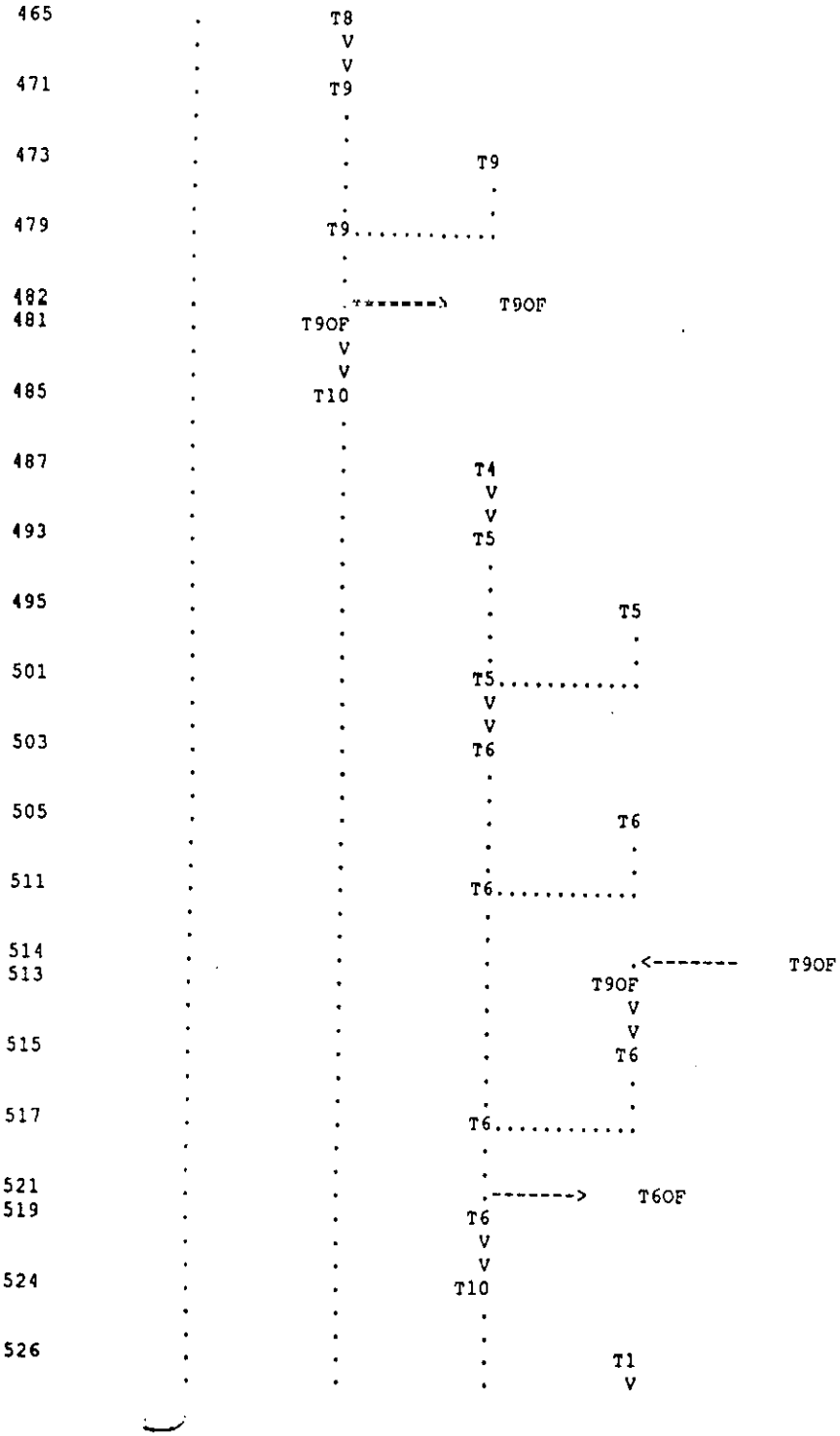

105 RR8
107 RR10
109 RR10
114 RR10
116 RR12
118 RR11
123 RR12
125 RR12
130 RR12
132 RR13
134 RR13
139 RR13
141 RR14
143 RR14
148 RR14
150 RR.DB
156 RR23
158 RR23
165 RR23
167 R1

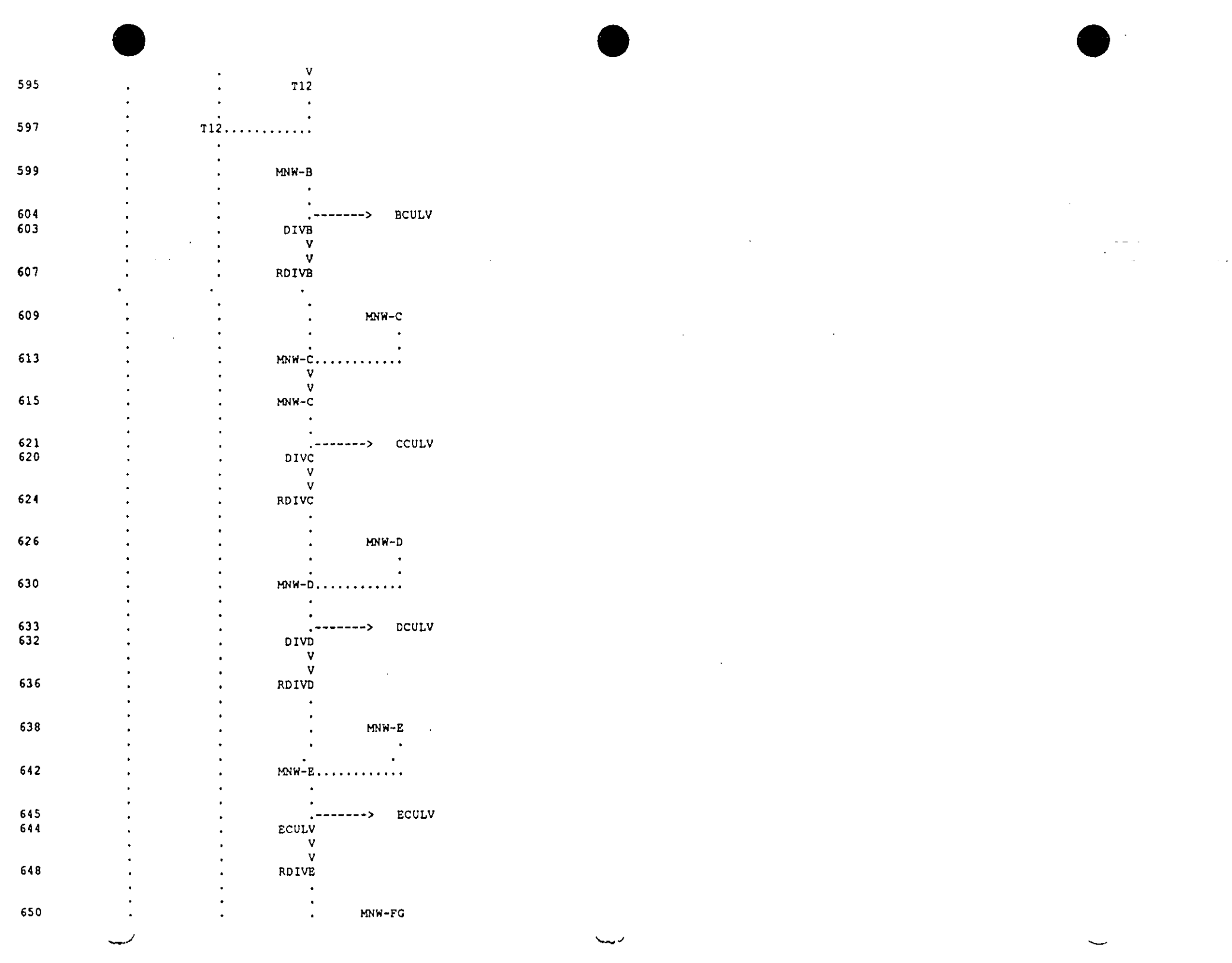

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RR23
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RR20
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RR22
V
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R5
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V
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R6
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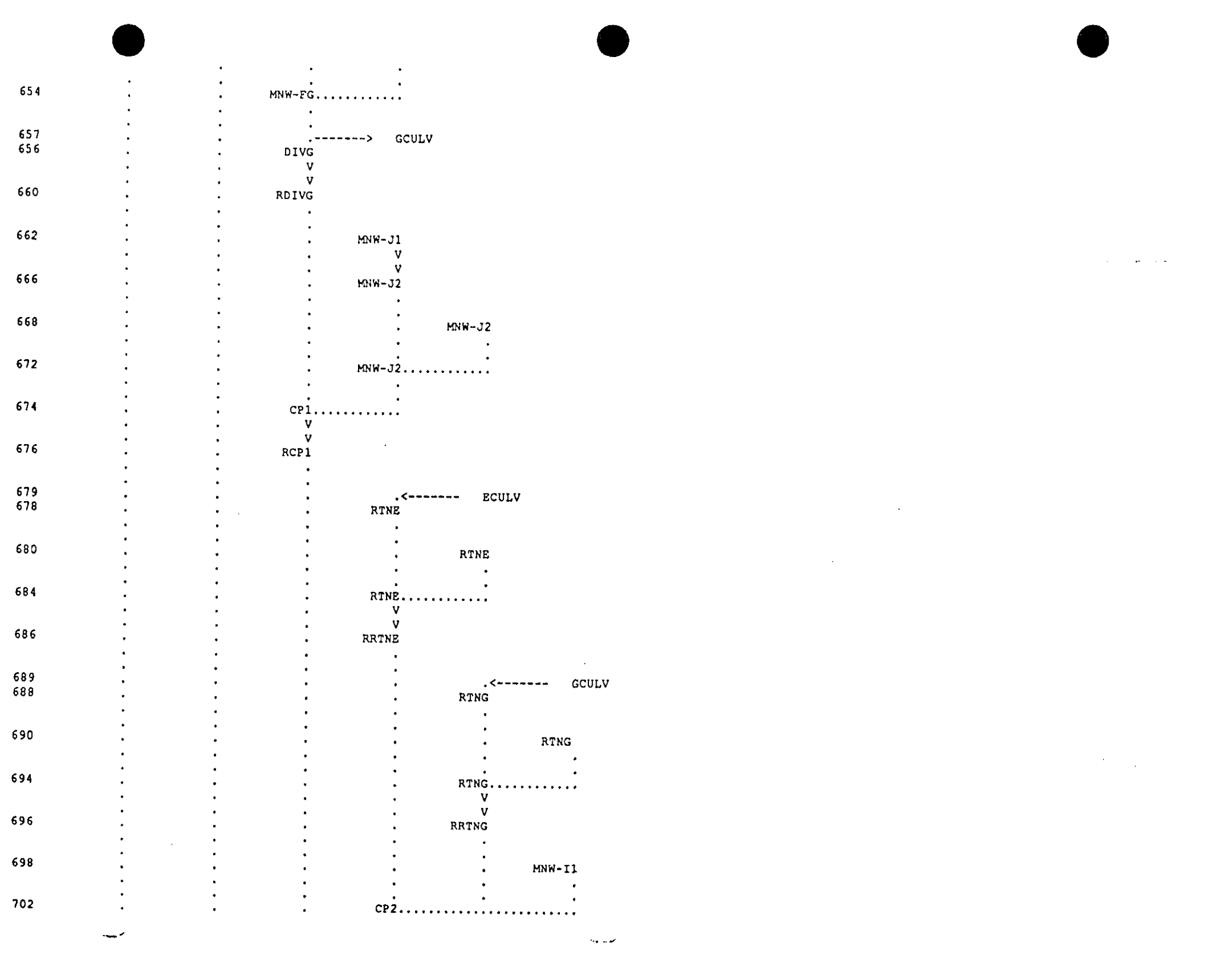

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UFL.DB
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F7
F7R
F8
F8
F9

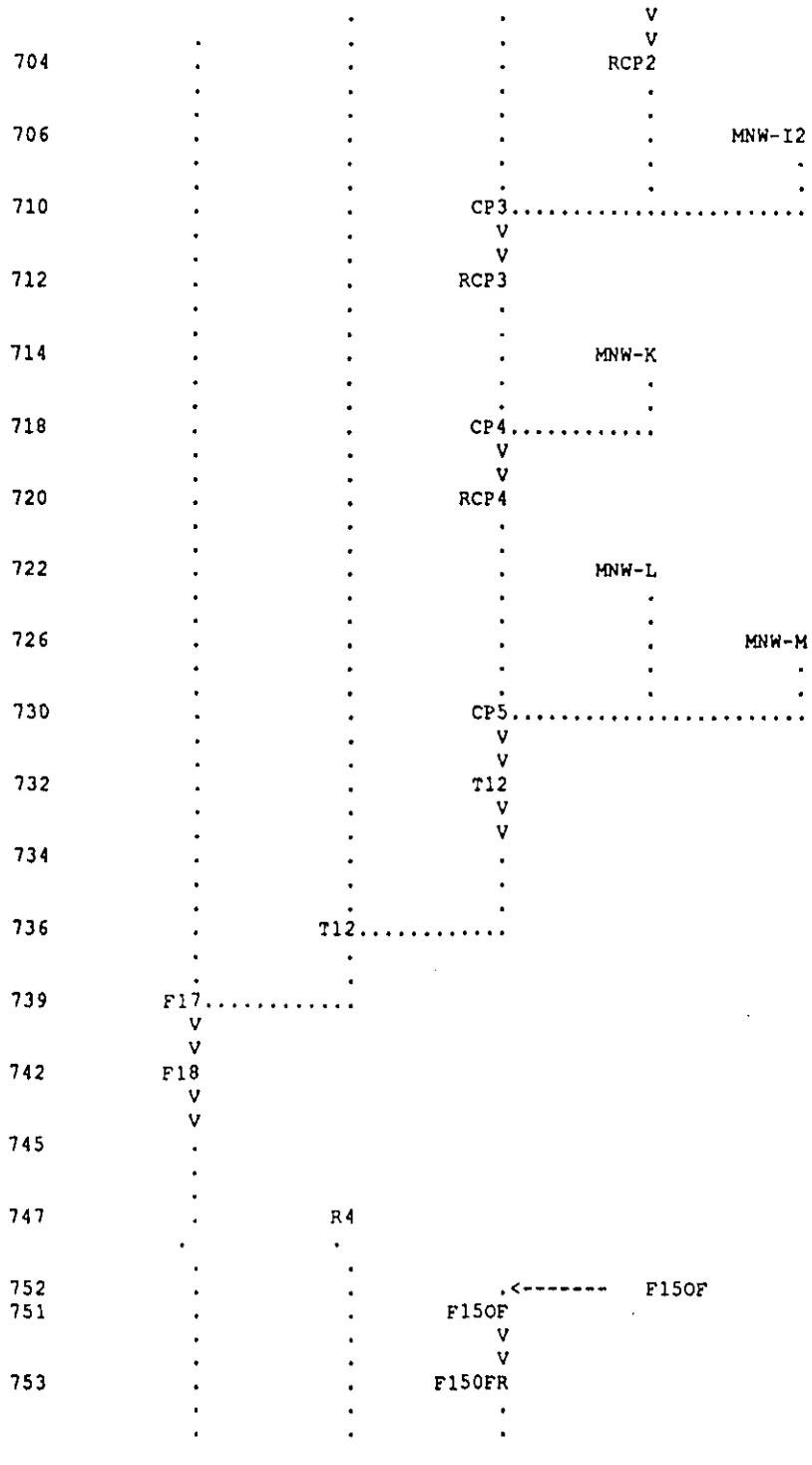

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F10
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R2
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R3
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R3
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R3
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R8
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R7
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R7OF
362
R7
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R8
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378
F10
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F14
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F12
388
F12R

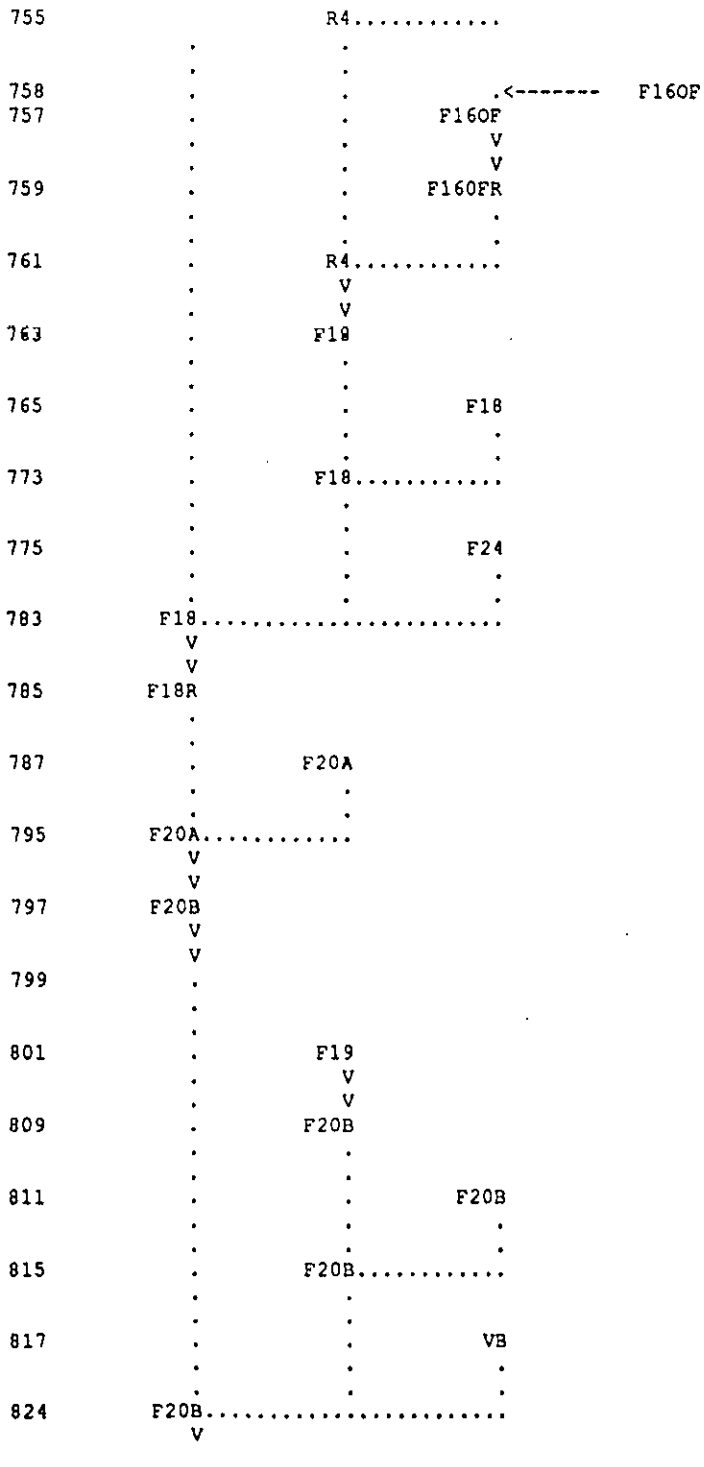

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F13
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F14
412
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F15
430
F15OF
428
F15OF
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443
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F17

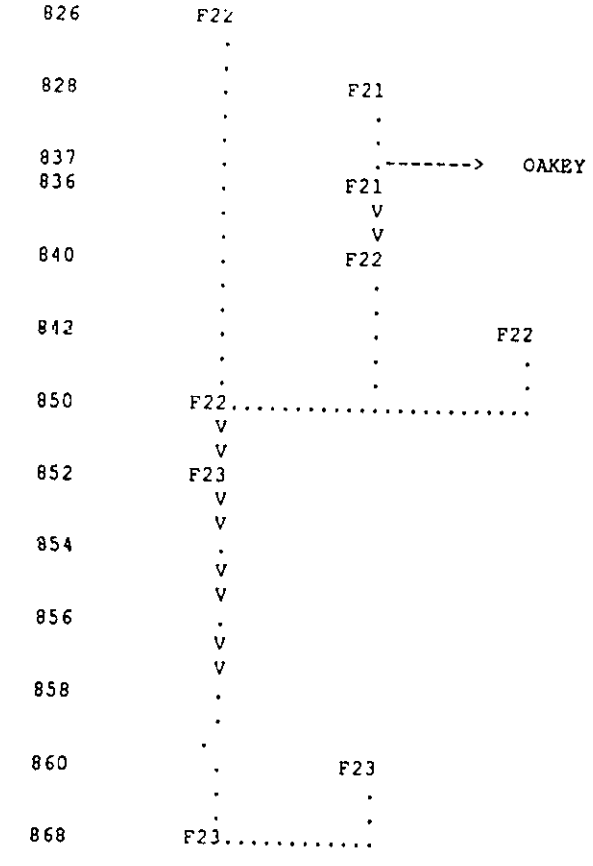

465
T8
V
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T9OF
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T1
V


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T12
597
T12
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MNW-B
604
BCULV
603
DIVB
607
RDIVB
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MNW-C
613
MNW-C
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MNW-C
621
CCULV
620
DIVC
624
RDIVC
626
MNW-D
630
MNW-D
633
DCULV
632
DIVD
636
RDIVD
638
MNW-E
642
MNW-E
645
ECULV
644
ECULV
648
RDIVE
650
MNW-FG


654
MNW-FG
657
GCULV
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DIVG
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RDIVG
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MNW-J1
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MNW-J2
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MNW-J2
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MNW-J2
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CP1
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RCP1
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ECULV
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RTNE
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GCULV
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RCP2
MNW-I2
CP3
RCP3
MNW-K
CP4
RCP4
MNW-L
MNW-M
CP5
T12
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F18
R4
F150F
F150F
F150FR


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F16OF
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F16OF
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F16OFR
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R4
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F18
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F18
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775
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F18
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F18R
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F20A
795
F20A
797
F20B
799
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F19
809
F20B
811
F20B
815
F20B
817
VB
824
F20B



(***) RUNOFF ALSO COMPUTED AT THIS LOCATION

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*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*           FEBRUARY 1981               *
*         REVISED 02 AUG 88             *
*                                       *
*  RUN DATE  12/12/1990  TIME  11:28:54 *
*                                       *
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*****************************************
*                                       *
*    U.S. ARMY CORPS OF ENGINEERS       *
*  THE HYDROLOGIC ENGINEERING CENTER    *
*         609 SECOND STREET             *
*       DAVIS, CALIFORNIA 95616         *
*                                       *
*****************************************
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INPUT FILE = FLEX100.DAT
CLARK COUNTY FLOOD CONTROL DISTRICT MASTER PLAN UPDATE
RED ROCK/FLAMINGO/TROPICANA WATERSHED
EXISTING DRAINAGE SYSTEM WITH PRESENT DEVELOPMENT
FLAMINGO/TROPICANA STORM (NO UPPER BLUE DIAMOND)- MAIN CHANNEL RUN
100-YEAR 6-HR STORM (SDN #5)
JMM OCTOBER 1990

BASIC DATA FILE BASED ON COE FILE S10P40X.
MODIFICATIONS ADDED FROM B&V RED ROCK BASIN AND UPPER FLAMINGO
BASIN HEC-1 RUNS; NIMBUS NORTHWEST MCCARRAN AIRPORT HEC-1 RUNS;
AND SUBBASIN MODIFICATIONS DUE TO RECENT DEVELOPMENT.

COE MUSKINGUM ROUTING CONVERTED TO KINEMATIC FOR EXISTING
IMPROVED CHANNELS FROM FACILITY INVENTORY.

PB CARDS CONTAIN POINT PRECIPITATION. DARF'S FROM CCRFCD MANUAL
BASED ON STORM AREAS FOR CONCENTRATION POINTS AS FOLLOWS:

SUBBASIN	AREA (SQMI)	DARF
T12,F5	20.8,15.9	0.81
RR14	53	0.68
F7,F14,F16,F16OF	92,103,105	0.60
F17,F20B,F22,F23	127,139,143,145	0.565

```
 29 IO          OUTPUT CONTROL VARIABLES
                      IPRNT           5  PRINT CONTROL
                      IPLOT           0  PLOT CONTROL
                      QSCAL          0.  HYDROGRAPH PLOT SCALE

    IT          HYDROGRAPH TIME DATA
                       NMIN           5  MINUTES IN COMPUTATION INTERVAL
                      IDATE      1    0  STARTING DATE
                      ITIME       0000  STARTING TIME
                         NQ         200  NUMBER OF HYDROGRAPH ORDINATES
                     NDDATE      1    0  ENDING DATE
                     NDTIME        1635  ENDING TIME
                      ICENT          19  CENTURY MARK

                COMPUTATION INTERVAL      .08 HOURS
```

TOTAL TIME BASE 16.58 HOURS

ENGLISH UNITS

DRAINAGE AREA	SQUARE MILES
PRECIPITATION DEPTH	INCHES
LENGTH, ELEVATION	FEET
FLOW	CUBIC FEET PER SECOND
STORAGE VOLUME	ACRE-FEET
SURFACE AREA	ACRES
TEMPERATURE	DEGREES FAHRENHEIT

JP MULTI-PLAN OPTION

NPLAN 1 NUMBER OF PLANS

JR MULTI-RATIO OPTION

RATIOS OF PRECIPITATION

.81 .68 .60 .56

*** ROFGRD - MAXIMUM NUMBER OF DX INTERVALS REACHED. MDX= 51
THIS MAY AFFECT ACCURACY OF KW SOLUTION TO REDUCE ERRORS SHORTEN OVERLANDFLOW LENGTH PLANE 1.

*** ROFGRD - MAXIMUM NUMBER OF DX INTERVALS REACHED. MDX= 51
THIS MAY AFFECT ACCURACY OF KW SOLUTION TO REDUCE ERRORS SHORTEN OVERLANDFLOW LENGTH PLANE 1.

*** FDKRUT - NEWTON RAPHSON FAILEDFIXED POINT ITERATION USED - ITERATION= 2

PEAK FLOW AND STAGE (END-OF-PERIOD) SUMMARY FOR MULTIPLE PLAN-RATIO ECONOMIC COMPUTATIONS
FLOWS IN CUIC FEET PER SECOND, AREA IN SQUARE MILES
TIME TO PEAK IN HOURS

OPERATION	STATION	AREA	PLAN		RATIOS APPLIED TO PRECIPITATION RATIO 1 .81	RATIO 2 .68	RATIO 3 .60	RATIO 4 .56
HYDROGRAPH AT	RR1	3.83	1	FLOW	2889.	2202.	1790.	1614.
				TIME	3.75	3.75	3.75	3.75
ROUTED TO	RR4	3.83	1	FLOW	2429.	1848.	1499.	1350.
				TIME	4.08	4.08	4.08	4.08
HYDROGRAPH AT	RR4	2.74	1	FLOW	835.	614.	487.	434.
				TIME	4.83	4.92	5.08	5.17
2 COMBINED AT	RR4	6.57	1	FLOW	2980.	2236.	1798.	1612.
				TIME	4.08	4.08	4.17	4.17
HYDROGRAPH AT	RR2	3.35	1	FLOW	2186.	1649.	1329.	1193.
				TIME	3.83	3.83	3.83	3.83
ROUTED TO	RR3	3.35	1	FLOW	1912.	1440.	1159.	1039.
				TIME	4.17	4.17	4.17	4.17
HYDROGRAPH AT	RR3	3.19	1	FLOW	1609.	1182.	931.	824.
				TIME	3.92	3.92	3.92	3.92
3 COMBINED AT	RR4	13.11	1	FLOW	6318.	4727.	3784.	3383.
				TIME	4.08	4.08	4.08	4.08
ROUTED TO	RR8	13.11	1	FLOW	5393.	4027.	3221.	2881.
				TIME	4.58	4.58	4.67	4.67
HYDROGRAPH AT	RR5	7.32	1	FLOW	2004.	1475.	1168.	1039.
				TIME	5.33	5.42	5.42	5.50
ROUTED TO	RR8	7.32	1	FLOW	1994.	1466.	1160.	1031.
				TIME	5.58	5.67	5.67	5.67
HYDROGRAPH AT	RR6	2.85	1	FLOW	1873.	1405.	1127.	1008.
				TIME	3.75	3.75	3.75	3.75
ROUTED TO	RR7	2.85	1	FLOW	1530.	1147.	920.	823.
				TIME	4.17	4.17	4.17	4.17
HYDROGRAPH AT	RR7	4.87	1	FLOW	1404.	1020.	797.	704.
				TIME	4,67	4.67	4.75	4.75
2 COMBINED AT	RR7	7.72	1	FLOW	2722.	1998.	1573.	1394.
				TIME	4.25	4.25	4.25	4.25
ROUTED TO	RR8	7.72	1	FLOW	2439.	1791.	1411.	1251.
				TIME	4.83	4.83	4.83	4.83
HYDROGRAPH AT	RR8	1.75	1	FLOW	422.	310.	245.	218.

				TIME	5.50	5.58	5.58	8
HYDROGRAPH AT	RR9	3.71	1	FLOW	1368.	1015.	807.	719.
				TIME	4.25	4.25	4.25	4.25
5 COMBINED AT	RR8	33.61	1	FLOW	10712.	7909.	6270.	5577.
				TIME	4.67	4.75	4.75	4.75
ROUTED TO	RR10	33.61	1	FLOW	10542.	7792.	6176.	5499.
				TIME	5.00	5.00	5.08	5.08
HYDROGRAPH AT	RR10	3.30	1	FLOW	842.	608.	474.	420.
				TIME	4.75	4.83	5.08	5.17
2 COMBINED AT	RR10	36.91	1	FLOW	11373.	8398.	6651.	5919.
				TIME	5.00	5.00	5.08	5.08
ROUTED TO	RR12	36.91	1	FLOW	11196.	8278.	6574.	5855.
				TIME	5.33	5.33	5.42	5.42
HYDROGRAPH AT	RR11	3.40	1	FLOW	1223.	900.	710.	630.
				TIME	4.25	4.25	4.25	4.25
ROUTED TO	RR12	3.40	1	FLOW	1202.	884.	698.	620.
				TIME	4.42	4.42	4.50	4.50
HYDROGRAPH AT	RR12	4.25	1	FLOW	1636.	1214.	967.	862.
				TIME	4.17	4.17	4.25	4.25
3 COMBINED AT	RR12	44.56	1	FLOW	13274.	9878.	7875.	7026.
				TIME	5.33	5.33	5.33	5.33
ROUTED TO	RR13	44.56	1	FLOW	13149.	9786.	7802.	6969.
				TIME	5.58	5.58	5.58	5.67
HYDROGRAPH AT	RR13	2.26	1	FLOW	833.	590.	449.	390.
				TIME	3.92	3.92	3.92	3.92
2 COMBINED AT	RR13	46.82	1	FLOW	13498.	10027.	7990.	7130.
				TIME	5.50	5.50	5.58	5.58
ROUTED TO	RR14	46.82	1	FLOW	13476.	10011.	7981.	7121.
				TIME	5.58	5.67	5.67	5.67
HYDROGRAPH AT	RR14	6.22	1	FLOW	1740.	1305.	1048.	940.
				TIME	5.42	5.42	5.50	5.50
2 COMBINED AT	RR14	53.04	1	FLOW	15197.	11303.	9018.	8052.
				TIME	5.58	5.58	5.67	5.67
ROUTED TO	RR.DB	53.04	1	FLOW	12101.	5740.	1381.	1335.
				TIME	6.58	7.25	8.33	8.33
			** PEAK STAGES IN FEET **					
			1	STAGE	3212.76	3211.42	3208.20	3205.32
				TIME	6.58	7.25	8.33	8.33
ROUTED TO	RR23	53.04	1	FLOW	11598.	5299.	1381.	1335.
				TIME	7.17	7.83	8.92	8.83

HYDROGRAPH AT	RR23	2.03	1	FLOW	402.	241.	182.	[illegible]
				TIME	4.33	5.25	5.25	5.33
2 COMBINED AT	RR23	55.07	1	FLOW	11655.	5329.	1396.	1349.
				TIME	7.17	7.83	8.58	8.58
HYDROGRAPH AT	R1	1.12	1	FLOW	584.	446.	363.	328.
				TIME	3.83	3.83	3.83	3.83
2 COMBINED AT	RR23	56.19	1	FLOW	11658.	5329.	1396.	1349.
				TIME	7.17	7.83	8.58	8.58
ROUTED TO	R5	56.19	1	FLOW	11363.	5120.	1395.	1349.
				TIME	7.58	8.25	9.00	8.92
HYDROGRAPH AT	RR20	1.37	1	FLOW	610.	468.	382.	346.
				TIME	4.08	4.08	4.08	4.08
ROUTED TO	R5	1.37	1	FLOW	569.	437.	357.	323.
				TIME	4.75	4.75	4.75	4.75
HYDROGRAPH AT	RR21	6.27	1	FLOW	2202.	1672.	1355.	1221.
				TIME	4.42	4.42	4.50	4.50
ROUTED TO	R5	6.27	1	FLOW	2130.	1618.	1315.	1185.
				TIME	5.08	5.08	5.17	5.17
HYDROGRAPH AT	RR22	2.15	1	FLOW	959.	728.	589.	530.
				TIME	4.00	4.00	4.00	4.00
ROUTED TO	R5	2.15	1	FLOW	878.	667.	540.	486.
				TIME	4.75	4.75	4.75	4.75
HYDROGRAPH AT	R5	5.77	1	FLOW	1040.	649.	482.	417.
				TIME	4.17	5.08	5.17	5.25
5 COMBINED AT	R5	71.75	1	FLOW	11916.	5292.	3472.	3141.
				TIME	7.50	8.25	5.33	5.50
ROUTED TO	R6	71.75	1	FLOW	11776.	5196.	3463.	3134.
				TIME	7.75	8.50	5.58	5.75
HYDROGRAPH AT	R6	1.51	1	FLOW	180.	114.	73.	57.
				TIME	5.17	5.33	5.58	5.75
2 COMBINED AT	R6	73.26	1	FLOW	11798.	5208.	3536.	3190.
				TIME	7.75	8.50	5.58	5.75
HYDROGRAPH AT	F1	4.63	1	FLOW	1938.	1485.	1213.	1096.
				TIME	4.17	4.17	4.17	4.17
ROUTED TO	F5	4.63	1	FLOW	1780.	1366.	1118.	1011.
				TIME	5.17	5.25	5.25	5.25
HYDROGRAPH AT	F2	1.28	1	FLOW	709.	545.	446.	403.
				TIME	3.83	3.83	3.83	3.83
ROUTED TO	F5	1.28	1	FLOW	615.	472.	386.	349.
				TIME	4.58	4.58	4.58	4.58

HYDROGRAPH AT	F3	2.60	1	FLOW	1459.	1107.	897.	,.
				TIME	3.75	3.75	3.75	3.75
ROUTED TO	F5	2.60	1	FLOW	1304.	990.	802.	721.
				TIME	4.17	4.17	4.17	4.17
HYDROGRAPH AT	F4	1.30	1	FLOW	618.	462.	370.	331.
				TIME	3.75	3.83	3.83	3.83
ROUTED TO	F5	1.30	1	FLOW	538.	402.	321.	287.
				TIME	4.50	4.50	4.50	4.50
HYDROGRAPH AT	F5N	4.04	1	FLOW	1319.	877.	644.	567.
				TIME	4.17	4.42	4.58	4.83
HYDROGRAPH AT	F5S	2.00	1	FLOW	665.	436.	308.	261.
				TIME	4.08	4.17	4.33	4.50
2 COMBINED AT	F5	6.04	1	FLOW	1960.	1290.	935.	818.
				TIME	4.17	4.33	4.58	4.83
5 COMBINED AT	F5	15.85	1	FLOW	4565.	3427.	2831.	2576.
				TIME	4.33	5.17	5.25	5.25
ROUTED TO	UFL.DB	15.85	1	FLOW	1159.	1059.	990.	962.
				TIME	6.92	6.83	6.75	6.75
			** PEAK STAGES IN FEET **					
			1	STAGE	2466.85	2463.92	2462.11	2461.37
				TIME	6.92	6.83	6.75	6.75
ROUTED TO	F5R	15.85	1	FLOW	1159.	1059.	990.	962.
				TIME	7.00	6.92	6.83	6.83
HYDROGRAPH AT	F6A	.55	1	FLOW	285.	216.	176.	158.
				TIME	3.75	3.75	3.75	3.75
ROUTED TO	F6B	.55	1	FLOW	257.	195.	158.	142.
				TIME	4.08	4.08	4.08	4.08
HYDROGRAPH AT	F6B	.85	1	FLOW	452.	342.	276.	248.
				TIME	3.67	3.67	3.67	3.67
2 COMBINED AT	F6B	1.40	1	FLOW	591.	445.	359.	322.
				TIME	3.75	3.75	3.75	3.75
ROUTED TO	F7	1.40	1	FLOW	558.	422.	340.	306.
				TIME	4.08	4.08	4.08	4.08
HYDROGRAPH AT	F7	1.50	1	FLOW	459.	296.	210.	191.
				TIME	4.08	4.17	4.42	5.00
2 COMBINED AT	F7	2.90	1	FLOW	1017.	714.	533.	458.
				TIME	4.08	4.17	4.17	4.25
3 COMBINED AT	F7	92.01	1	FLOW	12975.	6239.	4816.	4384.
				TIME	7.75	8.50	5.50	5.58
ROUTED TO	F7R	92.01	1	FLOW	12943.	6222.	4812.	4384.
				TIME	7.83	8.50	5.50	5.67

HYDROGRAPH AT	F8	.48	1	FLOW	64.	51.	44.	40.
				TIME	3.67	3.67	3.67	3.67
2 COMBINED AT	F8	92.49	1	FLOW	12950.	6225.	4823.	4392.
				TIME	7.83	8.50	5.50	5.67
ROUTED TO	F9	92.49	1	FLOW	12949.	6217.	4821.	4391.
				TIME	7.83	8.50	5.50	5.67
ROUTED TO	.	92.49	1	FLOW	12942.	6209.	4821.	4388.
				TIME	7.83	8.58	5.58	5.67
HYDROGRAPH AT	F9	.90	1	FLOW	190.	152.	130.	119.
				TIME	3.67	3.75	3.75	3.75
2 COMBINED AT	F9	93.39	1	FLOW	12955.	6214.	4852.	4414.
				TIME	7.83	8.58	5.58	5.67
ROUTED TO	F14	93.39	1	FLOW	12856.	6154.	4841.	4406.
				TIME	8.00	8.75	5.75	5.83
HYDROGRAPH AT	F10	1.17	1	FLOW	401.	317.	270.	251.
				TIME	3.58	3.58	3.58	3.58
HYDROGRAPH AT	R2	2.01	1	FLOW	881.	607.	451.	386.
				TIME	3.58	3.58	3.58	3.58
ROUTED TO	R3	2.01	1	FLOW	729.	503.	374.	320.
				TIME	4.00	4.00	4.00	4.00
HYDROGRAPH AT	R3	2.63	1	FLOW	249.	156.	105.	84.
				TIME	5.25	5.25	5.25	5.25
2 COMBINED AT	R3	4.64	1	FLOW	924.	588.	412.	343.
				TIME	4.00	4.00	4.00	4.00
ROUTED TO	R3	4.64	1	FLOW	208.	136.	98.	83.
				TIME	5.92	5.92	5.92	5.92
			** PEAK STAGES IN FEET **					
			1	STAGE	24.61	23.02	22.17	21.83
				TIME	5.92	5.92	5.92	5.92
ROUTED TO	R8	4.64	1	FLOW	208.	136.	98.	83.
				TIME	5.92	5.92	6.00	6.00
HYDROGRAPH AT	R7	1.39	1	FLOW	346.	232.	169.	144.
				TIME	3.92	3.92	4.00	4.00
DIVERSION TO	R7OF	1.39	1	FLOW	22.	0.	0.	0.
				TIME	3.92	.08	.08	.08
HYDROGRAPH AT	R7	1.39	1	FLOW	324.	232.	169.	144.
				TIME	3.83	3.92	4.00	4.00
ROUTED TO	R8	1.39	1	FLOW	324.	232.	169.	144.
				TIME	4.00	4.00	4.08	4.08
HYDROGRAPH AT	R8	.51	1	FLOW	90.	54.	40.	34.

				TIME	3.83	5.00	5.00	.0
3 COMBINED AT	R8	6.54	1	FLOW	489.	338.	254.	220.
				TIME	5.17	5.17	5.17	5.17
ROUTED TO	F10	6.54	1	FLOW	487.	337.	254.	220.
				TIME	5.25	5.25	5.25	5.25
2 COMBINED AT	F10	7.71	1	FLOW	600.	431.	334.	296.
				TIME	5.00	3.67	3.67	3.67
ROUTED TO	F14	7.71	1	FLOW	599.	428.	332.	293.
				TIME	5.08	5.08	5.08	5.08
HYDROGRAPH AT	F12	.88	1	FLOW	306.	209.	153.	131.
				TIME	4.00	4.17	4.33	4.42
ROUTED TO	F12R	.88	1	FLOW	296.	203.	150.	129.
				TIME	4.25	4.33	4.50	4.67
HYDROGRAPH AT	F13	.55	1	FLOW	160.	121.	94.	80.
				TIME	4.92	5.00	5.00	5.08
2 COMBINED AT	F13	1.43	1	FLOW	417.	287.	234.	208.
				TIME	4.25	4.92	5.00	5.08
ROUTED TO	F14	1.43	1	FLOW	412.	285.	231.	206.
				TIME	4.42	5.08	5.17	5.17
HYDROGRAPH AT	F14	.78	1	FLOW	130.	80.	54.	48.
				TIME	5.17	5.33	4.08	4.08
4 COMBINED AT	F14	103.31	1	FLOW	13082.	6561.	5310.	4787.
				TIME	8.00	5.50	5.58	5.75
ROUTED TO	F14R	103.31	1	FLOW	13064.	6557.	5308.	4785.
				TIME	8.00	5.50	5.67	5.75
ROUTED TO	.	103.31	1	FLOW	13029.	6546.	5305.	4781.
				TIME	8.08	5.50	5.67	5.83
ROUTED TO	.	103.31	1	FLOW	13029.	6545.	5302.	4781.
				TIME	8.08	5.58	5.67	5.83
HYDROGRAPH AT	F15	1.32	1	FLOW	302.	208.	161.	145.
				TIME	3.92	3.92	4.00	4.00
2 COMBINED AT	F15	104.63	1	FLOW	13047.	6692.	5412.	4868.
				TIME	8.08	5.50	5.67	5.83
DIVERSION TO	F15OF	104.63	1	FLOW	5769.	1519.	769.	450.
				TIME	8.08	5.50	5.67	5.83
HYDROGRAPH AT	F15OF	104.63	1	FLOW	7278.	5173.	4643.	4418.
				TIME	8.08	5.50	5.67	5.83
HYDROGRAPH AT	F16	.52	1	FLOW	186.	142.	123.	110.
				TIME	3.67	3.67	3.75	3.75
2 COMBINED AT	F16	105.15	1	FLOW	7283.	5227.	4681.	4449.

				TIME	8.08	5.50	5.67	.5
DIVERSION TO	F16OF	105.15	1	FLOW	1283.	0.	0.	0.
				TIME	8.08	.08	.08	.08
HYDROGRAPH AT	F16OF	105.15	1	FLOW	6000.	5227.	4681.	4449.
				TIME	7.67	5.50	5.67	5.75
ROUTED TO	F16	105.15	1	FLOW	6000.	5225.	4680.	4448.
				TIME	7.75	5.50	5.67	5.75
ROUTED TO	.	105.15	1	FLOW	6000.	5223.	4679.	4447.
				TIME	7.83	5.50	5.67	5.83
ROUTED TO	.	105.15	1	FLOW	6000.	5222.	4677.	4447.
				TIME	8.00	5.67	5.75	5.92
HYDROGRAPH AT	F17	.65	1	FLOW	201.	149.	120.	106.
				TIME	4.08	4.17	4.25	4.33
2 COMBINED AT	F17	105.80	1	FLOW	6013.	5305.	4745.	4504.
				TIME	8.00	5.58	5.75	5.92
HYDROGRAPH AT	T8	1.22	1	FLOW	59.	23.	10.	6.
				TIME	6.08	7.00	8.08	8.83
ROUTED TO	T9	1.22	1	FLOW	54.	22.	9.	6.
				TIME	6.67	7.50	8.58	9.42
HYDROGRAPH AT	T9	.87	1	FLOW	101.	58.	34.	25.
				TIME	5.25	5.58	5.92	6.17
2 COMBINED AT	T9	2.09	1	FLOW	112.	60.	35.	26.
				TIME	5.33	5.58	6.00	6.25
DIVERSION TO	T9OF	2.09	1	FLOW	0.	0.	0.	0.
				TIME	.08	.08	.08	.08
HYDROGRAPH AT	T9OF	2.09	1	FLOW	112.	60.	35.	26.
				TIME	5.33	5.58	6.00	6.25
ROUTED TO	T10	2.09	1	FLOW	111.	60.	35.	26.
				TIME	5.58	5.83	6.17	6.42
HYDROGRAPH AT	T4	3.22	1	FLOW	1208.	829.	615.	529.
				TIME	4.00	4.17	4.25	4.33
ROUTED TO	T5	3.22	1	FLOW	1201.	826.	610.	525.
				TIME	4.08	4.25	4.33	4.42
HYDROGRAPH AT	T5	1.00	1	FLOW	339.	227.	165.	140.
				TIME	4.00	4.08	4.25	4.92
2 COMBINED AT	T5	4.22	1	FLOW	1532.	1045.	774.	665.
				TIME	4.08	4.25	4.33	4.42
ROUTED TO	T6	4.22	1	FLOW	1524.	1044.	770.	663.
				TIME	4.25	4.42	4.58	4.67
HYDROGRAPH AT	T6	1.30	1	FLOW	422.	281.	205.	179.

				TIME	4.08	4.25	4.50	.0
2 COMBINED AT	T6	5.52	1	FLOW	1931.	1317.	972.	840.
				TIME	4.25	4.42	4.58	4.67
HYDROGRAPH AT	T9OF	.00	1	FLOW	0.	0.	0.	0.
				TIME	.08	.08	.08	.08
ROUTED TO	T6	.00	1	FLOW	0.	0.	0.	0.
				TIME	.08	.08	.08	.08
2 COMBINED AT	T6	5.52	1	FLOW	1931.	1317.	972.	840.
				TIME	4.25	4.42	4.58	4.67
DIVERSION TO	T6OF	5.52	1	FLOW	1181.	567.	222.	90.
				TIME	4.25	4.42	4.58	4.67
HYDROGRAPH AT	T6	5.52	1	FLOW	750.	750.	750.	750.
				TIME	3.83	4.08	4.33	4.50
ROUTED TO	T10	5.52	1	FLOW	750.	750.	750.	750.
				TIME	4.92	5.17	5.42	5.17
HYDROGRAPH AT	T1	1.56	1	FLOW	612.	427.	322.	276.
				TIME	4.00	4.08	4.17	4.25
ROUTED TO	T3	1.56	1	FLOW	608.	426.	320.	273.
				TIME	4.17	4.33	4.42	4.50
HYDROGRAPH AT	T3	.99	1	FLOW	170.	116.	86.	73.
				TIME	4.33	5.08	5.25	5.33
2 COMBINED AT	T3	2.55	1	FLOW	765.	500.	359.	304.
				TIME	4.25	4.33	4.50	4.58
HYDROGRAPH AT	T6OF	.00	1	FLOW	1181.	567.	222.	90.
				TIME	4.25	4.42	4.58	4.67
ROUTED TO	T3	.00	1	FLOW	1148.	548.	212.	83.
				TIME	4.33	4.50	4.67	4.75
2 COMBINED AT	T3	2.55	1	FLOW	1887.	1030.	556.	377.
				TIME	4.33	4.50	4.67	4.75
DIVERSION TO	T3OF	2.55	1	FLOW	409.	0.	0.	0.
				TIME	4.33	.08	.08	.08
YDROGRAPH AT	T3OF	2.55	1	FLOW	1478.	1030.	556.	377.
				TIME	4.33	4.50	4.67	4.75
OUTED TO	T10	2.55	1	FLOW	1477.	1026.	554.	375.
				TIME	4.33	4.50	4.67	4.83
YDROGRAPH AT	T10	.82	1	FLOW	183.	127.	104.	95.
				TIME	3.75	3.75	3.75	3.75
4 COMBINED AT	T10	10.98	1	FLOW	2382.	1859.	1370.	1185.
				TIME	4.33	4.50	4.75	4.83
OUTED TO	T10R	10.98	1	FLOW	2382.	1857.	1369.	1183.

				TIME	4.42	4.58	4.75	52
ROUTED TO	.	10.98	1	FLOW	2381.	1853.	1369.	1183.
				TIME	4.42	4.58	4.83	5.00
HYDROGRAPH AT	T11	1.09	1	FLOW	295.	227.	199.	177.
				TIME	3.75	3.75	3.83	3.92
2 COMBINED AT	T11	12.07	1	FLOW	2514.	1954.	1451.	1261.
				TIME	4.42	4.58	4.83	5.00
ROUTED TO	T11R	12.07	1	FLOW	2513.	1949.	1449.	1261.
				TIME	4.42	4.67	4.83	5.00
ROUTED TO	.	12.07	1	FLOW	2511.	1948.	1446.	1259.
				TIME	4.50	4.75	5.00	5.17
HYDROGRAPH AT	T12	.77	1	FLOW	225.	172.	144.	136.
				TIME	3.75	3.75	3.83	3.83
2 COMBINED AT	T12	12.84	1	FLOW	2611.	2018.	1515.	1327.
				TIME	4.50	4.75	5.00	5.17
HYDROGRAPH AT	T3OF	.00	1	FLOW	409.	0.	0.	0.
				TIME	4.33	.08	.08	.08
ROUTED TO	T12	.00	1	FLOW	141.	0.	0.	0.
				TIME	6.25	.08	.08	.08
2 COMBINED AT	T12	12.84	1	FLOW	2611.	2018.	1515.	1327.
				TIME	4.50	4.75	5.00	5.17
HYDROGRAPH AT	MNW-B	.68	1	FLOW	41.	27.	20.	17.
				TIME	6.50	6.42	6.42	6.42
DIVERSION TO	BCULV	.68	1	FLOW	22.	22.	20.	17.
				TIME	4.83	5.50	6.42	6.42
HYDROGRAPH AT	DIVB	.68	1	FLOW	19.	5.	0.	0.
				TIME	6.50	6.42	.08	.08
ROUTED TO	RDIVB	.68	1	FLOW	0.	0.	0.	0.
				TIME	.08	.08	.08	.08
HYDROGRAPH AT	MNW-C	.69	1	FLOW	59.	42.	33.	29.
				TIME	6.00	6.00	5.92	5.92
2 COMBINED AT	MNW-C	1.37	1	FLOW	59.	42.	33.	29.
				TIME	6.00	6.00	5.92	5.92
ROUTED TO	MNW-C	1.37	1	FLOW	49.	34.	29.	27.
				TIME	6.83	6.83	6.58	6.50
			** PEAK STAGES IN FEET **					
			1	STAGE	57.56	56.93	56.37	56.17
				TIME	6.83	6.83	6.58	6.50
DIVERSION TO	CCULV	1.37	1	FLOW	41.	34.	29.	27.
				TIME	6.83	6.83	6.58	6.50

HYDROGRAPH AT	DIVC	1.37	1	FLOW	8.	0.	0.	0.
				TIME	6.83	.08	.08	.08
ROUTED TO	RDIVC	1.37	1	FLOW	8.	0.	0.	0.
				TIME	6.92	.08	.08	.08
HYDROGRAPH AT	MNW-D	.05	1	FLOW	7.	4.	3.	3.
				TIME	3.83	5.08	5.08	3.75
2 COMBINED AT	MNW-D	1.42	1	FLOW	8.	4.	3.	3.
				TIME	6.92	5.08	5.08	3.75
DIVERSION TO	DCULV	1.42	1	FLOW	8.	4.	3.	3.
				TIME	6.92	5.08	5.08	3.75
HYDROGRAPH AT	DIVD	1.42	1	FLOW	0.	0.	0.	0.
				TIME	.08	.08	.08	.08
ROUTED TO	RDIVD	1.42	1	FLOW	0.	0.	0.	0.
				TIME	.08	.08	.08	.08
HYDROGRAPH AT	MNW-E	.05	1	FLOW	9.	6.	5.	5.
				TIME	3.75	3.75	3.75	3.75
2 COMBINED AT	MNW-E	1.47	1	FLOW	9.	6.	5.	5.
				TIME	3.75	3.75	3.75	3.75
DIVERSION TO	ECULV	1.47	1	FLOW	9.	6.	5.	5.
				TIME	3.75	3.75	3.75	3.75
HYDROGRAPH AT	ECULV	1.47	1	FLOW	0.	0.	0.	0.
				TIME	.08	.08	.08	.08
ROUTED TO	RDIVE	1.47	1	FLOW	0.	0.	0.	0.
				TIME	.08	.08	.08	.08
HYDROGRAPH AT	MNW-FG	.36	1	FLOW	38.	26.	20.	18.
				TIME	5.25	5.33	4.83	4.83
2 COMBINED AT	MNW-FG	1.83	1	FLOW	38.	26.	20.	18.
				TIME	5.25	5.33	4.83	4.83
DIVERSION TO	GCULV	1.83	1	FLOW	38.	26.	20.	18.
				TIME	5.25	5.33	4.83	4.83
HYDROGRAPH AT	DIVG	1.83	1	FLOW	0.	0.	0.	0.
				TIME	.08	.08	.08	.08
ROUTED TO	RDIVG	1.83	1	FLOW	0.	0.	0.	0.
				TIME	.08	.08	.08	.08
HYDROGRAPH AT	MNW-J1	2.37	1	FLOW	128.	75.	49.	39.
				TIME	6.92	7.00	7.08	7.17
ROUTED TO	MNW-J2	2.37	1	FLOW	128.	75.	49.	39.
				TIME	7.17	7.33	7.50	7.58
HYDROGRAPH AT	MNW-J2	1.21	1	FLOW	130.	88.	65.	56.
				TIME	5.42	5.50	5.50	5.50

2 COMBINED AT	N-J2	3.58	1	FLOW	199.	121.	81.	65.
				TIME	6.00	6.00	6.00	6.00
2 COMBINED AT	CP1	5.41	1	FLOW	199.	121.	81.	65.
				TIME	6.00	6.00	6.00	6.00
ROUTED TO	RCP1	5.41	1	FLOW	199.	121.	81.	65.
				TIME	6.08	6.08	6.17	6.17
HYDROGRAPH AT	RTNE	.00	1	FLOW	9.	6.	5.	5.
				TIME	3.75	3.75	3.75	3.75
HYDROGRAPH AT	RTNE	.01	1	FLOW	0.	0.	0.	0.
				TIME	4.92	.08	.08	.08
2 COMBINED AT	RTNE	.01	1	FLOW	9.	6.	5.	5.
				TIME	3.75	3.75	3.75	3.75
ROUTED TO	RRTNE	.01	1	FLOW	8.	6.	5.	4.
				TIME	4.42	4.50	4.33	4.42
HYDROGRAPH AT	RTNG	.00	1	FLOW	38.	26.	20.	18.
				TIME	5.25	5.33	4.83	4.83
HYDROGRAPH AT	RTNG	.01	1	FLOW	0.	0.	0.	0.
				TIME	4.92	.08	.08	.08
2 COMBINED AT	RTNG	.01	1	FLOW	38.	26.	20.	18.
				TIME	5.25	5.33	4.83	4.83
ROUTED TO	RRTNG	.01	1	FLOW	38.	26.	20.	18.
				TIME	5.50	5.50	5.08	5.08
HYDROGRAPH AT	MNW-I1	.25	1	FLOW	67.	47.	37.	32.
				TIME	4.00	4.00	4.00	4.00
3 COMBINED AT	CP2	.27	1	FLOW	88.	64.	51.	46.
				TIME	5.17	5.17	5.17	5.17
ROUTED TO	RCP2	.27	1	FLOW	88.	64.	51.	46.
				TIME	5.25	5.25	5.25	5.25
HYDROGRAPH AT	MNW-I2	.14	1	FLOW	34.	22.	15.	13.
				TIME	3.75	3.83	3.83	3.83
3 COMBINED AT	CP3	5.82	1	FLOW	272.	173.	125.	109.
				TIME	5.58	5.58	5.25	5.25
ROUTED TO	RCP3	5.82	1	FLOW	272.	173.	125.	109.
				TIME	5.75	5.75	5.42	5.42
HYDROGRAPH AT	MNW-K	1.43	1	FLOW	175.	129.	105.	96.
				TIME	5.50	5.42	5.33	5.25
2 COMBINED AT	CP4	7.25	1	FLOW	445.	301.	230.	205.
				TIME	5.58	5.58	5.42	5.42
ROUTED TO	RCP4	7.25	1	FLOW	444.	301.	230.	204.
				TIME	5.67	5.67	5.50	5.50

HYDROGRAPH AT	MNW-L	.27	1	FLOW	136.	109.	93.	7.
				TIME	3.75	3.75	3.75	3.75
HYDROGRAPH AT	MNW-M	.49	1	FLOW	191.	154.	131.	121.
				TIME	4.17	4.25	4.25	4.25
3 COMBINED AT	CP5	8.01	1	FLOW	608.	441.	357.	324.
				TIME	5.25	5.17	5.17	5.17
ROUTED TO	T12	8.01	1	FLOW	607.	441.	357.	323.
				TIME	5.33	5.25	5.25	5.17
ROUTED TO	.	8.01	1	FLOW	606.	441.	356.	323.
				TIME	5.50	5.42	5.42	5.42
2 COMBINED AT	T12	20.85	1	FLOW	3147.	2426.	1853.	1642.
				TIME	4.50	4.75	5.00	5.17
2 COMBINED AT	F17	126.65	1	FLOW	8595.	7396.	6424.	6003.
				TIME	5.08	5.50	5.58	5.67
ROUTED TO	F18	126.65	1	FLOW	8595.	7394.	6422.	6002.
				TIME	5.08	5.50	5.58	5.67
ROUTED TO	.	126.65	1	FLOW	8594.	7392.	6420.	6001.
				TIME	5.08	5.50	5.58	5.67
HYDROGRAPH AT	R4	2.28	1	FLOW	1051.	783.	624.	557.
				TIME	3.75	3.75	3.75	3.75
HYDROGRAPH AT	F150F	.00	1	FLOW	5769.	1519.	769.	450.
				TIME	8.08	5.50	5.67	5.83
ROUTED TO	F150FR	.00	1	FLOW	5664.	1481.	745.	435.
				TIME	8.33	5.83	5.92	6.08
2 COMBINED AT	R4	2.28	1	FLOW	5664.	1569.	800.	557.
				TIME	8.33	5.75	5.92	3.75
HYDROGRAPH AT	F160F	.00	1	FLOW	1283.	0.	0.	0.
				TIME	8.08	.08	.08	.08
ROUTED TO	F160FR	.00	1	FLOW	1159.	0.	0.	0.
				TIME	8.33	.08	.08	.08
2 COMBINED AT	R4	2.28	1	FLOW	6823.	1569.	800.	557.
				TIME	8.33	5.75	5.92	3.75
ROUTED TO	F18	2.28	1	FLOW	6271.	1489.	747.	446.
				TIME	9.25	6.67	6.83	4.67
HYDROGRAPH AT	F18	.87	1	FLOW	316.	246.	208.	192.
				TIME	3.75	3.83	3.83	3.83
2 COMBINED AT	F18	3.15	1	FLOW	6277.	1519.	769.	519.
				TIME	9.25	6.67	6.83	4.67
HYDROGRAPH AT	F24	1.03	1	FLOW	526.	425.	372.	344.
				TIME	3.58	3.67	3.67	3.67

3 COMBINED A.	F18	130.83	1	FLOW	12089.	8068.	6845.	J.
				TIME	9.17	5.92	5.67	5.67
ROUTED TO	F18R	130.83	1	FLOW	12080.	8068.	6844.	6381.
				TIME	9.25	6.00	5.75	5.75
HYDROGRAPH AT	F20A	.81	1	FLOW	139.	111.	92.	85.
				TIME	3.83	3.83	3.83	3.92
2 COMBINED AT	F20A	131.64	1	FLOW	12092.	8095.	6873.	6407.
				TIME	9.25	6.00	5.75	5.75
ROUTED TO	F20B	131.64	1	FLOW	12089.	8094.	6872.	6406.
				TIME	9.25	6.00	5.75	5.75
ROUTED TO	.	131.64	1	FLOW	12086.	8094.	6872.	6405.
				TIME	9.25	6.00	5.75	5.75
HYDROGRAPH AT	F19	1.54	1	FLOW	692.	565.	492.	449.
				TIME	3.67	3.67	3.67	3.67
ROUTED TO	F20B	1.54	1	FLOW	620.	503.	435.	399.
				TIME	3.83	3.83	3.83	3.83
HYDROGRAPH AT	F20B	.73	1	FLOW	300.	212.	161.	140.
				TIME	3.67	3.67	3.67	3.67
2 COMBINED AT	F20B	2.27	1	FLOW	855.	663.	558.	507.
				TIME	3.75	3.83	3.83	3.83
HYDROGRAPH AT	VB	4.58	1	FLOW	1034.	676.	481.	401.
				TIME	3.92	4.00	4.00	4.00
3 COMBINED AT	F20B	138.49	1	FLOW	12097.	8707.	7312.	6717.
				TIME	9.25	5.17	5.33	5.50
ROUTED TO	F22	138.49	1	FLOW	12078.	8702.	7305.	6711.
				TIME	9.25	5.25	5.42	5.58
HYDROGRAPH AT	F21	1.27	1	FLOW	593.	465.	389.	365.
				TIME	3.67	3.67	3.67	3.67
DIVERSION TO	OAKEY	1.27	1	FLOW	297.	233.	195.	182.
				TIME	3.67	3.67	3.67	3.67
HYDROGRAPH AT	F21	1.27	1	FLOW	297.	233.	195.	182.
				TIME	3.67	3.67	3.67	3.67
ROUTED TO	F22	1.27	1	FLOW	289.	225.	190.	178.
				TIME	3.67	3.67	3.75	3.75
HYDROGRAPH AT	F22	3.43	1	FLOW	1293.	1010.	850.	785.
				TIME	3.67	3.75	3.75	3.75
3 COMBINED AT	F22	143.19	1	FLOW	12118.	9272.	7704.	7013.
				TIME	9.25	5.17	5.33	5.50
ROUTED TO	F23	143.19	1	FLOW	12108.	9264.	7695.	7008.
				TIME	9.25	5.17	5.33	5.50

ROUTED TO	.	143.19	1	FLOW	12104.	9259.	7692.	64.
				TIME	9.33	5.25	5.42	5.58
ROUTED TO	.	143.19	1	FLOW	12079.	9240.	7679.	6992.
				TIME	9.33	5.33	5.50	5.67
ROUTED TO	.	143.19	1	FLOW	12075.	9238.	7670.	6990.
				TIME	9.42	5.33	5.50	5.67
HYDROGRAPH AT	F23	1.92	1	FLOW	379.	287.	239.	219.
				TIME	4.00	4.08	4.17	4.17
2 COMBINED AT	F23	145.11	1	FLOW	12098.	9431.	7814.	7111.
				TIME	9.42	5.33	5.50	5.67

*** NORMAL END OF HEC-1 ***
NORMAL END OF HEC-1

DUPLICATE EFFECTIVE HEC-1 MODEL
FILE NAME: F100R.DAT

DUPLICATE EFFECTIVE FIS HEC-1 MODEL
SEPTEMBER 1990 VERSION
FILE NAME: F100R.DAT

The Original Effective FIS HEC-1 model (F100.DAT) did not run on the September 1990 version without some minor routing modifications. See Special Problem Report 1. The revised model is referred to as the Duplicate Effective FIS HEC-1 model (F100R.DAT). Upon review of the two models results, it was determined that the differences in peak discharges was not significant. Therefore, the newer HEC-1 version could be used in further analyses and still maintain continuity with the older hydrology.

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*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*             SEPTEMBER 1990            *
*              VERSION 4.0              *
*                                       *
*  RUN DATE  10/06/1997  TIME  12:45:16 *
*                                       *
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*                                       *
*    U.S. ARMY CORPS OF ENGINEERS       *
*    HYDROLOGIC ENGINEERING CENTER      *
*          609 SECOND STREET            *
*       DAVIS, CALIFORNIA 95616         *
*            (916) 756-1104             *
*                                       *
*****************************************
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X     X  XXXXXXX   XXXXX           X
X     X  X        X     X         XX
X     X  X        X                X
XXXXXXX  XXXX     X        XXXXX   X
X     X  X        X                X
X     X  X        X     X          X
X     X  XXXXXXX   XXXXX          XXX
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THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.
THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION
NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL LOSS RATE:GREEN AND AMPT INFILTRATION
KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM

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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

          *DIAGRAM
    1     ID    INPUT FILE = F100R.DAT       BY: JEP       DATE:  10/06/97
    2     ID    REVISED ORIGINAL FIS MODEL TO RUN ON THE SEPTEMBER 1990 VERSION OF HEC-1
    3     ID    BY CHANGING 4 RK ROUTINGS TO RD ROUTINGS & COMMENTING OUT THE "RDIVC" RK
    4     ID    ROUTING
    5     ID
    6     ID     CLARK COUNTY FLOOD CONTROL DISTRICT MASTER PLAN UPDATE
    7     ID     RED ROCK/FLAMINGO/TROPICANA WATERSHED
    8     ID     EXISTING DRAINAGE SYSTEM WITH PRESENT DEVELOPMENT
    9     ID     FLAMINGO/TROPICANA STORM (NO UPPER BLUE DIAMOND)- MAIN CHANNEL RUN
   10     ID         100-YEAR 6-HR STORM (SDN #5)
   11     ID         JMM    OCTOBER 1990
   12     ID
   13     ID         BASIC DATA FILE BASED ON COE FILE S10P40X.
   14     ID         MODIFICATIONS ADDED FROM B&V RED ROCK BASIN AND UPPER FLAMINGO
   15     ID         BASIN HEC-1 RUNS; NIMBUS NORTHWEST MCCARRAN AIRPORT HEC-1 RUNS;
   16     ID         AND SUBBASIN MODIFICATIONS DUE TO RECENT DEVELOPMENT.
   17     ID
   18     ID         COE MUSKINGUM ROUTING CONVERTED TO KINEMATIC FOR EXISTING
   19     ID         IMPROVED CHANNELS FROM FACILITY INVENTORY.
   20     ID
   21     ID     PB CARDS CONTAIN POINT PRECIPITATION.  DARF'S FROM CCRFCD MANUAL
   22     ID     BASED ON STORM AREAS FOR CONCENTRATION POINTS AS FOLLOWS:
   23     ID
   24     ID         SUBBASIN          AREA (SQMI)          DARF
   25     ID         --------          -----------          ----
   26     ID          T12,F5            20.8,15.9           0.81
   27     ID            RR14                53              0.68
   28     ID      F7,F14,F16,F16OF       92,103,105           0.60
   29     ID      F17,F20B,F22,F23     127,139,143,145       0.565
   30     ID
   31     ID
   32     IT      5       0       0     200
   33     IO      5
   34     JR    PREC    0.81     .68     .60     .565

   35     KK     RR1 RUNOFF FROM RR1
   36     KM         RR1-RR14 DATA TAKEN FROM B&V TR-20 MODEL FOR UPPER FLAMINGO BASIN
   37     KM         NEW MUSKINGUM ROUTING PARAMETERS, CN'S AND LAGS USED FOR BETTER
   38     KM         AGREEMENT WITH COE FLOWS
   39     BA    3.83
   40     PC    .000    .020    .059    .080    .110    .144    .150    .160    .168    .171
   41     PC    .180    .182    .187    .190    .197    .202    .210    .220    .230    .241
   42     PC    .250    .259    .265    .280    .290    .300    .305    .309    .310    .317
   43     PC    .321    .327    .333    .346    .361    .381    .408    .430    .477    .514
   44     PC    .561    .630    .710    .720    .731    .752    .779    .790    .795    .804
   45     PC    .810    .820    .826    .840    .859    .889    .910    .938    .966    .970
   46     PC    .974    .979    .981    .983    .985    .989    .990    .992    .993    .996
   47     PC    .997    .999   1.00
   48     PB    4.08
   49     LS              84
   50     UO    0.34
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  51      KK     RR4 ROUTE RR1 THRU RR4
  52      RM       2    0.36    0.15

  53      KK     RR4 RUNOFF FROM RR4
  54      BA    2.74
  55      PB    3.82
  56      LS              81
  57      UD    1.26

  58      KK     RR4 COMBINE RR1+RR4
  59      HC       2

  60      KK     RR2 RUNOFF FROM RR2
  61      BA    3.35
  62      PB    4.10
  63      LS              83
  64      UD    0.44

  65      KK     RR3 ROUTE RR2 THRU RR3
  66      RM       2    0.36    0.15

  67      KK     RR3 RUNOFF FROM RR3
  68      BA    3.19
  69      PB    3.83
  70      LS              81
  71      UD    0.50

  72      KK     RR4 COMBINE RR2+RR3+RR4
  73      HC       3

  74      KK     RR8 ROUTE RR4 THRU RR8
  75      RM       2    0.52    0.15

  76      KK     RR5 RUNOFF FROM RR5
  77      BA    7.32
  78      PB    3.79
  79      LS              80
  80      UD    1.44

  81      KK     RR8 ROUTE RR5 THRU RR8
  82      RM       2    0.26    0.15

  83      KK     RR6 RUNOFF FROM RR6
  84      BA    2.85
  85      PB    3.88
  86      LS              83
  87      UD    0.36

  88      KK     RR7 ROUTE RR6 THRU RR7
  89      RM       2    0.41    0.15
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  90      KK    RR7 RUNOFF FROM RR7
  91      BA   4.87
  92      PB   3.59
  93      LS            81
  94      UD   1.13

  95      KK    RR7 COMBINE RR6+RR7
  96      HC      2

  97      KK    RR8 ROUTE RR7 THRU RR8
  98      RM      2    0.51    0.15

  99      KK    RR8 RUNOFF FROM RR8
 100      BA   1.75
 101      PB   3.49
 102      LS            81
 103      UD   1.57

 104      KK    RR9 RUNOFF FROM RR9
 105      BA   3.71
 106      PB   3.37
 107      LS            84
 108      UD   0.79

 109      KK    RR8 COMBINE RR4+RR5+RR7+RR8+RR9
 110      HC      5

 111      KK   RR10 ROUTE RR8 THRU RR10
 112      RM      2    0.25    0.15

 113      KK   RR10 RUNOFF FROM RR10
 114      BA   3.30
 115      PB   3.40
 116      LS            81
 117      UD   1.19

 118      KK   RR10 COMBINE RR8+RR10
 119      HC      2

 120      KK   RR12 ROUTE RR10 THRU RR12
 121      RM      2    0.28    0.15

 122      KK   RR11 RUNOFF FROM RR11
 123      BA   3.40
 124      PB   3.46
 125      LS            83
 126      UD    .82

 127      KK   RR12 ROUTE RR11 THRU RR12
 128      RM      2    0.18    0.15
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  129     KK    RR12 RUNOFF FROM RR12
  130     BA    4.25
  131     PB    3.43
  132     LS             84
  133     UD     .77

  134     KK    RR12 COMBINE RR10+RR11+RR12
  135     HC       3

  136     KK    RR13 ROUTE RR12 THRU RR13
  137     RM       2    0.24    0.15

  138     KK    RR13 RUNOFF FROM RR13
  139     BA    2.26
  140     PB    3.32
  141     LS             80
  142     UD    0.51

  143     KK    RR13 COMBINE RR12+RR13
  144     HC       2

  145     KK    RR14 ROUTE RR13 THRU RR14
  146     RM       2     .10     .15

  147     KK    RR14 RUNOFF FROM RR14
  148     BA    6.22
  149     PB    3.60
  150     LS             83
  151     UD    1.53

  152     KK    RR14 COMBINE RR13+RR14
  153     HC       2
          * ******** END OF DATA FROM B&V REPORT *******

  154     KK   RR.DB ROUTE THRU RED ROCK DETENTION BASIN
  155     KM         USE STORAGE-OUTFLOW DATA FROM COE FEASIBILITY REPORT
  156     RS       1    STOR       0
  157     SV       0     150     600    1100    1860    1900    2250    2630    2800
  158     SQ       0     750    1100    1250    1410    1420   22650   72500   97500
  159     SE    3159    3170    3190    3200    3210  3210.5    3215    3220    3222

  160     KK    RR23 ROUTE RED ROCK OUTFLOW THRU RR23
  161     RM       6    0.53    0.15

  162     KK    RR23 RUNOFF FROM RR23
  163     BA    2.03
  164     PB    3.20
  165     LS       0    74.9
  166     UK     500    .025    0.15     100
  167     RK    5500    .025    .030    0.09                      1
  168     RK   15500    .023    .030            TRAP     100      5      NO
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  169     KK    RR23 COMBINE RED ROCK OUTFLOW WITH RR23
  170     HC      2

  171     KK     R1 RUNOFF FROM R1
  172     BA   1.12
  173     PB   3.17
  174     LS      0    87.7
  175     UD   0.47

  176     KK    RR23 COMBINE R1+RR23
  177     HC      2

  178     KK     R5 ROUTE RR23 THRU R5
  179     RM      5    0.39    0.15

  180     KK    RR20 RUNOFF FROM RR20
  181     BA   1.37
  182     PB   3.22
  183     LS      0      88
  184     UD   0.69

  185     KK     R5 ROUTE RR20 THRU R5
  186     RM      7    0.61    0.15

  187     KK    RR21 RUNOFF FROM RR21
  188     BA   6.27
  189     PB   3.26
  190     LS      0      87
  191     UD   1.00

  192     KK     R5 ROUTE RR21 THRU R5
  193     RM      8    0.64    0.15

  194     KK    RR22 RUNOFF FROM RR22
  195     BA   2.15
  196     PB   3.20
  197     LS      0      87
  198     UD   0.62

  199     KK     R5 ROUTE RR22 THRU R5
  200     RM      8    0.70    0.15

  201     KK     R5 RUNOFF FROM R5
  202     BA   5.77
  203     PB   3.00
  204     LS      0    75.5
  205     UK    600    .025     .15     100
  206     RK   7920    .023     .030    .20                          1
  207     RK  13000    .019     .030            TRAP      40       2
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  208     KK      R5 COMBINE R5+RR23+RR22+RR21+RR20
  209     HC       5

  210     KK      R6 ROUTE R5 THRU R6
  211     RM       3    0.22    0.15

  212     KK      R6 RUNOFF FROM R6
  213     BA    1.51
  214     PB    2.77
  215     LS       0    73.2
  216     UK     500    .015     .15     100
  217     RK    5200    .016    .030     .13                      1
  218     RK    8000   .0044    .030             TRAP      40      1      NO

  219     KK      R6 COMBINE R5 WITH R6
  220     HC       2

  221     KK      F1 RUNOFF FROM F1
  222     BA    4.63
  223     PB    3.23
  224     LS       0      88
  225     UD    0.78

  226     KK      F5 ROUTE F1 THRU F5
  227     RM      12    0.99    0.15

  228     KK      F2 RUNOFF FROM F2
  229     BA    1.28
  230     PB    3.19
  231     LS       0      88
  232     UD     .43

  233     KK      F5 ROUTE F2 THRU F5
  234     RM       9    0.76    0.15

  235     KK      F3 RUNOFF FROM F3
  236     BA    2.66
  237     PB    3.09
  238     LS       0      87
  239     UD     .34

  240     KK      F5 ROUTE F3 THRU F5
  241     RM       5    0.40    0.15

  242     KK      F4 RUNOFF FROM F4
  243     BA    1.30
  244     PB    3.03
  245     LS       0      86
  246     UD     .41
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  247     KK      F5 ROUTE F4 THRU F5
  248     RM       8    0.69    0.15

  249     KK     F5N RUNOFF FROM F5N
  250     BA    4.04
  251     PB    3.00
  252     LS       0      85
  253     UK     300    .025     .15     100
  254     RK    3200    .025    .030     .20                        1
  255     RK   18000    .023    .030            TRAP      70       5      NO

  256     KK     F5S RUNOFF FROM F5S
  257     BA    2.00
  258     PB    2.86
  259     LS       0      85
  260     UK     400    .020     .25     100
  261     RK    3500    .020    .030     .16                        1
  262     RK   14500    .017    .030            TRAP      50       5      NO

  263     KK      F5 COMBINE F5N AND F5S
  264     HC       2

  265     KK      F5 F5 WITH ROUTED F1, F2, F3, AND F4
  266     HC       5

  267     KK  UFL.DB UPPER FLAMINGO DETENTION BASIN
  268     KM         STORAGE-OUTFLOW DATA FROM B&V DESIGN PLANS
  269     RS       1    STOR       0
  270     SV       0      10       25     100     220     560     950    1000    1130    1430
  271     SV    2070
  272     SQ       0      75      300     675     910    1100    1260    1280    5170   20600
  273     SQ   50300
  274     SE    2445  2447.5    2450    2455    2460    2465    2470  2470.5    2472    2475
  275     SE    2480

  276     KK     F5R ROUTE UPPER FLAMINGO DB OUTFLOW THRU OUTFALL CHANNEL
  277     KM         CHANNEL GEOMETRY FROM B&V PREDESIGN MEMORANDUM
  278     RK    3500    .010    .020            TRAP      30       3

  279     KK     F6A RUNOFF FROM F6A
  280     BA     .55
  281     PB    2.86
  282     LS       0      88
  283     UD    0.35

  284     KK     F6B ROUTE F6A THRU F6B
  285     RM       4    0.35    0.15

  286     KK     F6B RUNOFF FROM F6B
  287     BA    0.85
  288     PB    2.77
  289     LS       0      88
  290     UD    0.30
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  291     KK     F6B COMBINE F6A AND F6B
  292     HC       2

  293     KK     F7 ROUTE F6 THRU F7
  294     RM       3    0.28    0.15

  295     KK     F7 RUNOFF FROM F7
  296     BA   1.50
  297     PB   2.77
  298     LS       0    85.5
  299     UK     700    .015     .15     100
  300     RK    4000   .0114    .030     .65                    1
  301     RK    7500   .0116    .030          TRAP      50      5      NO

  302     KK     F7 COMBINE F7 WITH ROUTED F6
  303     HC       2

  304     KK     F7 COMBINED F7 WITH R6 AND F5R
  305     HC       3

  306     KK    F7R ROUTE F7 THRU F8 (FLWA1267-1335)
  307     RK   5230    .011    .030          TRAP      40      1

  308     KK     F8 RUNOFF FROM F8
  309     BA    .48
  310     LS       0    66.1       0       0      98       0
  311     UK    1500    .014     .28      83
  312     UK      50    .020     .10      17
  313     RK    1800     .01    .020    .048
  314     RK    7200    .010    .030                   30      2      NO

  315     KK     F8 COMBINE F8 AND F7R
  316     HC       2

  317     KK     F9 ROUTE F8 THRU F9 (FLWA1203)
  318     RK    1740   .0138    .015          TRAP      40      2

  319     KK      . (FLWA1152)
  320     RK    2640   .0044    .040          TRAP      50      3

  321     KK     F9 RUNOFF FROM F9
  322     BA    .90
  323     LS       0    63.0       0       0      98       0
  324     UK     500    .010     .25      73
  325     UK      40    .015     .10      27
  326     RK    2400    .007    .020     .35                    1
  327     RK    2300    .008    .020    .015                    1
  328     RK   10800    .013    .023          TRAP      50      3      NO
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  329     KK      F9 COMBINE F8 WITH F9
  330     HC       2

  331     KK     F14 ROUTE F9 THRU F14
  332     RM       2    0.16    0.20

  333     KK     F10 RUNOFF FROM F10
  334     BA    1.17
  335     LS       0    62.6       0       0      98       0
  336     UK     600    .010     .25      67
  337     UK      40    .015     .10      33
  338     RK    1300    .010    .020    .019                      1
  339     RK    1300    .006     .02    .080    TRAP              1
  340     RK    8200   .0117     .02            TRAP      40      1
          * *** SUBAREAS R2 - R8 NOW ASSUMED TO BE DIVERTED INTO FLAMINGO WASH BY
          *     RAINBOW AND FLAMINGO RD ****

  341     KK      R2 RUNOFF FROM R2
  342     BA    2.01
  343     PB    3.00
  344     LS       0    79.4
  345     UD    0.21

  346     KK      R3 ROUTE R2 THRU R3
  347     RM       5    0.38    0.15

  348     KK      R3 RUNOFF FROM R3
  349     BA    2.63
  350     PB    2.77
  351     LS       0    68.2
  352     UD    0.61

  353     KK      R3 COMBINE R2+R3
  354     HC       2

  355     KK      R3 ROUTE THRU EXISTING GRAVEL PIT
  356     RS       1    STOR     480
  357     SV       0     480    1290    3150    3420
  358     SE       0      20      60     110     120
  359     SQ       0       0    1800    1800   37500

  360     KK      R8 ROUTE R3 THRU R8
  361     RK    2750    .019    .020            TRAP      40      1

  362     KK      R7 RUNOFF FROM R7
  363     BA    1.39
  364     LS       0    79.5
  365     UD    0.51
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

366       KK     R7 DIVERT Q IN EXCESS OF PIPE CAPACITY
367       KM        LIMITING CAPACITY OF RAINBOW STORM DRAIN = 324 CFS (FLLA0307)
368       KM        OVERFLOW RUNS DOWN DESERT INN AND EDNA INTO CENTRAL BASIN
369       DT   R7OF
370       DI      0     324    1000    5000
371       DQ      0       0     676    4676

372       KK     R8 ROUTE R7 THRU R8 (90"-96" RCP IN RAINBOW)
373       RK   5280    .004    .015            CIRC     8.0

374       KK     R8 RUNOFF FROM R8
375       BA    .51
376       LS      0    73.3
377       UD   0.37

378       KK     R8 COMBINE R3+R7+R8
379       HC      3

380       KK    F10 ROUTE R8 THRU F10 (114" RCP IN FLAMINGO RD)
381       RK   5280    .010    .015            CIRC     9.5

382       KK    F10 COMBINE R8+F10
383       HC      2

384       KK    F14 ROUTE F10 THRU F14 (FLLA0000)
385       RK   4010   .0075    .015            TRAP      20       1

386       KK    F12 RUNOFF FROM F12
387       BA    .88
388       LS      0    87.9
389       UK    700    .012     .15     100
390       RK   3500   .0120    .030     .21                      1
391       RK   8200   .0130    .030             TRAP      10       5      NO

392       KK   F12R    ROUT     F12    THRU     F13
393       RM      2    0.20    0.15

394       KK    F13 RUNOFF FROM F13
395       BA    .55
396       LS      0    87.5       0       0      98       0
397       UK    750    .010     .25      83
398       UK     50    .015     .10      17
399       RK   1100     .01    .023     .04                      1
400       RK   2300     .01    .023     .10                      1
401       RK   5900    .012    .026             TRAP      40       2      NO

402       KK    F13 COMBINE     F13     AND     F1R
403       HC      2
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  404     KK    F14 ROUTE F13 THRU F14 (UNIMPROVED)
  405     RM      2    0.15    0.15

  406     KK    F14 RUNOFF FROM F14
  407     BA    .78
  408     LS      0    76.5       0       0      98       0
  409     UK    500    .010     .25      86
  410     UK    400    .015     .10      12
  411     RK   1200   .0090    .023    .024                      1
  412     RK   2400   .0075    .025     .12    TRAP      20       1
  413     RK   5200   .0090    .033            TRAP      75       4      NO

  414     KK    F14 COMBINE F9, F10, F13, AND F14
  415     HC      4

  416     KK    F14R ROUTE F14 THRU F15 (FLWA0990-1049)
  417     RK   3110    .020    .040            TRAP      50       3

  418     KK       .  (FLWA0924)
  419     RK   3490    .010    .040            TRAP      60       1

  420     KK       .  (FLWA0891-0923)
  421     RK   1580   .0076    .030            TRAP      90       1

  422     KK    F15 RUNOFF FROM F15
  423     BA   1.32
  424     LS      0    78.0       0       0      98       0
  425     UK    640    .013     .15      77
  426     UK    400    .014     .10      23
  427     RK   2500    .013    .020    0.08                      1
  428     RK   4500    .006    .020    0.25                      1
  429     RK   8500   0.012    .030            TRAP      40       3      NO

  430     KK    F15 COMBINE     F15     AND    F14R
  431     HC      2

  432     KK   F15OF DIVERT OVERFLOWS
  433     KM        DIVERSION RATING CURVE FROM COE FEASIBILITY STUDY
  434     DT   F15OF
  435     DI      0    4100    7000   10500   35000
  436     DQ      0       0    1700    4640   15500

  437     KK    F16 RUNOFF FROM F16
  438     BA    .52
  439     LS      0    75.5       0       0      98       0
  440     UK    600    .010    0.15      56
  441     UK    400    .015     .10      44
  442     RK   1000    .010    .025    .030                      1
  443     RK   2400    .015    .025     .10                      1
  444     RK   6000    .004    .020                              1
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  445     KK     F16 COMBINE F15 WITH F16
  446     HC       2

  447     KK   F160  DIVERT OVERFLOWS
  448     KM         LIMIT FLOW TO 6000 CFS AT CEASARS PALACE/LVB/IMPERIAL PALACE CULVERT
  449     KM         BASED ON COE ASSUMED CAPACITY
  450     DT   F160
  451     DI       0    6000   12000   20000
  452     DQ       0       0    6000   14000

  453     KK     F16 ROUT F16 THRU F17 (FLWA0798-0823)
  454     RK    3550    .009    .015           TRAP      48       0

  455     KK         (FLWA0773)
  456     RK    1320   .0091    .020           TRAP      80      10

  457     KK         (FLWA0648-0798)
  458     RK    7760   .0064    .040           TRAP      30       2

  459     KK     F17 RUNOFF FROM F17
  460     BA     .65
  461     LS       0    75.5       0       0      98       0
  462     UK     900    .057     .15      51
  463     UK     600    .010     .10      49
  464     RK    1000    .010    .025    .040                    1
  465     RK    1500    .010    .027     .09                    1
  466     RK   11400   .0110    .030           TRAP     100       5      NO

  467     KK     F17 COMBINE     F17     AND  F16
  468     HC       2
          *  *** NO CONTRIBUTION FROM UPPER BLUE DIAMOND FOR FLAMINGO/RED ROCK STORM ***

  469     KK      T8 RUNOFF FROM T8
  470     BA    1.22
  471     LS       0    65.6
  472     UK     600    .015    0.15     100
  473     RK    2000    .018    .030     .14                    1
  474     RK   18000   .0161    .030           TRAP      75       5      NO

  475     KK      T9 ROUTE T8 TO T9
  476     RM       2     .52    0.15

  477     KK      T9 RUNOFF FROM T9
  478     BA    0.87
  479     LS       0    73.1
  480     UK     600    .010    0.15     100
  481     RK    4000    .010    .030    0.12                    1
  482     RK   10200   .0134    .030           TRAP      30       5
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  483     KK      T9 COMBINE T8 AND T9
  484     HC       2

  485     KK    T9OF DIVERT OVERFLOW
  486     DT    T9OF
  487     DI       0    5480   11000   15000
  488     DQ       0       0    2700    2700

  489     KK     T10 ROUTE T9 THRU T10
  490     RM       3    0.21    0.10

  491     KK      T4 RUNOFF FROM T4
  492     BA    3.22
  493     LS       0    87.6
  494     UK     500    .015    0.15     100
  495     RK    2700   .0190    .030    0.25                          1
  496     RK   20000   .0185    .030            TRAP      75        5      NO

  497     KK      T5 ROUTE T4 TO T5
  498     RK    6500    .013    .030            TRAP      30        2

  499     KK      T5 RUNOFF FROM T5
  500     BA    1.00
  501     LS       0    87.0
  502     UK     600    .010    0.15     100
  503     RK    2500    .012    .030    0.21                          1
  504     RK    6500    .013    .030            TRAP      30        2

  505     KK      T5 COMBINE T4 AND T5
  506     HC       2

  507     KK      T6 ROUTE T5 TO T6
  508     RK   10800    .012    .030            TRAP      30        5

  509     KK      T6 RUNOFF FROM T6
  510     BA    1.30
  511     LS       0    86.9
  512     UK     600    .010    0.15     100
  513     RK    6000    .012    .030    .400                          1
  514     RK   10800    .012    .030            TRAP      30        5

  515     KK      T6 COMBINE T5 AND T6
  516     HC       2

  517     KK    T9OF RECALL T9OF
  518     DR    T9OF

  519     KK      T6 ROUTE T9OF THRU T6
  520     RM       3    0.23    0.15
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  521     KK      T6 COMBINE T6 AND T90F
  522     HC       2

  523     KK      T6 DIVERT OVERFLOW ALONG UPRR
  524     KM         UPRR 114" CMP CULVERT - 750 CFS CAPACITY
  525     DT    T60F
  526     DI       0     750    1500   10000
  527     DQ       0       0     750    9250

  528     KK     T10 ROUTE T6 THRU T10
  529     RM       2    0.18    0.15

  530     KK      T1 RUNOFF FROM T1
  531     BA    1.56
  532     LS       0      88
  533     UK     600    .020    0.15     100
  534     RK    4000   .0200    .030    0.28                        1
  535     RK   13200    .017    .030            TRAP      50       5      NO

  536     KK      T3 ROUTE T1 TO T3
  537     RK   10000   .0106    .032            TRAP      30       5

  538     KK      T3 RUNOFF FROM T3
  539     BA    0.99
  540     LS       0    78.9
  541     UK     500    .010    0.15     100
  542     RK    3000    .010    .030    0.16                        1
  543     RK   10000   .0106    .032            TRAP      30       5

  544     KK      T3 COMBINE T1 AND T3
  545     HC       2

  546     KK    T60F RECALL DIVERTED OVERFLOW FROM T6
  547     DR    T60F

  548     KK      T3 ROUTE T60F THRU T3
  549     RM       1    0.08    0.15

  550     KK      T3 COMBINE T60F AND T3
  551     HC       2

  552     KK    T30F DIVERT FLOW IN EXCESS OF CULVERT CAPACITY
  553     KM         BASED ON COE RATING CURVE FROM FEASIBILITY STUDY
  554     KM         DQ FLOWS NORTHEASTERLY, REJOINING FW NEAR PARADISE RD
  555     DT    T30F
  556     DI       0    1400    1900    3200    5500   19000
  557     DQ       0       0     420    1650    3650   14700

  558     KK     T10 ROUTE T3 THRU T10 (TRWA0272)
  559     RK    3800   .0132    .040            TRAP    17.5       2
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

560       KK    T10 RUNOFF FROM T10
561       BA   0.82
562       LS      0    78.0       0       0      98       0
563       UK    700    .013    0.15      78
564       UK    400    .011     .10      22
565       RK   1100    .012    .020    .120                  1
566       RK   3000    .008    .020     .50                  1
567       RK   3500   0.010    .030             TRAP      30       2

568       KK    T10 COMBINE T3, T6, T9 AND T10
569       HC      4

570       KK    T10R ROUT T10 THRU T11 (TRWA0235)
571       RK   1160    .010    .015             TRAP      32       0

572       KK       .   (TRWA0145-0218)
573       RK   4700   .0095    .030             TRAP      90     1.5

574       KK    T11 RUNOFF FROM T11
575       BA   1.09
576       LS      0    68.6       0       0      98       0
577       UK    800    .010    0.30      61
578       UK    500    .010    0.10      39
579       RK   3200   .0080    .020    0.17                  1
580       RK   5400   .0104    .030             TRAP     100       5      NO

581       KK    T11 COMBINE T11 AND T10R
582       HC      2

583       KK    T11R ROUT  T11 THRU T12 (TRWA0117)
584       RK   1130   .0088    .015             TRAP     1.5       2

585       KK       .   (TRWA0000-0034+)
586       RK   6500    .012    .040             TRAP     100     2.5

587       KK    T12 RUNOFF FROM T12
588       BA   0.77
589       LS      0    74.4       0       0      98       0
590       UK    500    .008    0.18      65
591       UK    200    0.01    0.10      35
592       RK   2200    .008    .023    0.12                  1
593       RK   3000    .007    .025     .24            20       2
594       RK   6600   .0103    .032                    30       5

595       KK    T12 ADD T12 AND T11R
596       HC      2

597       KK    T30F RECALL DIVERSION FROM T3
598       DR    T30F
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LINE      10.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

599       KK     T12 ROUTE T3OF TO T12
600       RM      20    1.99    0.10

601       KK     T12 COMBINE T3OF AND T12
602       HC       2
          *  *** DATA FOR SUBAREAS MNW-B THRU MNW-M TAKEN FROM NIMBUS HEC-1 ANALYSIS
          *       FOR NORTHWEST MCCARRAN AIRPORT DRAINAGE STUDY (WITH SMALL MODIFICATIONS)

603       KK   MNW-B RUNOFF FROM B
604       BA    0.68
605       LS              65      10
606       UD     2.4

607       KK    DIVB FLOW SPLIT AT I-15; BCULV IS FLOW CONVEYED BY CULVERT
608       DT   BCULV
609       DI       0      22     100     500
610       DQ       0      22      22      22

611       KK   RDIVB ROUTE DIVB TO CULVERT AT I15 AND C
612       KM        CHANGED RK TO RD SO 9/90 HEC-1 VERSION WOULD RUN
613       RD     600    .004     .05       0       0       5

614       KK   MNW-C RUNOFF AT C
615       BA    0.69
616       LS              65      17
617       UD     2.0

618       KK   MNW-C COMBINE DIVB+C
619       HC       2

620       KK   MNW-C PONDING STORAGE ROUTING AT I-15
621       RS       1    STOR       0
622       SA       0     .28     .92    2.02    3.19    3.44    5.37    9.09
623       SQ       0       8      25      35      40      78     360    1342
624       SE      54      55      56      57   57.43      58      59      60

625       KK    DIVC FLOW SPLIT AT C THRU AND AROUND CULVERT
626       DT   CCULV
627       DI       0       8      25      35      40      78     360    1342
628       DQ       0       8      25      35      40      45      55      65
          *  KK RDIVC ROUTE DIVC NORTH TO D
          *  COMMENTED OUT ROUTING SO 9/90 HEC-1 VERSION WOULD RUN
          *  RK   650    .004     .05       0       0       0      20

629       KK   MNW-D RUNOFF FROM D
630       BA     .05
631       LS              66      10
632       UD     .40
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  633     KK   MNW-D COMBINE DIVC AND D
  634     HC       2

  635     KK    DIVD DIVERT FLOW TO NORTH; DCULV CROSSES I-15
  636     DT   DCULV
  637     DI       0      28     100     500
  638     DQ       0      28      28      28

  639     KK   RDIVD ROUTE DIVERTED FLOW NORTH TO E
  640     KM         CHANGED RK TO RD SO 9/90 HEC-1 VERSION WOULD RUN
  641     RD     800    .004     .05       0       0       0      20

  642     KK   MNW-E RUNOFF FROM E
  643     BA    0.05
  644     LS              65      18
  645     UD    0.38

  646     KK   MNW-E COMBINE DIVD + E
  647     HC       2

  648     KK   ECULV DIVIDE FLOW AT I-15 CULVERT; ECULV CROSSES I-15 INTO MNW-I
  649     DT   ECULV
  650     DI       0      28     100     500
  651     DQ       0      28      28      28

  652     KK   RDIVE ROUTE FLOW FROM DIVE NORTH ALONG I-15
  653     KM         CHANGED RK TO RD SO 9/90 HEC-1 VERSION WOULD RUN
  654     RD    1200    .007     .05       0       0       0       4

  655     KK  MNW-FG RUNOFF FROM FG
  656     BA    0.36
  657     LS              66      17
  658     UD    1.24

  659     KK  MNW-FG COMBINE EDIV + FG
  660     HC       2

  661     KK    DIVG DIVERT FLOW NORTH; GCULV CROSSES I-15 INTO SUBAREA I
  662     DT   GCULV
  663     DI       C      50      60     100     150     250
  664     DQ       C      50      60      60      60      60

  665     KK   RDIVG ROUTE DIVG NORTH TO AIRPORT CHANNEL
  666     KM         CHANGED RK TO RD SO 9/90 HEC-1 VERSION WOULD RUN
  667     RD    2200    .009    .040       0       0       0      10

  668     KK  MNW-J1 RUNOFF FROM J1
  669     BA    2.37
  670     LS              70
  671     UD    2.67
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

672       KK  MNW-J2 ROUTE J1 TO J2
673       RK   10000    .012     .04                    10       2

674       KK  MNW-J2 RUNOFF FROM J2
675       BA    1.21
676       LS              70      10
677       UD    1.22

678       KK  MNW-J2 COMBINE J1+J2
679       HC       2

680       KK     CP1 COMBINE J2 + RDIVG
681       HC       2

682       KK    RCP1 ROUTE CP1 TO LAS VEGAS BLVD (CP3)
683       RK    2600    .008     .04       0       0      20       1

684       KK    RTNE RETURN FLOW FROM CULVERT E
685       DR   ECULV

686       KK    RTNE DUMMY SUBAREA TO GET 1988 HEC1 TO RUN (NEEDS NON-ZERO AREA)
687       BA    0.01
688       LS       0      50
689       UD     0.1

690       KK    RTNE COMBINE DIVERSION RECALL WITH DUMMY SUBAREA
691       HC       2

692       KK   RRTNE ROUTE ECULV TO OUTLET OF I
693       RK    3900    .013     .05       0       0       0      50

694       KK    RTNG RETURN FLOW FROM CULVERT G
695       DR   GCULV

696       KK    RTNG DUMMY SUBAREA TO GET 1988 HEC1 TO RUN (NEEDS NON-ZERO AREA)
697       BA    0.01
698       LS       0      50
699       UD     0.1

700       KK    RTNG COMBINE DIVERSION RECALL WITH DUMMY SUBAREA
701       HC       2

702       KK   RRTNG ROUTE GCULV TO OUTLET OF I
703       RK    2500    .013    0.05       0       0       0      50

704       KK  MNW-I1 RUNOFF FROM I1
705       BA    0.25
706       LS              78      15
707       UD    0.58
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  708     KK     CP2 COMBINE HYDROGRAPHS AT LAS VEGAS BLVD AND UPRR
  709     HC       3

  710     KK    RCP2 ROUTE CP2 TO AIRPORT CHANNEL AND LAS VEGAS BLVD (CP3)
  711     RK    2500    .009     .05       0       0       0       4

  712     KK  MNW-I2 RUNOFF FROM I2
  713     BA    0.14
  714     LS             77       1
  715     UD    0.38

  716     KK     CP3 COMBINE FLOW FROM B-I2 AT LAS VEGAS BLVD AND AIRPORT CHANNEL
  717     HC       3

  718     KK    RCP3 ROUTE CPE TO OUTLET OF K
  719     RK    7300     .01     .04       0       0       5       2

  720     KK   MNW-K RUNOFF FROM K
  721     BA    1.43
  722     LS             66      25
  723     UD    1.55

  724     KK     CP4 COMBINE HYDROGRAPHS FOR AIRPORT CHANNEL AND TAXIWAY S
  725     HC       2

  726     KK    RCP4 ROUTE FLOW TO TROPICANA BLVD
  727     RK    3300     .01     .03       0       0      20       4

  728     KK   MNW-L RUNOFF FROM L
  729     BA    0.27
  730     LS             77      60
  731     UD    0.42

  732     KK   MNW-M RUNOFF FROM M
  733     BA    0.49
  734     LS             84      56
  735     UD    0.83

  736     KK     CP5 COMBINE ALL HYDROGRAPHS AT OUTLET AT BOX CULVERT AT TROPICANA
  737     HC       3
          *  *** END OF DATA FROM NIMBUS NORTHWEST MCCARRAN HEC-1 DATA ***
          *

  738     KK     T12 ROUTE MNW-L TO T12 (TRMC0009)
  739     RK    2640   .0045    .040            TRAP      18     1.5

  740     KK       .   (TRWA0000-0034)
  741     RK    5000    .012    .040            TRAP     100     2.5
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  742     KK     T12 COMBINE MNW-L AND T12
  743     KM         AIRPORT CHANNEL + TROPICANA WASH
  744     HC       2

  745     KK     F17 COMBINE F17 AND T12
  746     KM         FLAMINGO WASH + TROPICANA WASH
  747     HC       2

  748     KK     F18 ROUTE F17 AND T12 THRU F18
  749     KM           (FLWA0593)
  750     RK    1430   .0182    .040            TRAP      50       1

  751     KK       .   (FLWA0564+FLWA0620) COMBINED DUE TO RK PROBLEMS WITH NEW HEC1
  752     RK    1695   .0045    .015            TRAP      50       1

  753     KK      R4 RUNOFF FROM R4
  754     BA    2.28
  755     LS       C    86.5
  756     UD    0.34

  757     KK   F15OF RECALL F15 OVERFLOW
  758     DR   F15OF

  759     KK  F15OFR ROUT F15OF THRU R4
  760     RM       3    0.24       0

  761     KK      R4 COMBINE R4 AND F15 OVERFLOW
  762     HC       2

  763     KK   F16OF RECALL F16 OVERFLOW
  764     DR   F16OF

  765     KK  F16OFR ROUT F16OF THRU R4
  766     RM       3    0.24       0

  767     KK      R4 COMBINE R4 AND F16 OVERFLOW
  768     HC       2

  769     KK     F18 ROUT R4 THRU F18
  770     RM      11    0.88    0.10

  771     KK     F18 RUNOFF FROM F18
  772     BA    0.87
  773     LS       0    72.0       0       0      98       0
  774     UK     50    .010    0.20      52
  775     UK     20    .015    0.10      48
  776     RK    100    .010    .023    .014                      1
  777     RK    100   .0010    .023    .050                      1
  778     RK   1590   .0090    .020            TRAP      30       1
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  779     KK     F18 COMBINE R4 AND F18
  780     HC       2

  781     KK     F24 RUNOFF FROM F24
  782     BA    1.03
  783     LS       0    66.3       0       0      98       0
  784     UK     300    .010    0.20      46
  785     UK     100    .015    0.10      54
  786     RK    1300    .013    .020    .035                      1
  787     RK    3000   .0075    .020    .014                      1
  788     RK    4400    .018    .030            TRAP      50      3      NO

  789     KK     F18 COMBINE F18, F24, AND F17
  790     HC       3

  791     KK    F18R ROUT F18 THRU F20A (FLWA0400-0493)
  792     RK    7970   .0065    .040            TRAP      60      2

  793     KK    F20A RUNOFF FROM F20A
  794     BA    0.81
  795     LS       0    70.7       0       0      98       0
  796     UK    1000    .010    0.25      77
  797     UK     250     .02    0.15      23
  798     RK    1900    .001    .020    0.05                      1
  799     RK    2000    .015    .020    0.14
  800     RK    5600   .0108    .033                      40      4

  801     KK    F20A COMBINE F20A AND F18R
  802     HC       2

  803     KK    F20B ROUTE F20A THRU F20B (FLWA0376)
  804     RK    1210   .0148    .040            TRAP      50      1

  805     KK       .   (FLWA0348)
  806     RK    1430    .007    .015            TRAP      60      1

  807     KK     F19 RUNOFF FROM F19
  808     BA    1.54
  809     LS       0    70.8       0       0      98       0
  810     UK     500    .008    0.25      51
  811     UK     100    .015    0.10      49
  812     RK    1300    .010    .020     .04                      1
  813     RK    2500    .010    .020    .019                      1
  814     RK   11400   .0118    .020            TRAP      40      1      NO

  815     KK    F20B ROUTE F19 THRU F20B
  816     RM       2    0.20    0.20

  817     KK    F20B RUNOFF FROM F20B
  818     BA    0.73
  819     LS       0      82
  820     UD    0.25
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

 821      KK    F203 COMBINE F19 AND F20B
 822      HC       2

 823      KK      VB VAN BUSKIRK DRAINAGE AREA
 824      KM         SINGLE SUBAREA TO SIMULATE RUNOFF FROM ENTIRE VAN BUSKIRK WATERSHED.
 825      KM         CN AND LAG SELECTED TO MATCH PEAK Q AND TIME-TO-PEAK
 826      KM         FROM VAN BUSKIRK PREDESIGN STUDY BY JMM.
 827      BA    4.58
 828      LS             78
 829      UD    0.50

 830      KK    F20B COMBINE VAN BUSKIRK AREA, F20A AND F20B
 831      HC       3

 832      KK     F22 ROUTE F20B THRU F22 (FLWA0258-0274)
 833      RK    4700   .0110    .030                      70     2.5

 834      KK     F21 RUNOFF FROM F21
 835      BA    1.27
 836      LS       0    77.1       0       0      98       0
 837      UK     300    .010    0.25      49
 838      UK      60    .020     .10      51
 839      RK    1300    .010    .020    .019                     1
 840      RK    1750    .008    .020    0.08                     1
 841      RK   1600C   .0128    .020            TRAP      40       1      NO

 842      KK     F21 DIVERT ACROSS BLDR HWY AT OAKEY
 843      DT   OAKEY
 844      DI       C   10000
 845      DQ       C    5000

 846      KK     F22 ROUTE F21 THRU F22
 847      RM       1    0.06    0.20

 848      KK     F22 RUNOFF FROM F22
 849      BA    3.43
 850      LS       0    74.9       0       0      98       0
 851      UK     700    .008    0.25      51
 852      UK      60    .015     .10      49
 853      RK    1500    .010    .020    .093                     1
 854      RK    3000    .008    .020    0.37                     1
 855      RK   29500    .0115   .020            TRAP      40       1      NO

 856      KK     F22 COMBINE F20B, F21 AND F22
 857      HC       3

 858      KK     F23 ROUTE F22 THRU F23 (FLWA0228)
 859      RK    1430    .014    .040            TRAP      50       1
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

860       KK       .   (FLWA0175)
861       RK    2690   .0007    .040          TRAP     100       1

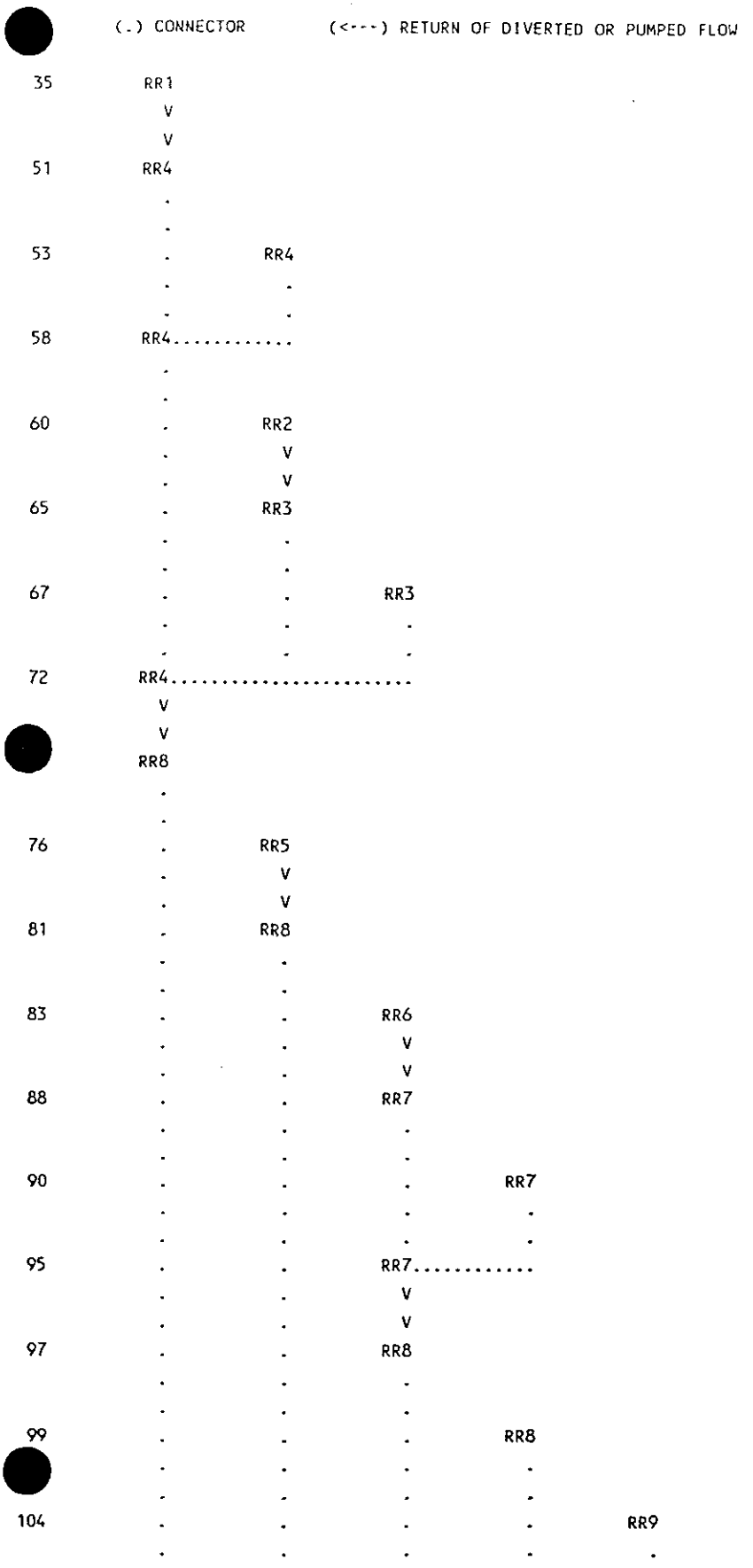
862       KK       .   (FLWA0079)
863       RK    5020   .0096    .040          TRAP      50       1

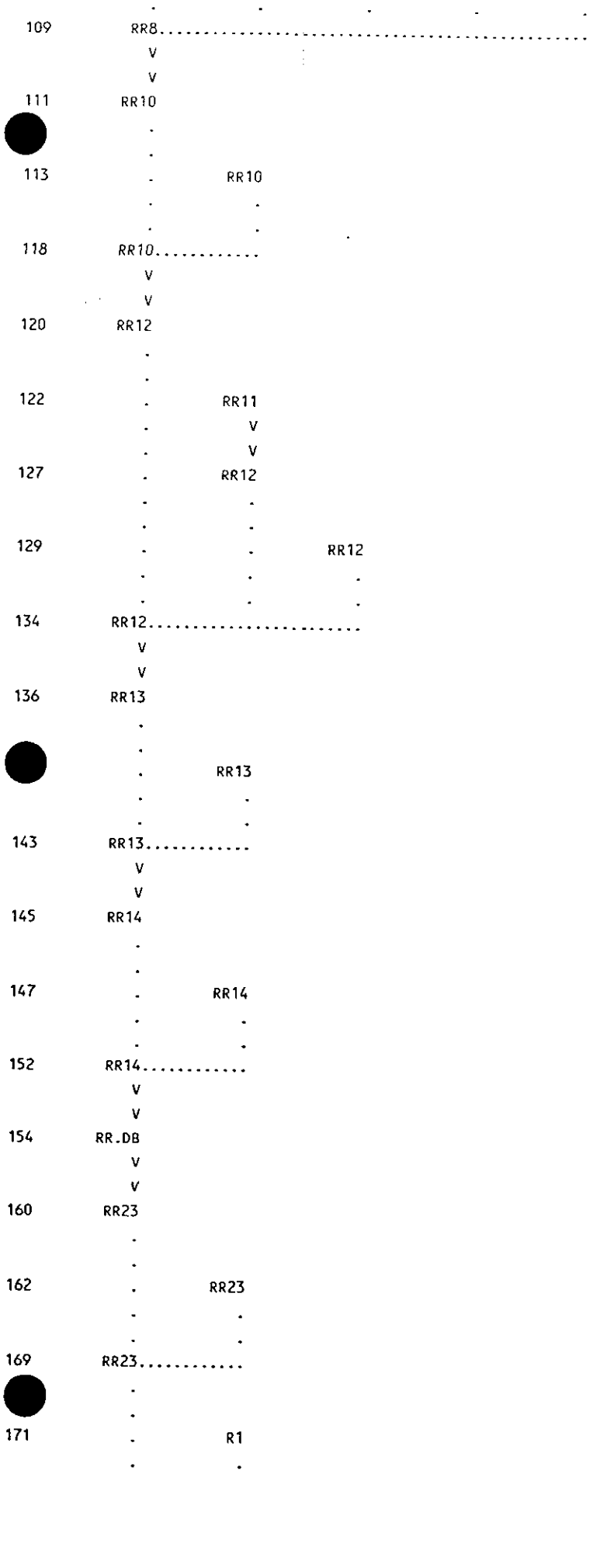
864       KK       .   (FLWA0000)
865       RK    4120   .0049    .040          TRAP     107       2

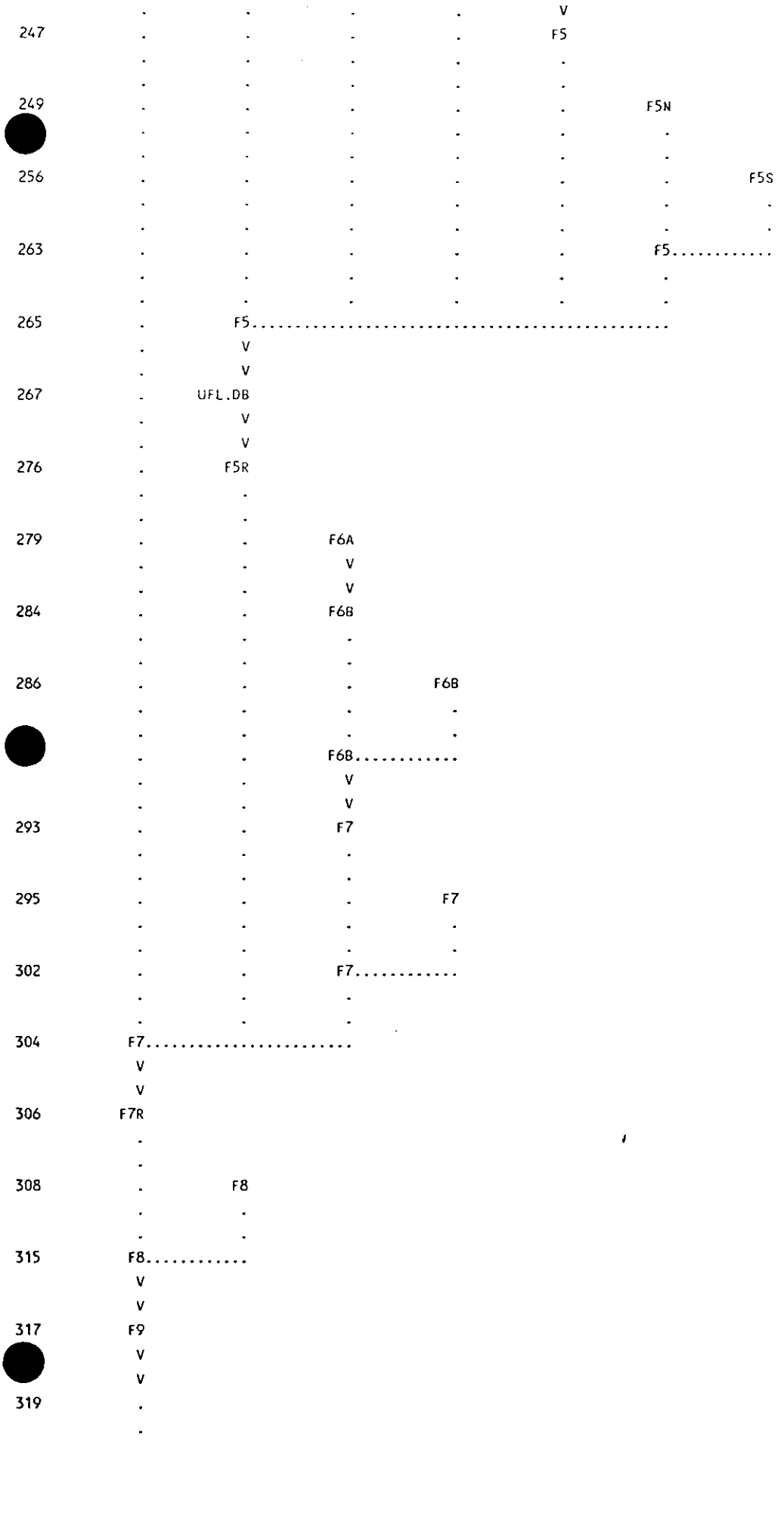
866       KK     F23 RUNOFF FROM F23
867       BA    1.92
868       LS       0    74.4                    98
869       UK     500     .01    0.25      70
870       UK     100    .015     .10      30
871       RK    2600    .005     .02    .037   TRAP      20       1
872       RK    2200   .0018     .02    0.21   TRAP      40       1
873       RK   13700   .0075    .032           TRAP      50       2      NO

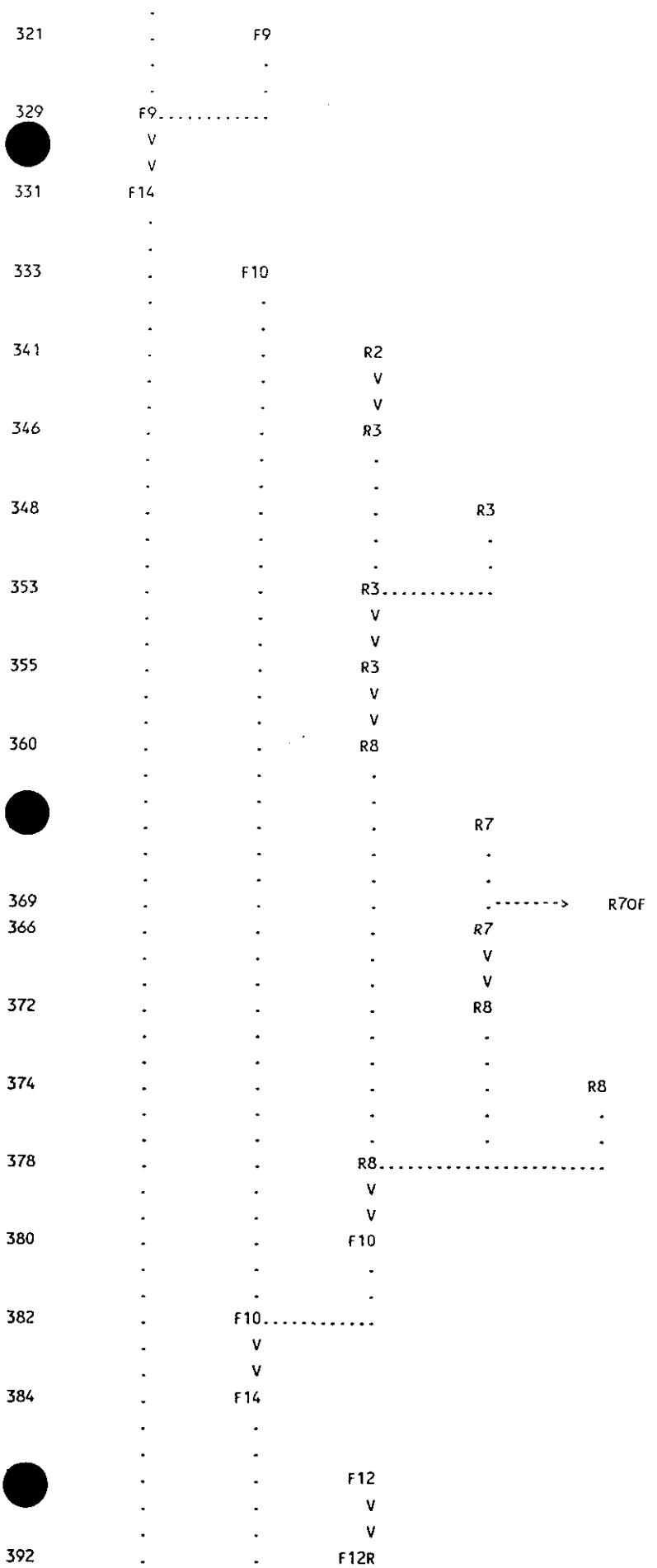
874       KK     F23 COMBINE F22 AND F23
875       KM         CONFLUENCE OF FLAMINGO WASH WITH LAS VEGAS WASH
876       HC       2
877       ZZ
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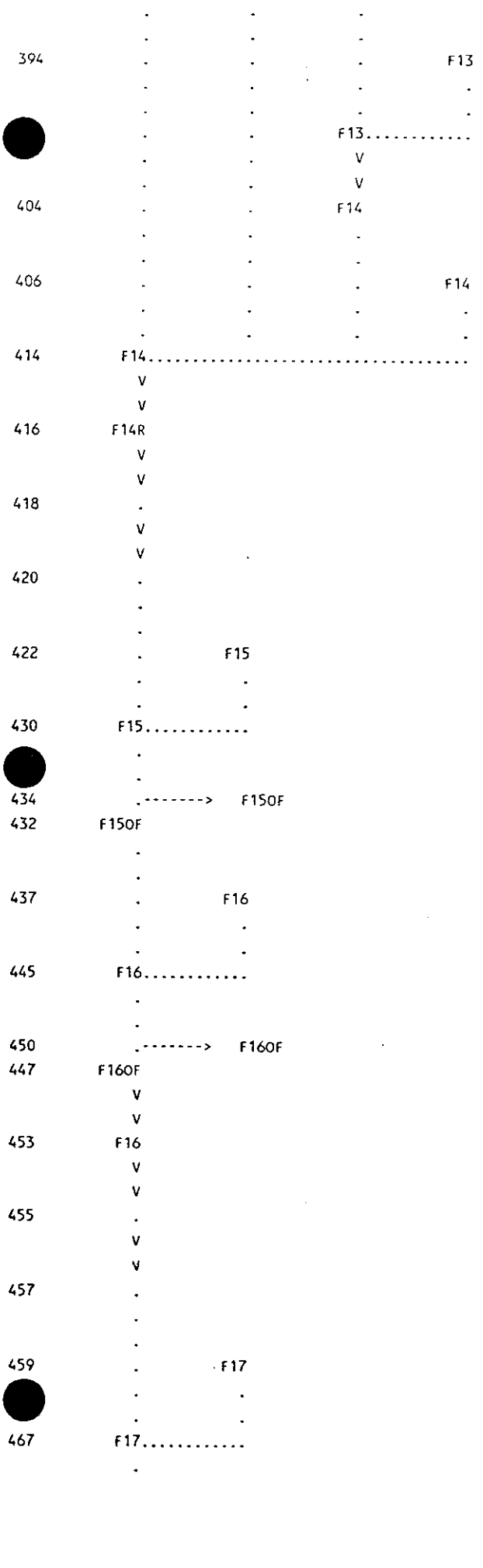
SCHEMATIC DIAGRAM OF STREAM NETWORK

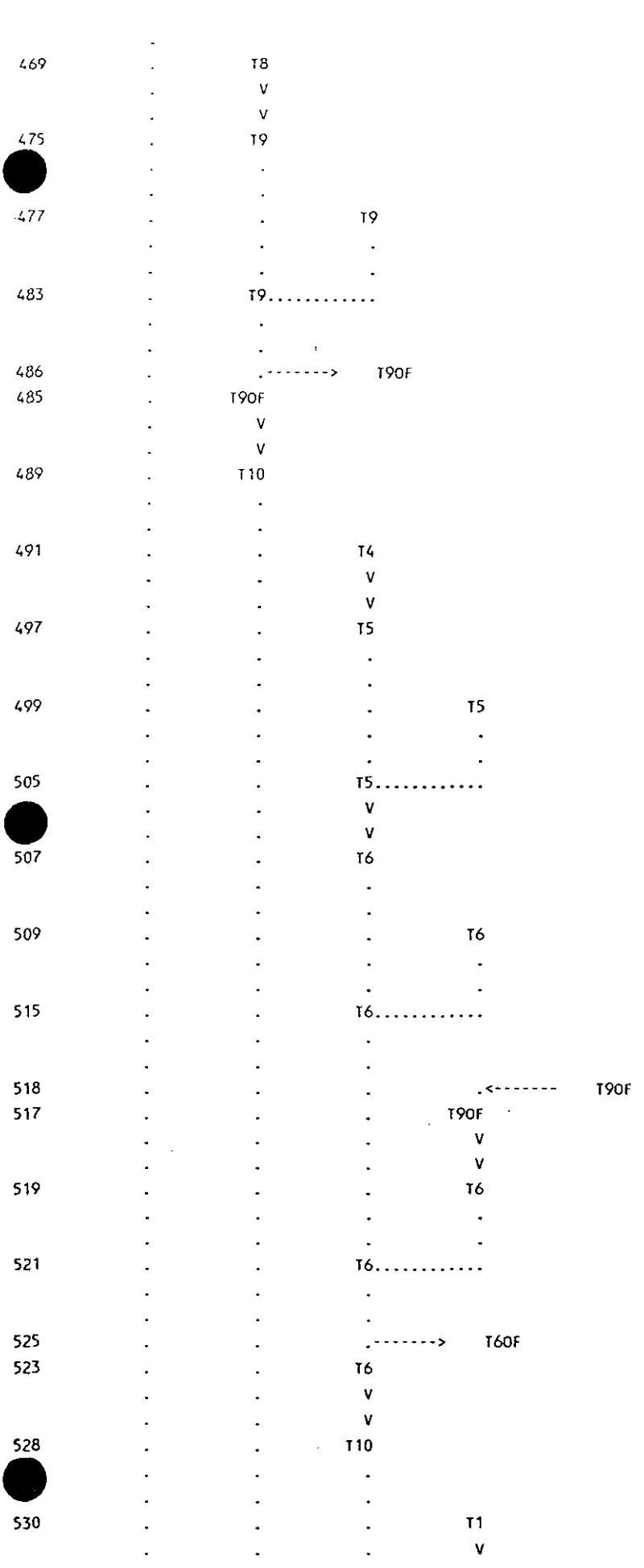


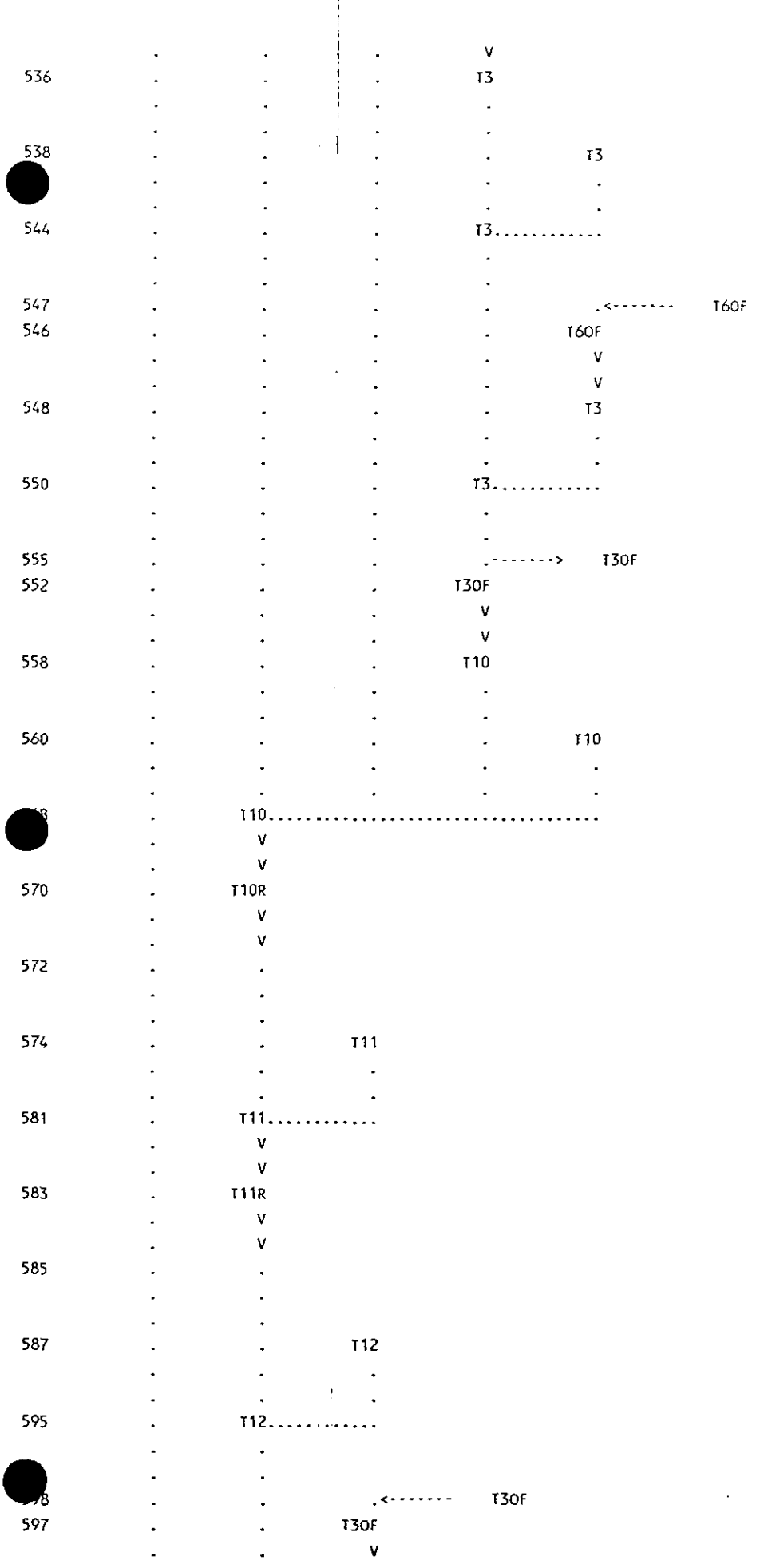

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RR8
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RR10
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RR10
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RR10
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RR12
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RR11
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RR12
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RR12
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RR12
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RR13
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RR13
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RR14
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RR14
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RR14
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RR.DB
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RR23
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RR23
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RR23
171
R1

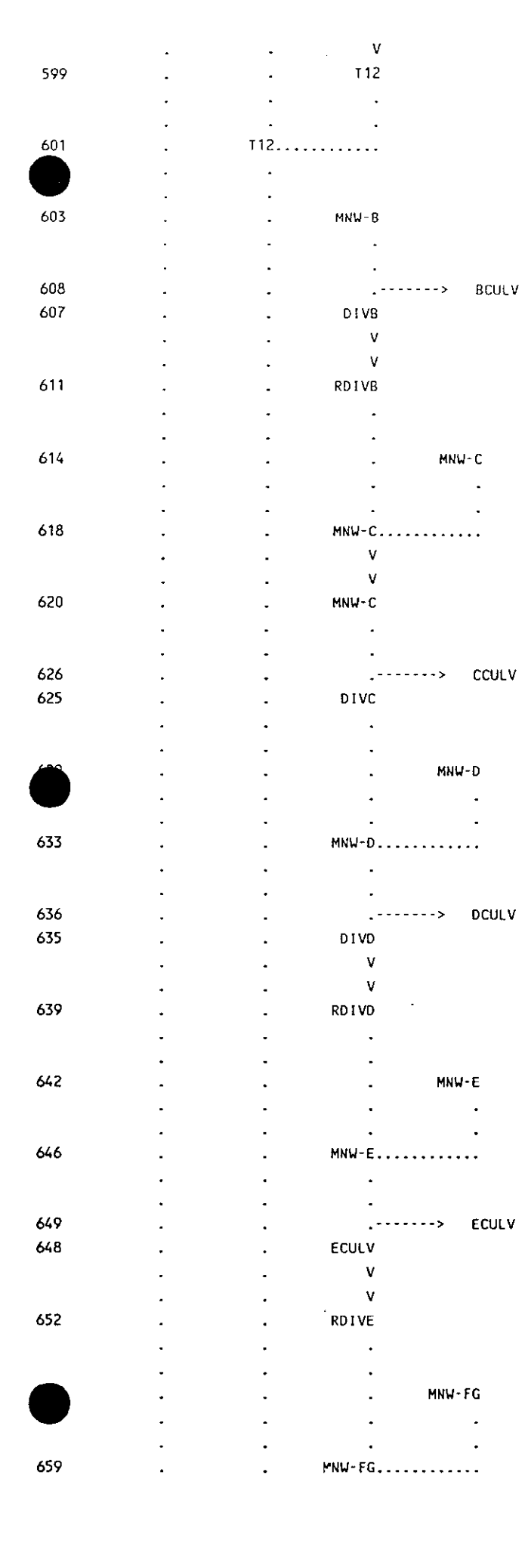

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F5
F5N
F5S
F5
F5
UFL.DB
F5R
F6A
F6B
F6B
F6B
F7
F7
F7
F7
F8
F8
F9

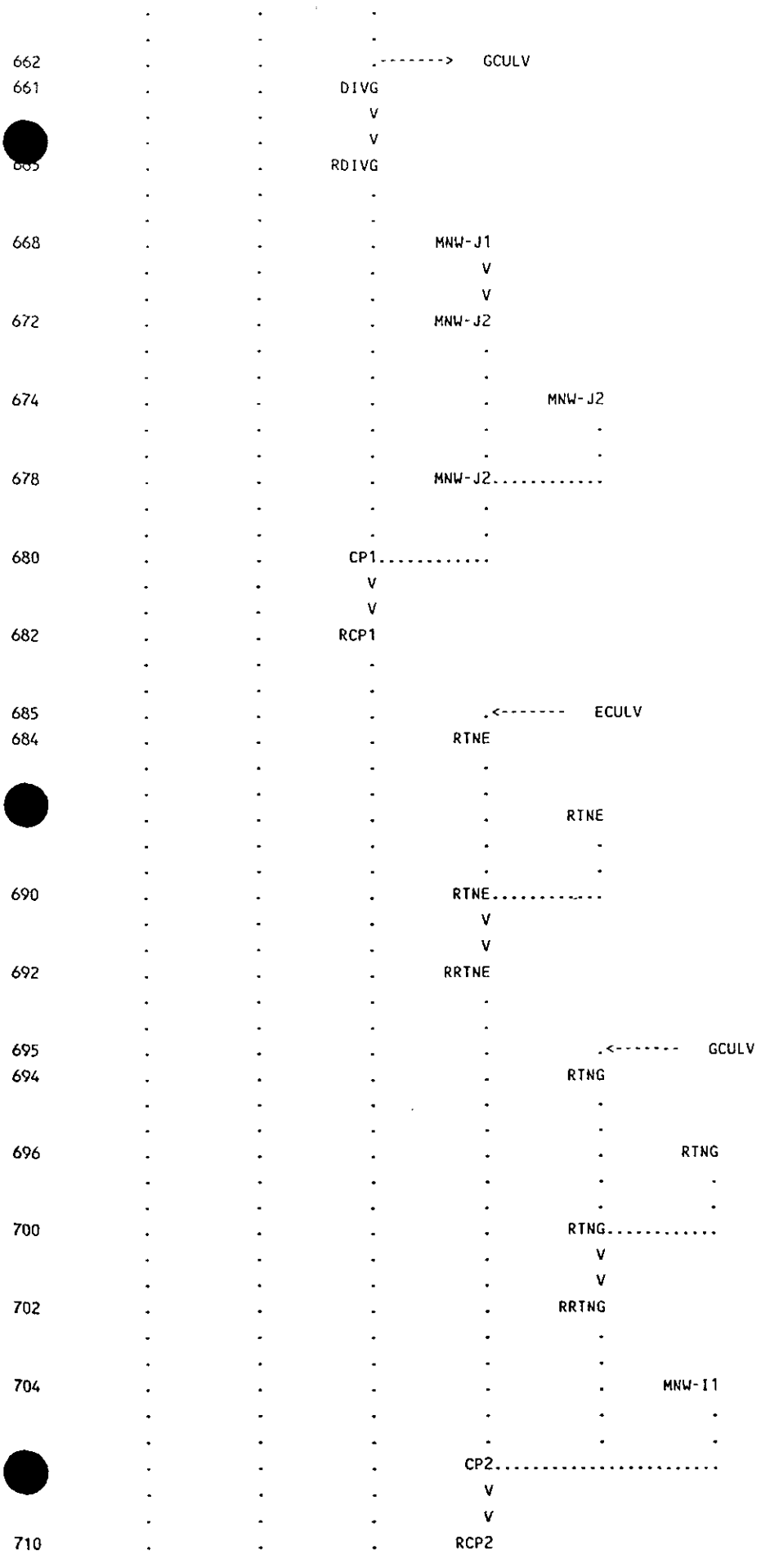

321
F9
329
F9
331
F14
333
F10
341
R2
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R3
348
R3
353
R3
355
R3
360
R8
R7
369
R7OF
366
R7
372
R8
374
R8
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R8
380
F10
382
F10
384
F14
F12
392
F12R

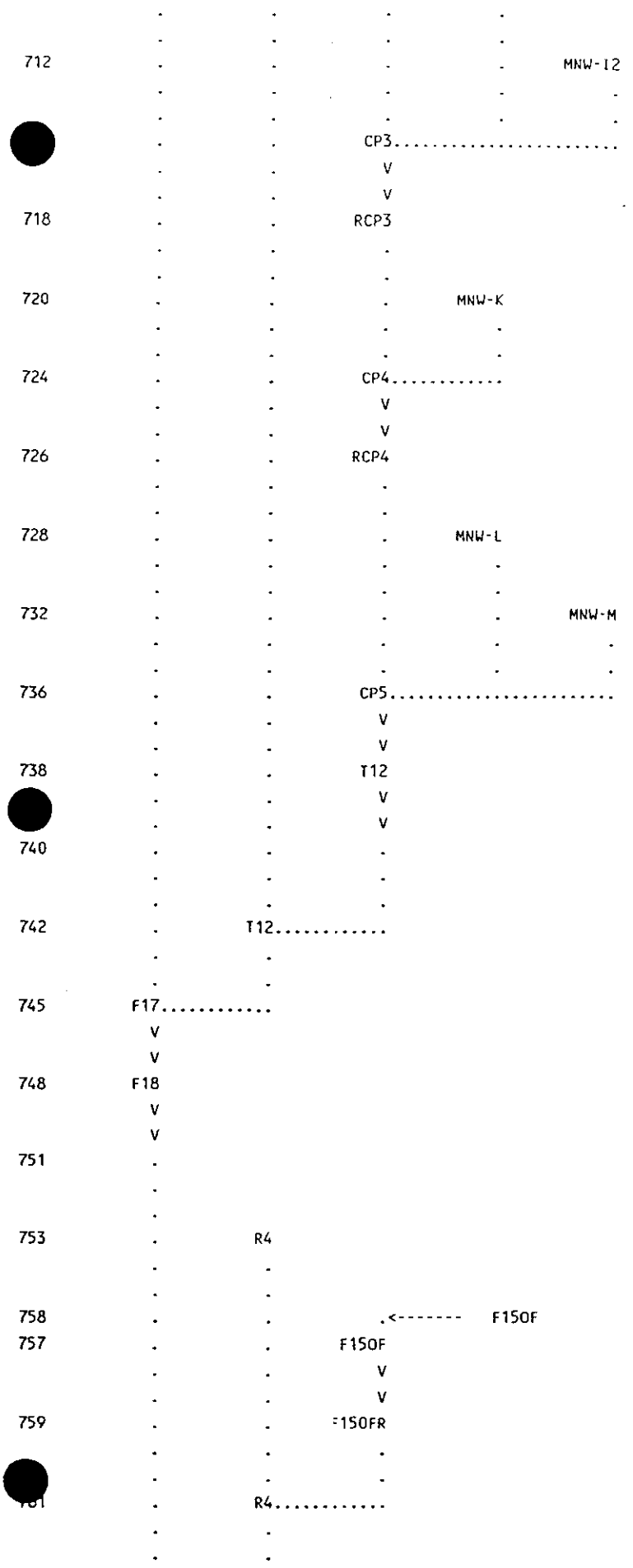

394
F13
F13
404
F14
406
F14
414
F14
416
F14R
418
420
422
F15
430
F15
434
F15OF
432
F15OF
437
F16
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F16
450
F16OF
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F16OF
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F16
455
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F17
467
F17

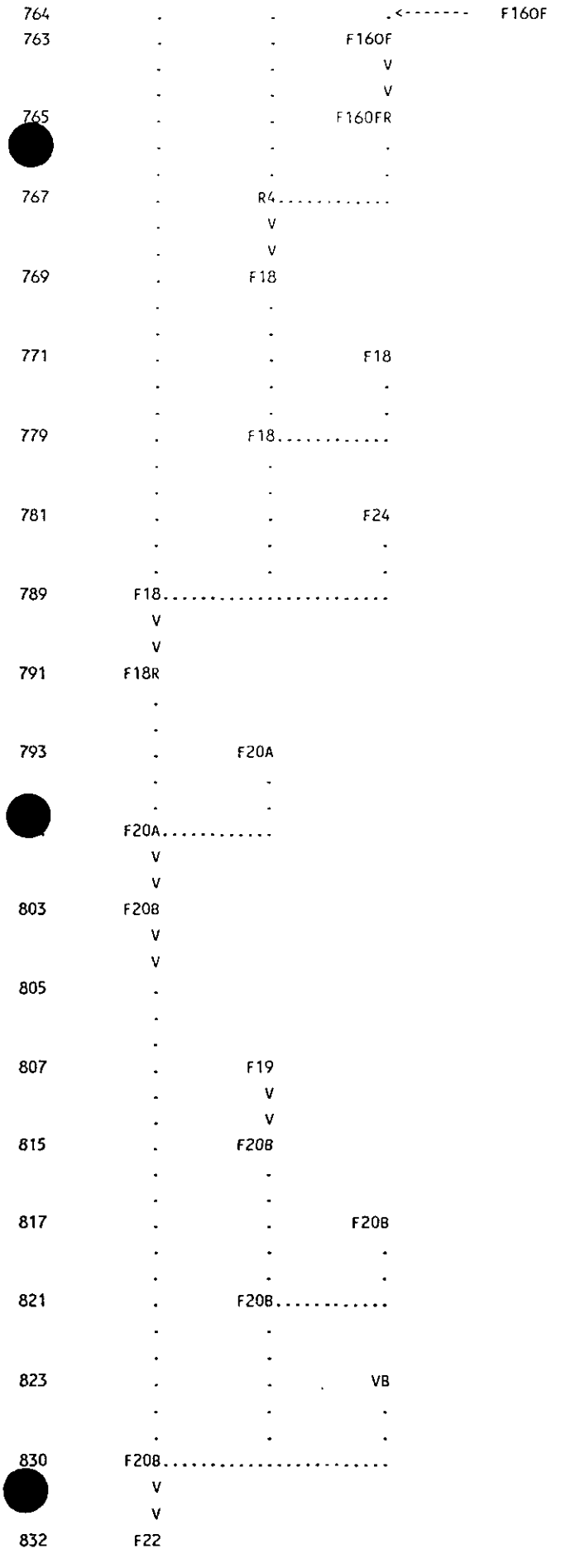

469 T8
475 T9
477 T9
483 T9
486
T90F
485 T90F
489 T10
491 T4
497 T5
499 T5
505 T5
507 T6
509 T6
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T90F
517 T90F
519 T6
521 T6
525
T60F
523 T6
528 T10
530 T1

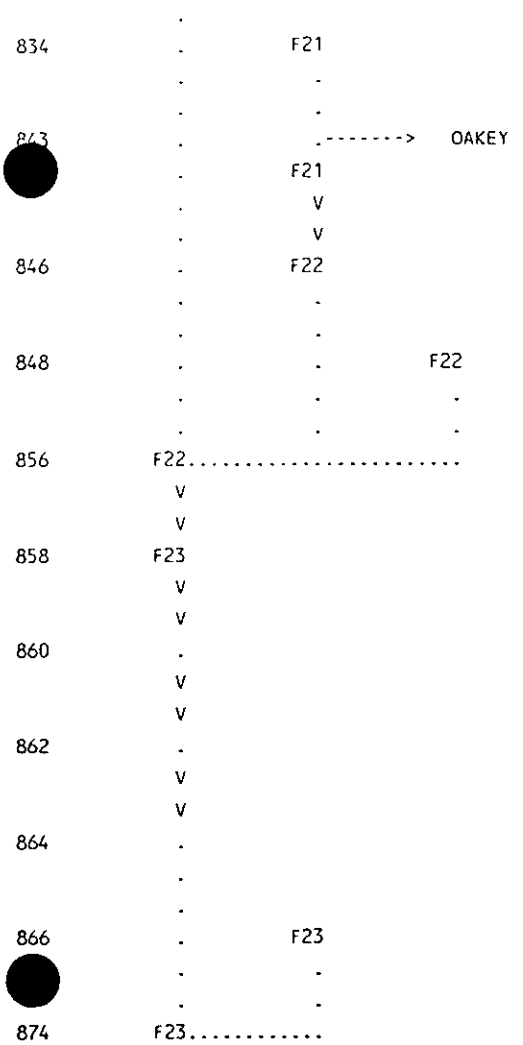

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T3
T60F
T30F
T10
T10R
T11
T11R
T12


V
599 T12
601 T12.....
603 MNW-B
608 .-------> BCULV
607 DIVB
611 RDIVB
614 MNW-C
618 MNW-C.....
620 MNW-C
626 .-------> CCULV
625 DIVC
MNW-D
633 MNW-D.....
636 .-------> DCULV
635 DIVD
639 RDIVD
642 MNW-E
646 MNW-E.....
649 .-------> ECULV
648 ECULV
652 RDIVE
MNW-FG
659 MNW-FG.....


662 GCULV
661 DIVG
RDIVG
668 MNW-J1
672 MNW-J2
674 MNW-J2
678 MNW-J2
680 CP1
682 RCP1
685 ECULV
684 RTNE
RTNE
690 RTNE
692 RRTNE
695 GCULV
694 RTNG
696 RTNG
700 RTNG
702 RRTNG
704 MNW-I1
CP2
710 RCP2


712
MNW-I2
CP3
718
RCP3
720
MNW-K
724
CP4
726
RCP4
728
MNW-L
732
MNW-M
736
CP5
738
T12
740
742
T12
745
F17
748
F18
751
753
R4
758
F15OF
757
F15OF
759
F15OFR
R4


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821
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F160F
F160FR
R4
F18
F24
F20A
F20B
VB
F22



(***) RUNOFF ALSO COMPUTED AT THIS LOCATION

```
*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*            SEPTEMBER 1990             *
*              VERSION 4.0              *
*                                       *
*  RUN DATE  10/06/1997  TIME  12:46:16 *
*                                       *
*****************************************
```

```
*****************************************
*                                       *
*    U.S. ARMY CORPS OF ENGINEERS       *
*    HYDROLOGIC ENGINEERING CENTER      *
*          609 SECOND STREET            *
*        DAVIS, CALIFORNIA 95616        *
*          (916) 756-1104               *
*                                       *
*****************************************
```

INPUT FILE = F100R.DAT BY: JEP DATE: 10/06/97
REVISED ORIGINAL FIS MODEL TO RUN ON THE SEPTEMBER 1990 VERSION OF HEC-1
BY CHANGING 4 RK ROUTINGS TO RD ROUTINGS & COMMENTING OUT THE "RDIVC" RK
ROUTING

CLARK COUNTY FLOOD CONTROL DISTRICT MASTER PLAN UPDATE
RED ROCK/FLAMINGO/TROPICANA WATERSHED
EXISTING DRAINAGE SYSTEM WITH PRESENT DEVELOPMENT
FLAMINGO/TROPICANA STORM (NO UPPER BLUE DIAMOND)- MAIN CHANNEL RUN
100-YEAR 6-HR STORM (SDN #5)
JMM OCTOBER 1990

BASIC DATA FILE BASED ON COE FILE S10P40X.
MODIFICATIONS ADDED FROM B&V RED ROCK BASIN AND UPPER FLAMINGO
BASIN HEC-1 RUNS; NIMBUS NORTHWEST MCCARRAN AIRPORT HEC-1 RUNS;
AND SUBBASIN MODIFICATIONS DUE TO RECENT DEVELOPMENT.

COE MUSKINGUM ROUTING CONVERTED TO KINEMATIC FOR EXISTING
IMPROVED CHANNELS FROM FACILITY INVENTORY.

PB CARDS CONTAIN POINT PRECIPITATION. DARF'S FROM CCRFCD MANUAL
BASED ON STORM AREAS FOR CONCENTRATION POINTS AS FOLLOWS:

SUBBASIN	AREA (SQMI)	DARF
T12,F5	20.8,15.9	0.81
RR14	53	0.68
F7,F14,F16,F160F	92,103,105	0.60
F17,F20B,F22,F23	127,139,143,145	0.565

```
33 IO        OUTPUT CONTROL VARIABLES
                 IPRNT         5  PRINT CONTROL
                 IPLOT         0  PLOT CONTROL
                 QSCAL        0.  HYDROGRAPH PLOT SCALE

   IT        HYDROGRAPH TIME DATA
                  NMIN         5  MINUTES IN COMPUTATION INTERVAL
                 IDATE     1    0  STARTING DATE
                 ITIME        0000  STARTING TIME
                    NQ        200  NUMBER OF HYDROGRAPH ORDINATES
                NDDATE     1    0  ENDING DATE
                NDTIME        1635  ENDING TIME
                 ICENT          19  CENTURY MARK
```

```
          COMPUTATION INTERVAL      .08 HOURS
              TOTAL TIME BASE   16.58 HOURS

    ENGLISH UNITS
         DRAINAGE AREA          SQUARE MILES
         PRECIPITATION DEPTH    INCHES
         LENGTH, ELEVATION      FEET
         FLOW                   CUBIC FEET PER SECOND
         STORAGE VOLUME         ACRE-FEET
         SURFACE AREA           ACRES
         TEMPERATURE            DEGREES FAHRENHEIT

JP       MULTI-PLAN OPTION
              NPLAN           1  NUMBER OF PLANS

JR       MULTI-RATIO OPTION
             RATIOS OF PRECIPITATION
             .81       .68       .60       .56

 *** FDKRUT - NEWTON RAPHSON FAILEDFIXED POINT ITERATION USED - ITERATION=  2

 *** FDKRUT - NEWTON RAPHSON FAILEDFIXED POINT ITERATION USED - ITERATION=  1

 *** FDKRUT - NEWTON RAPHSON FAILEDFIXED POINT ITERATION USED - ITERATION=  1

 *** FDKRUT - NEWTON RAPHSON FAILEDFIXED POINT ITERATION USED - ITERATION=  1

 *** FDKRUT - NEWTON RAPHSON FAILEDFIXED POINT ITERATION USED - ITERATION=  1

 *** FDKRUT - NEWTON RAPHSON FAILEDFIXED POINT ITERATION USED - ITERATION=  1

 *** FDKRUT - NEWTON RAPHSON FAILEDFIXED POINT ITERATION USED - ITERATION=  1
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*** FDKRUT - NEWTON RAPHSOM FAILEDFIXED POINT ITERATION USED - ITERATION= 2

*** FDKRUT - NEWTON RAPHSOM FAILEDFIXED POINT ITERATION USED - ITERATION= 2

*** FDKRUT - NEWTON RAPHSOM FAILEDFIXED POINT ITERATION USED - ITERATION= 1

*** FDKRUT - NEWTON RAPHSOM FAILEDFIXED POINT ITERATION USED - ITERATION= 1

*** FDKRUT WARNING TIME STEP CALCULATION FAILED TO CONVERGE. STABILITY PROBLEMS MAY RESULT

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*** FDKRUT - NEWTON RAPHSOM FAILEDFIXED POINT ITERATION USED - ITERATION= 1

*** FDKRUT - NEWTON RAPHSOM FAILEDFIXED POINT ITERATION USED - ITERATION= 1

*** FDKRUT - NEWTON RAPHSOM FAILEDFIXED POINT ITERATION USED - ITERATION= 2

*** FDKRUT - NEWTON RAPHSOM FAILEDFIXED POINT ITERATION USED - ITERATION= 1

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PEAK FLOW AND STAGE (END-OF-PERIOD) SUMMARY FOR MULTIPLE PLAN-RATIO ECONOMIC COMPUTATIONS
FLOWS IN CUBIC FEET PER SECOND, AREA IN SQUARE MILES
TIME TO PEAK IN HOURS

OPERATION	STATION	AREA	PLAN		RATIOS APPLIED TO PRECIPITATION RATIO 1 .81	RATIO 2 .68	RATIO 3 .60	RATIO 4 .56
HYDROGRAPH AT	RR1	3.83	1	FLOW	2889.	2202.	1790.	1614.
				TIME	3.75	3.75	3.75	3.75
ROUTED TO	RR4	3.83	1	FLOW	2429.	1848.	1499.	1350.
				TIME	4.08	4.08	4.08	4.08
HYDROGRAPH AT	RR4	2.74	1	FLOW	835.	614.	487.	434.
				TIME	4.83	4.92	5.08	5.17
2 COMBINED AT	RR4	6.57	1	FLOW	2980.	2236.	1798.	1612.
				TIME	4.08	4.08	4.17	4.17
HYDROGRAPH AT	RR2	3.35	1	FLOW	2186.	1649.	1329.	1193.
				TIME	3.83	3.83	3.83	3.83
ROUTED TO	RR3	3.35	1	FLOW	1912.	1440.	1159.	1039.
				TIME	4.17	4.17	4.17	4.17
HYDROGRAPH AT	RR3	3.19	1	FLOW	1609.	1182.	931.	824.
				TIME	3.92	3.92	3.92	3.92
3 COMBINED AT	RR4	13.11	1	FLOW	6318.	4727.	3784.	3383.
				TIME	4.08	4.08	4.08	4.08
ROUTED TO	RR8	13.11	1	FLOW	5393.	4027.	3221.	2881.
				TIME	4.58	4.58	4.67	4.67
HYDROGRAPH AT	RR5	7.32	1	FLOW	2004.	1475.	1168.	1039.
				TIME	5.33	5.42	5.42	5.50
ROUTED TO	RR8	7.32	1	FLOW	1994.	1466.	1160.	1031.
				TIME	5.58	5.67	5.67	5.67
HYDROGRAPH AT	RR6	2.85	1	FLOW	1873.	1405.	1127.	1008.
				TIME	3.75	3.75	3.75	3.75
ROUTED TO	RR7	2.85	1	FLOW	1530.	1147.	920.	823.
				TIME	4.17	4.17	4.17	4.17
HYDROGRAPH AT	RR7	4.87	1	FLOW	1404.	1020.	797.	704.
				TIME	4.67	4.67	4.75	4.75
2 COMBINED AT	RR7	7.72	1	FLOW	2722.	1998.	1573.	1394.
				TIME	4.25	4.25	4.25	4.25
[illegible] TO	RR8	7.72	1	FLOW	2439.	1791.	1411.	1251.
				TIME	4.83	4.83	4.83	4.83
HYDROGRAPH AT	RR8	1.75	1	FLOW	422.	310.	245.	218.

				TIME	5.50	5.58	5.58	5.58
HYDROGRAPH AT	RR9	3.71	1	FLOW	1368.	1015.	807.	719.
				TIME	4.25	4.25	4.25	4.25
[redacted]INED AT	RR8	33.61	1	FLOW	10712.	7909.	6270.	5577.
				TIME	4.67	4.75	4.75	4.75
ROUTED TO	RR10	33.61	1	FLOW	10542.	7792.	6176.	5499.
				TIME	5.00	5.00	5.08	5.08
HYDROGRAPH AT	RR10	3.30	1	FLOW	842.	608.	474.	420.
				TIME	4.75	4.83	5.08	5.17
2 COMBINED AT	RR10	36.91	1	FLOW	11373.	8398.	6651.	5919.
				TIME	5.00	5.00	5.08	5.08
ROUTED TO	RR12	36.91	1	FLOW	11196.	8278.	6574.	5855.
				TIME	5.33	5.33	5.42	5.42
HYDROGRAPH AT	RR11	3.40	1	FLOW	1223.	900.	710.	630.
				TIME	4.25	4.25	4.25	4.25
ROUTED TO	RR12	3.40	1	FLOW	1202.	884.	698.	620.
				TIME	4.42	4.42	4.50	4.50
HYDROGRAPH AT	RR12	4.25	1	FLOW	1636.	1214.	967.	862.
				TIME	4.17	4.17	4.25	4.25
3 COMBINED AT	RR12	44.56	1	FLOW	13274.	9878.	7875.	7026.
				TIME	5.33	5.33	5.33	5.33
ROUTED TO	RR13	44.56	1	FLOW	13149.	9786.	7802.	6969.
				TIME	5.58	5.58	5.58	5.67
HYDROGRAPH AT	RR13	2.26	1	FLOW	833.	590.	449.	390.
				TIME	3.92	3.92	3.92	3.92
2 COMBINED AT	RR13	46.82	1	FLOW	13498.	10027.	7990.	7130.
				TIME	5.50	5.50	5.58	5.58
ROUTED TO	RR14	46.82	1	FLOW	13476.	10011.	7981.	7121.
				TIME	5.58	5.67	5.67	5.67
HYDROGRAPH AT	RR14	6.22	1	FLOW	1740.	1305.	1048.	940.
				TIME	5.42	5.42	5.50	5.50
2 COMBINED AT	RR14	53.04	1	FLOW	15197.	11303.	9018.	8052.
				TIME	5.58	5.58	5.67	5.67
ROUTED TO	RR.DB	53.04	1	FLOW	12101.	5740.	1381.	1335.
				TIME	6.58	7.25	8.33	8.33
			** PEAK STAGES IN FEET **					
			1	STAGE	3212.76	3211.42	3208.20	3205.32
				TIME	6.58	7.25	8.33	8.33
ROUTED TO	RR23	53.04	1	FLOW	11598.	5299.	1381.	1335.
				TIME	7.17	7.83	8.92	8.83

HYDROGRAPH AT	RR23	2.03	1	FLOW	403.	242.	182.	155.
				TIME	4.33	5.25	5.25	5.33
2 COMBINED AT	RR23	55.07	1	FLOW	11655.	5329.	1395.	1349.
				TIME	7.17	7.83	8.58	8.58
HYDROGRAPH AT	R1	1.12	1	FLOW	584.	446.	363.	328.
				TIME	3.83	3.83	3.83	3.83
2 COMBINED AT	RR23	56.19	1	FLOW	11658.	5329.	1395.	1349.
				TIME	7.17	7.83	8.58	8.58
ROUTED TO	R5	56.19	1	FLOW	11363.	5120.	1395.	1349.
				TIME	7.58	8.25	9.00	8.92
HYDROGRAPH AT	RR20	1.37	1	FLOW	610.	468.	382.	346.
				TIME	4.08	4.08	4.08	4.08
ROUTED TO	R5	1.37	1	FLOW	569.	437.	357.	323.
				TIME	4.75	4.75	4.75	4.75
HYDROGRAPH AT	RR21	6.27	1	FLOW	2202.	1672.	1355.	1221.
				TIME	4.42	4.42	4.50	4.50
ROUTED TO	R5	6.27	1	FLOW	2130.	1618.	1315.	1185.
				TIME	5.08	5.08	5.17	5.17
HYDROGRAPH AT	RR22	2.15	1	FLOW	959.	728.	589.	530.
				TIME	4.00	4.00	4.00	4.00
R[illegible] TO	R5	2.15	1	FLOW	878.	667.	540.	486.
				TIME	4.75	4.75	4.75	4.75
HYDROGRAPH AT	R5	5.77	1	FLOW	1038.	650.	482.	417.
				TIME	4.25	5.17	5.17	5.25
5 COMBINED AT	R5	71.75	1	FLOW	11917.	5292.	3475.	3142.
				TIME	7.50	8.25	5.33	5.50
ROUTED TO	R6	71.75	1	FLOW	11776.	5196.	3466.	3135.
				TIME	7.75	8.50	5.58	5.75
HYDROGRAPH AT	R6	1.51	1	FLOW	180.	115.	73.	57.
				TIME	5.17	5.33	5.58	5.75
2 COMBINED AT	R6	73.26	1	FLOW	11799.	5208.	3539.	3191.
				TIME	7.75	8.50	5.58	5.75
HYDROGRAPH AT	F1	4.63	1	FLOW	1938.	1485.	1213.	1096.
				TIME	4.17	4.17	4.17	4.17
ROUTED TO	F5	4.63	1	FLOW	1780.	1366.	1118.	1011.
				TIME	5.17	5.25	5.25	5.25
HYDROGRAPH AT	F2	1.28	1	FLOW	709.	545.	446.	403.
				TIME	3.83	3.83	3.83	3.83
ROUTED TO	F5	1.28	1	FLOW	615.	472.	386.	349.
				TIME	4.58	4.58	4.58	4.58

HYDROGRAPH AT	F3	2.60	1	FLOW	1459.	1107.	897.	808.
				TIME	3.75	3.75	3.75	3.75
ROUTED TO	F5	2.60	1	FLOW	1304.	990.	802.	721.
				TIME	4.17	4.17	4.17	4.17
HYDROGRAPH AT	F4	1.30	1	FLOW	618.	462.	370.	331.
				TIME	3.75	3.83	3.83	3.83
ROUTED TO	F5	1.30	1	FLOW	538.	402.	321.	287.
				TIME	4.50	4.50	4.50	4.50
HYDROGRAPH AT	F5N	4.04	1	FLOW	1329.	875.	644.	568.
				TIME	4.17	4.42	4.58	4.75
HYDROGRAPH AT	F5S	2.00	1	FLOW	664.	436.	309.	262.
				TIME	4.08	4.17	4.33	4.50
2 COMBINED AT	F5	6.04	1	FLOW	1972.	1290.	936.	821.
				TIME	4.17	4.33	4.58	4.75
5 COMBINED AT	F5	15.85	1	FLOW	4568.	3428.	2831.	2575.
				TIME	4.33	5.17	5.25	5.25
ROUTED TO	UFL.DB	15.85	1	FLOW	1159.	1059.	990.	962.
				TIME	6.92	6.83	6.75	6.75
			** PEAK STAGES IN FEET **					
			1	STAGE	2466.85	2463.92	2462.11	2461.37
				TIME	6.92	6.83	6.75	6.75
ROUTED TO	F5R	15.85	1	FLOW	1159.	1059.	990.	962.
				TIME	7.00	6.92	6.83	6.83
HYDROGRAPH AT	F6A	.55	1	FLOW	285.	216.	176.	158.
				TIME	3.75	3.75	3.75	3.75
ROUTED TO	F6B	.55	1	FLOW	257.	195.	158.	142.
				TIME	4.08	4.08	4.08	4.08
HYDROGRAPH AT	F6B	.85	1	FLOW	452.	342.	276.	248.
				TIME	3.67	3.67	3.67	3.67
2 COMBINED AT	F6B	1.40	1	FLOW	591.	445.	359.	322.
				TIME	3.75	3.75	3.75	3.75
ROUTED TO	F7	1.40	1	FLOW	558.	422.	340.	306.
				TIME	4.08	4.08	4.08	4.08
HYDROGRAPH AT	F7	1.50	1	FLOW	460.	296.	211.	191.
				TIME	4.08	4.25	4.42	5.00
2 COMBINED AT	F7	2.90	1	FLOW	1018.	713.	532.	458.
				TIME	4.08	4.17	4.25	4.25
3 COMBINED AT	F7	92.01	1	FLOW	12976.	6239.	4818.	4385.
				TIME	7.75	8.50	5.50	5.58
ROUTED TO	F7R	92.01	1	FLOW	12944.	6222.	4814.	4385.
				TIME	7.83	8.50	5.50	5.67

HYDROGRAPH AT	F8	.48	1	FLOW	66.	52.	44.	41.
				TIME	3.75	3.75	3.75	3.75
2 COMBINED AT	F8	92.49	1	FLOW	12950.	6225.	4827.	4394.
				TIME	7.83	8.50	5.50	5.67
ROUTED TO	F9	92.49	1	FLOW	12950.	6217.	4825.	4394.
				TIME	7.83	8.50	5.50	5.67
ROUTED TO	.	92.49	1	FLOW	12942.	6209.	4825.	4391.
				TIME	7.83	8.58	5.58	5.67
HYDROGRAPH AT	F9	.90	1	FLOW	192.	154.	130.	119.
				TIME	3.83	3.83	3.83	3.92
2 COMBINED AT	F9	93.39	1	FLOW	12955.	6214.	4864.	4423.
				TIME	7.83	8.58	5.58	5.67
ROUTED TO	F14	93.39	1	FLOW	12856.	6154.	4852.	4414.
				TIME	8.00	8.75	5.75	5.83
HYDROGRAPH AT	F10	1.17	1	FLOW	384.	320.	277.	259.
				TIME	3.75	3.75	3.75	3.75
HYDROGRAPH AT	R2	2.01	1	FLOW	881.	607.	451.	386.
				TIME	3.58	3.58	3.58	3.58
ROUTED TO	R3	2.01	1	FLOW	729.	503.	374.	320.
				TIME	4.00	4.00	4.00	4.00
HYDROGRAPH AT	R3	2.63	1	FLOW	249.	156.	105.	84.
				TIME	5.25	5.25	5.25	5.25
2 COMBINED AT	R3	4.64	1	FLOW	924.	588.	412.	343.
				TIME	4.00	4.00	4.00	4.00
ROUTED TO	R3	4.64	1	FLOW	208.	136.	98.	83.
				TIME	5.92	5.92	5.92	5.92
			** PEAK STAGES IN FEET **					
			1	STAGE	24.61	23.02	22.17	21.83
				TIME	5.92	5.92	5.92	5.92
ROUTED TO	R8	4.64	1	FLOW	208.	136.	98.	83.
				TIME	5.92	5.92	6.00	6.00
HYDROGRAPH AT	R7	1.39	1	FLOW	346.	232.	169.	144.
				TIME	3.92	3.92	4.00	4.00
DIVERSION TO	R7OF	1.39	1	FLOW	22.	0.	0.	0.
				TIME	3.92	.08	.08	.08
HYDROGRAPH AT	R7	1.39	1	FLOW	324.	232.	169.	144.
				TIME	3.83	3.92	4.00	4.00
ROUTED TO	R8	1.39	1	FLOW	324.	231.	169.	143.
				TIME	3.92	4.00	4.08	4.08
HYDROGRAPH AT	R8	.51	1	FLOW	90.	54.	40.	34.

				TIME	3.83	5.00	5.00	5.00
3 COMBINED AT	R8	6.54	1	FLOW	488.	338.	255.	220.
				TIME	5.17	5.17	5.17	5.17
RO TO	F10	6.54	1	FLOW	486.	337.	255.	220.
				TIME	5.25	5.25	5.25	5.25
2 COMBINED AT	F10	7.71	1	FLOW	719.	516.	397.	351.
				TIME	3.75	3.75	3.75	3.75
ROUTED TO	F14	7.71	1	FLOW	698.	502.	390.	344.
				TIME	3.83	3.83	3.83	3.83
HYDROGRAPH AT	F12	.88	1	FLOW	306.	209.	154.	132.
				TIME	4.00	4.17	4.33	4.42
ROUTED TO	F12R	.88	1	FLOW	297.	203.	151.	130.
				TIME	4.25	4.42	4.50	4.67
HYDROGRAPH AT	F13	.55	1	FLOW	160.	124.	98.	85.
				TIME	5.00	5.08	5.08	5.08
2 COMBINED AT	F13	1.43	1	FLOW	425.	289.	237.	213.
				TIME	4.25	5.08	5.08	5.08
ROUTED TO	F14	1.43	1	FLOW	419.	287.	234.	210.
				TIME	4.42	5.17	5.25	5.25
HYDROGRAPH AT	F14	.78	1	FLOW	132.	84.	57.	50.
				TIME	5.25	5.42	4.17	4.17
4 COMBINED AT	F14	103.31	1	FLOW	13083.	6595.	5335.	4805.
				TIME	8.00	5.50	5.58	5.75
ROUTED TO	F14R	103.31	1	FLOW	13065.	6592.	5332.	4803.
				TIME	8.00	5.50	5.67	5.75
ROUTED TO	.	103.31	1	FLOW	13030.	6583.	5330.	4799.
				TIME	8.08	5.50	5.67	5.83
ROUTED TO	.	103.31	1	FLOW	13029.	6579.	5327.	4799.
				TIME	8.08	5.58	5.67	5.83
HYDROGRAPH AT	F15	1.32	1	FLOW	324.	223.	172.	154.
				TIME	4.00	4.00	4.08	4.08
2 COMBINED AT	F15	104.63	1	FLOW	13048.	6740.	5445.	4895.
				TIME	8.08	5.50	5.67	5.75
DIVERSION TO	F15OF	104.63	1	FLOW	5769.	1547.	789.	466.
				TIME	8.08	5.50	5.67	5.75
HYDROGRAPH AT	F15OF	104.63	1	FLOW	7279.	5192.	4657.	4429.
				TIME	8.08	5.50	5.67	5.75
H RAPH AT	F16	.52	1	FLOW	209.	163.	136.	121.
				TIME	3.83	3.83	3.83	3.83
2 COMBINED AT	F16	105.15	1	FLOW	7284.	5254.	4699.	4464.

				TIME	8.08	5.50	5.67	5.75
DIVERSION TO	F16OF	105.15	1	FLOW	1284.	0.	0.	0.
				TIME	8.08	.08	.08	.08
[redacted]GRAPH AT	F16OF	105.15	1	FLOW	6000.	5254.	4699.	4464.
				TIME	7.67	5.50	5.67	5.75
ROUTED TO	F16	105.15	1	FLOW	6000.	5253.	4699.	4463.
				TIME	7.75	5.50	5.67	5.75
ROUTED TO	.	105.15	1	FLOW	6000.	5250.	4698.	4462.
				TIME	7.83	5.50	5.67	5.75
ROUTED TO	.	105.15	1	FLOW	6000.	5249.	4697.	4461.
				TIME	8.00	5.58	5.75	5.83
HYDROGRAPH AT	F17	.65	1	FLOW	212.	154.	123.	112.
				TIME	4.17	4.25	4.33	4.33
2 COMBINED AT	F17	105.80	1	FLOW	6014.	5344.	4771.	4526.
				TIME	7.92	5.58	5.75	5.83
HYDROGRAPH AT	T8	1.22	1	FLOW	59.	23.	10.	6.
				TIME	6.08	7.00	8.08	8.83
ROUTED TO	T9	1.22	1	FLOW	54.	22.	9.	6.
				TIME	6.67	7.50	8.58	9.42
HYDROGRAPH AT	T9	.87	1	FLOW	102.	58.	34.	26.
[redacted]				TIME	5.25	5.58	5.92	6.17
2 COMBINED AT	T9	2.09	1	FLOW	113.	60.	35.	26.
				TIME	5.33	5.58	6.00	6.25
DIVERSION TO	T9OF	2.09	1	FLOW	0.	0.	0.	0.
				TIME	.08	.08	.08	.08
HYDROGRAPH AT	T9OF	2.09	1	FLOW	113.	60.	35.	26.
				TIME	5.33	5.58	6.00	6.25
ROUTED TO	T10	2.09	1	FLOW	112.	60.	35.	26.
				TIME	5.58	5.83	6.17	6.42
HYDROGRAPH AT	T4	3.22	1	FLOW	1204.	830.	616.	529.
				TIME	4.00	4.17	4.25	4.33
ROUTED TO	T5	3.22	1	FLOW	1197.	830.	612.	526.
				TIME	4.08	4.25	4.33	4.42
HYDROGRAPH AT	T5	1.00	1	FLOW	341.	228.	165.	141.
				TIME	4.00	4.08	4.25	4.42
2 COMBINED AT	T5	4.22	1	FLOW	1529.	1051.	777.	667.
				TIME	4.08	4.25	4.33	4.42
[redacted]ED TO	T6	4.22	1	FLOW	1511.	1042.	768.	661.
				TIME	4.25	4.42	4.50	4.67
HYDROGRAPH AT	T6	1.30	1	FLOW	422.	281.	206.	179.

				TIME	4.08	4.33	4.50	5.00
2 COMBINED AT	T6	5.52	1	FLOW	1920.	1320.	974.	839.
				TIME	4.25	4.33	4.50	4.67
[redacted]GRAPH AT	T9OF	.00	1	FLOW	0.	0.	0.	0.
				TIME	.08	.08	.08	.08
ROUTED TO	T6	.00	1	FLOW	0.	0.	0.	0.
				TIME	.08	.08	.08	.08
2 COMBINED AT	T6	5.52	1	FLOW	1920.	1320.	974.	839.
				TIME	4.25	4.33	4.50	4.67
DIVERSION TO	T6OF	5.52	1	FLOW	1170.	570.	224.	89.
				TIME	4.25	4.33	4.50	4.67
HYDROGRAPH AT	T6	5.52	1	FLOW	750.	750.	750.	750.
				TIME	3.83	4.08	4.33	4.50
ROUTED TO	T10	5.52	1	FLOW	750.	750.	750.	750.
				TIME	4.92	5.17	5.33	5.17
HYDROGRAPH AT	T1	1.56	1	FLOW	613.	428.	320.	277.
				TIME	4.00	4.08	4.17	4.25
ROUTED TO	T3	1.56	1	FLOW	611.	427.	318.	274.
				TIME	4.17	4.33	4.42	4.50
HYDROGRAPH AT	T3	.99	1	FLOW	170.	116.	86.	73.
[redacted]				TIME	4.42	5.08	5.25	5.33
2 COMBINED AT	T3	2.55	1	FLOW	762.	501.	359.	305.
				TIME	4.17	4.33	4.50	4.58
HYDROGRAPH AT	T6OF	.00	1	FLOW	1170.	570.	224.	89.
				TIME	4.25	4.33	4.50	4.67
ROUTED TO	T3	.00	1	FLOW	1143.	550.	212.	83.
				TIME	4.33	4.50	4.58	4.75
2 COMBINED AT	T3	2.55	1	FLOW	1892.	1050.	565.	382.
				TIME	4.25	4.42	4.58	4.67
DIVERSION TO	T3OF	2.55	1	FLOW	413.	0.	0.	0.
				TIME	4.25	.08	.08	.08
HYDROGRAPH AT	T3OF	2.55	1	FLOW	1479.	1050.	565.	382.
				TIME	4.25	4.42	4.58	4.67
ROUTED TO	T10	2.55	1	FLOW	1477.	1044.	563.	379.
				TIME	4.33	4.50	4.67	4.75
HYDROGRAPH AT	T10	.82	1	FLOW	205.	146.	116.	102.
				TIME	3.75	3.83	3.83	3.83
[redacted]MBINED AT	T10	10.98	1	FLOW	2392.	1882.	1370.	1181.
				TIME	4.33	4.50	4.67	4.83
ROUTED TO	T10R	10.98	1	FLOW	2391.	1879.	1367.	1180.

				TIME	4.33	4.50	4.67	4.83
ROUTED TO	.	10.98	1	FLOW	2389.	1875.	1364.	1178.
				TIME	4.42	4.58	4.75	4.92
HYDROGRAPH AT	T11	1.09	1	FLOW	297.	237.	196.	183.
				TIME	3.92	3.92	4.00	4.00
2 COMBINED AT	T11	12.07	1	FLOW	2558.	1981.	1447.	1256.
				TIME	4.33	4.58	4.75	4.92
ROUTED TO	T11R	12.07	1	FLOW	2557.	1979.	1444.	1255.
				TIME	4.33	4.58	4.75	4.92
ROUTED TO	.	12.07	1	FLOW	2552.	1970.	1443.	1254.
				TIME	4.42	4.67	4.92	5.08
HYDROGRAPH AT	T12	.77	1	FLOW	230.	178.	148.	135.
				TIME	3.92	3.92	3.92	3.92
2 COMBINED AT	T12	12.84	1	FLOW	2674.	2041.	1499.	1316.
				TIME	4.42	4.67	4.92	5.17
HYDROGRAPH AT	T3OF	.00	1	FLOW	413.	0.	0.	0.
				TIME	4.25	.08	.08	.08
ROUTED TO	T12	.00	1	FLOW	144.	0.	0.	0.
				TIME	6.25	.08	.08	.08
2 COMBINED AT	T12	12.84	1	FLOW	2674.	2041.	1499.	1316.
				TIME	4.42	4.67	4.92	5.17
HYDROGRAPH AT	MNW-B	.68	1	FLOW	41.	27.	20.	17.
				TIME	6.50	6.42	6.42	6.42
DIVERSION TO	BCULV	.68	1	FLOW	22.	22.	20.	17.
				TIME	4.83	5.50	6.42	6.42
HYDROGRAPH AT	DIVB	.68	1	FLOW	19.	5.	0.	0.
				TIME	6.50	6.42	.08	.08
ROUTED TO	RDIVB	.68	1	FLOW	19.	5.	0.	0.
				TIME	6.50	6.50	.08	.08
HYDROGRAPH AT	MNW-C	.69	1	FLOW	59.	42.	33.	29.
				TIME	6.00	6.00	5.92	5.92
2 COMBINED AT	MNW-C	1.37	1	FLOW	76.	45.	33.	29.
				TIME	6.17	6.17	5.92	5.92
ROUTED TO	MNW-C	1.37	1	FLOW	66.	36.	29.	27.
				TIME	6.83	7.00	6.58	6.50
			** PEAK STAGES IN FEET **					
			1	STAGE	57.82	57.08	56.37	56.17
				TIME	6.83	7.00	6.58	6.50
DIVERSION TO	CCULV	1.37	1	FLOW	43.	36.	29.	27.
				TIME	6.83	7.00	6.58	6.50

HYDROGRAPH AT	DIVC	1.37	1	FLOW	23.	0.	0.	0.
				TIME	6.83	.08	.08	.08
HYDROGRAPH AT	MNW-D	.05	1	FLOW	7.	4.	3.	3.
				TIME	3.83	5.08	5.08	3.75
2 COMBINED AT	MNW-D	1.42	1	FLOW	23.	4.	3.	3.
				TIME	6.83	5.08	5.08	3.75
DIVERSION TO	DCULV	1.42	1	FLOW	23.	4.	3.	3.
				TIME	6.83	5.08	5.08	3.75
HYDROGRAPH AT	DIVD	1.42	1	FLOW	0.	0.	0.	0.
				TIME	.08	.08	.08	.08
ROUTED TO	RDIVD	1.42	1	FLOW	0.	0.	0.	0.
				TIME	.08	.08	.08	.08
HYDROGRAPH AT	MNW-E	.05	1	FLOW	9.	6.	5.	5.
				TIME	3.75	3.75	3.75	3.75
2 COMBINED AT	MNW-E	1.47	1	FLOW	9.	6.	5.	5.
				TIME	3.75	3.75	3.75	3.75
DIVERSION TO	ECULV	1.47	1	FLOW	9.	6.	5.	5.
				TIME	3.75	3.75	3.75	3.75
HYDROGRAPH AT	ECULV	1.47	1	FLOW	0.	0.	0.	0.
				TIME	.08	.08	.08	.08
R TO	RDIVE	1.47	1	FLOW	0.	0.	0.	0.
				TIME	.08	.08	.08	.08
HYDROGRAPH AT	MNW-FG	.36	1	FLOW	38.	26.	20.	18.
				TIME	5.25	5.33	4.83	4.83
2 COMBINED AT	MNW-FG	1.83	1	FLOW	38.	26.	20.	18.
				TIME	5.25	5.33	4.83	4.83
DIVERSION TO	GCULV	1.83	1	FLOW	38.	26.	20.	18.
				TIME	5.25	5.33	4.83	4.83
HYDROGRAPH AT	DIVG	1.83	1	FLOW	0.	0.	0.	0.
				TIME	.08	.08	.08	.08
ROUTED TO	RDIVG	1.83	1	FLOW	0.	0.	0.	0.
				TIME	.08	.08	.08	.08
HYDROGRAPH AT	MNW-J1	2.37	1	FLOW	128.	75.	49.	39.
				TIME	6.92	7.00	7.08	7.17
ROUTED TO	MNW-J2	2.37	1	FLOW	128.	75.	49.	39.
				TIME	7.17	7.33	7.50	7.58
HYDROGRAPH AT	MNW-J2	1.21	1	FLOW	130.	88.	65.	56.
				TIME	5.42	5.50	5.50	5.50
2 COMBINED AT	MNW-J2	3.58	1	FLOW	198.	119.	80.	64.
				TIME	6.08	6.08	6.00	6.00

2 COMBINED AT	CP1	5.41	1	FLOW	198.	119.	80.	64.
				TIME	6.08	6.08	6.00	6.00
ROUTED TO	RCP1	5.41	1	FLOW	197.	119.	79.	64.
				TIME	6.08	6.17	6.17	6.17
HYDROGRAPH AT	RTNE	.00	1	FLOW	9.	6.	5.	5.
				TIME	3.75	3.75	3.75	3.75
HYDROGRAPH AT	RTNE	.01	1	FLOW	0.	0.	0.	0.
				TIME	4.92	.08	.08	.08
2 COMBINED AT	RTNE	.01	1	FLOW	9.	6.	5.	5.
				TIME	3.75	3.75	3.75	3.75
ROUTED TO	RRTNE	.01	1	FLOW	9.	6.	5.	4.
				TIME	4.42	4.50	4.50	4.50
HYDROGRAPH AT	RTNG	.00	1	FLOW	38.	26.	20.	18.
				TIME	5.25	5.33	4.83	4.83
HYDROGRAPH AT	RTNG	.01	1	FLOW	0.	0.	0.	0.
				TIME	4.92	.08	.08	.08
2 COMBINED AT	RTNG	.01	1	FLOW	38.	26.	20.	18.
				TIME	5.25	5.33	4.83	4.83
ROUTED TO	RRTNG	.01	1	FLOW	38.	26.	20.	18.
				TIME	5.50	5.58	5.17	5.08
HYDROGRAPH AT	MNW-I1	.25	1	FLOW	67.	47.	37.	32.
				TIME	4.00	4.00	4.00	4.00
3 COMBINED AT	CP2	.27	1	FLOW	88.	64.	51.	46.
				TIME	5.17	5.17	5.17	5.17
ROUTED TO	RCP2	.27	1	FLOW	88.	64.	51.	46.
				TIME	5.25	5.25	5.25	5.25
HYDROGRAPH AT	MNW-I2	.14	1	FLOW	34.	22.	15.	13.
				TIME	3.75	3.83	3.83	3.83
3 COMBINED AT	CP3	5.82	1	FLOW	269.	171.	125.	109.
				TIME	5.58	5.50	5.25	5.17
ROUTED TO	RCP3	5.82	1	FLOW	269.	171.	125.	109.
				TIME	5.75	5.67	5.42	5.42
HYDROGRAPH AT	MNW-K	1.43	1	FLOW	175.	129.	105.	96.
				TIME	5.50	5.42	5.33	5.25
2 COMBINED AT	CP4	7.25	1	FLOW	442.	299.	230.	205.
				TIME	5.58	5.58	5.42	5.42
ROUTED TO	RCP4	7.25	1	FLOW	442.	299.	230.	204.
				TIME	5.67	5.67	5.50	5.50
HYDROGRAPH AT	MNW-L	.27	1	FLOW	136.	109.	93.	87.
				TIME	3.75	3.75	3.75	3.75

HYDROGRAPH AT	MNW-M	.49	1	FLOW	191.	154.	131.	121.
				TIME	4.17	4.25	4.25	4.25
3 COMBINED AT	CP5	8.01	1	FLOW	607.	441.	356.	323.
				TIME	5.25	5.17	5.17	5.17
ROUTED TO	T12	8.01	1	FLOW	607.	441.	356.	323.
				TIME	5.33	5.25	5.25	5.25
ROUTED TO	.	8.01	1	FLOW	606.	440.	355.	323.
				TIME	5.42	5.42	5.33	5.33
2 COMBINED AT	T12	20.85	1	FLOW	3202.	2448.	1833.	1633.
				TIME	4.42	4.67	4.92	5.25
2 COMBINED AT	F17	126.65	1	FLOW	8647.	7462.	6478.	6051.
				TIME	5.42	5.50	5.58	5.58
ROUTED TO	F18	126.65	1	FLOW	8647.	7460.	6477.	6049.
				TIME	5.42	5.50	5.58	5.58
ROUTED TO	.	126.65	1	FLOW	8646.	7458.	6475.	6048.
				TIME	5.42	5.50	5.58	5.67
HYDROGRAPH AT	R4	2.28	1	FLOW	1051.	783.	624.	557.
				TIME	3.75	3.75	3.75	3.75
HYDROGRAPH AT	F15OF	.00	1	FLOW	5769.	1547.	789.	466.
				TIME	8.08	5.50	5.67	5.75
RO TO	F15OFR	.00	1	FLOW	5665.	1505.	763.	448.
				TIME	8.33	5.75	5.92	6.08
2 COMBINED AT	R4	2.28	1	FLOW	5665.	1593.	819.	557.
				TIME	8.33	5.75	5.92	3.75
HYDROGRAPH AT	F16OF	.00	1	FLOW	1284.	0.	0.	0.
				TIME	8.08	.08	.08	.08
ROUTED TO	F16OFR	.00	1	FLOW	1159.	0.	0.	0.
				TIME	8.33	.08	.08	.08
2 COMBINED AT	R4	2.28	1	FLOW	6824.	1593.	819.	557.
				TIME	8.33	5.75	5.92	3.75
ROUTED TO	F18	2.28	1	FLOW	6274.	1507.	763.	452.
				TIME	9.25	6.67	6.83	6.92
HYDROGRAPH AT	F18	.87	1	FLOW	321.	251.	210.	195.
				TIME	3.75	3.75	3.83	3.83
2 COMBINED AT	F18	3.15	1	FLOW	6279.	1538.	785.	518.
				TIME	9.25	6.67	6.83	4.67
HYDROGRAPH AT	F24	1.03	1	FLOW	533.	441.	383.	355.
				TIME	3.58	3.67	3.67	3.67
3 COMBINED AT	F18	130.83	1	FLOW	12063.	8069.	6895.	6430.
				TIME	9.17	5.83	5.58	5.67

ROUTED TO	F18R	130.83	1	FLOW	12044.	8068.	6893.	6428.
				TIME	9.25	5.92	5.67	5.75
HYDROGRAPH AT	F20A	.81	1	FLOW	141.	113.	94.	88.
				TIME	3.83	3.83	3.83	3.92
2 COMBINED AT	F20A	131.64	1	FLOW	12056.	8098.	6924.	6455.
				TIME	9.25	5.83	5.67	5.67
ROUTED TO	F20B	131.64	1	FLOW	12054.	8098.	6922.	6454.
				TIME	9.25	5.83	5.67	5.75
ROUTED TO	.	131.64	1	FLOW	12052.	8097.	6921.	6454.
				TIME	9.25	5.92	5.67	5.75
HYDROGRAPH AT	F19	1.54	1	FLOW	707.	572.	490.	456.
				TIME	3.67	3.67	3.67	3.67
ROUTED TO	F20B	1.54	1	FLOW	629.	508.	434.	403.
				TIME	3.83	3.83	3.83	3.83
HYDROGRAPH AT	F20B	.73	1	FLOW	300.	212.	161.	140.
				TIME	3.67	3.67	3.67	3.67
2 COMBINED AT	F20B	2.27	1	FLOW	860.	667.	557.	511.
				TIME	3.75	3.83	3.83	3.83
HYDROGRAPH AT	VB	4.58	1	FLOW	1034.	676.	481.	401.
				TIME	3.92	4.00	4.00	4.00
[redacted]BINED AT	F20B	138.49	1	FLOW	12062.	8703.	7348.	6782.
				TIME	9.25	5.25	5.33	5.50
ROUTED TO	F22	138.49	1	FLOW	12047.	8700.	7347.	6775.
				TIME	9.25	5.25	5.42	5.58
HYDROGRAPH AT	F21	1.27	1	FLOW	593.	466.	392.	362.
				TIME	3.67	3.67	3.67	3.67
DIVERSION TO	OAKEY	1.27	1	FLOW	296.	233.	196.	181.
				TIME	3.67	3.67	3.67	3.67
HYDROGRAPH AT	F21	1.27	1	FLOW	296.	233.	196.	181.
				TIME	3.67	3.67	3.67	3.67
ROUTED TO	F22	1.27	1	FLOW	289.	225.	191.	177.
				TIME	3.67	3.75	3.75	3.75
HYDROGRAPH AT	F22	3.43	1	FLOW	1299.	1016.	853.	791.
				TIME	3.67	3.67	3.75	3.75
3 COMBINED AT	F22	143.19	1	FLOW	12087.	9264.	7748.	7082.
				TIME	9.25	5.17	5.33	5.50
ROUTED TO	F23	143.19	1	FLOW	12078.	9257.	7742.	7079.
				TIME	9.25	5.17	5.33	5.50
ROUTED TO	.	143.19	1	FLOW	12071.	9255.	7738.	7073.
				TIME	9.33	5.25	5.42	5.58

)UTED TO	.	143.19	1	FLOW	12051.	9242.	7725.	7062.
				TIME	9.33	5.33	5.50	5.58
)UTED TO	.	143.19	1	FLOW	12041.	9238.	7722.	7061.
				TIME	9.42	5.33	5.50	5.67
'DROGRAPH AT	F23	1.92	1	FLOW	377.	288.	239.	219.
				TIME	4.00	4.08	4.17	4.17
2 COMBINED AT	F23	145.11	1	FLOW	12064.	9432.	7866.	7183.
				TIME	9.42	5.33	5.50	5.67

SUMMARY OF KINEMATIC WAVE - MUSKINGUM-CUNGE ROUTING
(FLOW IS DIRECT RUNOFF WITHOUT BASE FLOW)

ISTAQ	ELEMENT	DT	PEAK	TIME TO PEAK	VOLUME	INTERPOLATED TO COMPUTATION INTERVAL DT	PEAK	TIME TO PEAK	VOLUME
		(MIN)	(CFS)	(MIN)	(IN)	(MIN)	(CFS)	(MIN)	(IN)
FOR PLAN = 1 RATIO= .81									
	RR23 MANE	5.00	766.30	243.37	1.08	5.00	757.34	245.00	1.08

CONTINUITY SUMMARY (AC-FT) - INFLOW= .0000E+00 EXCESS= .1178E+03 OUTFLOW= .1165E+03 BASIN STORAGE= .2933E+00 PERCENT ERROR= .8

FOR PLAN = 1 RATIO= .81									
	RR23 MANE	5.00	406.42	256.83	.69	5.00	402.56	260.00	.69

CONTINUITY SUMMARY (AC-FT) - INFLOW= .0000E+00 EXCESS= .7583E+02 OUTFLOW= .7464E+02 BASIN STORAGE= .3271E+00 PERCENT ERROR= 1.1

FOR PLAN = 1 RATIO= .68									
	RR23 MANE	4.87	242.01	313.10	.46	5.00	241.73	315.00	.46

CONTINUITY SUMMARY (AC-FT) - INFLOW= .0000E+00 EXCESS= .5054E+02 OUTFLOW= .4947E+02 BASIN STORAGE= .3330E+00 PERCENT ERROR= 1.5

FOR PLAN = 1 RATIO= .60									
	RR23 MANE	4.79	182.28	315.42	.33	5.00	182.14	315.00	.33

CONTINUITY SUMMARY (AC-FT) - INFLOW= .0000E+00 EXCESS= .3675E+02 OUTFLOW= .3590E+02 BASIN STORAGE= .3132E+00 PERCENT ERROR= 1.5

FOR PLAN = 1 RATIO= .56									
	RR23 MANE	5.00	155.71	321.20	.28	5.00	155.45	320.00	.28

CONTINUITY SUMMARY (AC-FT) - INFLOW= .0000E+00 EXCESS= .3122E+02 OUTFLOW= .3046E+02 BASIN STORAGE= .2979E+00 PERCENT ERROR= 1.5

FOR PLAN = 1 RATIO= .81									
	R5 MANE	3.28	1993.78	240.86	.98	5.00	1992.70	240.00	.98

CONTINUITY SUMMARY (AC-FT) - INFLOW= .0000E+00 EXCESS= .3039E+03 OUTFLOW= .3007E+03 BASIN STORAGE= .4356E+00 PERCENT ERROR= .9

FOR PLAN = 1 RATIO= .81									
	R5 MANE	4.16	1038.81	250.77	.62	5.00	1037.60	255.00	.62

CONTINUITY SUMMARY (AC-FT) - INFLOW= .0000E+00 EXCESS= .1942E+03 OUTFLOW= .1913E+03 BASIN STORAGE= .4372E+00 PERCENT ERROR= 1.3

FOR PLAN = 1 RATIO= .68

FOR PLAN = 1 RATIO= .60

	. MANE	1.71	7723.19	331.41	.48	5.00	7721.53	330.00	.48

CONTINUITY SUMMARY (AC-FT) - INFLOW= .3705E+04 EXCESS= .0000E+00 OUTFLOW= .3687E+04 BASIN STORAGE= .1747E+02 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .56

	. MANE	1.78	7060.95	339.98	.44	5.00	7060.94	340.00	.44

CONTINUITY SUMMARY (AC-FT) - INFLOW= .3377E+04 EXCESS= .0000E+00 OUTFLOW= .3362E+04 BASIN STORAGE= .1688E+02 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .81

F23	MANE	5.00	547.72	240.08	1.29	5.00	547.57	240.00	1.29

CONTINUITY SUMMARY (AC-FT) - INFLOW= .0000E+00 EXCESS= .1343E+03 OUTFLOW= .1323E+03 BASIN STORAGE= .8572E+00 PERCENT ERROR= .8

FOR PLAN = 1 RATIO= .81

F23	MANE	5.00	380.46	240.98	.93	5.00	377.34	240.00	.93

CONTINUITY SUMMARY (AC-FT) - INFLOW= .0000E+00 EXCESS= .9664E+02 OUTFLOW= .9485E+02 BASIN STORAGE= .7965E+00 PERCENT ERROR= 1.0

FOR PLAN = 1 RATIO= .68

F23	MANE	5.00	288.50	243.60	.70	5.00	288.38	245.00	.70

CONTINUITY SUMMARY (AC-FT) - INFLOW= .0000E+00 EXCESS= .7306E+02 OUTFLOW= .7136E+02 BASIN STORAGE= .8523E+00 PERCENT ERROR= 1.2

FOR PLAN = 1 RATIO= .60

F23	MANE	5.31	239.87	249.36	.57	5.00	239.04	250.00	.57

CONTINUITY SUMMARY (AC-FT) - INFLOW= .0000E+00 EXCESS= .5963E+02 OUTFLOW= .5797E+02 BASIN STORAGE= .8364E+00 PERCENT ERROR= 1.4

FOR PLAN = 1 RATIO= .56

F23	MANE	5.00	219.71	249.39	.51	5.00	219.30	250.00	.51

CONTINUITY SUMMARY (AC-FT) - INFLOW= .0000E+00 EXCESS= .5406E+02 OUTFLOW= .5246E+02 BASIN STORAGE= .8033E+00 PERCENT ERROR= 1.5

*** NORMAL END OF HEC-1 ***

OVERALL STORM HEC-1 MODEL
FILE NAME: F-FL.DAT

OVERALL STORM HEC-1 MODEL
SEPTEMBER 1990 VERSION
FILE NAME: F-FL.DAT

This model is developed by deleting the Red Rock Detention Basin drainage area from the Duplicate Effective FIS HEC-1 model (F100R.DAT) and updating the rating curve for the Upper Flamingo Wash Detention Basin. The justification of these revisions come from the Red Rock Detention Basin Expansion project (LOMR Case No. 97-09-177P) and the Upper Flamingo Wash Detention Basin project (LOMR Case No. 97-09-138P).

```
*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*            SEPTEMBER 1990             *
*              VERSION 4.0              *
*                                       *
*  RUN DATE  10/06/1997  TIME  12:17:06 *
*                                       *
*****************************************
```


```
*****************************************
*                                       *
*    U.S. ARMY CORPS OF ENGINEERS       *
*    HYDROLOGIC ENGINEERING CENTER      *
*         609 SECOND STREET             *
*       DAVIS, CALIFORNIA 95616         *
*           (916) 756-1104              *
*                                       *
*****************************************
```


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X     X  XXXXXXX   XXXXX          X
X     X  X        X     X        XX
X     X  X        X              X
XXXXXXX  XXXX     X        XXXXX  X
X     X  X        X              X
X     X  X        X     X        X
X     X  XXXXXXX   XXXXX         XXX
```

THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.
THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION
NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL LOSS RATE:GREEN AND AMPT INFILTRATION
KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM

```
LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

          *DIAGRAM
    1     ID        INPUT FILE = F-FL.DAT       BY: JEP        DATE:  10/06/97
    2     ID        FLAMINGO WASH FIS RESTUDY GCW MODIFICATIONS
    3     ID
    4     ID        REVISED DUPLICATED FIS MODEL F100R.DAT
    5     ID        DELETE RED ROCK WATERSHED TO SIMULATE EXPANSION OF RR DET. BASIN
    6     ID        MODIFY UFWDB PER B & V LOMR REQUEST;BASIN R6 NOT ROUTED THRU UFWDB
    7     ID
    8     ID     CLARK COUNTY FLOOD CONTROL DISTRICT MASTER PLAN UPDATE
    9     ID     RED ROCK/FLAMINGO/TROPICANA WATERSHED
   10     ID     EXISTING DRAINAGE SYSTEM WITH PRESENT DEVELOPMENT
   11     ID     FLAMINGO/TROPICANA STORM (NO UPPER BLUE DIAMOND)- MAIN CHANNEL RUN
   12     ID         100-YEAR 6-HR STORM (SDN #5)
   13     ID         JMM    OCTOBER 1990
   14     ID
   15     ID         BASIC DATA FILE BASED ON COE FILE S10P40X.
   16     ID         MODIFICATIONS ADDED FROM B&V RED ROCK BASIN AND UPPER FLAMINGO
   17     ID         BASIN HEC-1 RUNS; NIMBUS NORTHWEST MCCARRAN AIRPORT HEC-1 RUNS;
   18     ID         AND SUBBASIN MODIFICATIONS DUE TO RECENT DEVELOPMENT.
   19     ID
   20     ID         COE MUSKINGUM ROUTING CONVERTED TO KINEMATIC FOR EXISTING
   21     ID         IMPROVED CHANNELS FROM FACILITY INVENTORY.
   22     ID
   23     ID     PB CARDS CONTAIN POINT PRECIPITATION.  DARF'S FROM CCRFCD MANUAL
   24     ID     BASED ON STORM AREAS FOR CONCENTRATION POINTS AS FOLLOWS:
   25     ID
   26     ID         SUBBASIN          AREA (SQMI)              DARF
   27     ID         --------          -----------              ----
   28     ID         RAINBOW            37.94                   0.72
   29     ID           JONES            40.35                   0.71
   30     ID         DECATUR,           50.27                   0.68
   31     ID        UPPR,I15,CAESARS,   51-53
   32     ID        WINNICK,HUGHES
   33     ID        FL/TROP CONF.,      73-78                   0.64
   34     ID         SPENCER
   35     ID        D/S FROM DI         85.45                   0.62
   36     ID        BLDR HWY,NELLIS,    90-92                   0.61
   37     ID        DESERT ROSE
   38     ID
   39     IT      5       0       0     200
   40     IO      5
   41     JR   PREC     .72     .71     .68     .64     .62     .61

   42     KK   RR23 RUNOFF FROM RR23
   43     BA   2.03
   44     PC   .000    .020    .059    .080    .110    .144    .150    .160    .168    .171
   45     PC   .180    .182    .187    .190    .197    .202    .210    .220    .230    .241
   46     PC   .250    .259    .265    .280    .290    .300    .305    .309    .310    .317
   47     PC   .321    .327    .333    .346    .361    .381    .408    .430    .477    .514
   48     PC   .561    .630    .710    .720    .731    .752    .779    .790    .795    .804
   49     PC   .810    .820    .826    .840    .859    .889    .910    .938    .966    .970
   50     PC   .974    .979    .981    .983    .985    .989    .990    .992    .993    .996
   51     PC   .997    .999   1.00
   52     PB   3.20
   53     LS     0    74.9
```

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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  54      UK     500    .025    0.15     100
  55      RK    5500    .025    .030    0.09                      1
  56      RK   15500    .023    .030            TRAP     100      5      NO

  57      KK      R1 RUNOFF FROM R1
  58      BA    1.12
  59      PB    3.17
  60      LS       C    87.7
  61      UD    0.47

  62      KK    RR23 COMBINE R1+RR23
  63      HC       2

  64      KK      R5 ROUTE RR23 THRU R5
  65      RM       5    0.39    0.15

  66      KK    RR20 RUNOFF FROM RR20
  67      BA    1.37
  68      PB    3.22
  69      LS       C      88
  70      UD    0.69

  71      KK      R5 ROUTE RR20 THRU R5
  72      RM       7    0.61    0.15

  73      KK    RR21 RUNOFF FROM RR21
  74      BA    6.27
  75      PB    3.26
  76      LS       C      87
  77      UD    1.00

  78      KK      R5 ROUTE RR21 THRU R5
  79      RM       8    0.64    0.15

  80      KK    RR22 RUNOFF FROM RR22
  81      BA    2.15
  82      PB    3.20
  83      LS       0      87
  84      UD    0.62

  85      KK      R5 ROUTE RR22 THRU R5
  86      RM       8    0.70    0.15

  87      KK      R5 RUNOFF FROM R5
  88      BA    5.77
  89      PB    3.00
  90      LS       0    75.5
  91      UK     600    .025     .15     100
  92      RK    7920    .023    .030     .20                      1
  93      RK   13000    .019    .030            TRAP      40     2
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 LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

   94      KK      R5 COMBINE R5+RR23+RR22+RR21+RR20
   95      HC       5

   96      KK      F1 RUNOFF FROM F1
   97      BA    4.63
   98      PB    3.23
   99      LS       0      88
  100      UD    0.78

  101      KK      F5 ROUTE F1 THRU F5
  102      RM      12    0.99    0.15

  103      KK      F2 RUNOFF FROM F2
  104      BA    1.28
  105      PB    3.19
  106      LS       0      88
  107      UD     .43

  108      KK      F5 ROUTE F2 THRU F5
  109      RM       9    0.76    0.15

  110      KK      F3 RUNOFF FROM F3
  111      BA    2.60
  112      PB    3.09
  113      LS       0      87
  114      UD     .34

  115      KK      F5 ROUTE F3 THRU F5
  116      RM       5    0.40    0.15

  117      KK      F4 RUNOFF FROM F4
  118      BA    1.30
  119      PB    3.03
  120      LS       0      86
  121      UD     .41

  122      KK      F5 ROUTE F4 THRU F5
  123      RM       8    0.69    0.15

  124      KK     F5N RUNOFF FROM F5N
  125      BA    4.04
  126      PB    3.00
  127      LS       0      85
  128      UK     300    .025     .15     100
  129      RK    3200    .025    .030     .20                      1
  130      RK   18000    .023    .030          TRAP      70       5      NO

  131      KK     F5S RUNOFF FROM F5S
  132      BA    2.00
  133      PB    2.86
  134      LS       0      85
  135      UK     400    .020     .25     100
  136      RK    3500    .020    .030     .16                      1
  137      RK   14500    .017    .030          TRAP      50       5      NO
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  138     KK      F5 COMBINE F5N AND F5S
  139     HC       2

  140     KK      F5 F5 WITH ROUTED F1, F2, F3, F4 AND R5
  141     HC       6

  142     KK  UFL.DB UPPER FLAMINGO DETENTION BASIN
  143     KM        MODIFIED TO AGREE WITH UFLDB LOMR SUBMITTAL BY B & V
  144     KM         STORAGE-OUTFLOW DATA FROM B&V DESIGN PLANS
  145     RS       1    STOR       0
  146     SV       0      10       25      100      220      585     1005     1045     1195     1515
  147     SV    2244
  148     SQ       0      75      300      675      910     1100     1260     1280     5170    20600
  149     SQ   50300
  150     SE    2445  2447.5     2450     2455     2460     2465     2470   2470.5     2472     2475
  151     SE    2480

  152     KK     F5R ROUTE UPPER FLAMINGO DB OUTFLOW THRU OUTFALL CHANNEL
  153     KM         CHANNEL GEOMETRY FROM B&V PREDESIGN MEMORANDUM
  154     RK    3500    .010    .020           TRAP      30       3

  155     KK     F6A RUNOFF FROM F6A
  156     BA     .55
  157     PB    2.86
  158     LS       0      88
  159     UD    0.35

  160     KK     F6B ROUTE F6A THRU F6B
  161     RM       4    0.35    0.15

  162     KK     F6B RUNOFF FROM F6B
  163     BA    0.85
  164     PB    2.77
  165     LS       0      88
  166     UD    0.30

  167     KK     F6B COMBINE F6A AND F6B
  168     HC       2

  169     KK      F7 ROUTE F6 THRU F7
  170     RM       3    0.28    0.15

  171     KK      F7 RUNOFF FROM F7
  172     BA    1.50
  173     PB    2.77
  174     LS       0    85.5
  175     UK     700    .015     .15     100
  176     RK    4000   .0114    .030     .65                      1
  177     RK    7500   .0116    .030          TRAP      50       5      NO
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

178       KK      F7 COMBINE F7 WITH ROUTED F6
179       HC       2

180       KK      F7 COMBINED F7 WITH F5R
181       HC       2

182       KK     F7R ROUTE F7 THRU F8 (FLWA1267-1335)
183       RK    5230    .011    .030            TRAP      40       1

184       KK      F8 RUNOFF FROM F8
185       BA     .48
186       LS       0    66.1       0       0      98       0
187       UK    1500    .014     .28      83
188       UK      50    .020     .10      17
189       RK    1800     .01    .020    .048
190       RK    7200    .010    .030                    30       2      NO

191       KK      F8 COMBINE F8 AND F7R
192       KM         RAINBOW
193       HC       2

194       KK      F9 ROUTE F8 THRU F9 (FLWA1203)
195       RK    1740   .0138    .015            TRAP      40       2

196       KK       . (FLWA1152)
197       RK    2640   .0044    .040            TRAP      50       3

198       KK      R6 RUNOFF FROM R6
199       KM        MOVED HYDROGRAPH
200       BA    1.51
201       PB    2.77
202       LS       0    73.2
203       UK     500    .015     .15     100
204       RK    5200    .016    .030     .13                      1
205       RK    8000   .0044    .030            TRAP      40       1      NO

206       KK      F9ROUTE R6 THRU F9
207       KM        ADDED ROUTING
208       RK    1740   .0138    .015            TRAP      40       2

209       KK      F9 RUNOFF FROM F9
210       BA     .90
211       LS       0    63.0       0       0      98       0
212       UK     500    .010     .25      73
213       UK      40    .015     .10      27
214       RK    2400    .007    .020     .35                      1
215       RK    2300    .008    .020    .015                      1
216       RK   10800    .013    .023            TRAP      50       3      NO
```

```
LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  217     KK      F9 COMBINE R6 WITH F9
  218     KM        ADDED COMBINATION
  219     HC       2

  220     KK      F9 COMBINE F8 WITH F9
  221     KM           JONES
  222     HC       2

  223     KK     F14 ROUTE F9 THRU F14
  224     RM       2    0.16    0.20

  225     KK     F10 RUNOFF FROM F10
  226     BA    1.17
  227     LS       0    62.6       0       0      98       0
  228     UK     600    .010     .25      67
  229     UK      40    .015     .10      33
  230     RK    1300    .010    .020    .019                      1
  231     RK    1300    .006     .02    .080    TRAP              1
  232     RK    8200   .0117     .02            TRAP      40      1
          * *** SUBAREAS R2 - R8 NOW ASSUMED TO BE DIVERTED INTO FLAMINGO WASH BY
          *     RAINBOW AND FLAMINGO RD ****

  233     KK      R2 RUNOFF FROM R2
  234     BA    2.01
  235     PB    3.00
  236     LS       0    79.4
  237     UD    0.21

  238     KK      R3 ROUTE R2 THRU R3
  239     RM       5    0.38    0.15

  240     KK      R3 RUNOFF FROM R3
  241     BA    2.63
  242     PB    2.77
  243     LS       0    68.2
  244     UD    0.61

  245     KK      R3 COMBINE R2+R3
  246     HC       2

  247     KK      R3 ROUTE THRU EXISTING GRAVEL PIT
  248     RS       1    STOR     480
  249     SV       0     480    1290    3150    3420
  250     SE       0      20      60     110     120
  251     SQ       0       0    1800    1800   37500

  252     KK      R8 ROUTE R3 THRU R8
  253     RK    2750    .019    .020            TRAP      40      1
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  254     KK      R7 RUNOFF FROM R7
  255     BA    1.39
  256     LS       0    79.5
  257     UD    0.51

  258     KK      R7 DIVERT Q IN EXCESS OF PIPE CAPACITY
  259     KM         LIMITING CAPACITY OF RAINBOW STORM DRAIN = 324 CFS (FLLA0307)
  260     KM         OVERFLOW RUNS DOWN DESERT INN AND EDNA INTO CENTRAL BASIN
  261     DT    R7OF
  262     DI       0     324    1000    5000
  263     DQ       0       0     676    4676

  264     KK      R8 ROUTE R7 THRU R8 (90"-96" RCP IN RAINBOW)
  265     RK    5280    .004    .015            CIRC     8.0

  266     KK      R8 RUNOFF FROM R8
  267     BA     .51
  268     LS       0    73.3
  269     UD    0.37

  270     KK      R8 COMBINE R3+R7+R8
  271     HC       3

  272     KK     F10 ROUTE R8 THRU F10 (114" RCP IN FLAMINGO RD)
  273     RK    5280    .010    .015            CIRC     9.5

  274     KK     F10 COMBINE R8+F10
  275     HC       2

  276     KK     F14 ROUTE F10 THRU F14 (FLLA0000)
  277     RK    4010   .0075    .015            TRAP      20       1

  278     KK     F12 RUNOFF FROM F12
  279     BA     .88
  280     LS       0    87.9
  281     UK     700    .012     .15     100
  282     RK    3500   .0120    .030     .21                      1
  283     RK    8200   .0130    .030          TRAP      10       5      NO

  284     KK    F12R    ROUT     F12    THRU     F13
  285     RM       2    0.20    0.15

  286     KK     F13 RUNOFF FROM F13
  287     BA     .55
  288     LS       0    87.5       0       0      98       0
  289     UK     750    .010     .25      83
  290     UK      50    .015     .10      17
  291     RK    1100     .01    .023     .04                      1
  292     RK    2300     .01    .023     .10                      1
  293     RK    5900    .012    .026          TRAP      40       2      NO
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

294       KK     F13 COMBINE     F13     AND     F1R
295       HC       2

296       KK     F14 ROUTE F13 THRU F14 (UNIMPROVED)
297       RM       2    0.15    0.15

298       KK     F14 RUNOFF FROM F14
299       BA     .78
300       LS       0    76.5       0       0      98       0
301       UK     500    .010     .25      86
302       UK     400    .015     .10      12
303       RK    1200   .0090    .023    .024                      1
304       RK    2400   .0075    .025     .12    TRAP      20       1
305       RK    5200   .0090    .033            TRAP      75       4      NO

306       KK     F14 COMBINE F9, F10, F13, AND F14
307       KM        DECATUR
308       HC       4

309       KK    F14R ROUTE F14 THRU F15 (FLWA0990-1049)
310       RK    3110    .020    .040            TRAP      50       3

311       KK       .  (FLWA0924)
312       RK    3490    .010    .040            TRAP      60       1

313       KK       .  (FLWA0891-0923)
314       RK    1580   .0076    .030            TRAP      90       1

315       KK     F15 RUNOFF FROM F15
316       BA    1.32
317       LS       0    78.0       0       0      98       0
318       UK     640    .013     .15      77
319       UK     400    .014     .10      23
320       RK    2500    .013    .020    0.08                      1
321       RK    4500    .006    .020    0.25                      1
322       RK    8500   0.012    .030            TRAP      40       3      NO

323       KK     F15 COMBINE     F15     AND    F14R
324       KM           UPPR
325       HC       2

326       KK   F15OF DIVERT OVERFLOWS
327       KM         DIVERSION RATING CURVE FROM COE FEASIBILITY STUDY
328       DT   F15OF
329       DI       0    4100    7000   10500   35000
330       DQ       0       0    1700    4640   15500

331       KK     F16 RUNOFF FROM F16
332       BA     .52
333       LS       0    75.5       0       0      98       0
334       UK     600    .010    0.15      56
335       UK     400    .015     .10      44
336       RK    1000    .010    .025    .030                      1
337       RK    2400    .015    .025     .10                      1
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  338     RK    6000    .004    .020                              1

  339     KK     F16 COMBINE F15 WITH F16
  340     KM            I15
  341     HC       2

  342     KK   F16OF DIVERT OVERFLOWS
  343     KM         LIMIT FLOW TO 6000 CFS AT CAESARS PALACE/LVB/IMPERIAL PALACE CULVERT
  344     KM         BASED ON COE ASSUMED CAPACITY
  345     KM         CAESARS
  346     DT   F16OF
  347     DI       0    6000   12000   20000
  348     DQ       0       0    6000   14000

  349     KK     F16 ROUT F16 THRU F17 (FLWA0798-0823)
  350     RK    3550    .009    .015            TRAP      48       0

  351     KK       .  (FLWA0773)
  352     RK    1320   .0091    .020            TRAP      80      10

  353     KK       .  (FLWA0648-0798)
  354     RK    7760   .0064    .040            TRAP      30       2

  355     KK     F17 RUNOFF FROM F17
  356     BA     .65
  357     LS       0    75.5       0       0      98       0
  358     UK     900    .057     .15      51
  359     UK     600    .010     .10      49
  360     RK    1000    .010    .025    .040                      1
  361     RK    1500    .010    .027     .09                      1
  362     RK   11400   .0110    .030            TRAP     100       5      NO

  363     KK     F17 COMBINE     F17     AND  F16
  364     KM        WINNICK,HUGHES
  365     HC       2
          *  *** NO CONTRIBUTION FROM UPPER BLUE DIAMOND FOR FLAMINGO/RED ROCK STORM ***

  366     KK      T8 RUNOFF FROM T8
  367     BA    1.22
  368     LS       0    65.6
  369     UK     600    .015    0.15     100
  370     RK    2000    .018    .030     .14                      1
  371     RK   18000   .0161    .030            TRAP      75       5      NO

  372     KK      T9 ROUTE T8 TO T9
  373     RM       2     .52    0.15

  374     KK      T9 RUNOFF FROM T9
  375     BA    0.87
  376     LS       0    73.1
  377     UK     600    .010    0.15     100
  378     RK    4000    .010    .030    0.12                      1
  379     RK   10200   .0134    .030            TRAP      30       5
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

380       KK      T9 COMBINE T8 AND T9
381       HC       2

382       KK    T9OF DIVERT OVERFLOW
383       DT    T9OF
384       DI       0    5480   11000   15000
385       DQ       0       0    2700    2700

386       KK     T10 ROUTE T9 THRU T10
387       RM       3    0.21    0.10

388       KK      T4 RUNOFF FROM T4
389       BA    3.22
390       LS       0    87.6
391       UK     500    .015    0.15     100
392       RK    2700    .0190   .030    0.25                          1
393       RK   20000    .0185   .030            TRAP      75        5      NO

394       KK      T5 ROUTE T4 TO T5
395       RK    6500    .013    .030            TRAP      30        2

396       KK      T5 RUNOFF FROM T5
397       BA    1.00
398       LS       0    87.0
399       UK     600    .010    0.15     100
400       RK    2500    .012    .030    0.21                          1
401       RK    6500    .013    .030            TRAP      30        2

402       KK      T5 COMBINE T4 AND T5
403       HC       2

404       KK      T6 ROUTE T5 TO T6
405       RK   10800    .012    .030            TRAP      30        5

406       KK      T6 RUNOFF FROM T6
407       BA    1.30
408       LS       0    86.9
409       UK     600    .010    0.15     100
410       RK    6000    .012    .030    .400                          1
411       RK   10800    .012    .030            TRAP      30        5

412       KK      T6 COMBINE T5 AND T6
413       HC       2

414       KK    T9OF RECALL T9OF
415       DR    T9OF

416       KK      T6 ROUTE T9OF THRU T6
417       RM       3    0.23    0.15
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

418       KK      T6 COMBINE T6 AND T9OF
419       HC       2

420       KK      T6 DIVERT OVERFLOW ALONG UPRR
421       KM         UPRR 114" CMP CULVERT - 750 CFS CAPACITY
422       DT    T6OF
423       DI       0     750    1500   10000
424       DQ       0       0     750    9250

425       KK     T10 ROUTE T6 THRU T10
426       RM       2    0.18    0.15

427       KK      T1 RUNOFF FROM T1
428       BA    1.56
429       LS       0      88
430       UK     600    .020    0.15     100
431       RK    4000   .0200    .030    0.28                              1
432       RK   13200    .017    .030            TRAP      50       5      NO

433       KK      T3 ROUTE T1 TO T3
434       RK   10000   .0106    .032            TRAP      30       5

435       KK      T3 RUNOFF FROM T3
436       BA    0.95
437       LS       0    78.9
438       UK     500    .010    0.15     100
439       RK    3000    .010    .030    0.16                              1
440       RK   10000   .0106    .032            TRAP      30       5

441       KK      T3 COMBINE T1 AND T3
442       HC       2

443       KK    T6OF RECALL DIVERTED OVERFLOW FROM T6
444       DR    T6OF

445       KK      T3 ROUTE T6OF THRU T3
446       RM       1    0.08    0.15

447       KK      T3 COMBINE T6OF AND T3
448       HC       2

449       KK    T3OF DIVERT FLOW IN EXCESS OF CULVERT CAPACITY
450       KM         BASED ON COE RATING CURVE FROM FEASIBILITY STUDY
451       KM         DQ FLOWS NORTHEASTERLY, REJOINING FW NEAR PARADISE RD
452       DT    T3OF
453       DI       0    1400    1900    3200    5500   19000
454       DQ       0       0     420    1650    3650   14700

455       KK     T10 ROUTE T3 THRU T10 (TRWA0272)
456       RK    3800   .0132    .040            TRAP    17.5       2
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

457       KK    T13 RUNOFF FROM T10
458       BA   0.82
459       LS      0    78.0       0       0      98       0
460       UK    700    .013    0.15      78
461       UK    400    .011     .10      22
462       RK   1100    .012    .020    .120                        1
463       RK   3000    .008    .020     .50                        1
464       RK   3500   0.010    .030             TRAP      30       2

465       KK    T10 COMBINE T3, T6, T9 AND T10
466       HC     4

467       KK    T10R ROUT T10 THRU T11 (TRWA0235)
468       RK   1160    .010    .015             TRAP      32       0

469       KK       .   (TRWA0145-0218)
470       RK   4700   .0095    .030             TRAP      90     1.5

471       KK    T11 RUNOFF FROM T11
472       BA   1.09
473       LS      0    68.6       0       0      98       0
474       UK    80C    .010    0.30      61
475       UK    50C    .010    0.10      39
476       RK   320C   .0080    .020    0.17                        1
477       RK   540C   .0104    .030             TRAP     100       5      NO

478       KK    T11 COMBINE T11 AND T10R
479       HC     2

480       KK    T11R ROUT  T11 THRU T12 (TRWA0117)
481       RK   1130   .0088    .015             TRAP     1.5       2

482       KK       .   (TRWA0000-0034+)
483       RK   6500    .012    .040             TRAP     100     2.5

484       KK    T12 RUNOFF FROM T12
485       BA   0.77
486       LS      0    74.4       0       0      98       0
487       UK    500    .008    0.18      65
488       UK    200    0.01    0.10      35
489       RK   2200    .008    .023    0.12                        1
490       RK   3000    .007    .025     .24              20       2
491       RK   6600   .0103    .032                      30       5

492       KK    T12 ADD T12 AND T11R
493       HC     2

494       KK    T30F RECALL DIVERSION FROM T3
495       DR    T30F
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

496       KK     T12 ROUTE T3OF TO T12
497       RM      2C    1.99    0.10

498       KK     T12 COMBINE T3OF AND T12
499       HC       2
          *  *** DATA FOR SUBAREAS MNW-B THRU MNW-M TAKEN FROM NIMBUS HEC-1 ANALYSIS
          *      FOR NORTHWEST MCCARRAN AIRPORT DRAINAGE STUDY (WITH SMALL MODIFICATIONS)

500       KK   MNW-B RUNOFF FROM B
501       BA    0.68
502       LS              65      10
503       UD     2.4

504       KK    DIVB FLOW SPLIT AT I-15; BCULV IS FLOW CONVEYED BY CULVERT
505       DT   BCULV
506       DI       0      22     100     500
507       DQ       0      22      22      22

508       KK   RDIVB ROUTE DIVB TO CULVERT AT I15 AND C
509       KM        CHANGED RK TO RD SO 9/90 HEC-1 VERSION WOULD RUN
510       RD     600    .004     .05       0       0       5

511       KK   MNW-C RUNOFF AT C
512       BA    0.69
513       LS              65      17
514       UD     2.0

515       KK   MNW-C COMBINE DIVB+C
516       HC       2

517       KK   MNW-C PONDING STORAGE ROUTING AT I-15
518       RS       1    STOR       0
519       SA       0     .28     .92    2.02    3.19    3.44    5.37    9.09
520       SQ       0       8      25      35      40      78     360    1342
521       SE      54      55      56      57   57.43      58      59      60

522       KK    DIVC FLOW SPLIT AT C THRU AND AROUND CULVERT
523       DT   CCULV
524       DI       0       8      25      35      40      78     360    1342
525       DQ       0       8      25      35      40      45      55      65
          *  KK RDIVC ROUTE DIVC NORTH TO D
          *  COMMENTED OUT ROUTING SO 9/90 HEC-1 VERSION WOULD RUN
          *  RK   650    .004     .05       0       0       0      20

526       KK   MNW-D RUNOFF FROM D
527       BA     .05
528       LS              66      10
529       UD     .4C
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

530       KK   MNW-D COMBINE DIVC AND D
531       HC       2

532       KK    DIVD DIVERT FLOW TO NORTH; DCULV CROSSES I-15
533       DT   DCULV
534       DI       0      28     100     500
535       DQ       0      28      28      28

536       KK   RDIVD ROUTE DIVERTED FLOW NORTH TO E
537       KM        CHANGED RK TO RD SO 9/90 HEC-1 VERSION WOULD RUN
538       RD     800    .004     .05       0       0       0      20

539       KK   MNW-E RUNOFF FROM E
540       BA    0.05
541       LS              65      18
542       UD    0.38

543       KK   MNW-E COMBINE DIVD + E
544       HC       2

545       KK   ECULV DIVIDE FLOW AT I-15 CULVERT; ECULV CROSSES I-15 INTO MNW-I
546       DT   ECULV
547       DI       0      28     100     500
548       DQ       0      28      28      28

549       KK   RDIVE ROUTE FLOW FROM DIVE NORTH ALONG I-15
550       KM        CHANGED RK TO RD SO 9/90 HEC-1 VERSION WOULD RUN
551       RD    1200    .007     .05       0       0       0       4

552       KK  MNW-FG RUNOFF FROM FG
553       BA    0.36
554       LS              66      17
555       UD    1.24

556       KK  MNW-FG COMBINE EDIV + FG
557       HC       2

558       KK    DIVG DIVERT FLOW NORTH; GCULV CROSSES I-15 INTO SUBAREA I
559       DT   GCULV
560       DI       0      50      60     100     150     250
561       DQ       0      50      60      60      60      60

562       KK   RDIVG ROUTE DIVG NORTH TO AIRPORT CHANNEL
563       KM        CHANGED RK TO RD SO 9/90 HEC-1 VERSION WOULD RUN
564       RD    2200    .009    .040       0       0       0      10

565       KK  MNW-J1 RUNOFF FROM J1
566       BA    2.37
567       LS              70
568       UD    2.67
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

569       KK  MNW-J2 ROUTE J1 TO J2
570       RK   10000    .012     .04                      10       2

571       KK  MNW-J2 RUNOFF FROM J2
572       BA    1.21
573       LS              70      10
574       UD    1.22

575       KK  MNW-J2 COMBINE J1+J2
576       HC       2

577       KK     CP1 COMBINE J2 + RDIVG
578       HC       2

579       KK    RCP1 ROUTE CP1 TO LAS VEGAS BLVD (CP3)
580       RK    2600    .008     .04       0       0      20       1

581       KK    RTNE RETURN FLOW FROM CULVERT E
582       DR   ECULV

583       KK    RTNE DUMMY SUBAREA TO GET 1988 HEC1 TO RUN (NEEDS NON-ZERO AREA)
584       BA    0.01
585       LS       0      50
586       UD     0.1

587       KK    RTNE COMBINE DIVERSION RECALL WITH DUMMY SUBAREA
588       HC       2

589       KK   RRTNE ROUTE ECULV TO OUTLET OF I
590       RK    3900    .013     .05       0       0       0      50

591       KK    RTNG RETURN FLOW FROM CULVERT G
592       DR   GCULV

593       KK    RTNG DUMMY SUBAREA TO GET 1988 HEC1 TO RUN (NEEDS NON-ZERO AREA)
594       BA    0.01
595       LS       0      50
596       UD     0.1

597       KK    RTNG COMBINE DIVERSION RECALL WITH DUMMY SUBAREA
598       HC       2

599       KK   RRTNG ROUTE GCULV TO OUTLET OF I
600       RK    2500    .013    0.05       0       0       0      50

601       KK  MNW-I1 RUNOFF FROM I1
602       BA    0.25
603       LS              78      15
604       UD    0.58
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

605       KK     CP2 COMBINE HYDROGRAPHS AT LAS VEGAS BLVD AND UPRR
606       HC       3

607       KK    RCP2 ROUTE CP2 TO AIRPORT CHANNEL AND LAS VEGAS BLVD (CP3)
608       RK    2500    .009     .05       0       0       0       4

609       KK  MNW-I2 RUNOFF FROM I2
610       BA    0.14
611       LS              77       1
612       UD    0.38

613       KK     CP3 COMBINE FLOW FROM B-I2 AT LAS VEGAS BLVD AND AIRPORT CHANNEL
614       HC       3

615       KK    RCP3 ROUTE CPE TO OUTLET OF K
616       RK    7300     .01     .04       0       0       5       2

617       KK   MNW-K RUNOFF FROM K
618       BA    1.43
619       LS              66      25
620       UD    1.55

621       KK     CP4 COMBINE HYDROGRAPHS FOR AIRPORT CHANNEL AND TAXIWAY S
622       HC       2

623       KK    RCP4 ROUTE FLOW TO TROPICANA BLVD
624       RK    3300     .01     .03       0       0      20       4

625       KK   MNW-L RUNOFF FROM L
626       BA    0.27
627       LS              77      60
628       UD    0.42

629       KK   MNW-M RUNOFF FROM M
630       BA    0.49
631       LS              84      56
632       UD    0.83

633       KK     CP5 COMBINE ALL HYDROGRAPHS AT OUTLET AT BOX CULVERT AT TROPICANA
634       HC       3
          *  *** END OF DATA FROM NIMBUS NORTHWEST MCCARRAN HEC-1 DATA ***
          *

635       KK     T12 ROUTE MNW-L TO T12 (TRMC0009)
636       RK    2640   .0045    .040            TRAP      18     1.5

637       KK       .   (TRWA0000-0034)
638       RK    5000    .012    .040            TRAP     100     2.5
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  639     KK     T12 COMBINE MNW-L AND T12
  640     KM         AIRPORT CHANNEL + TROPICANA WASH
  641     HC       2

  642     KK     F17 COMBINE F17 AND T12
  643     KM         FLAMINGO WASH + TROPICANA WASH
  644     KM        FLAM/TROP CONF.
  645     HC       2

  646     KK     F18 ROUTE F17 AND T12 THRU F18
  647     KM           (FLWA0593)
  648     RK    1430   .0182    .040            TRAP      50       1

  649     KK       .   (FLWA0564+FLWA0620) COMBINED DUE TO RK PROBLEMS WITH NEW HEC1
  650     RK    1695   .0045    .015            TRAP      50       1

  651     KK      R4 RUNOFF FROM R4
  652     BA    2.28
  653     LS       0    86.5
  654     UD    0.34

  655     KK   F15OF RECALL F15 OVERFLOW
  656     DR   F15OF

  657     KK  F15OFR ROUT F15OF THRU R4
  658     RM       3    0.24       0

  659     KK      R4 COMBINE R4 AND F15 OVERFLOW
  660     HC       2

  661     KK   F16OF RECALL F16 OVERFLOW
  662     DR   F16OF

  663     KK  F16OFR ROUT F16OF THRU R4
  664     RM       3    0.24       0

  665     KK      R4 COMBINE R4 AND F16 OVERFLOW
  666     HC       2

  667     KK     F18 ROUT R4 THRU F18
  668     RM      11    0.88    0.10

  669     KK     F18 RUNOFF FROM F18
  670     BA    0.87
  671     LS       C    72.0       0       0      98       0
  672     UK     50C    .010    0.20      52
  673     UK     20C    .015    0.10      48
  674     RK    1000    .010    .023    .014                       1
  675     RK    1000   .0010    .023    .050                       1
  676     RK   15900   .0090    .020            TRAP      30       1
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

677       KK    F18 COMBINE R4 AND F18
678       HC      2

679       KK    F24 RUNOFF FROM F24
680       BA   1.03
681       LS      0    66.3       0       0      98       0
682       UK    300    .010    0.20      46
683       UK    100    .015    0.10      54
684       RK   1300    .013    .020    .035                      1
685       RK   3000   .0075    .020    .014                      1
686       RK   4400    .018    .030            TRAP      50      3      NO

687       KK    F18 COMBINE F18, F24, AND F17
688       KM        SPENCER
689       HC      3

690       KK    F18R ROUT F18 THRU F20A (FLWA0400-0493)
691       RK   7970   .0065    .040            TRAP      60      2

692       KK    F20A RUNOFF FROM F20A
693       BA   0.81
694       LS      0    70.7       0       0      98       0
695       UK   1000    .010    0.25      77
696       UK    250     .02    0.15      23
697       RK   1900    .001    .020    0.05                      1
698       RK   2000    .015    .020    0.14
699       RK   5600   .0108    .033                      40      4

700       KK    F20A COMBINE F20A AND F18R
701       HC      2

702       KK    F20B ROUTE F20A THRU F20B (FLWA0376)
703       RK   1210   .0148    .040            TRAP      50      1

704       KK       .   (FLWA0348)
705       RK   1430    .007    .015            TRAP      60      1

706       KK    F19 RUNOFF FROM F19
707       BA   1.54
708       LS      0    70.8       0       0      98       0
709       UK    500    .008    0.25      51
710       UK    100    .015    0.10      49
711       RK   1300    .010    .020     .04                      1
712       RK   2500    .010    .020    .019                      1
713       RK  11400   .0118    .020            TRAP      40      1      NO

714       KK    F20B ROUTE F19 THRU F20B
715       RM      2    0.20    0.20
```

```
LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

716       KK    F20B RUNOFF FROM F20B
717       BA   0.73
718       LS      0      82
719       UD   0.25

720       KK    F20B COMBINE F19 AND F20B
721       HC      2

722       KK     VB VAN BUSKIRK DRAINAGE AREA
723       KM        SINGLE SUBAREA TO SIMULATE RUNOFF FROM ENTIRE VAN BUSKIRK WATERSHED.
724       KM        CN AND LAG SELECTED TO MATCH PEAK Q AND TIME-TO-PEAK
725       KM        FROM VAN BUSKIRK PREDESIGN STUDY BY JMM.
726       BA   4.58
727       LS            78
728       UD   0.50

729       KK    F20B COMBINE VAN BUSKIRK AREA, F20A AND F20B
730       KM       D/S FROM DI
731       HC      3

732       KK     F22 ROUTE F20B THRU F22 (FLWA0258-0274)
733       RK   4700   .0110    .030                    70     2.5

734       KK     F21 RUNOFF FROM F21
735       BA   1.27
736       LS      0    77.1       0       0      98       0
737       UK    300    .010    0.25      49
738       UK     60    .020     .10      51
739       RK   1300    .010    .020    .019                      1
740       RK   1750    .008    .020    0.08                      1
741       RK  16000   .0128    .020            TRAP      40      1      NO

742       KK     F21 DIVERT ACROSS BLDR HWY AT OAKEY
743       DT   OAKEY
744       DI      0   10000
745       DQ      0    5000

746       KK     F22 ROUTE F21 THRU F22
747       RM      1    0.06    0.20

748       KK     F22 RUNOFF FROM F22
749       BA   3.43
750       LS      0    74.9       0       0      98       0
751       UK    700    .008    0.25      51
752       UK     60    .015     .10      49
753       RK   1500    .010    .020    .093                      1
754       RK   3000    .008    .020    0.37                      1
755       RK  29500   .0115    .020            TRAP      40      1      NO
```

```
LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  756     KK    F22 COMBINE F20B, F21 AND F22
  757     KM      BOULDER HWY
  758     HC     3

  759     KK    F23 ROUTE F22 THRU F23 (FLWA0228)
  760     RK   1430   .014    .040          TRAP     50      1

  761     KK     .   (FLWA0175)
  762     RK   2690   .0007   .040          TRAP    100      1

  763     KK     .   (FLWA0079)
  764     RK   5020   .0096   .040          TRAP     50      1

  765     KK     .   (FLWA0000)
  766     RK   4120   .0049   .040          TRAP    107      2

  767     KK    F23 RUNOFF FROM F23
  768     BA   1.92
  769     LS      0   74.4                    98
  770     UK    500    .01   0.25     70
  771     UK    100    .015   .10     30
  772     RK   2600   .005    .02    .037    TRAP     20      1
  773     RK   2200   .0018   .02    0.21    TRAP     40      1
  774     RK  13700   .0075   .032           TRAP     50      2     NO

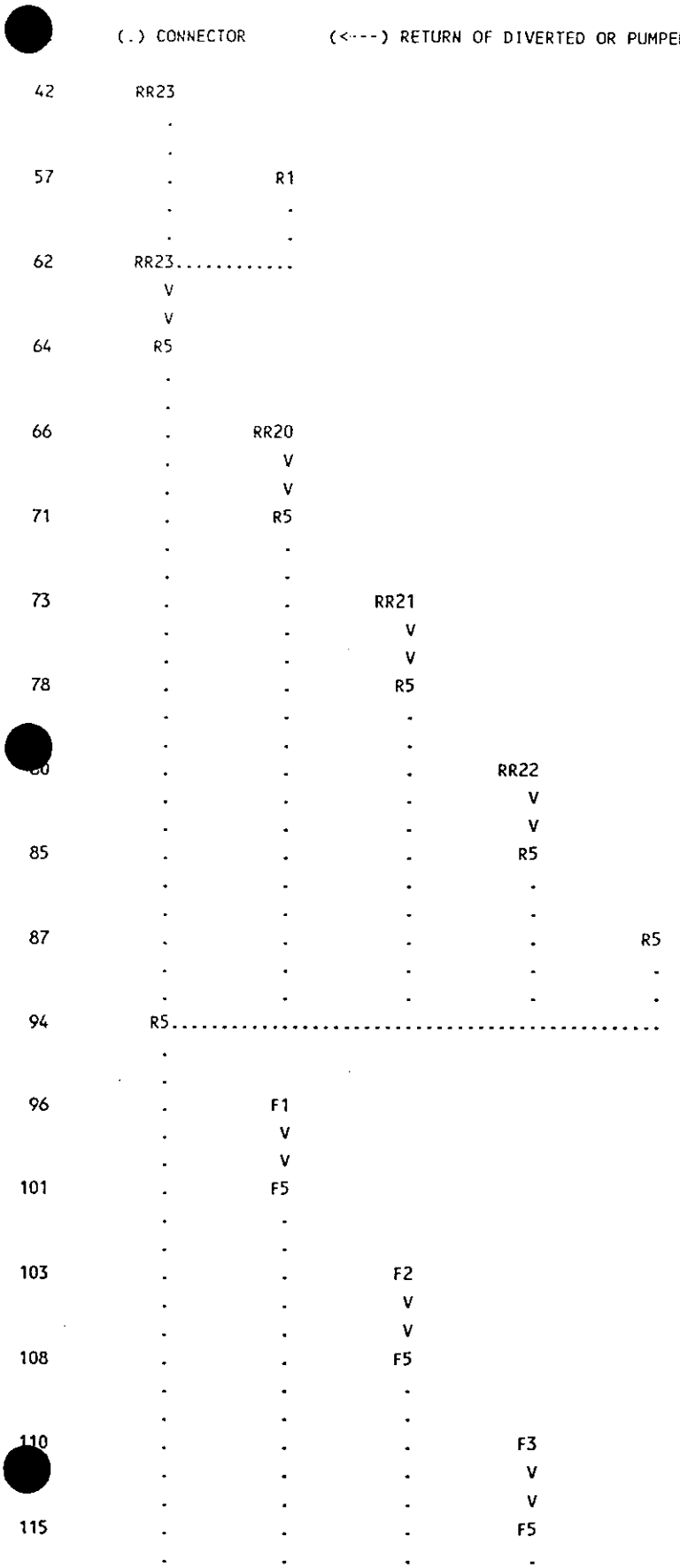
  775     KK    F23 COMBINE F22 AND F23
  776     KM      CONFLUENCE OF FLAMINGO WASH WITH LAS VEGAS WASH
  777     KM     NELLIS,DESERT ROSE
  778     HC     2
  779     ZZ
```

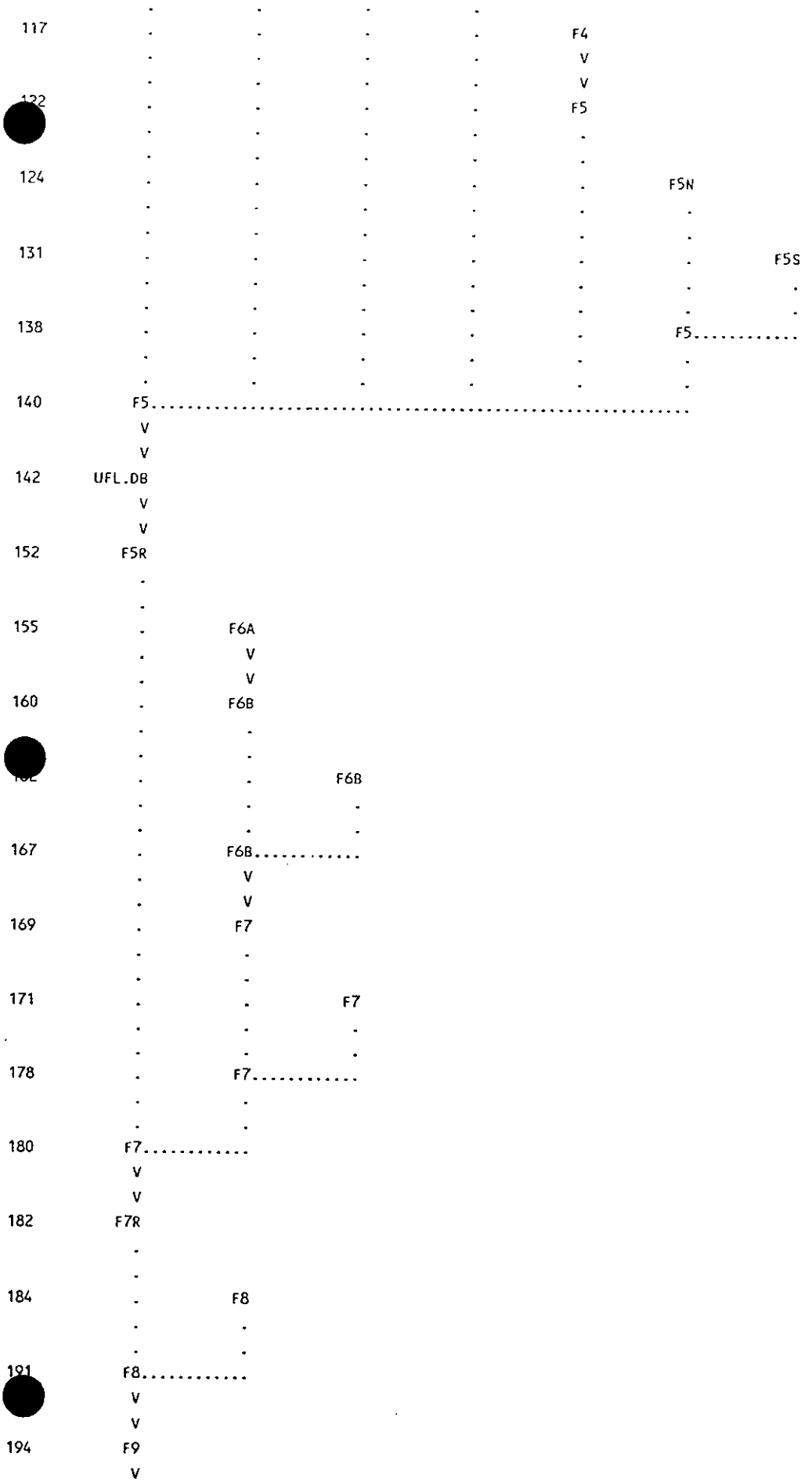
SCHEMATIC DIAGRAM OF STREAM NETWORK

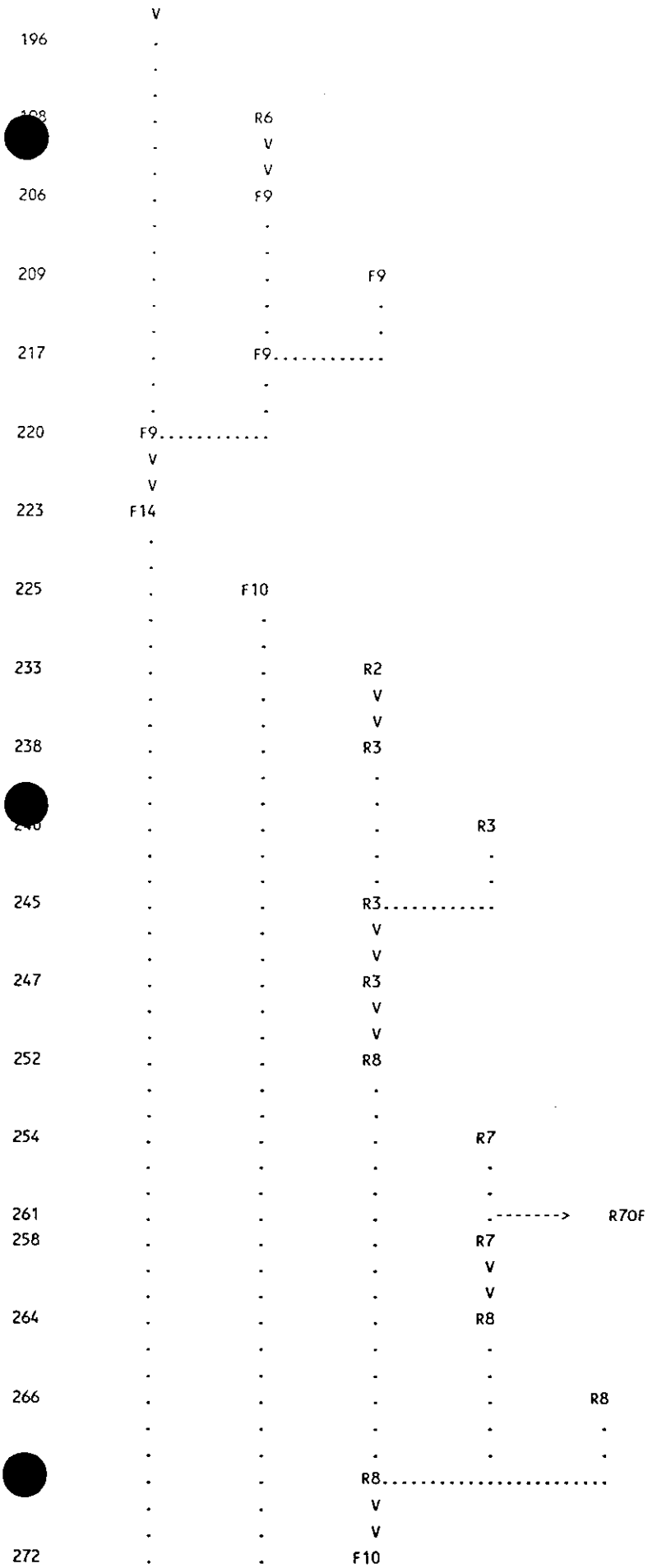
INPUT LINE

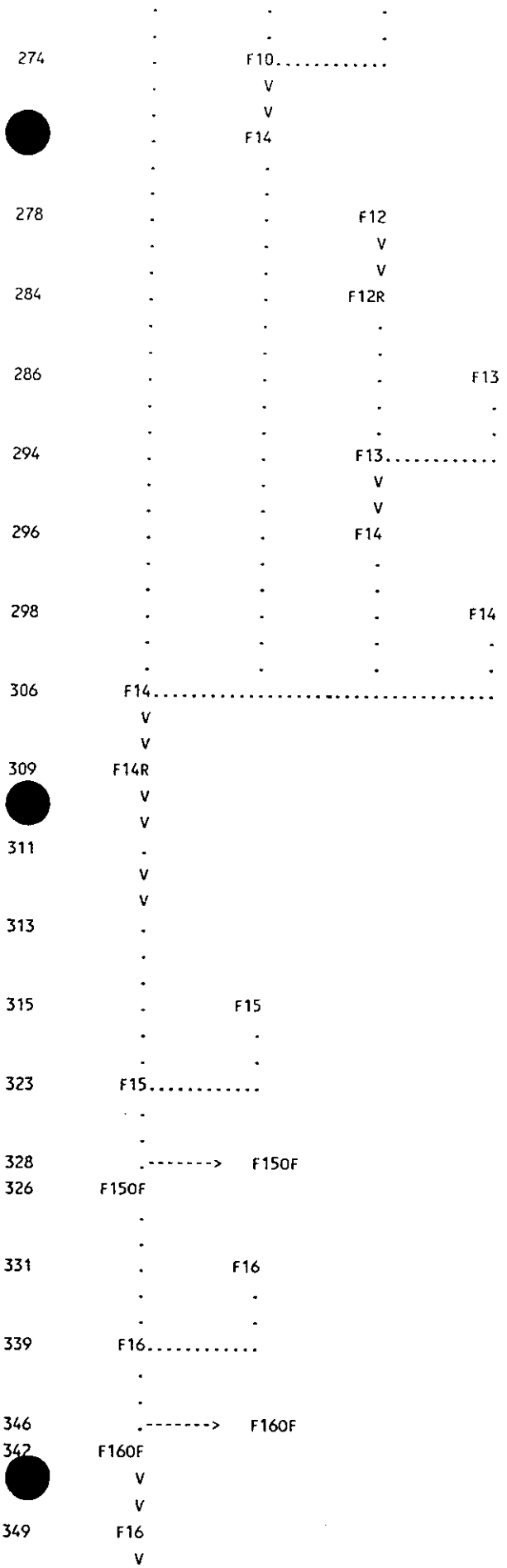
(V) ROUTING (----->) DIVERSION OR PUMP FLOW

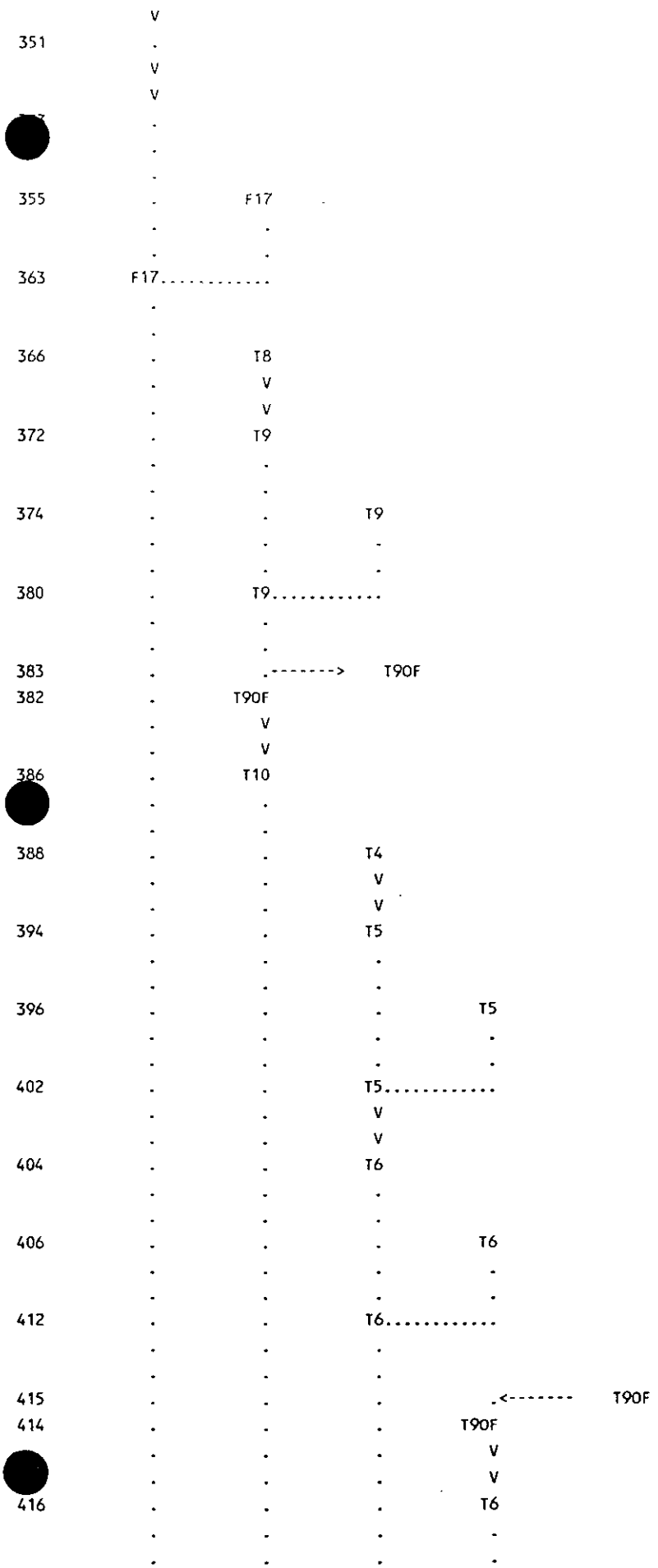
(.) CONNECTOR (<-----) RETURN OF DIVERTED OR PUMPED FLOW

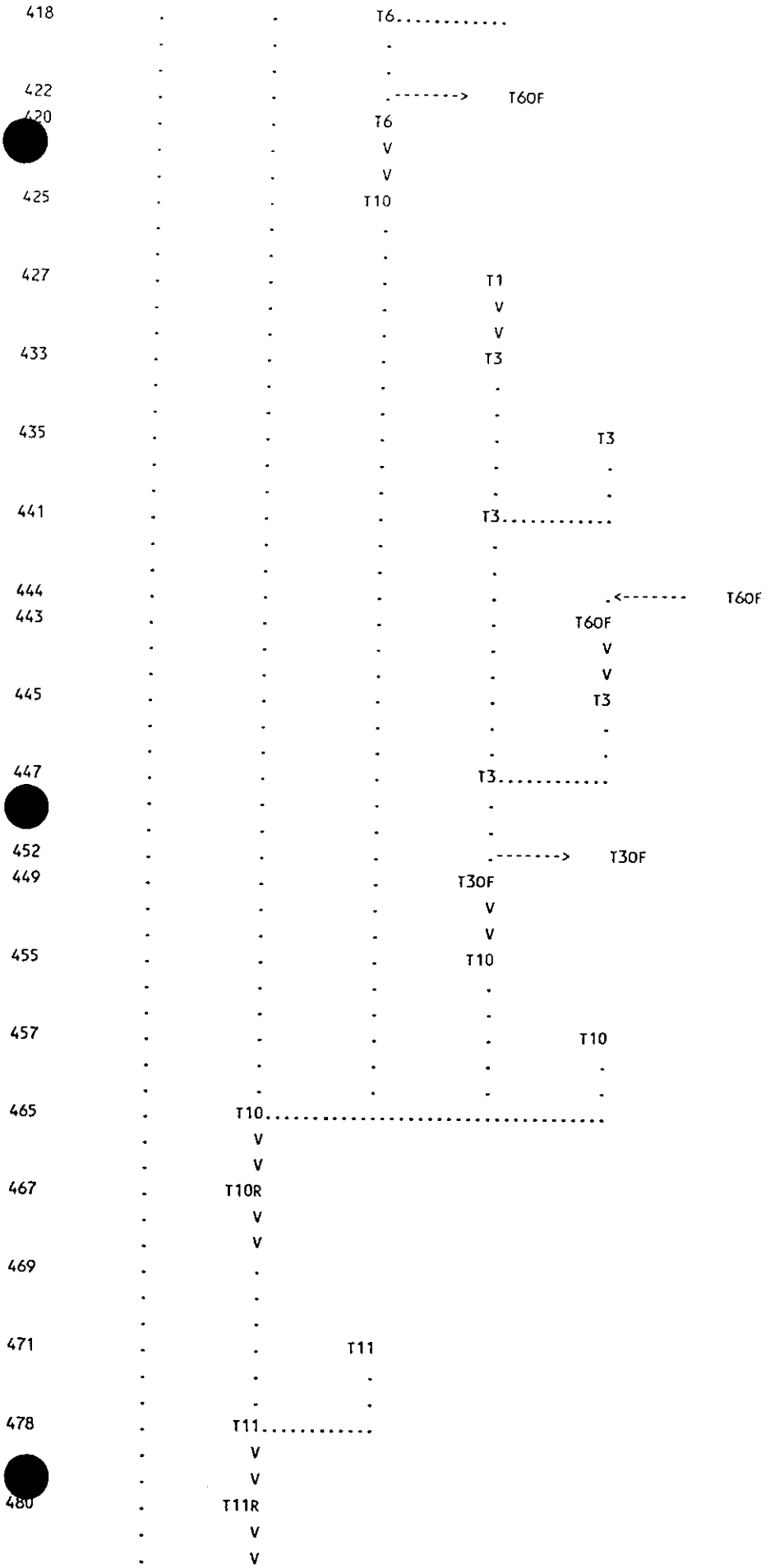


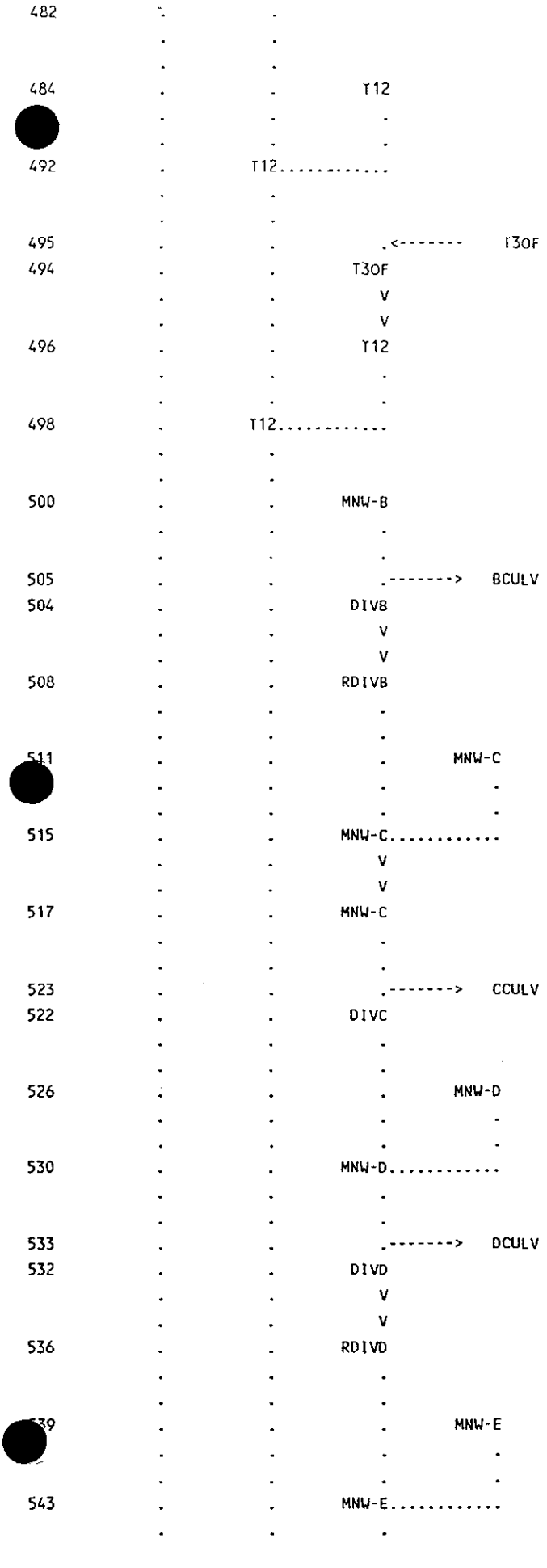

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F5N
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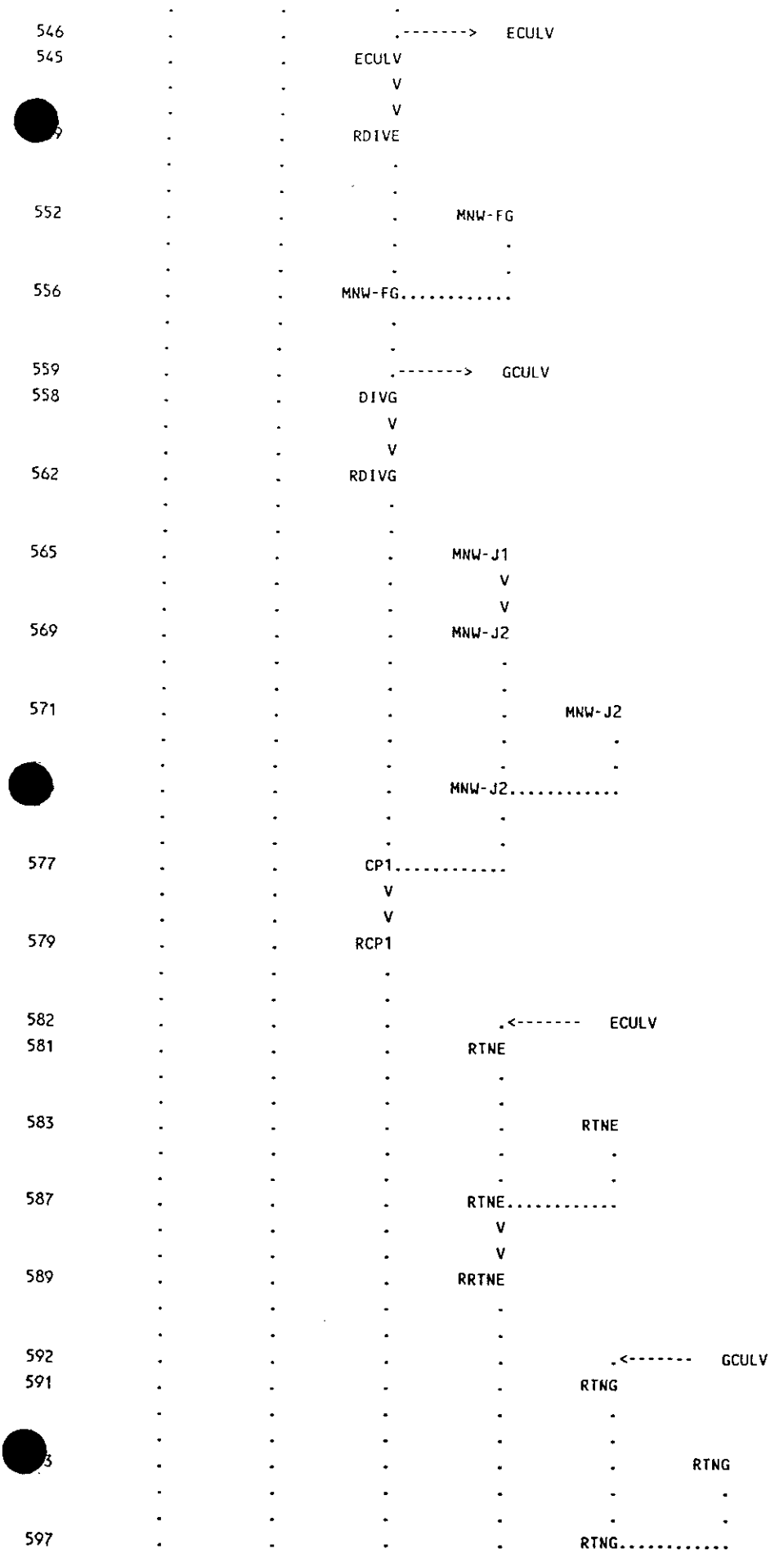

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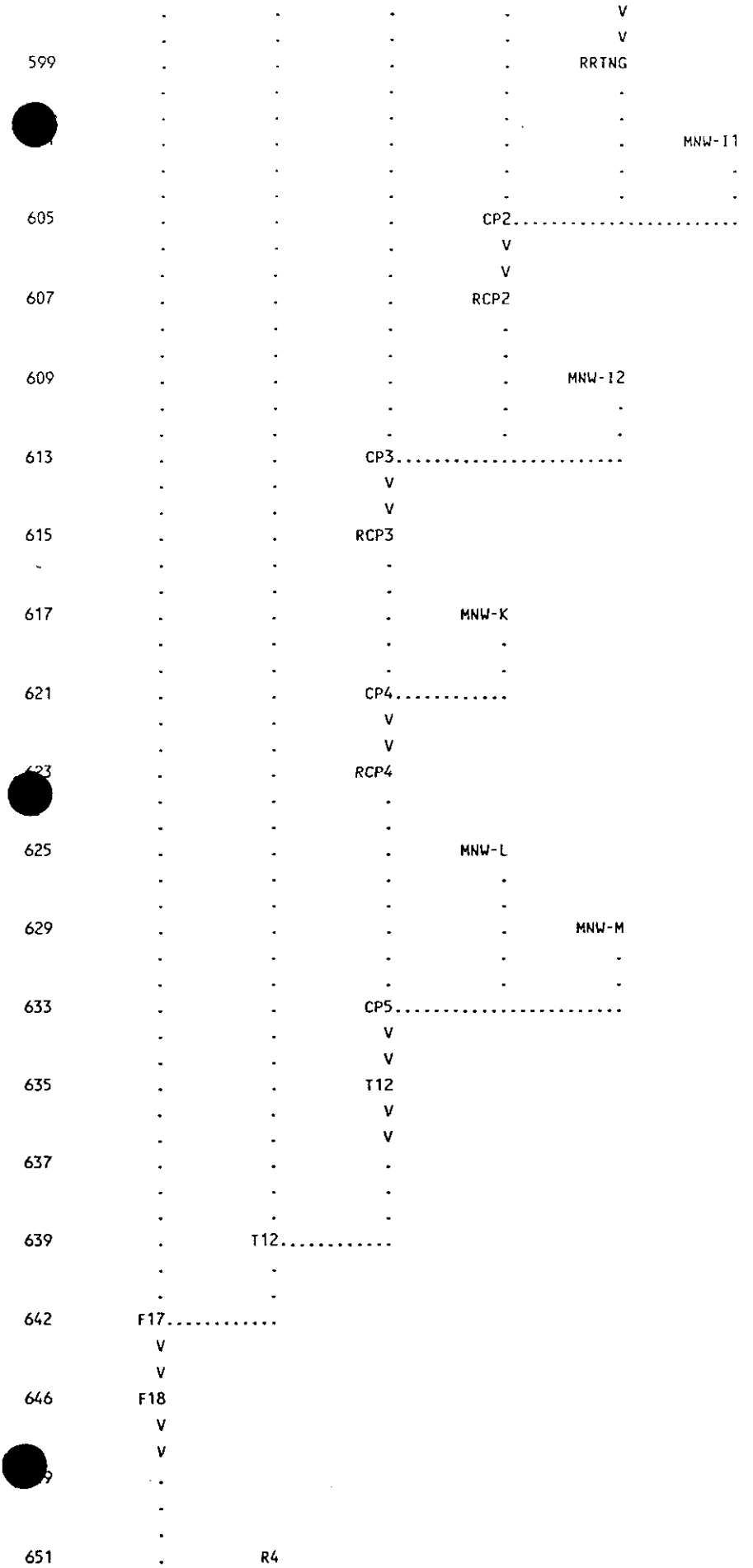

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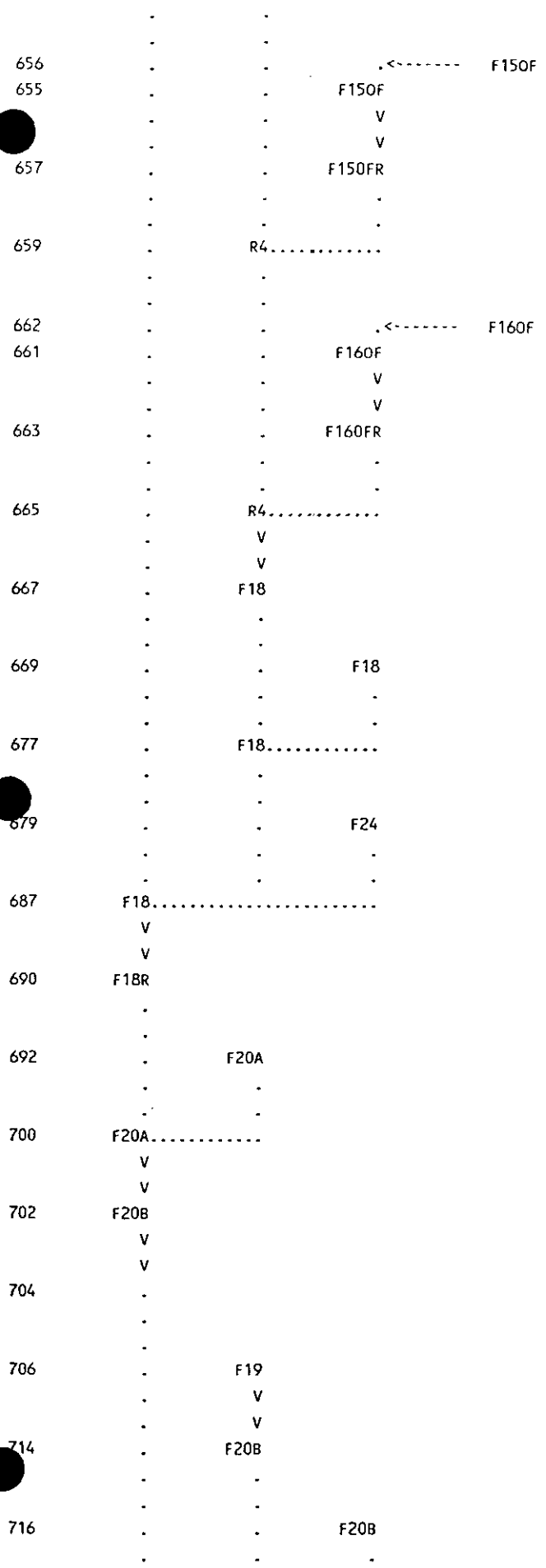

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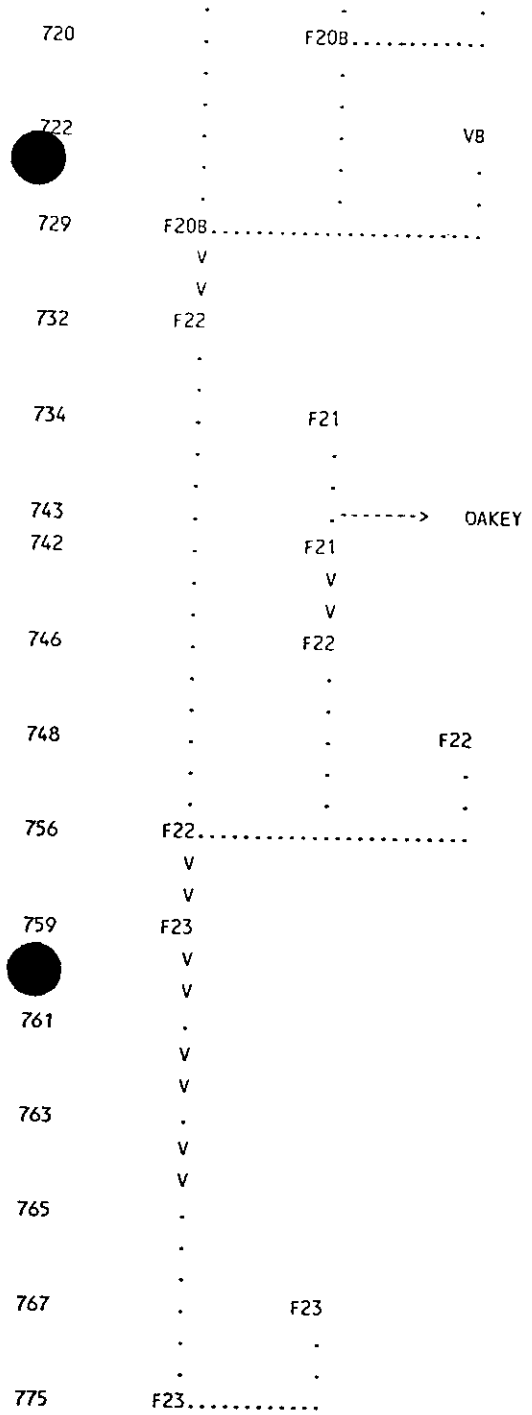

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GCULV
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RTNG
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F18R
F20A
F20A
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F150F
F160F



(***) RUNOFF ALSO COMPUTED AT THIS LOCATION

```
*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*            SEPTEMBER 1990             *
*             VERSION 4.0               *
*                                       *
*  RUN DATE  10/06/1997  TIME  12:17:06 *
*                                       *
*****************************************
```

```
*****************************************
*                                       *
*    U.S. ARMY CORPS OF ENGINEERS       *
*    HYDROLOGIC ENGINEERING CENTER      *
*          609 SECOND STREET            *
*        DAVIS, CALIFORNIA 95616        *
*          (916) 756-1104               *
*                                       *
*****************************************
```

INPUT FILE = F-FL.DAT BY: JEP DATE: 10/06/97
FLAMINGO WASH FIS RESTUDY GCW MODIFICATIONS

REVISED DUPLICATED FIS MODEL F100R.DAT
DELETE RED ROCK WATERSHED TO SIMULATE EXPANSION OF RR DET. BASIN
MODIFY UFWDB PER B & V LOMR REQUEST;BASIN R6 NOT ROUTED THRU UFWDB

CLARK COUNTY FLOOD CONTROL DISTRICT MASTER PLAN UPDATE
RED ROCK/FLAMINGO/TROPICANA WATERSHED
EXISTING DRAINAGE SYSTEM WITH PRESENT DEVELOPMENT
FLAMINGO/TROPICANA STORM (NO UPPER BLUE DIAMOND)- MAIN CHANNEL RUN
100-YEAR 6-HR STORM (SDN #5)
JMM OCTOBER 1990

BASIC DATA FILE BASED ON COE FILE S10P40X.
MODIFICATIONS ADDED FROM B&V RED ROCK BASIN AND UPPER FLAMINGO
BASIN HEC-1 RUNS; NIMBUS NORTHWEST MCCARRAN AIRPORT HEC-1 RUNS;
AND SUBBASIN MODIFICATIONS DUE TO RECENT DEVELOPMENT.

COE MUSKINGUM ROUTING CONVERTED TO KINEMATIC FOR EXISTING
IMPROVED CHANNELS FROM FACILITY INVENTORY.

PB CARDS CONTAIN POINT PRECIPITATION. DARF'S FROM CCRFCD MANUAL
BASED ON STORM AREAS FOR CONCENTRATION POINTS AS FOLLOWS:

SUBBASIN	AREA (SQMI)	DARF
RAINBOW	37.94	0.72
JONES	40.35	0.71
DECATUR,	50.27	0.68
UPPR,I15,CAESARS, WINNICK,HUGHES	51-53	
FL/TROP CONF., SPENCER	73-78	0.64
D/S FROM DI	85.45	0.62
BLDR HWY,NELLIS, DESERT ROSE	90-92	0.61

```
40 IO        OUTPUT CONTROL VARIABLES
                IPRNT        5  PRINT CONTROL
                IPLOT        0  PLOT CONTROL
                QSCAL        0.  HYDROGRAPH PLOT SCALE

   IT        HYDROGRAPH TIME DATA
                NMIN         5  MINUTES IN COMPUTATION INTERVAL
```

```
                IDATE      1    0  STARTING DATE
                ITIME           0000  STARTING TIME
                   NQ            200  NUMBER OF HYDROGRAPH ORDINATES
               NDDATE      1    0  ENDING DATE
               NDTIME           1635  ENDING TIME
               ICENT              19  CENTURY MARK

          COMPUTATION INTERVAL      .08 HOURS
              TOTAL TIME BASE    16.58 HOURS

    ENGLISH UNITS
         DRAINAGE AREA          SQUARE MILES
         PRECIPITATION DEPTH    INCHES
         LENGTH, ELEVATION      FEET
         FLOW                   CUBIC FEET PER SECOND
         STORAGE VOLUME         ACRE-FEET
         SURFACE AREA           ACRES
         TEMPERATURE            DEGREES FAHRENHEIT

JP       MULTI-PLAN OPTION
              NPLAN             1  NUMBER OF PLANS

JR       MULTI-RATIO OPTION
             RATIOS OF PRECIPITATION
             .72       .71       .68       .64       .62       .61


 *** FDKRUT - NEWTON RAPHSON FAILEDFIXED POINT ITERATION USED - ITERATION=  2


 *** FDKRUT WARNING TIME STEP CALCULATION FAILED TO CONVERGE. STABILITY PROBLEMS MAY RESULT


 *** FDKRUT WARNING TIME STEP CALCULATION FAILED TO CONVERGE. STABILITY PROBLEMS MAY RESULT


 *** FDKRUT - NEWTON RAPHSON FAILEDFIXED POINT ITERATION USED - ITERATION=  1


 *** FDKRUT - NEWTON RAPHSON FAILEDFIXED POINT ITERATION USED - ITERATION=  1


 *** FDKRUT - NEWTON RAPHSON FAILEDFIXED POINT ITERATION USED - ITERATION=  1


 *** FDKRUT - NEWTON RAPHSON FAILEDFIXED POINT ITERATION USED - ITERATION=  1
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*** FDKRUT - NEWTON RAPHSCN FAILEDFIXED POINT ITERATION USED - ITERATION= 1

*** FDKRUT - NEWTON RAPHSON FAILEDFIXED POINT ITERATION USED - ITERATION= 1

*** FDKRUT - NEWTON RAPHSON FAILEDFIXED POINT ITERATION USED - ITERATION= 1

*** FDKRUT - NEWTON RAPHSON FAILEDFIXED POINT ITERATION USED - ITERATION= 1

*** FDKRUT - NEWTON RAPHSON FAILEDFIXED POINT ITERATION USED - ITERATION= 1

*** FDKRUT - NEWTON RAPHSON FAILEDFIXED POINT ITERATION USED - ITERATION= 1

*** FDKRUT - NEWTON RAPHSON FAILEDFIXED POINT ITERATION USED - ITERATION= 2

*** FDKRUT - NEWTON RAPHSON FAILEDFIXED POINT ITERATION USED - ITERATION= 2

*** FDKRUT - NEWTON RAPHSON FAILEDFIXED POINT ITERATION USED - ITERATION= 1

*** FDKRUT WARNING TIME STEP CALCULATION FAILED TO CONVERGE. STABILITY PROBLEMS MAY RESULT

*** FDKRUT WARNING TIME STEP CALCULATION FAILED TO CONVERGE. STABILITY PROBLEMS MAY RESULT

*** FDKRUT - NEWTON RAPHSON FAILEDFIXED POINT ITERATION USED - ITERATION= 1

*** FDKRUT - NEWTON RAPHSON FAILEDFIXED POINT ITERATION USED - ITERATION= 1

*** FDKRUT - NEWTON RAPHSON FAILEDFIXED POINT ITERATION USED - ITERATION= 2

*** FDKRUT - NEWTON RAPHSON FAILEDFIXED POINT ITERATION USED - ITERATION= 2

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*** FDKRUT - NEWTON RAPHSON FAILEDFIXED POINT ITERATION USED - ITERATION= 1

*** FDKRUT - NEWTON RAPHSON FAILEDFIXED POINT ITERATION USED - ITERATION= 1

*** FDKRUT - NEWTON RAPHSON FAILEDFIXED POINT ITERATION USED - ITERATION= 1

*** FDKRUT - NEWTON RAPHSON FAILEDFIXED POINT ITERATION USED - ITERATION= 1

PEAK FLOW AND STAGE (END-OF-PERIOD) SUMMARY FOR MULTIPLE PLAN-RATIO ECONOMIC COMPUTATIONS
FLOWS IN CUBIC FEET PER SECOND, AREA IN SQUARE MILES
TIME TO PEAK IN HOURS

OPERATION	STATION	AREA	PLAN		RATIOS APPLIED TO PRECIPITATION RATIO 1 .72	RATIO 2 .71	RATIO 3 .68	RATIO 4 .64	RATIO 5 .62	RATIO 6 .61
HYDROGRAPH AT	RR23	2.03	1	FLOW	274.	268.	242.	214.	199.	191.
				TIME	5.25	5.25	5.25	5.25	5.25	5.25
HYDROGRAPH AT	R1	1.12	1	FLOW	488.	477.	446.	404.	384.	373.
				TIME	3.83	3.83	3.83	3.83	3.83	3.83
2 COMBINED AT	RR23	3.15	1	FLOW	564.	552.	510.	461.	434.	420.
				TIME	5.08	5.08	5.08	5.08	5.08	5.08
ROUTED TO	R5	3.15	1	FLOW	546.	531.	490.	442.	416.	402.
				TIME	4.50	5.50	5.50	5.50	5.50	5.50
HYDROGRAPH AT	RR20	1.37	1	FLOW	511.	500.	468.	425.	403.	393.
				TIME	4.08	4.08	4.08	4.08	4.08	4.08
ROUTED TO	R5	1.37	1	FLOW	477.	467.	437.	397.	377.	367.
				TIME	4.75	4.75	4.75	4.75	4.75	4.75
HYDROGRAPH AT	RR21	6.27	1	FLOW	1833.	1793.	1672.	1512.	1433.	1394.
				TIME	4.42	4.42	4.42	4.42	4.42	4.42
ROUTED TO	R5	6.27	1	FLOW	1774.	1735.	1618.	1465.	1390.	1352.
				TIME	5.08	5.08	5.08	5.17	5.17	5.17
HYDROGRAPH AT	RR22	2.15	1	FLOW	798.	780.	728.	658.	623.	606.
				TIME	4.00	4.00	4.00	4.00	4.00	4.00
ROUTED TO	R5	2.15	1	FLOW	731.	715.	667.	603.	572.	556.
				TIME	4.75	4.75	4.75	4.75	4.75	4.75
HYDROGRAPH AT	R5	5.77	1	FLOW	733.	705.	650.	573.	525.	508.
				TIME	5.17	5.17	5.17	5.17	5.17	5.17
5 COMBINED AT	R5	18.71	1	FLOW	4055.	3949.	3663.	3272.	3064.	2966.
				TIME	5.00	5.00	5.00	5.00	5.00	5.08
HYDROGRAPH AT	F1	4.63	1	FLOW	1623.	1588.	1485.	1348.	1280.	1247.
				TIME	4.17	4.17	4.17	4.17	4.17	4.17
ROUTED TO	F5	4.63	1	FLOW	1492.	1461.	1366.	1241.	1180.	1149.
				TIME	5.25	5.25	5.25	5.25	5.25	5.25
HYDROGRAPH AT	F2	1.28	1	FLOW	595.	582.	545.	495.	470.	458.
				TIME	3.83	3.83	3.83	3.83	3.83	3.83
ROUTED TO	F5	1.28	1	FLOW	516.	505.	472.	428.	407.	396.
				TIME	4.58	4.58	4.58	4.58	4.58	4.58
HYDROGRAPH AT	F3	2.60	1	FLOW	1214.	1188.	1107.	1002.	949.	923.

				TIME	3.75	3.75	3.75	3.75	3.75	3.75
ROUTED TO	F5	2.60	1	FLOW	1085.	1061.	990.	895.	848.	825.
				TIME	4.17	4.17	4.17	4.17	4.17	4.17
H[illegible]GRAPH AT	F4	1.30	1	FLOW	509.	497.	462.	416.	393.	382.
				TIME	3.83	3.83	3.83	3.83	3.83	3.83
ROUTED TO	F5	1.30	1	FLOW	443.	433.	402.	361.	341.	331.
				TIME	4.50	4.50	4.50	4.50	4.50	4.50
HYDROGRAPH AT	F5N	4.04	1	FLOW	1010.	975.	875.	758.	697.	674.
				TIME	4.33	4.33	4.42	4.50	4.58	4.58
HYDROGRAPH AT	F5S	2.00	1	FLOW	502.	486.	436.	370.	339.	323.
				TIME	4.17	4.17	4.17	4.25	4.33	4.33
2 COMBINED AT	F5	6.04	1	FLOW	1492.	1435.	1290.	1102.	1014.	973.
				TIME	4.25	4.25	4.33	4.42	4.50	4.58
6 COMBINED AT	F5	34.56	1	FLOW	7739.	7559.	7051.	6376.	6021.	5850.
				TIME	5.08	5.08	5.08	5.08	5.08	5.17
ROUTED TO	UFL.DB	34.56	1	FLOW	3766.	3488.	2584.	1266.	1238.	1225.
				TIME	6.50	6.50	6.75	7.25	7.25	7.25
			** PEAK STAGES IN FEET **							
			1	STAGE	2471.46	2471.35	2471.00	2470.15	2469.32	2468.91
				TIME	6.50	6.50	6.75	7.25	7.25	7.25
R[illegible]D TO	F5R	34.56	1	FLOW	3761.	3486.	2580.	1266.	1238.	1225.
				TIME	6.50	6.58	6.83	7.33	7.33	7.33
HYDROGRAPH AT	F6A	.55	1	FLOW	237.	232.	216.	196.	186.	181.
				TIME	3.75	3.75	3.75	3.75	3.75	3.75
ROUTED TO	F6B	.55	1	FLOW	214.	209.	195.	176.	167.	162.
				TIME	4.08	4.08	4.08	4.08	4.08	4.08
HYDROGRAPH AT	F6B	.85	1	FLOW	375.	367.	342.	308.	292.	284.
				TIME	3.67	3.67	3.67	3.67	3.67	3.67
2 COMBINED AT	F6B	1.40	1	FLOW	490.	479.	445.	402.	380.	370.
				TIME	3.75	3.75	3.75	3.75	3.75	3.75
ROUTED TO	F7	1.40	1	FLOW	463.	453.	422.	381.	360.	350.
				TIME	4.08	4.08	4.08	4.08	4.08	4.08
HYDROGRAPH AT	F7	1.50	1	FLOW	347.	335.	296.	253.	232.	221.
				TIME	4.17	4.17	4.25	4.33	4.33	4.42
2 COMBINED AT	F7	2.90	1	FLOW	806.	783.	713.	623.	577.	554.
				TIME	4.08	4.17	4.17	4.17	4.17	4.17
2 COMBINED AT	F7	37.46	1	FLOW	3881.	3591.	2652.	1536.	1494.	1473.
				TIME	6.50	6.58	6.83	5.33	5.33	5.33
ROUTED TO	F7R	37.46	1	FLOW	3869.	3582.	2647.	1535.	1493.	1472.
				TIME	6.58	6.58	6.83	5.33	5.42	5.42

HYDROGRAPH AT	F8	.48	1	FLOW	56.	55.	51.	48.	46.	45.	
				TIME	3.67	3.67	3.67	3.67	3.67	3.67	
2 COMBINED AT	F8	37.94	1	FLOW	3874.	3586.	2650.	1550.	1507.	1486.	RAINBOW
				TIME	6.58	6.58	6.83	5.33	5.33	5.33	
ROUTED TO	F9	37.94	1	FLOW	3874.	3581.	2645.	1549.	1506.	1485.	
				TIME	6.58	6.58	6.83	5.33	5.33	5.33	
ROUTED TO	.	37.94	1	FLOW	3868.	3580.	2644.	1549.	1506.	1485.	
				TIME	6.58	6.67	6.92	5.42	5.42	5.42	
HYDROGRAPH AT	R6	1.51	1	FLOW	134.	129.	115.	94.	84.	78.	
				TIME	5.25	5.25	5.33	5.42	5.50	5.58	
ROUTED TO	F9	1.51	1	FLOW	133.	129.	114.	94.	83.	78.	
				TIME	5.25	5.33	5.33	5.50	5.50	5.58	
HYDROGRAPH AT	F9	.90	1	FLOW	164.	162.	153.	143.	136.	133.	
				TIME	3.75	3.75	3.75	3.75	3.75	3.75	
2 COMBINED AT	F9	2.41	1	FLOW	202.	194.	173.	143.	136.	133.	
				TIME	5.17	5.17	5.25	3.75	3.75	3.75	
2 COMBINED AT	F9	40.35	1	FLOW	3940.	3646.	2694.	1688.	1631.	1603.	JONES
				TIME	6.58	6.67	6.92	5.42	5.42	5.42	
ROUTED TO	F14	40.35	1	FLOW	3907.	3614.	2666.	1681.	1625.	1597.	
				TIME	6.75	6.83	7.08	5.58	5.58	5.58	
[redacted]GRAPH AT	F10	1.17	1	FLOW	347.	338.	319.	294.	284.	277.	
				TIME	3.58	3.58	3.58	3.58	3.58	3.58	
HYDROGRAPH AT	R2	2.01	1	FLOW	689.	668.	607.	528.	489.	470.	
				TIME	3.58	3.58	3.58	3.58	3.58	3.58	
ROUTED TO	R3	2.01	1	FLOW	571.	553.	503.	437.	405.	389.	
				TIME	4.00	4.00	4.00	4.00	4.00	4.00	
HYDROGRAPH AT	R3	2.63	1	FLOW	183.	176.	156.	130.	117.	111.	
				TIME	5.25	5.25	5.25	5.25	5.25	5.25	
2 COMBINED AT	R3	4.64	1	FLOW	686.	661.	588.	497.	453.	432.	
				TIME	4.00	4.00	4.00	4.00	4.00	4.00	
ROUTED TO	R3	4.64	1	FLOW	157.	152.	136.	116.	107.	102.	
				TIME	5.92	5.92	5.92	5.92	5.92	5.92	
			** PEAK STAGES IN FEET **								
			1	STAGE	23.49	23.37	23.02	22.58	22.37	22.27	
				TIME	5.92	5.92	5.92	5.92	5.92	5.92	
ROUTED TO	R8	4.64	1	FLOW	157.	152.	136.	116.	107.	102.	
				TIME	5.92	5.92	5.92	6.00	6.00	6.00	
HYDROGRAPH AT	R7	1.39	1	FLOW	266.	257.	232.	200.	185.	177.	
[redacted]				TIME	3.92	3.92	3.92	4.00	4.00	4.00	
DIVERSION TO	R7OF	1.39	1	FLOW	0.	0.	0.	0.	0.	0.	
				TIME	.08	.08	.08	.08	.08	.08	

HYDROGRAPH AT	R7	1.39	1	FLOW	266.	257.	232.	200.	185.	177.	
				TIME	3.92	3.92	3.92	4.00	4.00	4.00	
ROUTED TO	R8	1.39	1	FLOW	266.	256.	231.	200.	184.	176.	
				TIME	4.00	4.00	4.00	4.08	4.08	4.08	
HYDROGRAPH AT	R8	.51	1	FLOW	64.	61.	54.	47.	44.	42.	
				TIME	3.83	3.83	5.00	5.00	5.00	5.00	
3 COMBINED AT	R8	6.54	1	FLOW	382.	371.	338.	295.	275.	265.	
				TIME	5.17	5.17	5.17	5.17	5.17	5.17	
ROUTED TO	F10	6.54	1	FLOW	381.	370.	337.	295.	274.	265.	
				TIME	5.25	5.25	5.25	5.25	5.25	5.25	
2 COMBINED AT	F10	7.71	1	FLOW	487.	478.	437.	389.	365.	352.	
				TIME	3.67	3.67	3.67	3.67	3.67	3.67	
ROUTED TO	F14	7.71	1	FLOW	479.	466.	429.	379.	357.	344.	
				TIME	5.08	5.08	5.08	5.08	5.08	5.08	
HYDROGRAPH AT	F12	.88	1	FLOW	238.	230.	209.	180.	167.	160.	
				TIME	4.08	4.17	4.17	4.25	4.25	4.33	
ROUTED TO	F12R	.88	1	FLOW	231.	224.	203.	176.	163.	157.	
				TIME	4.33	4.33	4.42	4.42	4.50	4.50	
HYDROGRAPH AT	F13	.55	1	FLOW	135.	132.	123.	109.	102.	98.	
				TIME	4.92	5.00	5.00	5.00	5.00	5.00	
2 COMBINED AT	F13	1.43	1	FLOW	320.	310.	288.	260.	248.	241.	
				TIME	4.33	4.33	5.00	5.00	5.00	5.00	
ROUTED TO	F14	1.43	1	FLOW	317.	307.	286.	258.	246.	239.	
				TIME	4.50	4.50	5.08	5.17	5.17	5.17	
HYDROGRAPH AT	F14	.78	1	FLOW	98.	94.	82.	67.	60.	57.	
				TIME	5.25	5.33	5.33	5.42	5.42	4.08	
4 COMBINED AT	F14	50.27	1	FLOW	4223.	3907.	2902.	2307.	2209.	2161.	DECATUR
				TIME	6.75	6.83	7.08	5.33	5.33	5.33	
ROUTED TO	F14R	50.27	1	FLOW	4215.	3903.	2897.	2304.	2207.	2160.	
				TIME	6.75	6.83	7.08	5.42	5.42	5.42	
ROUTED TO	.	50.27	1	FLOW	4207.	3891.	2890.	2303.	2205.	2158.	
				TIME	6.83	6.92	7.17	5.42	5.42	5.42	
ROUTED TO	.	50.27	1	FLOW	4205.	3890.	2887.	2301.	2204.	2156.	
				TIME	6.83	6.92	7.17	5.42	5.50	5.50	
HYDROGRAPH AT	F15	1.32	1	FLOW	238.	231.	214.	187.	176.	173.	
				TIME	3.92	3.92	3.92	3.92	3.92	3.92	
2 COMBINED AT	F15	51.59	1	FLOW	4253.	3934.	2921.	2454.	2349.	2297.	UPRR
				TIME	6.83	6.92	7.17	5.42	5.42	5.42	
DIVERSION TO	F15OF	51.59	1	FLOW	90.	0.	0.	0.	0.	0.	
				TIME	6.83	.08	.08	.08	.08	.08	

HYDROGRAPH AT	F150F	51.59	1	FLOW	4163.	3934.	2921.	2454.	2349.	2297.	
				TIME	6.83	6.92	7.17	5.42	5.42	5.42	
HYDROGRAPH AT	F16	.52	1	FLOW	172.	169.	158.	146.	137.	136.	
				TIME	3.67	3.67	3.67	3.67	3.75	3.75	
2 COMBINED AT	F16	52.11	1	FLOW	4177.	3946.	2931.	2516.	2406.	2351.	I15
				TIME	6.83	6.92	7.17	5.33	5.33	5.33	
DIVERSION TO	F160F	52.11	1	FLOW	0.	0.	0.	0.	0.	0.	
				TIME	.08	.08	.08	.08	.08	.08	
HYDROGRAPH AT	F160F	52.11	1	FLOW	4177.	3946.	2931.	2516.	2406.	2351.	CAESARS
				TIME	6.83	6.92	7.17	5.33	5.33	5.33	
ROUTED TO	F16	52.11	1	FLOW	4175.	3944.	2926.	2513.	2405.	2350.	
				TIME	6.83	6.92	7.17	5.33	5.42	5.42	
ROUTED TO	.	52.11	1	FLOW	4173.	3939.	2919.	2512.	2404.	2350.	
				TIME	6.83	6.92	7.17	5.42	5.42	5.42	
ROUTED TO	.	52.11	1	FLOW	4168.	3934.	2914.	2511.	2403.	2347.	
				TIME	6.92	7.00	7.33	5.50	5.50	5.50	
HYDROGRAPH AT	F17	.65	1	FLOW	167.	163.	152.	136.	129.	125.	
				TIME	4.17	4.17	4.17	4.17	4.17	4.25	
2 COMBINED AT	F17	52.76	1	FLOW	4198.	3961.	2934.	2599.	2486.	2429.	WINNICK / HUGHES CENTER
				TIME	6.92	7.00	7.33	5.50	5.50	5.50	
HYDROGRAPH AT	T8	1.22	1	FLOW	32.	30.	23.	16.	12.	11.	
				TIME	6.67	6.75	7.00	7.42	7.75	7.92	
ROUTED TO	T9	1.22	1	FLOW	30.	28.	22.	15.	12.	10.	
				TIME	7.17	7.25	7.50	8.00	8.25	8.42	
HYDROGRAPH AT	T9	.87	1	FLOW	71.	67.	58.	45.	40.	37.	
				TIME	5.42	5.50	5.58	5.75	5.83	5.92	
2 COMBINED AT	T9	2.09	1	FLOW	75.	71.	60.	47.	41.	38.	
				TIME	5.50	5.50	5.58	5.75	5.83	5.92	
DIVERSION TO	T90F	2.09	1	FLOW	0.	0.	0.	0.	0.	0.	
				TIME	.08	.08	.08	.08	.08	.08	
HYDROGRAPH AT	T90F	2.09	1	FLOW	75.	71.	60.	47.	41.	38.	
				TIME	5.50	5.50	5.58	5.75	5.83	5.92	
ROUTED TO	T10	2.09	1	FLOW	74.	70.	60.	47.	41.	38.	
				TIME	5.75	5.75	5.83	6.00	6.08	6.17	
HYDROGRAPH AT	T4	3.22	1	FLOW	937.	916.	830.	719.	664.	637.	
				TIME	4.08	4.08	4.17	4.17	4.25	4.25	
ROUTED TO	T5	3.22	1	FLOW	933.	911.	830.	714.	662.	634.	
				TIME	4.17	4.17	4.25	4.25	4.33	4.33	
HYDROGRAPH AT	T5	1.00	1	FLOW	262.	254.	228.	196.	181.	173.	
				TIME	4.08	4.08	4.08	4.17	4.25	4.25	

2 COMBINED AT	T5	4.22	1	FLOW	1190.	1160.	1051.	909.	839.	805.
				TIME	4.17	4.17	4.25	4.25	4.33	4.33
[illegible] TO	T6	4.22	1	FLOW	1177.	1149.	1042.	903.	837.	797.
				TIME	4.33	4.33	4.42	4.42	4.50	4.50
HYDROGRAPH AT	T6	1.30	1	FLOW	323.	314.	281.	243.	225.	215.
				TIME	4.25	4.25	4.33	4.33	4.42	4.42
2 COMBINED AT	T6	5.52	1	FLOW	1494.	1458.	1320.	1145.	1059.	1012.
				TIME	4.33	4.33	4.33	4.42	4.50	4.50
HYDROGRAPH AT	T9OF	.00	1	FLOW	0.	0.	0.	0.	0.	0.
				TIME	.08	.08	.08	.08	.08	.08
ROUTED TO	T6	.00	1	FLOW	0.	0.	0.	0.	0.	0.
				TIME	.08	.08	.08	.08	.08	.08
2 COMBINED AT	T6	5.52	1	FLOW	1494.	1458.	1320.	1145.	1059.	1012.
				TIME	4.33	4.33	4.33	4.42	4.50	4.50
DIVERSION TO	T6OF	5.52	1	FLOW	744.	708.	570.	395.	309.	262.
				TIME	4.33	4.33	4.33	4.42	4.50	4.50
HYDROGRAPH AT	T6	5.52	1	FLOW	750.	750.	750.	750.	750.	750.
				TIME	4.00	4.00	4.08	4.17	4.25	4.25
ROUTED TO	T10	5.52	1	FLOW	750.	750.	750.	750.	750.	750.
				TIME	5.08	5.08	5.17	5.25	5.42	5.33
HYDROGRAPH AT	T1	1.56	1	FLOW	477.	466.	428.	376.	348.	334.
				TIME	4.00	4.00	4.08	4.08	4.17	4.17
ROUTED TO	T3	1.56	1	FLOW	472.	463.	427.	371.	345.	331.
				TIME	4.25	4.25	4.33	4.42	4.42	4.42
HYDROGRAPH AT	T3	.99	1	FLOW	129.	126.	116.	101.	94.	90.
				TIME	5.08	5.08	5.08	5.17	5.25	5.25
2 COMBINED AT	T3	2.55	1	FLOW	571.	556.	501.	429.	393.	376.
				TIME	4.33	4.33	4.33	4.42	4.50	4.50
HYDROGRAPH AT	T6OF	.00	1	FLOW	744.	708.	570.	395.	309.	262.
				TIME	4.33	4.33	4.33	4.42	4.50	4.50
ROUTED TO	T3	.00	1	FLOW	724.	687.	550.	378.	298.	250.
				TIME	4.42	4.42	4.50	4.50	4.58	4.58
2 COMBINED AT	T3	2.55	1	FLOW	1284.	1234.	1050.	803.	681.	619.
				TIME	4.42	4.42	4.42	4.50	4.58	4.58
DIVERSION TO	T3OF	2.55	1	FLOW	0.	0.	0.	0.	0.	0.
				TIME	.08	.08	.08	.08	.08	.08
HYDROGRAPH AT	T3OF	2.55	1	FLOW	1284.	1234.	1050.	803.	681.	619.
				TIME	4.42	4.42	4.42	4.50	4.58	4.58
ROUTED TO	T10	2.55	1	FLOW	1277.	1222.	1044.	797.	678.	614.
				TIME	4.42	4.42	4.50	4.58	4.58	4.67

HYDROGRAPH AT	T10	.82	1	FLOW	157.	151.	142.	126.	117.	116.
				TIME	3.75	3.75	3.75	3.75	3.75	3.75
4 COMBINED AT	T10	10.98	1	FLOW	2129.	2068.	1878.	1617.	1491.	1428.
				TIME	4.42	4.42	4.50	4.58	4.67	4.67
ROUTED TO	T10R	10.98	1	FLOW	2124.	2066.	1875.	1614.	1491.	1426.
				TIME	4.42	4.50	4.50	4.58	4.67	4.67
ROUTED TO	.	10.98	1	FLOW	2122.	2062.	1871.	1612.	1486.	1425.
				TIME	4.50	4.50	4.58	4.67	4.75	4.75
HYDROGRAPH AT	T11	1.09	1	FLOW	255.	251.	236.	216.	210.	205.
				TIME	3.83	3.83	3.83	3.83	3.83	3.83
2 COMBINED AT	T11	12.07	1	FLOW	2233.	2171.	1968.	1699.	1570.	1508.
				TIME	4.50	4.50	4.58	4.67	4.75	4.75
ROUTED TO	T11R	12.07	1	FLOW	2229.	2165.	1965.	1697.	1570.	1506.
				TIME	4.50	4.50	4.58	4.67	4.75	4.75
ROUTED TO	.	12.07	1	FLOW	2213.	2153.	1954.	1685.	1567.	1500.
				TIME	4.67	4.67	4.67	4.83	4.83	4.92
HYDROGRAPH AT	T12	.77	1	FLOW	191.	188.	176.	163.	155.	153.
				TIME	3.83	3.83	3.83	3.83	3.83	3.83
2 COMBINED AT	T12	12.84	1	FLOW	2287.	2226.	2020.	1748.	1625.	1562.
				TIME	4.58	4.67	4.67	4.83	4.83	4.92
HYDROGRAPH AT	T3OF	.00	1	FLOW	0.	0.	0.	0.	0.	0.
				TIME	.08	.08	.08	.08	.08	.08
ROUTED TO	T12	.00	1	FLOW	0.	0.	0.	0.	0.	0.
				TIME	.08	.08	.08	.08	.08	.08
2 COMBINED AT	T12	12.84	1	FLOW	2287.	2226.	2020.	1748.	1625.	1562.
				TIME	4.58	4.67	4.67	4.83	4.83	4.92
HYDROGRAPH AT	MNW-B	.68	1	FLOW	31.	30.	27.	23.	22.	21.
				TIME	6.50	6.50	6.42	6.42	6.42	6.42
DIVERSION TO	BCULV	.68	1	FLOW	22.	22.	22.	22.	22.	21.
				TIME	5.25	5.33	5.50	6.00	6.42	6.42
HYDROGRAPH AT	DIVB	.68	1	FLOW	9.	8.	5.	1.	0.	0.
				TIME	6.50	6.50	6.42	6.42	.08	.08
ROUTED TO	RDIVB	.68	1	FLOW	9.	8.	5.	1.	0.	0.
				TIME	6.50	6.50	6.50	6.58	.08	.08
HYDROGRAPH AT	MNW-C	.69	1	FLOW	47.	45.	42.	37.	35.	34.
				TIME	6.00	6.00	6.00	5.92	5.92	5.92
2 COMBINED AT	MNW-C	1.37	1	FLOW	54.	52.	45.	37.	35.	34.
				TIME	6.17	6.17	6.17	5.92	5.92	5.92
ROUTED TO	MNW-C	1.37	1	FLOW	40.	39.	36.	32.	30.	29.
				TIME	7.08	7.08	7.00	6.75	6.67	6.67

** PEAK STAGES IN FEET **

			1	STAGE	57.43	57.33	57.08	56.66	56.49	56.43
				TIME	7.08	7.08	7.00	6.75	6.67	6.67
[redacted]ION TO	CCULV	1.37	1	FLOW	40.	39.	36.	32.	30.	29.
				TIME	7.08	7.08	7.00	6.75	6.67	6.67
HYDROGRAPH AT	DIVC	1.37	1	FLOW	0.	0.	0.	0.	0.	0.
				TIME	.08	.08	.08	.08	.08	.08
HYDROGRAPH AT	MNW-D	.05	1	FLOW	5.	5.	4.	3.	3.	3.
				TIME	3.83	3.83	5.08	5.08	5.08	5.08
2 COMBINED AT	MNW-D	1.42	1	FLOW	5.	5.	4.	3.	3.	3.
				TIME	3.83	3.83	5.08	5.08	5.08	5.08
DIVERSION TO	DCULV	1.42	1	FLOW	5.	5.	4.	3.	3.	3.
				TIME	3.83	3.83	5.08	5.08	5.08	5.08
HYDROGRAPH AT	DIVD	1.42	1	FLOW	0.	0.	0.	0.	0.	0.
				TIME	.08	.08	.08	.08	.08	.08
ROUTED TO	RDIVD	1.42	1	FLOW	0.	0.	0.	0.	0.	0.
				TIME	.08	.08	.08	.08	.08	.08
HYDROGRAPH AT	MNW-E	.05	1	FLOW	7.	7.	6.	5.	5.	5.
				TIME	3.75	3.75	3.75	3.75	3.75	3.75
2 COMBINED AT	MNW-E	1.47	1	FLOW	7.	7.	6.	5.	5.	5.
[redacted]				TIME	3.75	3.75	3.75	3.75	3.75	3.75
DIVERSION TO	ECULV	1.47	1	FLOW	7.	7.	6.	5.	5.	5.
				TIME	3.75	3.75	3.75	3.75	3.75	3.75
HYDROGRAPH AT	ECULV	1.47	1	FLOW	0.	0.	0.	0.	0.	0.
				TIME	.08	.08	.08	.08	.08	.08
ROUTED TO	RDIVE	1.47	1	FLOW	0.	0.	0.	0.	0.	0.
				TIME	.08	.08	.08	.08	.08	.08
HYDROGRAPH AT	MNW-FG	.36	1	FLOW	29.	29.	26.	23.	22.	21.
				TIME	5.33	5.33	5.33	5.25	5.25	5.17
2 COMBINED AT	MNW-FG	1.83	1	FLOW	29.	29.	26.	23.	22.	21.
				TIME	5.33	5.33	5.33	5.25	5.25	5.17
DIVERSION TO	GCULV	1.83	1	FLOW	29.	29.	26.	23.	22.	21.
				TIME	5.33	5.33	5.33	5.25	5.25	5.17
HYDROGRAPH AT	DIVG	1.83	1	FLOW	0.	0.	0.	0.	0.	0.
				TIME	.08	.08	.08	.08	.08	.08
ROUTED TO	RDIVG	1.83	1	FLOW	0.	0.	0.	0.	0.	0.
				TIME	.08	.08	.08	.08	.08	.08
[redacted]GRAPH AT	MNW-J1	2.37	1	FLOW	90.	87.	75.	62.	55.	52.
				TIME	6.92	6.92	7.00	7.00	7.08	7.08
ROUTED TO	MNW-J2	2.37	1	FLOW	90.	87.	75.	62.	55.	52.

				TIME	7.33	7.33	7.33	7.42	7.50	7.50
HYDROGRAPH AT	MNW-J2	1.21	1	FLOW	100.	97.	88.	76.	70.	68.
				TIME	5.50	5.50	5.50	5.50	5.50	5.50
2 COMBINED AT	MNW-J2	3.58	1	FLOW	142.	136.	119.	98.	89.	84.
				TIME	6.00	6.00	6.08	6.08	6.08	6.00
2 COMBINED AT	CP1	5.41	1	FLOW	142.	136.	119.	98.	89.	84.
				TIME	6.00	6.00	6.08	6.08	6.08	6.00
ROUTED TO	RCP1	5.41	1	FLOW	142.	136.	119.	98.	89.	84.
				TIME	6.08	6.08	6.17	6.17	6.17	6.17
HYDROGRAPH AT	RTNE	.00	1	FLOW	7.	7.	6.	5.	5.	5.
				TIME	3.75	3.75	3.75	3.75	3.75	3.75
HYDROGRAPH AT	RTNE	.01	1	FLOW	0.	0.	0.	0.	0.	0.
				TIME	.08	.08	.08	.08	.08	.08
2 COMBINED AT	RTNE	.01	1	FLOW	7.	7.	6.	5.	5.	5.
				TIME	3.75	3.75	3.75	3.75	3.75	3.75
ROUTED TO	RRTNE	.01	1	FLOW	7.	7.	6.	5.	5.	5.
				TIME	4.42	4.50	4.50	4.50	4.50	4.50
HYDROGRAPH AT	RTNG	.00	1	FLOW	29.	29.	26.	23.	22.	21.
				TIME	5.33	5.33	5.33	5.25	5.25	5.17
HYDROGRAPH AT	RTNG	.01	1	FLOW	0.	0.	0.	0.	0.	0.
				TIME	.08	.08	.08	.08	.08	.08
2 COMBINED AT	RTNG	.01	1	FLOW	29.	29.	26.	23.	22.	21.
				TIME	5.33	5.33	5.33	5.25	5.25	5.17
ROUTED TO	RRTNG	.01	1	FLOW	29.	29.	26.	23.	22.	21.
				TIME	5.58	5.58	5.58	5.50	5.50	5.42
HYDROGRAPH AT	MNW-I1	.25	1	FLOW	53.	52.	47.	42.	39.	38.
				TIME	4.00	4.00	4.00	4.00	4.00	4.00
3 COMBINED AT	CP2	.27	1	FLOW	71.	69.	64.	58.	54.	53.
				TIME	5.17	5.17	5.17	5.17	5.17	5.17
ROUTED TO	RCP2	.27	1	FLOW	71.	69.	64.	57.	54.	53.
				TIME	5.25	5.25	5.25	5.25	5.25	5.25
HYDROGRAPH AT	MNW-I2	.14	1	FLOW	26.	25.	22.	19.	17.	16.
				TIME	3.83	3.83	3.83	3.83	3.83	3.83
3 COMBINED AT	CP3	5.82	1	FLOW	200.	192.	171.	145.	134.	129.
				TIME	5.50	5.50	5.50	5.33	5.25	5.25
ROUTED TO	RCP3	5.82	1	FLOW	199.	192.	171.	145.	134.	129.
				TIME	5.67	5.67	5.67	5.50	5.50	5.42
HYDROGRAPH AT	MNW-K	1.43	1	FLOW	142.	139.	129.	117.	111.	108.
				TIME	5.50	5.50	5.42	5.42	5.42	5.42
2 COMBINED AT	CP4	7.25	1	FLOW	341.	331.	299.	262.	245.	237.

				TIME	5.58	5.58	5.58	5.50	5.42	5.42
ROUTED TO	RCP4	7.25	1	FLOW	341.	330.	299.	261.	245.	237.
				TIME	5.67	5.67	5.67	5.58	5.50	5.50
[redacted]	MNW-L	.27	1	FLOW	118.	115.	109.	101.	97.	95.
				TIME	3.75	3.75	3.75	3.75	3.75	3.75
HYDROGRAPH AT	MNW-M	.49	1	FLOW	165.	162.	154.	142.	137.	134.
				TIME	4.25	4.25	4.25	4.25	4.25	4.25
3 COMBINED AT	CP5	8.01	1	FLOW	488.	476.	441.	398.	376.	366.
				TIME	5.17	5.17	5.17	5.17	5.17	5.17
ROUTED TO	T12	8.01	1	FLOW	488.	476.	441.	398.	376.	366.
				TIME	5.25	5.25	5.25	5.25	5.25	5.25
ROUTED TO	.	8.01	1	FLOW	487.	475.	440.	397.	375.	365.
				TIME	5.42	5.42	5.42	5.42	5.33	5.42
2 COMBINED AT	T12	20.85	1	FLOW	2733.	2662.	2428.	2117.	1975.	1905.
				TIME	4.58	4.67	4.67	4.83	4.83	4.92
2 COMBINED AT	F17	73.61	1	FLOW	5548.	5401.	4985.	4556.	4346.	4235.
				TIME	4.67	4.67	5.33	5.33	5.33	5.42
ROUTED TO	F18	73.61	1	FLOW	5544.	5395.	4984.	4555.	4343.	4234.
				TIME	4.67	4.67	5.33	5.33	5.33	5.42
ROUTED TO	.	73.61	1	FLOW	5538.	5387.	4983.	4553.	4342.	4234.
				TIME	4.67	4.67	5.33	5.33	5.42	5.42
HYDROGRAPH AT	R4	2.28	1	FLOW	865.	844.	783.	703.	664.	644.
				TIME	3.75	3.75	3.75	3.75	3.75	3.75
HYDROGRAPH AT	F15OF	.00	1	FLOW	90.	0.	0.	0.	0.	0.
				TIME	6.83	.08	.08	.08	.08	.08
ROUTED TO	F15OFR	.00	1	FLOW	56.	0.	0.	0.	0.	0.
				TIME	7.08	.08	.08	.08	.08	.08
2 COMBINED AT	R4	2.28	1	FLOW	865.	844.	783.	703.	664.	644.
				TIME	3.75	3.75	3.75	3.75	3.75	3.75
HYDROGRAPH AT	F16OF	.00	1	FLOW	0.	0.	0.	0.	0.	0.
				TIME	.08	.08	.08	.08	.08	.08
ROUTED TO	F16OFR	.00	1	FLOW	0.	0.	0.	0.	0.	0.
				TIME	.08	.08	.08	.08	.08	.08
2 COMBINED AT	R4	2.28	1	FLOW	865.	844.	783.	703.	664.	644.
				TIME	3.75	3.75	3.75	3.75	3.75	3.75
ROUTED TO	F18	2.28	1	FLOW	692.	676.	627.	563.	531.	515.
				TIME	4.67	4.67	4.67	4.67	4.67	4.67
[redacted]	F18	.87	1	FLOW	269.	267.	251.	229.	219.	215.
				TIME	3.75	3.75	3.75	3.83	3.83	3.83
2 COMBINED AT	F18	3.15	1	FLOW	789.	771.	717.	646.	611.	594.

FLAMINGO / TROPICANA CONFLUENCE

				TIME	4.67	4.67	4.67	4.67	4.67	4.67	
HYDROGRAPH AT	F24	1.03	1	FLOW	468.	463.	440.	411.	396.	385.	
				TIME	3.67	3.67	3.67	3.67	3.67	3.67	
3 COMBINED AT	F18	77.79	1	FLOW	6430.	6263.	5767.	5151.	4863.	4721.	SPENCER
				TIME	4.67	4.75	4.83	5.00	5.00	5.08	
ROUTED TO	F18R	77.79	1	FLOW	6425.	6261.	5764.	5150.	4860.	4719.	
				TIME	4.75	4.83	4.92	5.08	5.17	5.17	
HYDROGRAPH AT	F20A	.81	1	FLOW	121.	120.	113.	104.	100.	97.	
				TIME	3.83	3.83	3.83	3.83	3.83	3.83	
2 COMBINED AT	F20A	78.60	1	FLOW	6468.	6305.	5808.	5197.	4906.	4764.	
				TIME	4.75	4.83	4.92	5.08	5.17	5.17	
ROUTED TO	F20B	78.60	1	FLOW	6465.	6303.	5806.	5196.	4906.	4763.	
				TIME	4.83	4.83	4.92	5.08	5.17	5.25	
ROUTED TO	.	78.60	1	FLOW	6465.	6301.	5804.	5195.	4905.	4763.	
				TIME	4.83	4.83	4.92	5.08	5.17	5.25	
HYDROGRAPH AT	F19	1.54	1	FLOW	614.	603.	571.	534.	509.	504.	
				TIME	3.67	3.67	3.67	3.67	3.67	3.67	
ROUTED TO	F20B	1.54	1	FLOW	545.	536.	508.	472.	452.	445.	
				TIME	3.83	3.83	3.83	3.83	3.83	3.83	
HYDROGRAPH AT	F20B	.73	1	FLOW	238.	231.	212.	186.	173.	167.	
				TIME	3.67	3.67	3.67	3.67	3.67	3.67	
2 COMBINED AT	F20B	2.27	1	FLOW	724.	710.	668.	613.	584.	573.	
				TIME	3.83	3.83	3.83	3.83	3.83	3.83	
HYDROGRAPH AT	VB	4.58	1	FLOW	781.	754.	676.	576.	528.	504.	
				TIME	3.92	3.92	4.00	4.00	4.00	4.00	
3 COMBINED AT	F20B	85.45	1	FLOW	7341.	7175.	6661.	5993.	5650.	5483.	DIS DESERT INN
				TIME	5.00	5.00	5.08	5.08	5.17	5.17	
ROUTED TO	F22	85.45	1	FLOW	7332.	7165.	6659.	5984.	5649.	5477.	
				TIME	5.00	5.08	5.08	5.17	5.17	5.17	
HYDROGRAPH AT	F21	1.27	1	FLOW	505.	497.	466.	439.	408.	401.	
				TIME	3.67	3.67	3.67	3.67	3.67	3.67	
DIVERSION TO	OAKEY	1.27	1	FLOW	253.	248.	233.	219.	204.	200.	
				TIME	3.67	3.67	3.67	3.67	3.67	3.67	
HYDROGRAPH AT	F21	1.27	1	FLOW	253.	248.	233.	219.	204.	200.	
				TIME	3.67	3.67	3.67	3.67	3.67	3.67	
ROUTED TO	F22	1.27	1	FLOW	243.	239.	225.	212.	198.	195.	
				TIME	3.75	3.75	3.75	3.75	3.75	3.75	
HYDROGRAPH AT	F22	3.43	1	FLOW	1111.	1075.	1015.	938.	896.	875.	
				TIME	3.67	3.67	3.67	3.67	3.75	3.75	
3 COMBINED AT	F22	90.15	1	FLOW	8002.	7826.	7270.	6530.	6161.	5974.	BOULDER HWY

				TIME	5.08	5.08	5.08	5.08	5.17	5.17
ROUTED TO	F23	90.15	1	FLOW	8001.	7825.	7266.	6521.	6159.	5970.
				TIME	5.08	5.08	5.08	5.17	5.17	5.17
ROUTED TO	.	90.15	1	FLOW	7995.	7813.	7255.	6520.	6148.	5961.
				TIME	5.08	5.08	5.17	5.17	5.25	5.25
ROUTED TO	.	90.15	1	FLOW	7987.	7808.	7246.	6512.	6142.	5949.
				TIME	5.17	5.17	5.17	5.25	5.25	5.25
ROUTED TO	.	90.15	1	FLOW	7976.	7791.	7239.	6497.	6135.	5947.
				TIME	5.17	5.17	5.25	5.33	5.33	5.33
HYDROGRAPH AT	F23	1.92	1	FLOW	315.	309.	288.	263.	250.	243.
				TIME	4.08	4.08	4.08	4.17	4.17	4.17
2 COMBINED AT	F23	92.07	1	FLOW	8188.	8002.	7430.	6664.	6292.	6098.
				TIME	5.17	5.25	5.25	5.33	5.33	5.33

NELLIS / LAS VEGAS WASH

SUMMARY OF KINEMATIC WAVE - MUSKINGUM-CUNGE ROUTING
(FLOW IS DIRECT RUNOFF WITHOUT BASE FLOW)

ISTAQ	ELEMENT	DT	PEAK	TIME TO PEAK	VOLUME	INTERPOLATED TO COMPUTATION INTERVAL DT	PEAK	TIME TO PEAK	VOLUME
		(MIN)	(CFS)	(MIN)	(IN)	(MIN)	(CFS)	(MIN)	(IN)
FOR PLAN = 1 RATIO= .72									
	RR23 MANE	5.00	766.30	243.37	1.08	5.00	757.34	245.00	1.08

CONTINUITY SUMMARY (AC-FT) - INFLOW= .0000E+00 EXCESS= .1178E+03 OUTFLOW= .1165E+03 BASIN STORAGE= .2933E+00 PERCENT ERROR= .8

FOR PLAN = 1 RATIO= .72									
	RR23 MANE	5.00	274.70	311.38	.53	5.00	274.30	315.00	.53

CONTINUITY SUMMARY (AC-FT) - INFLOW= .0000E+00 EXCESS= .5797E+02 OUTFLOW= .5689E+02 BASIN STORAGE= .3317E+00 PERCENT ERROR= 1.3

FOR PLAN = 1 RATIO= .71									
	RR23 MANE	5.00	268.63	313.61	.51	5.00	268.02	315.00	.51

CONTINUITY SUMMARY (AC-FT) - INFLOW= .0000E+00 EXCESS= .5608E+02 OUTFLOW= .5499E+02 BASIN STORAGE= .3307E+00 PERCENT ERROR= 1.3

FOR PLAN = 1 RATIO= .68									
	RR23 MANE	4.87	242.01	313.10	.46	5.00	241.73	315.00	.46

CONTINUITY SUMMARY (AC-FT) - INFLOW= .0000E+00 EXCESS= .5054E+02 OUTFLOW= .4947E+02 BASIN STORAGE= .3330E+00 PERCENT ERROR= 1.5

FOR PLAN = 1 RATIO= .64									
	RR23 MANE	5.00	213.92	314.04	.39	5.00	213.76	315.00	.39

CONTINUITY SUMMARY (AC-FT) - INFLOW= .0000E+00 EXCESS= .4346E+02 OUTFLOW= .4256E+02 BASIN STORAGE= .2923E+00 PERCENT ERROR= 1.4

FOR PLAN = 1 RATIO= .62									
	RR23 MANE	5.00	199.11	314.34	.36	5.00	199.04	315.00	.36

CONTINUITY SUMMARY (AC-FT) - INFLOW= .0000E+00 EXCESS= .4006E+02 OUTFLOW= .3920E+02 BASIN STORAGE= .3073E+00 PERCENT ERROR= 1.4

FOR PLAN = 1 RATIO= .61									
	RR23 MANE	5.00	191.60	316.93	.35	5.00	191.25	315.00	.35

CONTINUITY SUMMARY (AC-FT) - INFLOW= .0000E+00 EXCESS= .3839E+02 OUTFLOW= .3753E+02 BASIN STORAGE= .3150E+00 PERCENT ERROR= 1.4

FOR PLAN = 1 RATIO= .72

FOR PLAN = 1 RATIO= .68

F23	MANE	5.00	288.39	243.46	.70	5.00	288.29	245.00	.70

CONTINUITY SUMMARY (AC-FT) - INFLOW= .0000E+00 EXCESS= .7306E+02 OUTFLOW= .7138E+02 BASIN STORAGE= .8135E+00 PERCENT ERROR= 1.2

FOR PLAN = 1 RATIO= .64

F23	MANE	5.00	264.35	249.04	.63	5.00	262.53	250.00	.63

CONTINUITY SUMMARY (AC-FT) - INFLOW= .0000E+00 EXCESS= .6623E+02 OUTFLOW= .6453E+02 BASIN STORAGE= .8448E+00 PERCENT ERROR= 1.3

FOR PLAN = 1 RATIO= .62

F23	MANE	5.00	251.75	246.36	.60	5.00	249.98	250.00	.60

CONTINUITY SUMMARY (AC-FT) - INFLOW= .0000E+00 EXCESS= .6290E+02 OUTFLOW= .6123E+02 BASIN STORAGE= .8371E+00 PERCENT ERROR= 1.3

FOR PLAN = 1 RATIO= .61

F23	MANE	5.00	243.09	251.12	.58	5.00	242.99	250.00	.58

CONTINUITY SUMMARY (AC-FT) - INFLOW= .0000E+00 EXCESS= .6126E+02 OUTFLOW= .5959E+02 BASIN STORAGE= .8347E+00 PERCENT ERROR= 1.4

*** NORMAL END OF HEC-1 ***

CENTRAL STORM HEC-1 MODEL
FILE NAME: F-FLC.DAT

CENTRAL STORM HEC-1 MODEL
SEPTEMBER 1990 VERSION
FILE NAME: F-FLC.DAT

This model was developed by deleting the Upper Flamingo Wash Detention Basin drainage area from the Overall Storm HEC-1 model (F-FL.DAT). The reason for this modification was to check the effects of a different storm centering. The HEC-1 model results indicated a significant increase in 100-year peak discharges downstream of the Flamingo/Tropicana Wash confluence.

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*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*             SEPTEMBER 1990            *
*              VERSION 4.0              *
*                                       *
*  RUN DATE  10/06/1997  TIME  13:05:44 *
*                                       *
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*****************************************
*                                       *
*    U.S. ARMY CORPS OF ENGINEERS       *
*    HYDROLOGIC ENGINEERING CENTER      *
*          609 SECOND STREET            *
*       DAVIS, CALIFORNIA 95616         *
*           (916) 756-1104              *
*                                       *
*****************************************
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X     X  XXXXXXX   XXXXX          X
X     X  X        X     X        XX
X     X  X        X              X
XXXXXXX  XXXX     X        XXXXX  X
X     X  X        X              X
X     X  X        X     X        X
X     X  XXXXXXX  XXXXX          XXX
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THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.
THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION
NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL LOSS RATE:GREEN AND AMPT INFILTRATION
KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM

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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

          *DIAGRAM
    1     ID        INPUT FILE = F-FLC.DAT       BY: JEP       DATE:  10/06/97
    2     ID        FLAMINGO WASH FIS RESTUDY GCW MODIFICATIONS
    3     ID
    4     ID        REVISED DUPLICATED FIS MODEL F100R.DAT
    5     ID        DELETE RED ROCK WATERSHED TO SIMULATE EXPANSION OF RR DET. BASIN
    6     ID        DELETE UPPER FLAMINGO DET. BASIN WATERSHED TO SIMULATE
    7     ID        STORM CENTERING BELOW BASIN
    8     ID
    9     ID     CLARK COUNTY FLOOD CONTROL DISTRICT MASTER PLAN UPDATE
   10     ID     RED ROCK/FLAMINGO/TROPICANA WATERSHED
   11     ID     EXISTING DRAINAGE SYSTEM WITH PRESENT DEVELOPMENT
   12     ID     FLAMINGO/TROPICANA STORM (NO UPPER BLUE DIAMOND)- MAIN CHANNEL RUN
   13     ID         100-YEAR 6-HR STORM (SDN #5)
   14     ID         JMM    OCTOBER 1990
   15     ID
   16     ID         BASIC DATA FILE BASED ON COE FILE S10P40X.
   17     ID         MODIFICATIONS ADDED FROM B&V RED ROCK BASIN AND UPPER FLAMINGO
   18     ID         BASIN HEC-1 RUNS; NIMBUS NORTHWEST MCCARRAN AIRPORT HEC-1 RUNS;
   19     ID         AND SUBBASIN MODIFICATIONS DUE TO RECENT DEVELOPMENT.
   20     ID
   21     ID         COE MUSKINGUM ROUTING CONVERTED TO KINEMATIC FOR EXISTING
   22     ID         IMPROVED CHANNELS FROM FACILITY INVENTORY.
   23     ID
   24     ID     PB CARDS CONTAIN POINT PRECIPITATION.  DARF'S FROM CCRFCD MANUAL
   25     ID     BASED ON STORM AREAS FOR CONCENTRATION POINTS AS FOLLOWS:
   26     ID
   27     ID         SUBBASIN          AREA (SQMI)              DARF
   28     ID         --------          -----------              ----
   29     ID         RAINBOW             3.38                   0.92
   30     ID           JONES             5.79                   0.90
   31     ID         DECATUR,            15.71                  0.82
   32     ID        UPPR,I15,CAESARS     17-19                  0.80
   33     ID        WINNICK,HUGHES
   34     ID        FL/TROP CONF.,       38-43                  0.71
   35     ID         SPENCER
   36     ID        D/S FROM DI          50.89                  0.68
   37     ID        BLDR HWY,NELLIS,     55-57                  0.67
   38     ID        DESERT ROSE
   39     ID
   40     IT      5       0       0     200
   41     IO      5
   42     JR   PREC     .92     .90     .82     .80     .71     .68     .67

   43     KK    F6A RUNOFF FROM F6A
   44     BA    .55
   45     PC   .000    .020    .059    .080    .110    .144    .150    .160    .168    .171
   46     PC   .180    .182    .187    .190    .197    .202    .210    .220    .230    .241
   47     PC   .250    .259    .265    .280    .290    .300    .305    .309    .310    .317
   48     PC   .321    .327    .333    .346    .361    .381    .408    .430    .477    .514
   49     PC   .561    .630    .710    .720    .731    .752    .779    .790    .795    .804
   50     PC   .810    .820    .826    .840    .859    .889    .910    .938    .966    .970
   51     PC   .974    .979    .981    .983    .985    .989    .990    .992    .993    .996
   52     PC   .997    .999   1.00
   53     PB  2.86
```

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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  54      LS      0      88
  55      UD   0.35

  56      KK     F6B ROUTE F6A THRU F6B
  57      RM       4    0.35    0.15

  58      KK     F6B RUNOFF FROM F6B
  59      BA    0.85
  60      PB    2.77
  61      LS       0      88
  62      UD    0.30

  63      KK     F6B COMBINE F6A AND F6B
  64      HC       2

  65      KK      F7 ROUTE F6 THRU F7
  66      RM       3    0.28    0.15

  67      KK      F7 RUNOFF FROM F7
  68      BA    1.50
  69      PB    2.77
  70      LS       0    85.5
  71      UK     700    .015     .15     100
  72      RK    4000   .0114    .030     .65                          1
  73      RK    7500   .0116    .030            TRAP      50       5      NO

  74      KK      F7 COMBINE F7 WITH ROUTED F6
  75      HC       2

  76      KK     F7R ROUTE F7 THRU F8 (FLWA1267-1335)
  77      RK    5230    .011    .030            TRAP      40       1

  78      KK      F8 RUNOFF FROM F8
  79      BA     .48
  80      LS       0    66.1       0       0      98       0
  81      UK    150C    .014     .28      83
  82      UK      5C    .020     .10      17
  83      RK    180C     .01    .020    .048
  84      RK    720C    .010    .030                    30       2      NO

  85      KK      F8 COMBINE F8 AND F7R
  86      KM         RAINBOW
  87      HC       2

  88      KK      F9 ROUTE F8 THRU F9 (FLWA1203)
  89      RK    1740    .0138    .015            TRAP      40       2

  90      KK       . (FLWA1152)
  91      RK    2640    .0044    .040            TRAP      50       3
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  92      KK      R6 RUNOFF FROM R6
  93      KM        MOVED HYDROGRAPH
  94      BA    1.51
  95      PB    2.77
  96      LS       0    73.2
  97      UK     500    .015     .15     100
  98      RK    5200    .016    .030     .13                      1
  99      RK    8000   .0044    .030          TRAP      40       1      NO

 100      KK      F9ROUTE R6 THRU F9
 101      KM        ADDED ROUTING
 102      RK    1740   .0138    .015          TRAP      40       2

 103      KK      F9 RUNOFF FROM F9
 104      BA     .90
 105      LS       0    63.0       0       0     98       0
 106      UK     500    .010     .25      73
 107      UK      40    .015     .10      27
 108      RK    2400    .007    .020     .35                      1
 109      RK    2300    .008    .020    .015                      1
 110      RK   10800    .013    .023          TRAP      50       3      NO

 111      KK      F9 COMBINE R6 WITH F9
 112      KM        ADDED COMBINATION
 113      HC       2

 114      KK      F9 COMBINE F8 WITH F9
 115      KM           JONES
 116      HC       2

 117      KK     F14 ROUTE F9 THRU F14
 118      RM       2    0.16    0.20

 119      KK     F10 RUNOFF FROM F10
 120      BA    1.17
 121      LS       0    62.6       0       0     98       0
 122      UK     600    .010     .25      67
 123      UK      40    .015     .10      33
 124      RK    1300    .010    .020    .019                      1
 125      RK    1300    .006     .02    .080    TRAP              1
 126      RK    8200   .0117     .02          TRAP      40       1
          * *** SUBAREAS R2 - R8 NOW ASSUMED TO BE DIVERTED INTO FLAMINGO WASH BY
          *     RAINBOW AND FLAMINGO RD ****

 127      KK      R2 RUNOFF FROM R2
 128      BA    2.01
 129      PB    3.00
 130      LS       C    79.4
 131      UD    0.21
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  132     KK     R3 ROUTE R2 THRU R3
  133     RM      5    0.38    0.15

  134     KK     R3 RUNOFF FROM R3
  135     BA   2.63
  136     PB   2.77
  137     LS      0    68.2
  138     UD   0.61

  139     KK     R3 COMBINE R2+R3
  140     HC      2

  141     KK     R3 ROUTE THRU EXISTING GRAVEL PIT
  142     RS      1    STOR     480
  143     SV      0     480    1290    3150    3420
  144     SE      0      20      60     110     120
  145     SQ      0       0    1800    1800   37500

  146     KK     R8 ROUTE R3 THRU R8
  147     RK   2750    .019    .020            TRAP      40       1

  148     KK     R7 RUNOFF FROM R7
  149     BA   1.39
  150     LS      0    79.5
  151     UD   0.51

  152     KK     R7 DIVERT Q IN EXCESS OF PIPE CAPACITY
  153     KM        LIMITING CAPACITY OF RAINBOW STORM DRAIN = 324 CFS (FLLA0307)
  154     KM        OVERFLOW RUNS DOWN DESERT INN AND EDNA INTO CENTRAL BASIN
  155     DT   R7OF
  156     DI      0     324    1000    5000
  157     DQ      0       0     676    4676

  158     KK     R8 ROUTE R7 THRU R8 (90"-96" RCP IN RAINBOW)
  159     RK   5280    .004    .015            CIRC     8.0

  160     KK     R8 RUNOFF FROM R8
  161     BA    .51
  162     LS      0    73.3
  163     UD   0.37

  164     KK     R8 COMBINE R3+R7+R8
  165     HC      3

  166     KK    F10 ROUTE R8 THRU F10 (114" RCP IN FLAMINGO RD)
  167     RK   5280    .010    .015            CIRC     9.5

  168     KK    F10 COMBINE R8+F10
  169     HC      2
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  170     KK    F14 ROUTE F10 THRU F14 (FLLA0000)
  171     RK   4010   .0075    .015            TRAP      20       1

  172     KK    F12 RUNOFF FROM F12
  173     BA    .88
  174     LS      0    87.9
  175     UK    700    .012     .15     100
  176     RK   3500   .0120    .030     .21                        1
  177     RK   8200   .0130    .030             TRAP      10       5      NO

  178     KK   F12R    ROUT     F12    THRU     F13
  179     RM      2    0.20    0.15

  180     KK    F13 RUNOFF FROM F13
  181     BA    .55
  182     LS      0    87.5       0       0      98       0
  183     UK    750    .010     .25      83
  184     UK     50    .015     .10      17
  185     RK   1100     .01    .023     .04                        1
  186     RK   2300     .01    .023     .10                        1
  187     RK   5900    .012    .026             TRAP      40       2      NO

  188     KK    F13 COMBINE     F13     AND     F1R
  189     HC      2

  190     KK    F14 ROUTE F13 THRU F14 (UNIMPROVED)
  191     RM      2    0.15    0.15

  192     KK    F14 RUNOFF FROM F14
  193     BA    .78
  194     LS      0    76.5       0       0      98       0
  195     UK    500    .010     .25      86
  196     UK    400    .015     .10      12
  197     RK   1200   .0090    .023    .024                        1
  198     RK   2400   .0075    .025     .12    TRAP      20       1
  199     RK   5200   .0090    .033            TRAP      75       4      NO

  200     KK    F14 COMBINE F9, F10, F13, AND F14
  201     KM        DECATUR
  202     HC      4

  203     KK   F14R ROUTE F14 THRU F15 (FLWA0990-1049)
  204     RK   3110    .020    .040            TRAP      50       3

  205     KK      .  (FLWA0924)
  206     RK   3490    .010    .040            TRAP      60       1

  207     KK      .  (FLWA0891-0923)
  208     RK   1580   .0076    .030            TRAP      90       1
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  209     KK    F15 RUNOFF FROM F15
  210     BA   1.32
  211     LS      0    78.0       0       0      98       0
  212     UK    640    .013     .15      77
  213     UK    400    .014     .10      23
  214     RK   2500    .013    .020    0.08                      1
  215     RK   4500    .006    .020    0.25                      1
  216     RK   8500   0.012    .030            TRAP      40      3      NO

  217     KK    F15 COMBINE     F15     AND    F14R
  218     KM          UPPR
  219     HC      2

  220     KK   F15OF DIVERT OVERFLOWS
  221     KM        DIVERSION RATING CURVE FROM COE FEASIBILITY STUDY
  222     DT   F15OF
  223     DI      0    4100    7000   10500   35000
  224     DQ      0       0    1700    4640   15500

  225     KK    F16 RUNOFF FROM F16
  226     BA    .52
  227     LS      0    75.5       0       0      98       0
  228     UK    600    .010    0.15      56
  229     UK    400    .015     .10      44
  230     RK   1000    .010    .025    .030                      1
  231     RK   2400    .015    .025     .10                      1
  232     RK   6000    .004    .020                              1

  233     KK    F16 COMBINE F15 WITH F16
  234     KM          I15
  235     HC      2

  236     KK   F16OF DIVERT OVERFLOWS
  237     KM        LIMIT FLOW TO 6000 CFS AT CAESARS PALACE/LVB/IMPERIAL PALACE CULVERT
  238     KM        BASED ON COE ASSUMED CAPACITY
  239     KM        CAESARS
  240     DT   F16OF
  241     DI      0    6000   12000   20000
  242     DQ      0       0    6000   14000

  243     KK    F16 ROUT F16 THRU F17 (FLWA0798-0823)
  244     RK   3550    .009    .015            TRAP      48       0

  245     KK      .  (FLWA0773)
  246     RK   1320   .0091    .020            TRAP      80      10

  247     KK      .  (FLWA0648-0798)
  248     RK   7760   .0064    .040            TRAP      30       2
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  249     KK     F17 RUNOFF FROM F17
  250     BA     .65
  251     LS       0    75.5       0       0      98       0
  252     UK     900    .057     .15      51
  253     UK     600    .010     .10      49
  254     RK    1000    .010    .025    .040                    1
  255     RK    1500    .010    .027     .09                    1
  256     RK   11400   .0110    .030            TRAP     100       5      NO

  257     KK     F17 COMBINE     F17     AND  F16
  258     KM       WINNICK,HUGHES
  259     HC       2
          *  *** NO CONTRIBUTION FROM UPPER BLUE DIAMOND FOR FLAMINGO/RED ROCK STORM ***

  260     KK      T8 RUNOFF FROM T8
  261     BA    1.22
  262     LS       0    65.6
  263     UK     60C    .015    0.15     100
  264     RK    200C    .018    .030     .14                    1
  265     RK   1800C   .0161    .030            TRAP      75       5      NO

  266     KK      T9 ROUTE T8 TO T9
  267     RM       2     .52    0.15

  268     KK      T9 RUNOFF FROM T9
  269     BA    0.87
  270     LS       C    73.1
  271     UK     60C    .010    0.15     100
  272     RK    400C    .010    .030    0.12                    1
  273     RK   1020C   .0134    .030            TRAP      30       5

  274     KK      T9 COMBINE T8 AND T9
  275     HC       2

  276     KK    T9OF DIVERT OVERFLOW
  277     DT    T9OF
  278     DI       0    5480   11000   15000
  279     DQ       0       0    2700    2700

  280     KK     T10 ROUTE T9 THRU T10
  281     RM       3    0.21    0.10

  282     KK      T4 RUNOFF FROM T4
  283     BA    3.22
  284     LS       0    87.6
  285     UK     500    .015    0.15     100
  286     RK    2700   .0190    .030    0.25                    1
  287     RK   20000   .0185    .030            TRAP      75       5      NO
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

288       KK      T5 ROUTE T4 TO T5
289       RK    6500    .013    .030           TRAP      30       2

290       KK      T5 RUNOFF FROM T5
291       BA    1.00
292       LS       0    87.0
293       UK     600    .010    0.15     100
294       RK    2500    .012    .030    0.21                      1
295       RK    6500    .013    .030           TRAP      30       2

296       KK      T5 COMBINE T4 AND T5
297       HC       2

298       KK      T6 ROUTE T5 TO T6
299       RK   10800    .012    .030           TRAP      30       5

300       KK      T6 RUNOFF FROM T6
301       BA    1.30
302       LS       0    86.9
303       UK     600    .010    0.15     100
304       RK    6000    .012    .030    .400                      1
305       RK   10800    .012    .030           TRAP      30       5

306       KK      T6 COMBINE T5 AND T6
307       HC       2

308       KK    T9OF RECALL T9OF
309       DR    T9OF

310       KK      T6 ROUTE T9OF THRU T6
311       RM       3    0.23    0.15

312       KK      T6 COMBINE T6 AND T9OF
313       HC       2

314       KK      T6 DIVERT OVERFLOW ALONG UPRR
315       KM         UPRR 114" CMP CULVERT - 750 CFS CAPACITY
316       DT    T6OF
317       DI       0     750    1500   10000
318       DQ       0       0     750    9250

319       KK     T10 ROUTE T6 THRU T10
320       RM       2    0.18    0.15

321       KK      T1 RUNOFF FROM T1
322       BA    1.56
323       LS       0      88
324       UK     600    .020    0.15     100
325       RK    4000   .0200    .030    0.28                      1
326       RK   13200    .017    .030           TRAP      50       5      NO
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

327       KK     T3 ROUTE T1 TO T3
328       RK  10000   .0106    .032           TRAP     30       5

329       KK     T3 RUNOFF FROM T3
330       BA   0.99
331       LS      0    78.9
332       UK    500    .010    0.15     100
333       RK   3000    .010    .030    0.16                     1
334       RK  10000   .0106    .032           TRAP     30       5

335       KK     T3 COMBINE T1 AND T3
336       HC      2

337       KK   T6OF RECALL DIVERTED OVERFLOW FROM T6
338       DR   T6OF

339       KK     T3 ROUTE T6OF THRU T3
340       RM      1    0.08    0.15

341       KK     T3 COMBINE T6OF AND T3
342       HC      2

343       KK   T3OF DIVERT FLOW IN EXCESS OF CULVERT CAPACITY
344       KM        BASED ON COE RATING CURVE FROM FEASIBILITY STUDY
345       KM        DQ FLOWS NORTHEASTERLY, REJOINING FW NEAR PARADISE RD
346       DT   T3OF
347       DI      0    1400    1900    3200    5500   19000
348       DQ      0       0     420    1650    3650   14700

349       KK    T10 ROUTE T3 THRU T10 (TRWA0272)
350       RK   3800   .0132    .040           TRAP    17.5       2

351       KK    T10 RUNOFF FROM T10
352       BA   0.82
353       LS      0    78.0       0       0      98       0
354       UK    700    .013    0.15      78
355       UK    400    .011     .10      22
356       RK   1100    .012    .020    .120                     1
357       RK   3000    .008    .020     .50                     1
358       RK   3500   0.010    .030           TRAP     30       2

359       KK    T10 COMBINE T3, T6, T9 AND T10
360       HC      4

361       KK   T10R ROUT T10 THRU T11 (TRWA0235)
362       RK   1160    .010    .015           TRAP     32       0

363       KK      .  (TRWA0145-0218)
364       RK   4700   .0095    .030           TRAP     90     1.5
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  365     KK     T11 RUNOFF FROM T11
  366     BA    1.09
  367     LS       0    68.6       0       0      98       0
  368     UK     800    .010    0.30      61
  369     UK     500    .010    0.10      39
  370     RK    3200   .0080    .020    0.17                    1
  371     RK    5400   .0104    .030            TRAP     100       5      NO

  372     KK     T11 COMBINE T11 AND T10R
  373     HC       2

  374     KK    T11R ROUT  T11 THRU T12 (TRWA0117)
  375     RK    1130   .0088    .015            TRAP     1.5       2

  376     KK       .   (TRWA0000-0034+)
  377     RK    6500    .012    .040            TRAP     100     2.5

  378     KK     T12 RUNOFF FROM T12
  379     BA    0.77
  380     LS       0    74.4       0       0      98       0
  381     UK     500    .008    0.18      65
  382     UK     200    0.01    0.10      35
  383     RK    2200    .008    .023    0.12                    1
  384     RK    3000    .007    .025     .24              20       2
  385     RK    6600   .0103    .032                      30       5

  386     KK     T12 ADD T12 AND T11R
  387     HC       2

  388     KK    T3OF RECALL DIVERSION FROM T3
  389     DR    T3OF

  390     KK     T12 ROUTE T3OF TO T12
  391     RM      20    1.99    0.10

  392     KK     T12 COMBINE T3OF AND T12
  393     HC       2
          *  *** DATA FOR SUBAREAS MNW-B THRU MNW-M TAKEN FROM NIMBUS HEC-1 ANALYSIS
          *      FOR NORTHWEST MCCARRAN AIRPORT DRAINAGE STUDY (WITH SMALL MODIFICATIONS)

  394     KK   MNW-B RUNOFF FROM B
  395     BA    0.68
  396     LS              65      10
  397     UD     2.4

  398     KK    DIVE FLOW SPLIT AT I-15; BCULV IS FLOW CONVEYED BY CULVERT
  399     DT   BCULV
  400     DI       0      22     100     500
  401     DQ       0      22      22      22
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

402       KK   RDIVB ROUTE DIVB TO CULVERT AT I15 AND C
403       KM        CHANGED RK TO RD SO 9/90 HEC-1 VERSION WOULD RUN
404       RD     600    .004     .05       0       0.      5

405       KK   MNW-C RUNOFF AT C
406       BA    0.69
407       LS             65      17
408       UD     2.0

409       KK   MNW-C COMBINE DIVB+C
410       HC       2

411       KK   MNW-C PONDING STORAGE ROUTING AT I-15
412       RS       1    STOR       0
413       SA       0     .28     .92    2.02    3.19    3.44    5.37    9.09
414       SQ       0       8      25      35      40      78     360    1342
415       SE      54      55      56      57   57.43      58      59      60

416       KK    DIVC FLOW SPLIT AT C THRU AND AROUND CULVERT
417       DT   CCULV
418       DI       0       8      25      35      40      78     360    1342
419       DQ       0       8      25      35      40      45      55      65
          *  KK RDIVC ROUTE DIVC NORTH TO D
          *  COMMENTED OUT ROUTING SO 9/90 HEC-1 VERSION WOULD RUN
          *  RK   650    .004     .05       0       0       0      20

420       KK   MNW-D RUNOFF FROM D
421       BA     .05
422       LS             66      10
423       UD     .40

424       KK   MNW-D COMBINE DIVC AND D
425       HC       2

426       KK    DIVD DIVERT FLOW TO NORTH; DCULV CROSSES I-15
427       DT   DCULV
428       DI       0      28     100     500
429       DQ       0      28      28      28

430       KK   RDIVD ROUTE DIVERTED FLOW NORTH TO E
431       KM        CHANGED RK TO RD SO 9/90 HEC-1 VERSION WOULD RUN
432       RD     800    .004     .05       0       0       0      20

433       KK   MNW-E RUNOFF FROM E
434       BA    0.05
435       LS             65      18
436       UD    0.38

437       KK   MNW-E COMBINE DIVD + E
438       HC       2
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

439       KK   ECULW DIVIDE FLOW AT I-15 CULVERT; ECULV CROSSES I-15 INTO MNW-I
440       DT   ECULW
441       DI       0.      28     100     500
442       DQ       0       28      28      28

443       KK   RDIVE ROUTE FLOW FROM DIVE NORTH ALONG I-15
444       KM         CHANGED RK TO RD SO 9/90 HEC-1 VERSION WOULD RUN
445       RD    1200    .007     .05       0       0       0       4

446       KK  MNW-FG RUNOFF FROM FG
447       BA    0.36
448       LS              66      17
449       UD    1.24

450       KK  MNW-FG COMBINE EDIV + FG
451       HC       2

452       KK    DIVG DIVERT FLOW NORTH; GCULV CROSSES I-15 INTO SUBAREA I
453       DT   GCULV
454       DI       0      50      60     100     150     250
455       DQ       0      50      60      60      60      60

456       KK   RDIVG ROUTE DIVG NORTH TO AIRPORT CHANNEL
457       KM         CHANGED RK TO RD SO 9/90 HEC-1 VERSION WOULD RUN
458       RD    220C    .009    .040       0       0       0      10

459       KK  MNW-J1 RUNOFF FROM J1
460       BA    2.37
461       LS              70
462       UD    2.67

463       KK  MNW-J2 ROUTE J1 TO J2
464       RK   1000C    .012     .04                      10       2

465       KK  MNW-J2 RUNOFF FROM J2
466       BA    1.21
467       LS              70      10
468       UD    1.22

469       KK  MNW-J2 COMBINE J1+J2
470       HC       2

471       KK     CP1 COMBINE J2 + RDIVG
472       HC       2

473       KK    RCP1 ROUTE CP1 TO LAS VEGAS BLVD (CP3)
474       RK    260C    .008     .04       0       0      20       1

475       KK    RTNE RETURN FLOW FROM CULVERT E
476       DR   ECULW
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

477       KK    RTNE DUMMY SUBAREA TO GET 1988 HEC1 TO RUN (NEEDS NON-ZERO AREA)
478       BA    0.01
479       LS       0      50
480       UD     0.1

481       KK    RTNE COMBINE DIVERSION RECALL WITH DUMMY SUBAREA
482       HC       2

483       KK   RRTNE ROUTE ECULV TO OUTLET OF I
484       RK    3900    .013     .05       0       0       0      50

485       KK    RTNG RETURN FLOW FROM CULVERT G
486       DR   GCULV

487       KK    RTNG DUMMY SUBAREA TO GET 1988 HEC1 TO RUN (NEEDS NON-ZERO AREA)
488       BA    0.01
489       LS       0      50
490       UD     0.1

491       KK    RTNG COMBINE DIVERSION RECALL WITH DUMMY SUBAREA
492       HC       2

493       KK   RRTNG ROUTE GCULV TO OUTLET OF I
494       RK    2500    .013    0.05       0       0       0      50

495       KK  MNW-I1 RUNOFF FROM I1
496       BA    0.25
497       LS              78      15
498       UD    0.58

499       KK     CP2 COMBINE HYDROGRAPHS AT LAS VEGAS BLVD AND UPRR
500       HC       3

501       KK    RCP2 ROUTE CP2 TO AIRPORT CHANNEL AND LAS VEGAS BLVD (CP3)
502       RK    2500    .009     .05       0       0       0       4

503       KK  MNW-I2 RUNOFF FROM I2
504       BA    0.14
505       LS              77       1
506       UD    0.38

507       KK     CP3 COMBINE FLOW FROM B-I2 AT LAS VEGAS BLVD AND AIRPORT CHANNEL
508       HC       3

509       KK    RCP3 ROUTE CPE TO OUTLET OF K
510       RK    7300     .01     .04       0       0       5       2

511       KK   MNW-K RUNOFF FROM K
512       BA    1.43
513       LS              66      25
514       UD    1.55
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

 515      KK     CP4 COMBINE HYDROGRAPHS FOR AIRPORT CHANNEL AND TAXIWAY S
 516      HC       2

 517      KK    RCP4 ROUTE FLOW TO TROPICANA BLVD
 518      RK    3300     .01     .03       0       0      20       4

 519      KK   MNW-L RUNOFF FROM L
 520      BA    0.27
 521      LS              77      60
 522      UD    0.42

 523      KK   MNW-M RUNOFF FROM M
 524      BA    0.49
 525      LS              84      56
 526      UD    0.83

 527      KK     CP5 COMBINE ALL HYDROGRAPHS AT OUTLET AT BOX CULVERT AT TROPICANA
 528      HC       3
          *  *** END OF DATA FROM NIMBUS NORTHWEST MCCARRAN HEC-1 DATA ***
          *

 529      KK     T12 ROUTE MNW-L TO T12 (TRMC0009)
 530      RK    2640   .0045    .040            TRAP      18     1.5

 531      KK       .   (TRWA0000-0034)
 532      RK    5000    .012    .040            TRAP     100     2.5

 533      KK     T12 COMBINE MNW-L AND T12
 534      KM         AIRPORT CHANNEL + TROPICANA WASH
 535      HC       2

 536      KK     F17 COMBINE F17 AND T12
 537      KM         FLAMINGO WASH + TROPICANA WASH
 538      KM        FLAM/TROP CONF.
 539      HC       2

 540      KK     F18 ROUTE F17 AND T12 THRU F18
 541      KM           (FLWA0593)
 542      RK    1430   .0182    .040            TRAP      50       1

 543      KK       .   (FLWA0564+FLWA0620) COMBINED DUE TO RK PROBLEMS WITH NEW HEC1
 544      RK    1695   .0045    .015            TRAP      50       1

 545      KK      R4 RUNOFF FROM R4
 546      BA    2.28
 547      LS       0    86.5
 548      UD    0.34

 549      KK   F15OF RECALL F15 OVERFLOW
 550      DR   F15OF
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

551       KK  F15OFR ROUT F15OF THRU R4
552       RM       3    0.24       0

553       KK      R4 COMBINE R4 AND F15 OVERFLOW
554       HC       2

555       KK   F16OF RECALL F16 OVERFLOW
556       DR   F16OF

557       KK  F16OFR ROUT F16OF THRU R4
558       RM       3    0.24       0

559       KK      R4 COMBINE R4 AND F16 OVERFLOW
560       HC       2

561       KK     F18 ROUT R4 THRU F18
562       RM      11    0.88    0.10

563       KK     F18 RUNOFF FROM F18
564       BA    0.87
565       LS       0    72.0       0       0      98       0
566       UK     500    .010    0.20      52
567       UK     200    .015    0.10      48
568       RK    1000    .010    .023    .014                      1
569       RK    1000   .0010    .023    .050                      1
570       RK   15900   .0090    .020            TRAP      30      1

571       KK     F18 COMBINE R4 AND F18
572       HC       2

573       KK     F24 RUNOFF FROM F24
574       BA    1.03
575       LS       0    66.3       0       0      98       0
576       UK     300    .010    0.20      46
577       UK     100    .015    0.10      54
578       RK    1300    .013    .020    .035                      1
579       RK    3000   .0075    .020    .014                      1
580       RK    4400    .018    .030            TRAP      50      3      NO

581       KK     F18 COMBINE F18, F24, AND F17
582       KM         SPENCER
583       HC       3

584       KK    F18R ROUT F18 THRU F20A (FLWA0400-0493)
585       RK    7970   .0065    .040            TRAP      60      2

586       KK    F20A RUNOFF FROM F20A
587       BA    0.81
588       LS       0    70.7       0       0      98       0
589       UK    1000    .010    0.25      77
590       UK     250     .02    0.15      23
591       RK    1900    .001    .020    0.05                      1
592       RK    2000    .015    .020    0.14
593       RK    5600   .0108    .033                      40      4
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  594     KK    F20A COMBINE F20A AND F18R
  595     HC      2

  596     KK    F20B ROUTE F20A THRU F20B (FLWA0376)
  597     RK    1210   .0148    .040            TRAP      50       1

  598     KK       .   (FLWA0348)
  599     RK    1430    .007    .015            TRAP      60       1

  600     KK     F19 RUNOFF FROM F19
  601     BA    1.54
  602     LS       0    70.8       0       0      98       0
  603     UK     500    .008    0.25      51
  604     UK     100    .015    0.10      49
  605     RK    1300    .010    .020     .04                      1
  606     RK    2500    .010    .020    .019                      1
  607     RK   11400   .0118    .020            TRAP      40       1      NO

  608     KK    F20B ROUTE F19 THRU F20B
  609     RM      2    0.20    0.20

  610     KK    F20B RUNOFF FROM F20B
  611     BA    0.73
  612     LS       0      82
  613     UD    0.25

  614     KK    F20B COMBINE F19 AND F20B
  615     HC      2

  616     KK      VB VAN BUSKIRK DRAINAGE AREA
  617     KM         SINGLE SUBAREA TO SIMULATE RUNOFF FROM ENTIRE VAN BUSKIRK WATERSHED.
  618     KM         CN AND LAG SELECTED TO MATCH PEAK Q AND TIME-TO-PEAK
  619     KM         FROM VAN BUSKIRK PREDESIGN STUDY BY JMM.
  620     BA    4.58
  621     LS              78
  622     UD    0.50

  623     KK    F20B COMBINE VAN BUSKIRK AREA, F20A AND F20B
  624     KM       D/S FROM D1
  625     HC      3

  626     KK     F22 ROUTE F20B THRU F22 (FLWA0258-0274)
  627     RK    4700   .0110    .030                      70     2.5

  628     KK     F21 RUNOFF FROM F21
  629     BA    1.27
  630     LS       0    77.1       0       0      98       0
  631     UK     300    .010    0.25      49
  632     UK      60    .020     .10      51
  633     RK    1300    .010    .020    .019                      1
  634     RK    1750    .008    .020    0.08                      1
  635     RK   16000   .0128    .020            TRAP      40       1      NO
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  636     KK     F21 DIVERT ACROSS BLDR HWY AT OAKEY
  637     DT   OAKEY
  638     DI       C   10000
  639     DQ       C    5000

  640     KK     F22 ROUTE F21 THRU F22
  641     RM       1    0.06    0.20

  642     KK     F22 RUNOFF FROM F22
  643     BA    3.43
  644     LS       0    74.9       0       0      98       0
  645     UK     700    .008    0.25      51
  646     UK      60    .015     .10      49
  647     RK    1500    .010    .020    .093                      1
  648     RK    3000    .008    .020    0.37                      1
  649     RK   29500    .0115   .020            TRAP      40      1      NO

  650     KK     F22 COMBINE F20B, F21 AND F22
  651     KM       BOULDER HWY
  652     HC       3

  653     KK     F23 ROUTE F22 THRU F23 (FLWA0228)
  654     RK    1430    .014    .040            TRAP      50      1

  655     KK       .   (FLWA0175)
  656     RK    2690    .0007   .040            TRAP     100      1

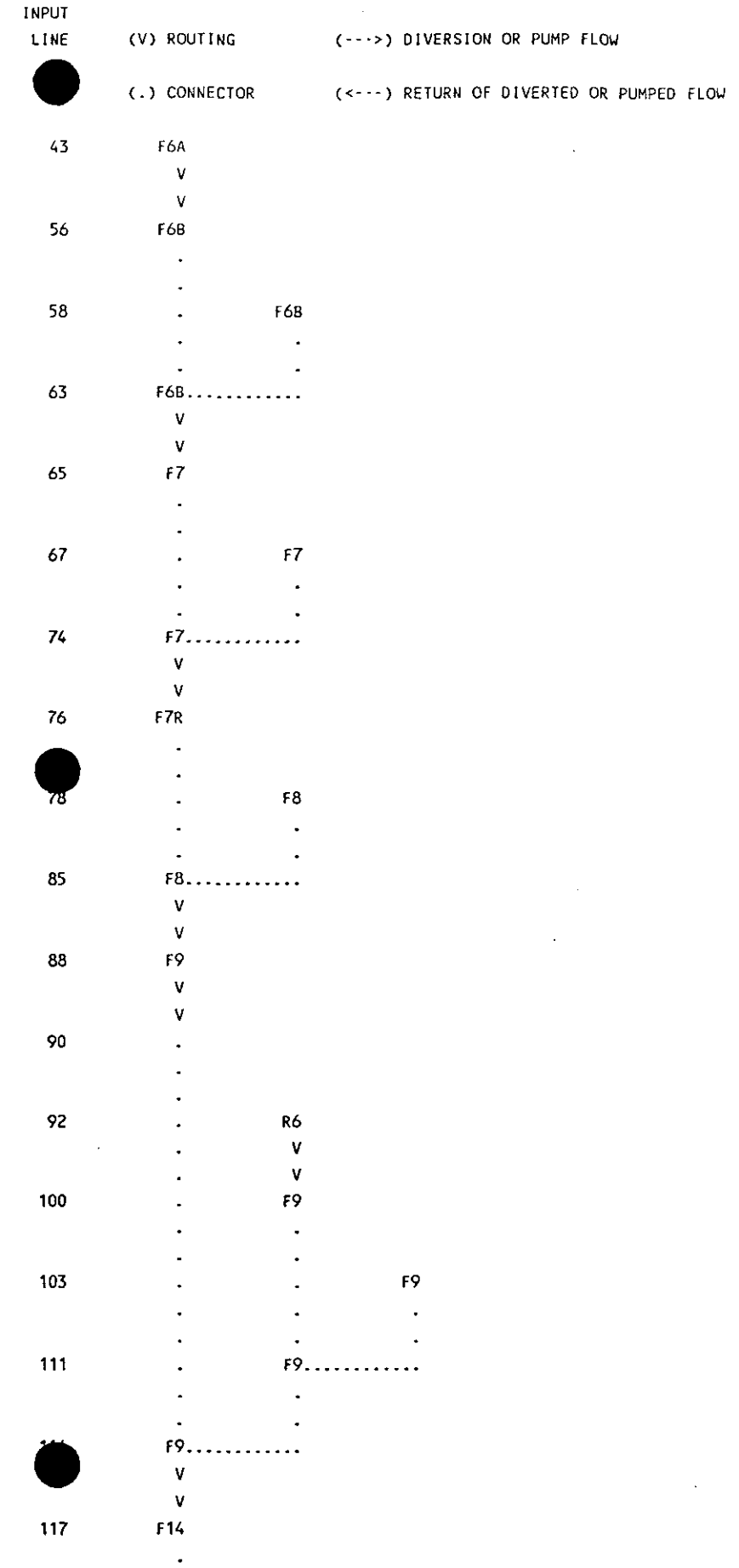
  657     KK       .   (FLWA0079)
  658     RK    5020    .0096   .040            TRAP      50      1

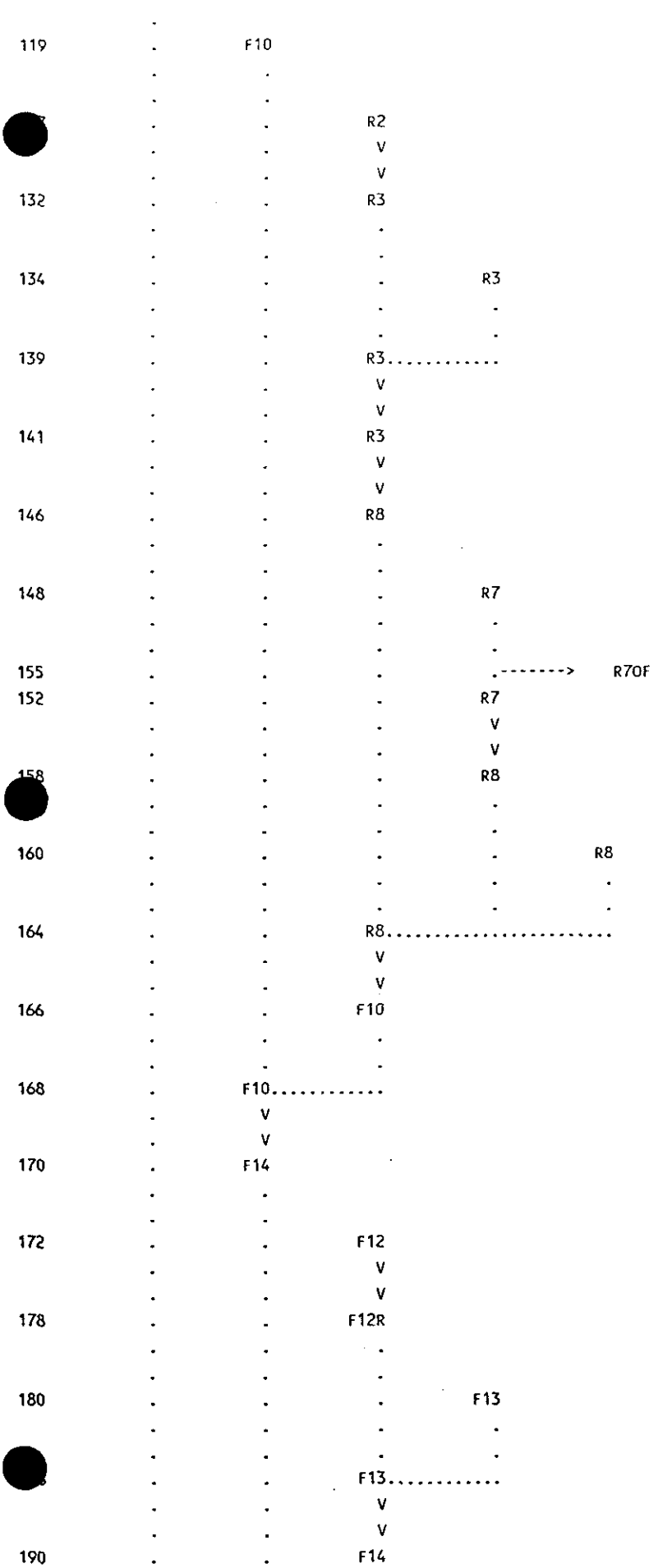
  659     KK       .   (FLWA0000)
  660     RK    4120    .0049   .040            TRAP     107      2

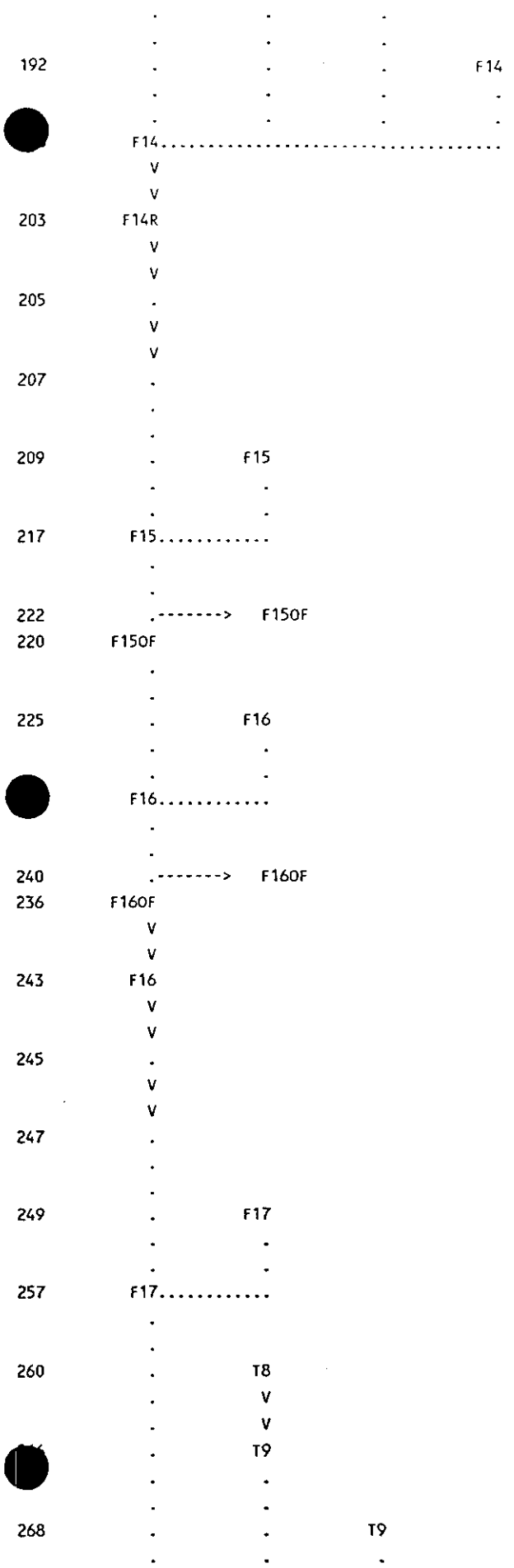
  661     KK     F23 RUNOFF FROM F23
  662     BA    1.92
  663     LS       0    74.4                     98
  664     UK     500     .01    0.25      70
  665     UK     100    .015     .10      30
  666     RK    2600    .005     .02    .037    TRAP      20      1
  667     RK    2200   .0018     .02    0.21    TRAP      40      1
  668     RK   13700   .0075    .032            TRAP      50      2      NO

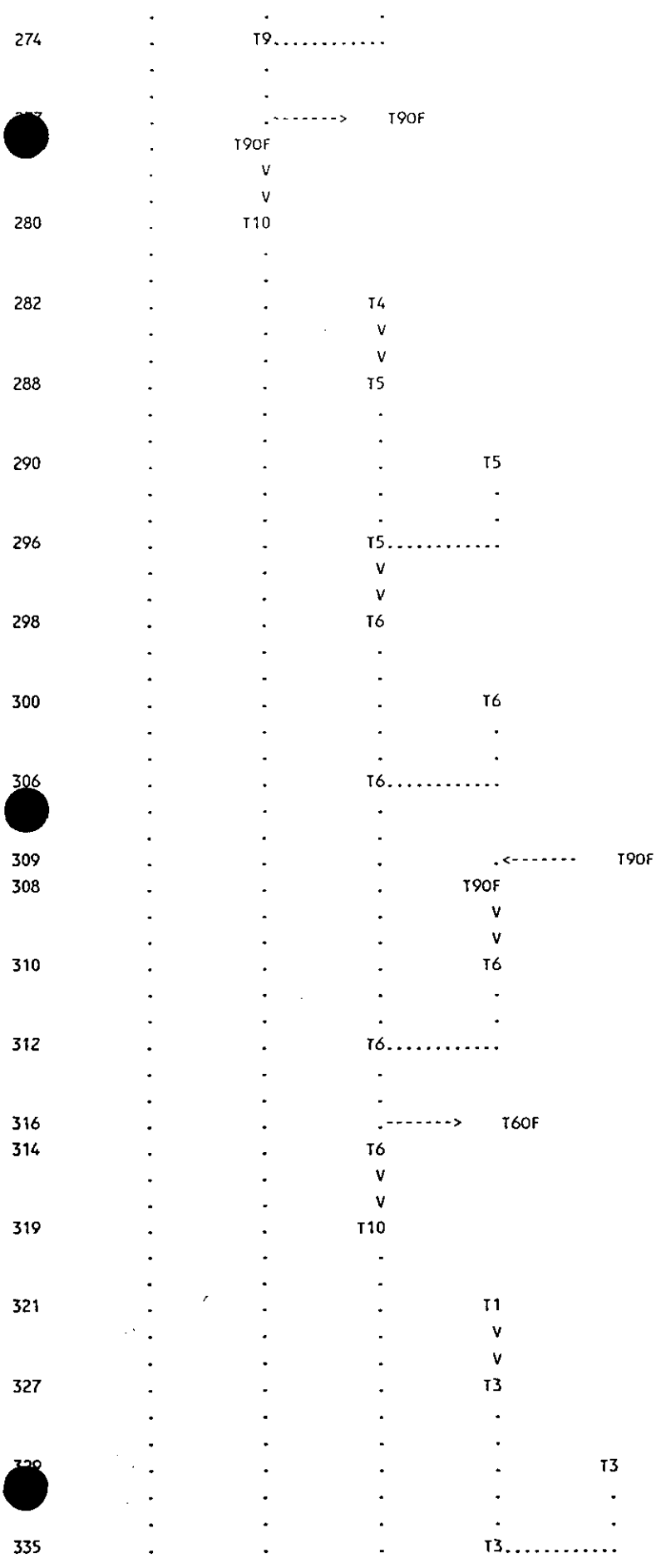
  669     KK     F23 COMBINE F22 AND F23
  670     KM       CONFLUENCE OF FLAMINGO WASH WITH LAS VEGAS WASH
  671     KM       NELLIS,DESERT ROSE
  672     HC       2
  673     ZZ
```

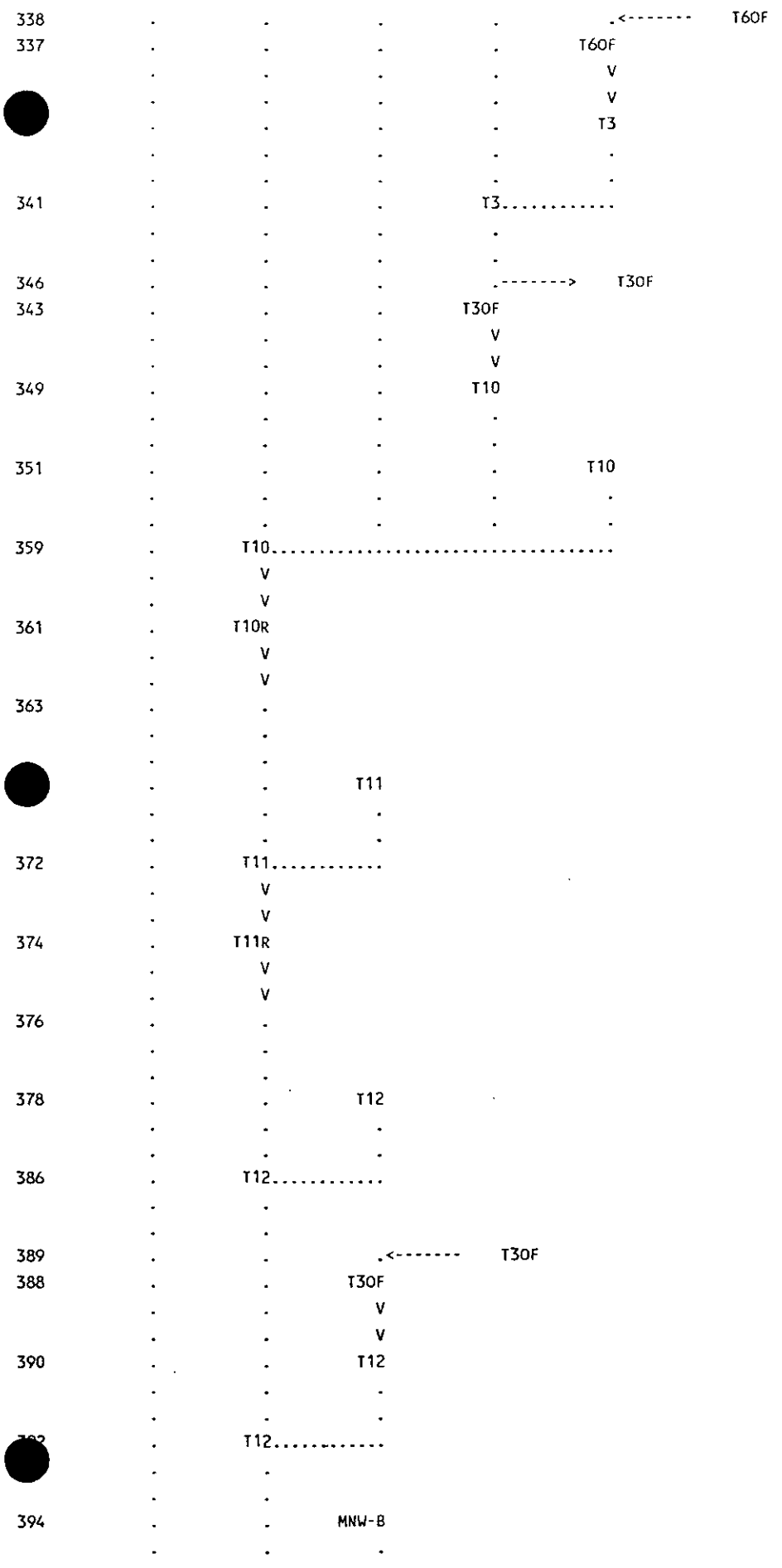
SCHEMATIC DIAGRAM OF STREAM NETWORK

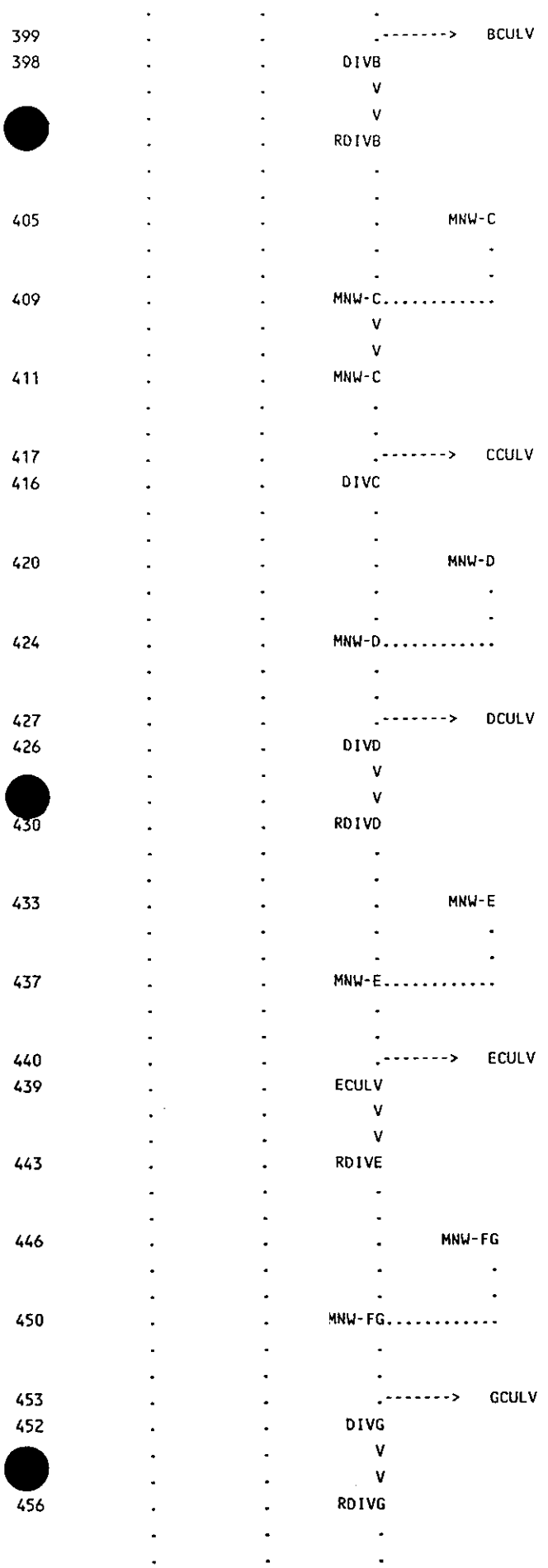


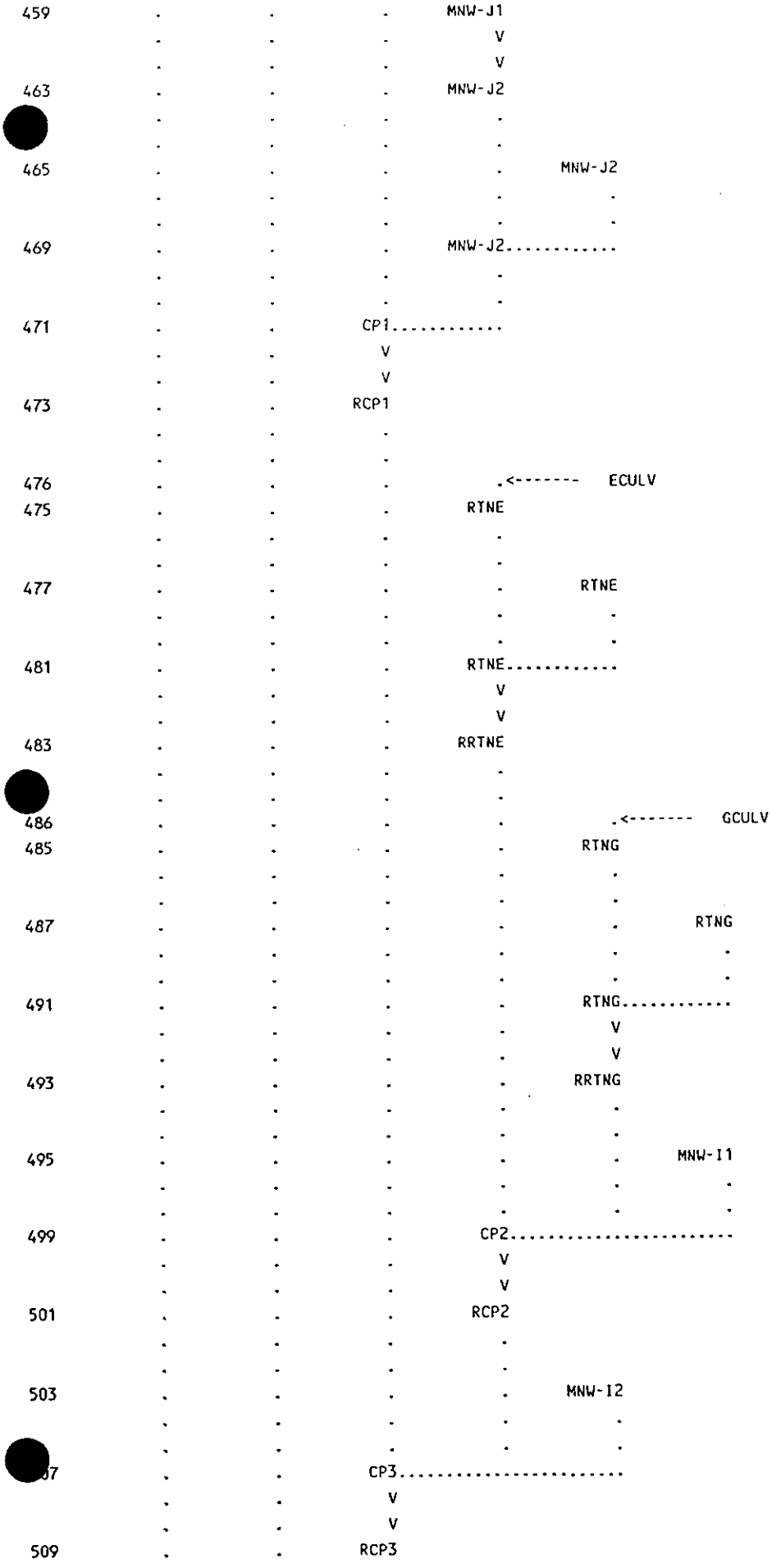

119
F10
R2
132
R3
134
R3
139
R3
141
R3
146
R8
148
R7
155
R70F
152
R7
158
R8
160
R8
164
R8
166
F10
168
F10
170
F14
172
F12
178
F12R
180
F13
F13
190
F14

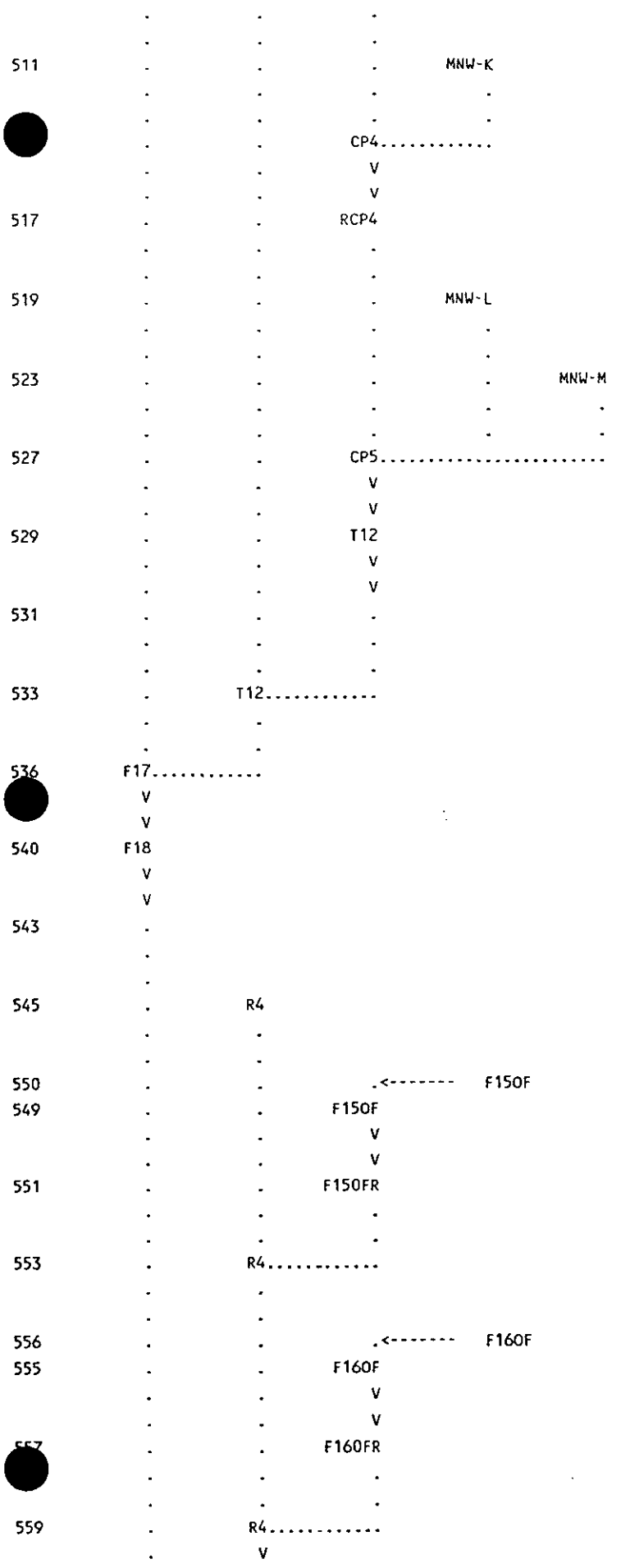

192
F14
F14
203
F14R
205
207
209
F15
217
F15
222
F15OF
220
F15OF
225
F16
F16
240
F16OF
236
F16OF
243
F16
245
247
249
F17
257
F17
260
T8
T9
268
T9

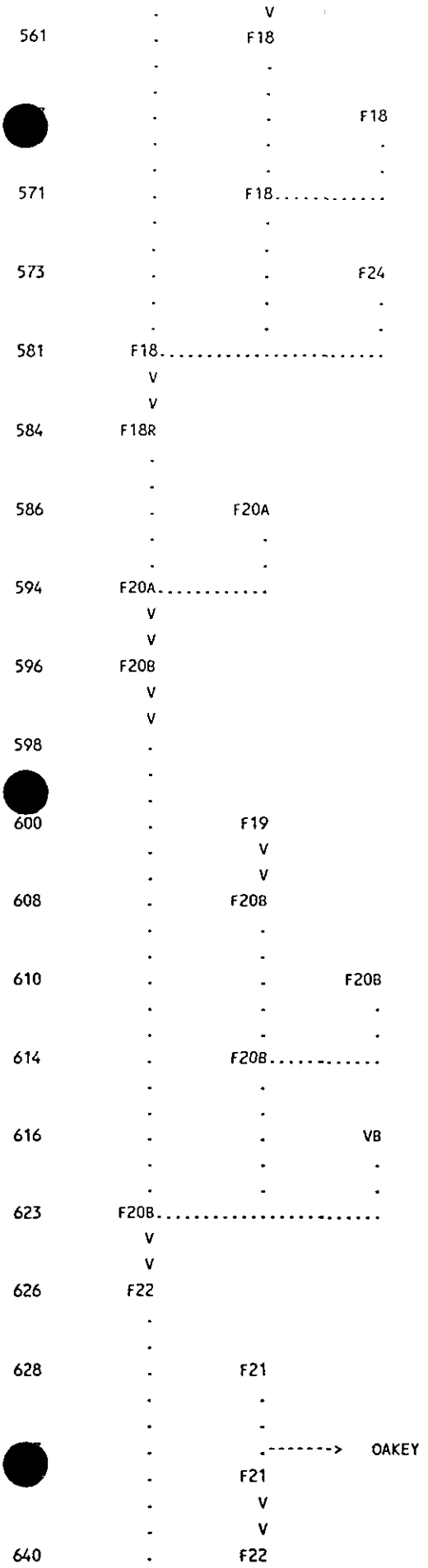

274
T9
T90F
T90F
280
T10
282
T4
288
T5
290
T5
296
T5
298
T6
300
T6
306
T6
309
T90F
308
T90F
310
T6
312
T6
316
T60F
314
T6
319
T10
321
T1
327
T3
T3
335
T3

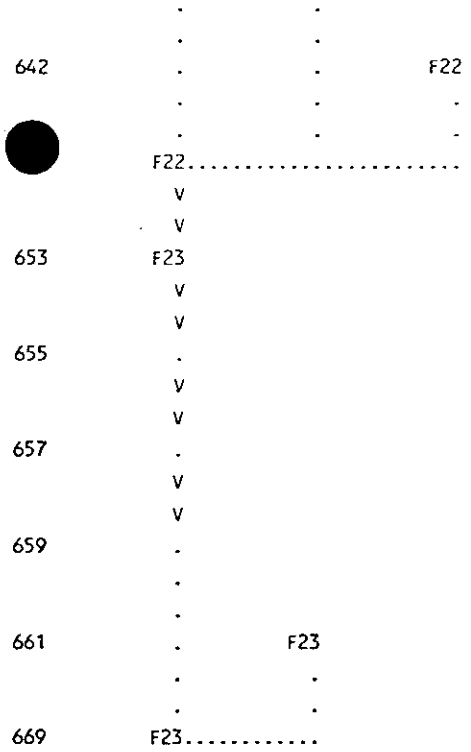

338 .<-------- T60F
337 T60F
V
V
T3
341 T3.....
346 .--------> T30F
343 T30F
V
V
349 T10
351 T10
359 T10.....
V
V
361 T10R
V
V
363
T11
372 T11.....
V
V
374 T11R
V
V
376
378 T12
386 T12.....
389 .<-------- T30F
388 T30F
V
V
390 T12
394 MNW-B


399 BCULV
398 DIVB
405 MNW-C
409 MNW-C
411 MNW-C
417 CCULV
416 DIVC
420 MNW-D
424 MNW-D
427 DCULV
426 DIVD
430 RDIVD
433 MNW-E
437 MNW-E
440 ECULV
439 ECULV
443 RDIVE
446 MNW-FG
450 MNW-FG
453 GCULV
452 DIVG
456 RDIVG


459
MNW-J1
463
MNW-J2
465
MNW-J2
469
MNW-J2
471
CP1
473
RCP1
476
ECULV
475
RTNE
477
RTNE
481
RTNE
483
RRTNE
486
GCULV
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RTNG
487
RTNG
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RTNG
493
RRTNG
495
MNW-I1
499
CP2
501
RCP2
503
MNW-I2
CP3
509
RCP3


511
MNW-K
CP4
517
RCP4
519
MNW-L
523
MNW-M
527
CP5
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T12
531
533
T12
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F17
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F18
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545
R4
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F150F
551
F150FR
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R4
556
555
F160F
557
559
R4


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623
626
628
640
F18
F18
F18
F24
F18
F18R
F20A
F20A
F20B
F19
F20B
F20B
F20B
VB
F20B
F22
F21
OAKEY
F21
F22



(***) RUNOFF ALSO COMPUTED AT THIS LOCATION

```
*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*            SEPTEMBER 1990             *
*             VERSION 4.0               *
*                                       *
*  RUN DATE  10/06/1997  TIME  13:05:44 *
*                                       *
*****************************************
```

```
*****************************************
*                                       *
*    U.S. ARMY CORPS OF ENGINEERS       *
*    HYDROLOGIC ENGINEERING CENTER      *
*          609 SECOND STREET            *
*       DAVIS, CALIFORNIA 95616         *
*           (916) 756-1104              *
*                                       *
*****************************************
```

INPUT FILE = F-FLC.DAT BY: JEP DATE: 10/06/97
FLAMINGO WASH FIS RESTUDY GCW MODIFICATIONS

REVISED DUPLICATED FIS MODEL F100R.DAT
DELETE RED ROCK WATERSHED TO SIMULATE EXPANSION OF RR DET. BASIN
DELETE UPPER FLAMINGO DET. BASIN WATERSHED TO SIMULATE
STORM CENTERING BELOW BASIN

CLARK COUNTY FLOOD CONTROL DISTRICT MASTER PLAN UPDATE
RED ROCK/FLAMINGO/TROPICANA WATERSHED
EXISTING DRAINAGE SYSTEM WITH PRESENT DEVELOPMENT
FLAMINGO/TROPICANA STORM (NO UPPER BLUE DIAMOND)- MAIN CHANNEL RUN
100-YEAR 6-HR STORM (SDN #5)
JMM OCTOBER 1990

BASIC DATA FILE BASED ON COE FILE S10P40X.
MODIFICATIONS ADDED FROM B&V RED ROCK BASIN AND UPPER FLAMINGO
BASIN HEC-1 RUNS; NIMBUS NORTHWEST MCCARRAN AIRPORT HEC-1 RUNS;
AND SUBBASIN MODIFICATIONS DUE TO RECENT DEVELOPMENT.

COE MUSKINGUM ROUTING CONVERTED TO KINEMATIC FOR EXISTING
IMPROVED CHANNELS FROM FACILITY INVENTORY.

PB CARDS CONTAIN POINT PRECIPITATION. DARF'S FROM CCRFCD MANUAL
BASED ON STORM AREAS FOR CONCENTRATION POINTS AS FOLLOWS:

SUBBASIN	AREA (SQMI)	DARF
RAINBOW	3.38	0.92
JONES	5.79	0.90
DECATUR,	15.71	0.82
UPPR,I15,CAESARS	17-19	0.80
WINNICK,HUGHES		
FL/TROP CONF.,	38-43	0.71
SPENCER		
D/S FROM DI	50.89	0.68
BLDR HWY,NELLIS,	55-57	0.67
DESERT ROSE		

41 IO OUTPUT CONTROL VARIABLES

IPRNT	5	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE

IT HYDROGRAPH TIME DATA

```
                NMIN          5  MINUTES IN COMPUTATION INTERVAL
               IDATE      1    0  STARTING DATE
               ITIME         0000  STARTING TIME
                  NQ          200  NUMBER OF HYDROGRAPH ORDINATES
              NDDATE      1    0  ENDING DATE
              NDTIME         1635  ENDING TIME
              ICENT           19  CENTURY MARK

          COMPUTATION INTERVAL      .08 HOURS
              TOTAL TIME BASE   16.58 HOURS

    ENGLISH UNITS
         DRAINAGE AREA          SQUARE MILES
         PRECIPITATION DEPTH    INCHES
         LENGTH, ELEVATION      FEET
         FLOW                   CUBIC FEET PER SECOND
         STORAGE VOLUME         ACRE-FEET
         SURFACE AREA           ACRES
         TEMPERATURE            DEGREES FAHRENHEIT

JP       MULTI-PLAN OPTION
              NPLAN           1  NUMBER OF PLANS

JR       MULTI-RATIO OPTION
           RATIOS OF PRECIPITATION
           .92       .90       .82       .80       .71       .68       .67


 *** FDKRUT - NEWTON RAPHSON FAILEDFIXED POINT ITERATION USED - ITERATION=  1


 *** FDKRUT - NEWTON RAPHSON FAILEDFIXED POINT ITERATION USED - ITERATION=  1


 *** FDKRUT - NEWTON RAPHSON FAILEDFIXED POINT ITERATION USED - ITERATION=  1


 *** FDKRUT - NEWTON RAPHSON FAILEDFIXED POINT ITERATION USED - ITERATION=  1


 *** FDKRUT - NEWTON RAPHSON FAILEDFIXED POINT ITERATION USED - ITERATION=  1


 *** FDKRUT - NEWTON RAPHSON FAILEDFIXED POINT ITERATION USED - ITERATION=  1


 *** FDKRUT - NEWTON RAPHSON FAILEDFIXED POINT ITERATION USED - ITERATION=  1
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*** FDKRUT - NEWTON RAPHSON FAILEDFIXED POINT ITERATION USED - ITERATION= 1

*** FDKRUT - NEWTON RAPHSON FAILEDFIXED POINT ITERATION USED - ITERATION= 1

*** FDKRUT - NEWTON RAPHSON FAILEDFIXED POINT ITERATION USED - ITERATION= 1

*** FDKRUT - NEWTON RAPHSON FAILEDFIXED POINT ITERATION USED - ITERATION= 2

*** FDKRUT - NEWTON RAPHSON FAILEDFIXED POINT ITERATION USED - ITERATION= 1

*** FDKRUT - NEWTON RAPHSON FAILEDFIXED POINT ITERATION USED - ITERATION= 1

*** FDKRUT - NEWTON RAPHSON FAILEDFIXED POINT ITERATION USED - ITERATION= 1

*** FDKRUT - NEWTON RAPHSON FAILEDFIXED POINT ITERATION USED - ITERATION= 2

*** FDKRUT - NEWTON RAPHSON FAILEDFIXED POINT ITERATION USED - ITERATION= 2

*** FDKRUT - NEWTON RAPHSON FAILEDFIXED POINT ITERATION USED - ITERATION= 2

*** FDKRUT - NEWTON RAPHSON FAILEDFIXED POINT ITERATION USED - ITERATION= 1

*** FDKRUT - NEWTON RAPHSON FAILEDFIXED POINT ITERATION USED - ITERATION= 1

*** FDKRUT - NEWTON RAPHSON FAILEDFIXED POINT ITERATION USED - ITERATION= 2

*** FDKRUT WARNING TIME STEP CALCULATION FAILED TO CONVERGE. STABILITY PROBLEMS MAY RESULT

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PEAK FLOW AND STAGE (END-OF-PERIOD) SUMMARY FOR MULTIPLE PLAN-RATIO ECONOMIC COMPUTATIONS
FLOWS IN CUBIC FEET PER SECOND, AREA IN SQUARE MILES
TIME TO PEAK IN HOURS

OPERATION	STATION	AREA	PLAN		RATIOS APPLIED TO PRECIPITATION RATIO 1 .92	RATIO 2 .90	RATIO 3 .82	RATIO 4 .80	RATIO 5 .71	RATIO 6 .68	RATIO 7 .67
HYDROGRAPH AT	F6A	.55	1	FLOW	344.	333.	290.	280.	232.	216.	211.
				TIME	3.75	3.75	3.75	3.75	3.75	3.75	3.75
ROUTED TO	F6B	.55	1	FLOW	311.	301.	262.	252.	209.	195.	190.
				TIME	4.08	4.08	4.08	4.08	4.08	4.08	4.08
HYDROGRAPH AT	F6B	.85	1	FLOW	547.	529.	460.	443.	367.	342.	333.
				TIME	3.67	3.67	3.67	3.67	3.67	3.67	3.67
2 COMBINED AT	F6B	1.40	1	FLOW	717.	694.	602.	580.	479.	445.	435.
				TIME	3.75	3.75	3.75	3.75	3.75	3.75	3.75
ROUTED TO	F7	1.40	1	FLOW	676.	655.	569.	548.	453.	422.	411.
				TIME	4.08	4.08	4.08	4.08	4.08	4.08	4.08
HYDROGRAPH AT	F7	1.50	1	FLOW	608.	579.	473.	450.	335.	296.	288.
				TIME	4.00	4.00	4.08	4.08	4.17	4.25	4.25
2 COMBINED AT	F7	2.90	1	FLOW	1276.	1225.	1042.	997.	783.	713.	692.
				TIME	4.00	4.00	4.08	4.08	4.17	4.17	4.17
ROUTED TO	F7R	2.90	1	FLOW	1273.	1223.	1037.	994.	781.	710.	690.
				TIME	4.08	4.08	4.17	4.17	4.17	4.25	4.25
HYDROGRAPH AT	F8	.48	1	FLOW	75.	73.	65.	63.	55.	51.	51.
				TIME	3.58	3.58	3.67	3.67	3.67	3.67	3.67
2 COMBINED AT	F8	3.38	1	FLOW	1310.	1260.	1066.	1022.	806.	731.	711.
				TIME	4.08	4.08	4.17	4.17	4.17	4.25	4.25
ROUTED TO	F9	3.38	1	FLOW	1307.	1256.	1065.	1021.	802.	731.	710.
				TIME	4.08	4.08	4.17	4.17	4.17	4.25	4.25
ROUTED TO	.	3.38	1	FLOW	1301.	1252.	1059.	1015.	802.	728.	707.
				TIME	4.17	4.17	4.25	4.25	4.25	4.33	4.33
HYDROGRAPH AT	R6	1.51	1	FLOW	236.	224.	185.	175.	129.	115.	109.
				TIME	5.17	5.17	5.17	5.17	5.25	5.33	5.33
ROUTED TO	F9	1.51	1	FLOW	236.	224.	184.	175.	129.	114.	109.
				TIME	5.17	5.17	5.17	5.17	5.33	5.33	5.42
HYDROGRAPH AT	F9	.90	1	FLOW	224.	221.	197.	189.	162.	153.	150.
				TIME	3.67	3.67	3.67	3.67	3.75	3.75	3.75
2 COMBINED AT	F9	2.41	1	FLOW	347.	330.	272.	258.	194.	173.	166.
				TIME	5.08	5.08	5.17	5.17	5.17	5.25	5.25
2 COMBINED AT	F9	5.79	1	FLOW	1596.	1517.	1239.	1172.	898.	809.	783.

RAINBOW

JONES

				TIME	4.17	4.17	4.25	4.25	4.25	4.25	4.33
ROUTED TO	F14	5.79	1	FLOW	1568.	1492.	1222.	1157.	885.	798.	774.
				TIME	4.33	4.33	4.42	4.42	4.42	4.50	4.50
[redacted]RAPH AT	F10	1.17	1	FLOW	458.	454.	402.	395.	339.	319.	319.
				TIME	3.58	3.58	3.58	3.58	3.58	3.58	3.58
HYDROGRAPH AT	R2	2.01	1	FLOW	1127.	1082.	903.	859.	668.	607.	587.
				TIME	3.58	3.58	3.58	3.58	3.58	3.58	3.58
ROUTED TO	R3	2.01	1	FLOW	933.	895.	747.	711.	553.	503.	486.
				TIME	4.00	4.00	4.00	4.00	4.00	4.00	4.00
HYDROGRAPH AT	R3	2.63	1	FLOW	336.	319.	256.	241.	176.	156.	149.
				TIME	5.17	5.17	5.25	5.25	5.25	5.25	5.25
2 COMBINED AT	R3	4.64	1	FLOW	1245.	1185.	952.	897.	661.	588.	565.
				TIME	4.00	4.00	4.00	4.00	4.00	4.00	4.00
ROUTED TO	R3	4.64	1	FLOW	275.	263.	213.	202.	152.	136.	131.
				TIME	5.83	5.83	5.92	5.92	5.92	5.92	5.92
			** PEAK STAGES IN FEET **								
			1	STAGE	26.12	25.84	24.74	24.48	23.37	23.02	22.91
				TIME	5.83	5.83	5.92	5.92	5.92	5.92	5.92
ROUTED TO	R8	4.64	1	FLOW	275.	263.	213.	202.	152.	136.	131.
				TIME	5.92	5.92	5.92	5.92	5.92	5.92	6.00
H[redacted]RAPH AT	R7	1.39	1	FLOW	449.	430.	355.	337.	257.	232.	224.
				TIME	3.92	3.92	3.92	3.92	3.92	3.92	4.00
DIVERSION TO	R7OF	1.39	1	FLOW	125.	106.	31.	13.	0.	0.	0.
				TIME	3.92	3.92	3.92	3.92	.08	.08	.08
HYDROGRAPH AT	R7	1.39	1	FLOW	324.	324.	324.	324.	257.	232.	224.
				TIME	3.67	3.67	3.83	3.83	3.92	3.92	4.00
ROUTED TO	R8	1.39	1	FLOW	324.	324.	324.	324.	256.	231.	223.
				TIME	3.83	3.83	4.00	4.00	4.00	4.00	4.00
HYDROGRAPH AT	R8	.51	1	FLOW	126.	119.	93.	87.	61.	54.	52.
				TIME	3.75	3.75	3.83	3.83	3.83	5.00	5.00
3 COMBINED AT	R8	6.54	1	FLOW	626.	601.	501.	476.	371.	338.	327.
				TIME	5.17	5.17	5.17	5.17	5.17	5.17	5.17
ROUTED TO	F10	6.54	1	FLOW	622.	597.	499.	474.	370.	337.	326.
				TIME	5.25	5.25	5.25	5.25	5.25	5.25	5.25
2 COMBINED AT	F10	7.71	1	FLOW	764.	733.	621.	592.	475.	435.	423.
				TIME	5.00	5.00	3.67	3.67	3.67	3.67	3.67
ROUTED TO	F14	7.71	1	FLOW	762.	731.	614.	586.	466.	429.	416.
				TIME	5.08	5.08	5.08	5.08	5.08	5.08	3.67
[redacted]											
HYDROGRAPH AT	F12	.88	1	FLOW	395.	380.	315.	299.	230.	209.	201.
				TIME	4.00	4.00	4.00	4.08	4.17	4.17	4.17

ROUTED TO	F12R	.88	1	FLOW	382.	366.	305.	291.	224.	203.	196.	
				TIME	4.17	4.17	4.25	4.25	4.33	4.42	4.42	
HYDROGRAPH AT	F13	.55	1	FLOW	188.	182.	163.	158.	132.	123.	119.	
				TIME	4.92	4.92	4.92	4.92	5.00	5.00	5.00	
2 COMBINED AT	F13	1.43	1	FLOW	547.	524.	429.	408.	310.	288.	281.	
				TIME	4.17	4.17	4.25	4.25	4.33	5.00	5.00	
ROUTED TO	F14	1.43	1	FLOW	539.	516.	424.	404.	307.	286.	279.	
				TIME	4.33	4.33	4.42	4.42	4.50	5.08	5.08	
HYDROGRAPH AT	F14	.78	1	FLOW	169.	163.	136.	129.	94.	82.	78.	
				TIME	5.08	5.08	5.17	5.17	5.33	5.33	5.33	
4 COMBINED AT	F14	15.71	1	FLOW	2859.	2737.	2268.	2151.	1631.	1472.	1422.	DECATUR
				TIME	4.33	4.33	4.33	4.33	4.33	4.42	4.42	
ROUTED TO	F14R	15.71	1	FLOW	2849.	2726.	2257.	2142.	1631.	1470.	1419.	
				TIME	4.33	4.33	4.33	4.33	4.42	4.42	4.42	
ROUTED TO	.	15.71	1	FLOW	2844.	2723.	2256.	2141.	1626.	1468.	1417.	
				TIME	4.42	4.42	4.42	4.42	4.50	4.50	4.50	
ROUTED TO	.	15.71	1	FLOW	2839.	2717.	2249.	2135.	1625.	1465.	1414.	
				TIME	4.42	4.42	4.42	4.42	4.50	4.50	4.50	
HYDROGRAPH AT	F15	1.32	1	FLOW	410.	388.	313.	299.	231.	214.	207.	
				TIME	3.92	3.92	3.92	3.92	3.92	3.92	3.92	
3 COMBINED AT	F15	17.03	1	FLOW	3147.	3013.	2494.	2366.	1789.	1633.	1588.	UPRR
				TIME	4.42	4.42	4.42	4.42	4.50	5.25	5.25	
DIVERSION TO	F15OF	17.03	1	FLOW	0.	0.	0.	0.	0.	0.	0.	
				TIME	.08	.08	.08	.08	.08	.08	.08	
HYDROGRAPH AT	F15OF	17.03	1	FLOW	3147.	3013.	2494.	2366.	1789.	1633.	1588.	
				TIME	4.42	4.42	4.42	4.42	4.50	5.25	5.25	
HYDROGRAPH AT	F16	.52	1	FLOW	252.	240.	206.	202.	169.	158.	153.	
				TIME	3.67	3.67	3.67	3.67	3.67	3.67	3.75	
2 COMBINED AT	F16	17.55	1	FLOW	3253.	3114.	2578.	2445.	1863.	1714.	1666.	I15
				TIME	4.42	4.42	4.42	4.42	5.17	5.17	5.17	
DIVERSION TO	F16OF	17.55	1	FLOW	0.	0.	0.	0.	0.	0.	0.	
				TIME	.08	.08	.08	.08	.08	.08	.08	
HYDROGRAPH AT	F16OF	17.55	1	FLOW	3253.	3114.	2578.	2445.	1863.	1714.	1666.	CAESARS
				TIME	4.42	4.42	4.42	4.42	5.17	5.17	5.17	
ROUTED TO	F16	17.55	1	FLOW	3251.	3111.	2572.	2440.	1860.	1712.	1665.	
				TIME	4.42	4.42	4.42	4.42	5.17	5.25	5.25	
ROUTED TO	.	17.55	1	FLOW	3248.	3107.	2565.	2434.	1858.	1712.	1665.	
				TIME	4.42	4.42	4.50	4.50	5.25	5.25	5.25	
ROUTED TO	.	17.55	1	FLOW	3238.	3100.	2564.	2432.	1857.	1708.	1661.	
				TIME	4.50	4.50	4.58	4.58	5.33	5.33	5.33	

HYDROGRAPH AT	F17	.65	1	FLOW	261.	254.	211.	203.	163.	152.	148.	
				TIME	4.08	4.08	4.08	4.08	4.17	4.17	4.17	
2 COMBINED AT	F17	18.20	1	FLOW	3425.	3283.	2718.	2581.	1965.	1809.	1760.	WINNICK / HUGHES CENTER
				TIME	4.50	4.50	4.58	4.58	5.33	5.33	5.33	
HYDROGRAPH AT	T8	1.22	1	FLOW	99.	91.	62.	55.	30.	23.	21.	
				TIME	5.67	5.75	6.08	6.17	6.75	7.00	7.08	
ROUTED TO	T9	1.22	1	FLOW	91.	84.	57.	51.	28.	22.	20.	
				TIME	6.25	6.25	6.58	6.67	7.25	7.50	7.67	
HYDROGRAPH AT	T9	.87	1	FLOW	136.	130.	105.	98.	67.	58.	55.	
				TIME	5.08	5.17	5.25	5.25	5.50	5.58	5.58	
2 COMBINED AT	T9	2.09	1	FLOW	175.	161.	117.	108.	71.	60.	57.	
				TIME	5.75	5.75	5.33	5.42	5.50	5.58	5.67	
DIVERSION TO	T90F	2.09	1	FLOW	0.	0.	0.	0.	0.	0.	0.	
				TIME	.08	.08	.08	.08	.08	.08	.08	
HYDROGRAPH AT	T90F	2.09	1	FLOW	175.	161.	117.	108.	71.	60.	57.	
				TIME	5.75	5.75	5.33	5.42	5.50	5.58	5.67	
ROUTED TO	T10	2.09	1	FLOW	174.	161.	116.	107.	70.	60.	56.	
				TIME	5.92	5.92	5.58	5.58	5.75	5.83	5.92	
HYDROGRAPH AT	T4	3.22	1	FLOW	1539.	1462.	1235.	1165.	916.	830.	799.	
				TIME	3.92	4.00	4.00	4.00	4.08	4.17	4.17	
RO[redacted] TO	T5	3.22	1	FLOW	1532.	1454.	1231.	1159.	911.	830.	796.	
				TIME	4.00	4.00	4.08	4.08	4.17	4.25	4.25	
HYDROGRAPH AT	T5	1.00	1	FLOW	444.	425.	351.	334.	254.	228.	220.	
				TIME	3.92	3.92	4.00	4.00	4.08	4.08	4.17	
2 COMBINED AT	T5	4.22	1	FLOW	1968.	1876.	1572.	1485.	1160.	1051.	1010.	
				TIME	4.00	4.00	4.08	4.08	4.17	4.25	4.25	
ROUTED TO	T6	4.22	1	FLOW	1950.	1858.	1557.	1471.	1149.	1042.	1006.	
				TIME	4.17	4.17	4.25	4.25	4.33	4.42	4.42	
HYDROGRAPH AT	T6	1.30	1	FLOW	550.	529.	432.	411.	314.	281.	271.	
				TIME	4.08	4.08	4.08	4.17	4.25	4.33	4.33	
2 COMBINED AT	T6	5.52	1	FLOW	2481.	2373.	1981.	1870.	1458.	1320.	1272.	
				TIME	4.17	4.17	4.17	4.25	4.33	4.33	4.42	
HYDROGRAPH AT	T90F	.00	1	FLOW	0.	0.	0.	0.	0.	0.	0.	
				TIME	.08	.08	.08	.08	.08	.08	.08	
ROUTED TO	T6	.00	1	FLOW	0.	0.	0.	0.	0.	0.	0.	
				TIME	.08	.08	.08	.08	.08	.08	.08	
2 COMBINED AT	T6	5.52	1	FLOW	2481.	2373.	1981.	1870.	1458.	1320.	1272.	
				TIME	4.17	4.17	4.17	4.25	4.33	4.33	4.42	
DIVERSION TO	T60F	5.52	1	FLOW	1731.	1623.	1231.	1120.	708.	570.	522.	
				TIME	4.17	4.17	4.17	4.25	4.33	4.33	4.42	

HYDROGRAPH AT	T6	5.52	1	FLOW	750.	750.	750.	750.	750.	750.	750.
				TIME	3.67	3.75	3.83	3.83	4.00	4.08	4.08
ROUTED TO	T10	5.52	1	FLOW	750.	750.	750.	750.	750.	750.	750.
				TIME	4.75	4.75	4.92	4.92	5.08	5.17	5.17
HYDROGRAPH AT	T1	1.56	1	FLOW	786.	759.	628.	598.	466.	428.	413.
				TIME	3.92	3.92	3.92	4.00	4.00	4.08	4.08
ROUTED TO	T3	1.56	1	FLOW	778.	752.	627.	593.	463.	427.	408.
				TIME	4.08	4.08	4.17	4.17	4.25	4.33	4.33
HYDROGRAPH AT	T3	.99	1	FLOW	247.	235.	177.	164.	126.	116.	112.
				TIME	4.25	4.25	4.33	4.42	5.08	5.08	5.17
2 COMBINED AT	T3	2.55	1	FLOW	1013.	973.	786.	737.	556.	501.	479.
				TIME	4.08	4.17	4.17	4.25	4.33	4.33	4.42
HYDROGRAPH AT	T6OF	.00	1	FLOW	1731.	1623.	1231.	1120.	708.	570.	522.
				TIME	4.17	4.17	4.17	4.25	4.33	4.33	4.42
ROUTED TO	T3	.00	1	FLOW	1691.	1587.	1197.	1094.	687.	550.	506.
				TIME	4.25	4.25	4.25	4.33	4.42	4.50	4.50
2 COMBINED AT	T3	2.55	1	FLOW	2686.	2538.	1974.	1816.	1234.	1050.	974.
				TIME	4.17	4.17	4.25	4.25	4.42	4.42	4.42
DIVERSION TO	T3OF	2.55	1	FLOW	1164.	1024.	490.	349.	0.	0.	0.
				TIME	4.17	4.17	4.25	4.25	.08	.08	.08
HYDROGRAPH AT	T3OF	2.55	1	FLOW	1522.	1514.	1484.	1466.	1234.	1050.	974.
				TIME	4.17	4.17	4.25	4.25	4.42	4.42	4.42
ROUTED TO	T10	2.55	1	FLOW	1521.	1514.	1483.	1466.	1222.	1044.	974.
				TIME	4.25	4.25	4.33	4.33	4.42	4.50	4.50
HYDROGRAPH AT	T10	.82	1	FLOW	267.	249.	207.	196.	152.	143.	136.
				TIME	3.67	3.67	3.67	3.75	3.75	3.75	3.75
4 COMBINED AT	T10	10.98	1	FLOW	2510.	2487.	2397.	2366.	2069.	1879.	1803.
				TIME	4.25	4.25	4.33	4.33	4.42	4.50	4.50
ROUTED TO	T10R	10.98	1	FLOW	2510.	2487.	2397.	2365.	2066.	1876.	1798.
				TIME	4.25	4.25	4.33	4.33	4.50	4.50	4.50
ROUTED TO	.	10.98	1	FLOW	2509.	2486.	2396.	2364.	2063.	1871.	1797.
				TIME	4.33	4.33	4.42	4.42	4.50	4.58	4.58
HYDROGRAPH AT	T11	1.09	1	FLOW	359.	355.	304.	294.	252.	237.	231.
				TIME	3.75	3.75	3.75	3.83	3.83	3.83	3.83
2 COMBINED AT	T11	12.07	1	FLOW	2716.	2683.	2547.	2506.	2173.	1969.	1893.
				TIME	4.17	4.17	4.33	4.33	4.50	4.58	4.58
ROUTED TO	T11R	12.07	1	FLOW	2715.	2680.	2546.	2504.	2167.	1966.	1889.
				TIME	4.17	4.17	4.33	4.33	4.50	4.58	4.58
ROUTED TO	.	12.07	1	FLOW	2708.	2673.	2543.	2500.	2155.	1956.	1879.
				TIME	4.25	4.33	4.42	4.50	4.67	4.67	4.75

HYDROGRAPH AT	T12	.77	1	FLOW	278.	271.	232.	223.	188.	177.	175.
				TIME	3.75	3.75	3.83	3.83	3.83	3.83	3.83
2 COMBINED AT	T12	12.84	1	FLOW	2874.	2829.	2655.	2602.	2227.	2023.	1944.
				TIME	4.25	4.25	4.42	4.42	4.67	4.67	4.75
HYDROGRAPH AT	T3OF	.00	1	FLOW	1164.	1024.	490.	349.	0.	0.	0.
				TIME	4.17	4.17	4.25	4.25	.08	.08	.08
ROUTED TO	T12	.00	1	FLOW	540.	462.	175.	114.	0.	0.	0.
				TIME	6.17	6.17	6.25	6.25	.08	.08	.08
2 COMBINED AT	T12	12.84	1	FLOW	2874.	2829.	2655.	2602.	2227.	2023.	1944.
				TIME	4.25	4.25	4.42	4.42	4.67	4.67	4.75
HYDROGRAPH AT	MNW-B	.68	1	FLOW	55.	52.	42.	40.	30.	27.	26.
				TIME	6.50	6.50	6.50	6.50	6.50	6.42	6.42
DIVERSION TO	BCULV	.68	1	FLOW	22.	22.	22.	22.	22.	22.	22.
				TIME	4.58	4.58	4.83	4.92	5.33	5.50	5.67
HYDROGRAPH AT	DIVB	.68	1	FLOW	33.	30.	20.	18.	8.	5.	4.
				TIME	6.50	6.50	6.50	6.50	6.50	6.42	6.42
ROUTED TO	RDIVB	.68	1	FLOW	33.	30.	20.	18.	8.	5.	4.
				TIME	6.50	6.50	6.50	6.50	6.50	6.50	6.50
HYDROGRAPH AT	MNW-C	.69	1	FLOW	76.	73.	60.	57.	45.	42.	40.
				TIME	6.00	6.00	6.00	6.00	6.00	6.00	6.00
2 COMBINED AT	MNW-C	1.37	1	FLOW	107.	101.	79.	74.	52.	45.	43.
				TIME	6.17	6.17	6.17	6.17	6.17	6.17	6.17
ROUTED TO	MNW-C	1.37	1	FLOW	103.	97.	69.	63.	39.	36.	35.
				TIME	6.50	6.50	6.83	6.83	7.08	7.00	6.92
			** PEAK STAGES IN FEET **								
			1	STAGE	58.09	58.07	57.86	57.78	57.33	57.08	57.00
				TIME	6.50	6.50	6.83	6.83	7.08	7.00	6.92
DIVERSION TO	CCULV	1.37	1	FLOW	46.	46.	44.	43.	39.	36.	35.
				TIME	6.50	6.50	6.83	6.83	7.08	7.00	6.92
HYDROGRAPH AT	DIVC	1.37	1	FLOW	57.	51.	25.	20.	0.	0.	0.
				TIME	6.50	6.50	6.83	6.83	.08	.08	.08
HYDROGRAPH AT	MNW-D	.05	1	FLOW	9.	9.	7.	6.	5.	4.	4.
				TIME	3.83	3.83	3.83	3.83	3.83	5.08	5.08
2 COMBINED AT	MNW-D	1.42	1	FLOW	58.	51.	25.	20.	5.	4.	4.
				TIME	6.50	6.50	6.83	6.83	3.83	5.08	5.08
DIVERSION TO	DCULV	1.42	1	FLOW	28.	28.	25.	20.	5.	4.	4.
				TIME	5.83	6.00	6.83	6.83	3.83	5.08	5.08
HYDROGRAPH AT	DIVD	1.42	1	FLOW	30.	23.	0.	0.	0.	0.	0.
				TIME	6.50	6.50	.08	.08	.08	.08	.08
ROUTED TO	RDIVD	1.42	1	FLOW	30.	23.	0.	0.	0.	0.	0.
				TIME	6.58	6.67	.08	.08	.08	.08	.08

HYDROGRAPH AT	MNW-E	.05	1	FLOW	12.	11.	9.	9.	7.	6.	6.
				TIME	3.75	3.75	3.75	3.75	3.75	3.75	3.75
2 COMBINED AT	MNW-E	1.47	1	FLOW	30.	23.	9.	9.	7.	6.	6.
				TIME	6.58	6.67	3.75	3.75	3.75	3.75	3.75
DIVERSION TO	ECULV	1.47	1	FLOW	28.	23.	9.	9.	7.	6.	6.
				TIME	6.50	6.67	3.75	3.75	3.75	3.75	3.75
HYDROGRAPH AT	ECULV	1.47	1	FLOW	2.	0.	0.	0.	0.	0.	0.
				TIME	6.58	.08	.08	.08	.08	.08	.08
ROUTED TO	RDIVE	1.47	1	FLOW	2.	0.	0.	0.	0.	0.	0.
				TIME	6.83	.08	.08	.08	.08	.08	.08
HYDROGRAPH AT	MNW-FG	.36	1	FLOW	49.	46.	38.	37.	29.	26.	25.
				TIME	5.25	5.25	5.25	5.33	5.33	5.33	5.33
2 COMBINED AT	MNW-FG	1.83	1	FLOW	49.	46.	38.	37.	29.	26.	25.
				TIME	5.25	5.25	5.25	5.33	5.33	5.33	5.33
DIVERSION TO	GCULV	1.83	1	FLOW	49.	46.	38.	37.	29.	26.	25.
				TIME	5.25	5.25	5.25	5.33	5.33	5.33	5.33
HYDROGRAPH AT	DIVG	1.83	1	FLOW	0.	0.	0.	0.	0.	0.	0.
				TIME	.08	.08	.08	.08	.08	.08	.08
ROUTED TO	RDIVG	1.83	1	FLOW	0.	0.	0.	0.	0.	0.	0.
				TIME	.08	.08	.08	.08	.08	.08	.08
HYDROGRAPH AT	MNW-J1	2.37	1	FLOW	179.	170.	132.	123.	87.	75.	72.
				TIME	6.83	6.83	6.92	6.92	6.92	7.00	7.00
ROUTED TO	MNW-J2	2.37	1	FLOW	179.	169.	132.	123.	87.	75.	72.
				TIME	7.08	7.08	7.17	7.25	7.33	7.33	7.42
HYDROGRAPH AT	MNW-J2	1.21	1	FLOW	170.	163.	133.	126.	97.	88.	85.
				TIME	5.25	5.33	5.33	5.42	5.50	5.50	5.50
2 COMBINED AT	MNW-J2	3.58	1	FLOW	276.	261.	204.	191.	136.	119.	114.
				TIME	6.00	6.00	6.08	6.08	6.00	6.08	6.08
2 COMBINED AT	CP1	5.41	1	FLOW	276.	261.	204.	191.	136.	119.	114.
				TIME	6.00	6.00	6.08	6.08	6.00	6.08	6.08
ROUTED TO	RCP1	5.41	1	FLOW	276.	261.	204.	191.	136.	119.	114.
				TIME	6.08	6.08	6.08	6.08	6.08	6.17	6.17
HYDROGRAPH AT	RTNE	.00	1	FLOW	28.	23.	9.	9.	7.	6.	6.
				TIME	6.50	6.67	3.75	3.75	3.75	3.75	3.75
HYDROGRAPH AT	RTNE	.01	1	FLOW	0.	0.	0.	0.	0.	0.	0.
				TIME	4.83	4.83	4.92	4.92	.08	.08	.08
2 COMBINED AT	RTNE	.01	1	FLOW	28.	23.	9.	9.	7.	6.	6.
				TIME	6.50	6.67	3.75	3.75	3.75	3.75	3.75
ROUTED TO	RRTNE	.01	1	FLOW	28.	23.	9.	8.	7.	6.	6.
				TIME	7.00	7.17	4.42	4.42	4.50	4.50	4.50

HYDROGRAPH AT	RTNG	.00	1	FLOW	49.	46.	38.	37.	29.	26.	25.
				TIME	5.25	5.25	5.25	5.33	5.33	5.33	5.33
HYDROGRAPH AT	RTNG	.01	1	FLOW	0.	0.	0.	0.	0.	0.	0.
				TIME	4.83	4.83	4.92	4.92	.08	.08	.08
2 COMBINED AT	RTNG	.01	1	FLOW	49.	47.	38.	37.	29.	26.	25.
				TIME	5.17	5.25	5.25	5.33	5.33	5.33	5.33
ROUTED TO	RRTNG	.01	1	FLOW	49.	46.	38.	37.	29.	26.	25.
				TIME	5.42	5.42	5.50	5.50	5.58	5.58	5.58
HYDROGRAPH AT	MNW-I1	.25	1	FLOW	84.	81.	68.	65.	52.	47.	46.
				TIME	4.00	4.00	4.00	4.00	4.00	4.00	4.00
3 COMBINED AT	CP2	.27	1	FLOW	111.	107.	90.	86.	69.	64.	63.
				TIME	4.25	5.17	5.17	5.17	5.17	5.17	5.17
ROUTED TO	RCP2	.27	1	FLOW	111.	106.	90.	86.	69.	64.	62.
				TIME	5.25	5.25	5.25	5.25	5.25	5.25	5.25
HYDROGRAPH AT	MNW-I2	.14	1	FLOW	45.	43.	35.	33.	25.	22.	21.
				TIME	3.75	3.75	3.75	3.75	3.83	3.83	3.83
3 COMBINED AT	CP3	5.82	1	FLOW	368.	349.	278.	261.	192.	171.	164.
				TIME	5.58	5.58	5.58	5.58	5.50	5.50	5.50
ROUTED TO	RCP3	5.82	1	FLOW	368.	349.	277.	261.	192.	171.	164.
				TIME	5.75	5.75	5.75	5.75	5.67	5.67	5.67
HYDROGRAPH AT	MNW-K	1.43	1	FLOW	218.	210.	179.	171.	139.	129.	126.
				TIME	5.50	5.50	5.50	5.50	5.50	5.42	5.42
2 COMBINED AT	CP4	7.25	1	FLOW	584.	557.	454.	431.	331.	299.	289.
				TIME	5.58	5.58	5.58	5.58	5.58	5.58	5.58
ROUTED TO	RCP4	7.25	1	FLOW	584.	557.	454.	430.	330.	299.	289.
				TIME	5.67	5.67	5.67	5.67	5.67	5.67	5.58
HYDROGRAPH AT	MNW-L	.27	1	FLOW	160.	155.	138.	134.	115.	109.	107.
				TIME	3.75	3.75	3.75	3.75	3.75	3.75	3.75
HYDROGRAPH AT	MNW-M	.49	1	FLOW	223.	217.	194.	188.	162.	154.	151.
				TIME	4.17	4.17	4.17	4.17	4.25	4.25	4.25
3 COMBINED AT	CP5	8.01	1	FLOW	774.	744.	621.	593.	476.	441.	430.
				TIME	5.25	5.25	5.25	5.25	5.17	5.17	5.17
ROUTED TO	T12	8.01	1	FLOW	773.	743.	621.	593.	476.	441.	430.
				TIME	5.33	5.33	5.33	5.33	5.25	5.25	5.25
ROUTED TO	.	8.01	1	FLOW	773.	742.	620.	592.	475.	440.	429.
				TIME	5.42	5.42	5.42	5.42	5.42	5.42	5.42
2 COMBINED AT	T12	20.85	1	FLOW	3508.	3431.	3194.	3126.	2664.	2430.	2342.
				TIME	5.50	4.33	4.42	4.50	4.67	4.67	4.75
2 COMBINED AT	F17	39.05	1	FLOW	6888.	6688.	5904.	5706.	4627.	4207.	4049.
				TIME	4.50	4.50	4.50	4.50	4.67	4.67	4.75

FLAMINGO/ TROPICANA CONFLUENCE

ROUTED TO	F18	39.05	1	FLOW	6888.	6686.	5899.	5698.	4627.	4197.	4049.
				TIME	4.50	4.50	4.50	4.50	4.67	4.67	4.75
ROUTED TO	.	39.05	1	FLOW	6886.	6683.	5892.	5694.	4624.	4188.	4048.
				TIME	4.50	4.50	4.50	4.58	4.67	4.75	4.75
HYDROGRAPH AT	R4	2.28	1	FLOW	1285.	1242.	1073.	1031.	844.	783.	763.
				TIME	3.75	3.75	3.75	3.75	3.75	3.75	3.75
HYDROGRAPH AT	F150F	.00	1	FLOW	0.	0.	0.	0.	0.	0.	0.
				TIME	.08	.08	.08	.08	.08	.08	.08
ROUTED TO	F150FR	.00	1	FLOW	0.	0.	0.	0.	0.	0.	0.
				TIME	.08	.08	.08	.08	.08	.08	.08
2 COMBINED AT	R4	2.28	1	FLOW	1285.	1242.	1073.	1031.	844.	783.	763.
				TIME	3.75	3.75	3.75	3.75	3.75	3.75	3.75
HYDROGRAPH AT	F160F	.00	1	FLOW	0.	0.	0.	0.	0.	0.	0.
				TIME	.08	.08	.08	.08	.08	.08	.08
ROUTED TO	F160FR	.00	1	FLOW	0.	0.	0.	0.	0.	0.	0.
				TIME	.08	.08	.08	.08	.08	.08	.08
2 COMBINED AT	R4	2.28	1	FLOW	1285.	1242.	1073.	1031.	844.	783.	763.
				TIME	3.75	3.75	3.75	3.75	3.75	3.75	3.75
ROUTED TO	F18	2.28	1	FLOW	1030.	995.	859.	825.	676.	627.	611.
				TIME	4.67	4.67	4.67	4.67	4.67	4.67	4.67
HYDROGRAPH AT	F18	.87	1	FLOW	386.	368.	322.	313.	267.	251.	244.
				TIME	3.75	3.75	3.75	3.75	3.75	3.75	3.75
2 COMBINED AT	F18	3.15	1	FLOW	1178.	1137.	979.	940.	771.	717.	698.
				TIME	4.67	4.67	4.67	4.67	4.67	4.67	4.67
HYDROGRAPH AT	F24	1.03	1	FLOW	629.	607.	546.	527.	459.	440.	431.
				TIME	3.58	3.58	3.58	3.58	3.67	3.67	3.67
3 COMBINED AT	F18	43.23	1	FLOW	8168.	7924.	6978.	6736.	5496.	5006.	4846.
				TIME	4.58	4.58	4.58	4.58	4.67	4.75	4.75
ROUTED TO	F18R	43.23	1	FLOW	8162.	7919.	6973.	6731.	5487.	5000.	4838.
				TIME	4.67	4.67	4.67	4.67	4.75	4.83	4.83
HYDROGRAPH AT	F20A	.81	1	FLOW	170.	164.	145.	141.	120.	113.	110.
				TIME	3.75	3.75	3.83	3.83	3.83	3.83	3.83
2 COMBINED AT	F20A	44.04	1	FLOW	8229.	7983.	7026.	6783.	5529.	5041.	4878.
				TIME	4.67	4.67	4.67	4.67	4.75	4.83	4.83
ROUTED TO	F20B	44.04	1	FLOW	8228.	7982.	7023.	6779.	5520.	5037.	4871.
				TIME	4.67	4.67	4.67	4.67	4.75	4.83	4.83
ROUTED TO	.	44.04	1	FLOW	8226.	7980.	7019.	6774.	5511.	5033.	4868.
				TIME	4.67	4.67	4.67	4.67	4.83	4.83	4.92
HYDROGRAPH AT	F19	1.54	1	FLOW	814.	798.	718.	691.	599.	571.	561.
				TIME	3.67	3.67	3.67	3.67	3.67	3.67	3.67

SPENCER

ROUTED TO	F20B	1.54	1	FLOW	729.	712.	638.	618.	533.	508.	499.	
				TIME	3.83	3.83	3.83	3.83	3.83	3.83	3.83	
HYDROGRAPH AT	F20B	.73	1	FLOW	378.	364.	307.	293.	231.	212.	205.	
				TIME	3.67	3.67	3.67	3.67	3.67	3.67	3.67	
2 COMBINED AT	F20B	2.27	1	FLOW	1036.	1003.	875.	844.	707.	668.	654.	
				TIME	3.75	3.75	3.75	3.75	3.83	3.83	3.83	
HYDROGRAPH AT	VB	4.58	1	FLOW	1363.	1302.	1063.	1005.	754.	676.	650.	
				TIME	3.92	3.92	3.92	3.92	3.92	4.00	4.00	
3 COMBINED AT	F20B	50.89	1	FLOW	9490.	9208.	8028.	7742.	6322.	5832.	5669.	D/S DESERT INN
				TIME	5.00	5.00	4.92	4.92	4.92	5.00	5.00	
ROUTED TO	F22	50.89	1	FLOW	9475.	9194.	8027.	7733.	6318.	5825.	5657.	
				TIME	5.00	5.00	5.00	5.00	5.00	5.00	5.00	
HYDROGRAPH AT	F21	1.27	1	FLOW	708.	697.	599.	577.	497.	466.	463.	
				TIME	3.67	3.67	3.67	3.67	3.67	3.67	3.67	
DIVERSION TO	OAKEY	1.27	1	FLOW	354.	348.	300.	289.	248.	233.	231.	
				TIME	3.67	3.67	3.67	3.67	3.67	3.67	3.67	
HYDROGRAPH AT	F21	1.27	1	FLOW	354.	348.	300.	289.	248.	233.	231.	
				TIME	3.67	3.67	3.67	3.67	3.67	3.67	3.67	
ROUTED TO	F22	1.27	1	FLOW	348.	342.	291.	281.	239.	225.	222.	
				TIME	3.67	3.67	3.67	3.67	3.75	3.75	3.75	
HYDROGRAPH AT	F22	3.43	1	FLOW	1549.	1499.	1317.	1288.	1075.	1015.	1001.	
				TIME	3.67	3.67	3.67	3.67	3.67	3.67	3.67	
3 COMBINED AT	F22	55.59	1	FLOW	10511.	10187.	8868.	8536.	6971.	6434.	6257.	BOULDER HWY
				TIME	5.00	5.00	5.00	5.00	5.00	5.00	5.08	
ROUTED TO	F23	55.59	1	FLOW	10500.	10176.	8860.	8530.	6965.	6427.	6256.	
				TIME	5.00	5.00	5.00	5.00	5.00	5.08	5.08	
ROUTED TO	.	55.59	1	FLOW	10497.	10175.	8847.	8518.	6962.	6425.	6242.	
				TIME	5.08	5.08	5.08	5.08	5.08	5.08	5.08	
ROUTED TO	.	55.59	1	FLOW	10469.	10145.	8831.	8505.	6945.	6417.	6241.	
				TIME	5.08	5.08	5.08	5.08	5.08	5.17	5.17	
ROUTED TO	.	55.59	1	FLOW	10466.	10144.	8822.	8495.	6944.	6401.	6227.	
				TIME	5.17	5.17	5.17	5.17	5.17	5.17	5.25	
HYDROGRAPH AT	F23	1.92	1	FLOW	469.	451.	387.	368.	308.	288.	284.	
				TIME	4.00	4.00	4.00	4.08	4.08	4.08	4.08	
2 COMBINED AT	F23	57.51	1	FLOW	10871.	10528.	9123.	8777.	7149.	6590.	6411.	NELLIS / LAS VEGAS WASH
				TIME	5.17	5.17	5.17	5.17	5.17	5.25	5.25	

SUMMARY OF KINEMATIC WAVE - MUSKINGUM-CUNGE ROUTING
(FLOW IS DIRECT RUNOFF WITHOUT BASE FLOW)

ISTAQ	ELEMENT	DT	PEAK	TIME TO PEAK	VOLUME	INTERPOLATED TO COMPUTATION INTERVAL DT	PEAK	TIME TO PEAK	VOLUME
		(MIN)	(CFS)	(MIN)	(IN)	(MIN)	(CFS)	(MIN)	(IN)
FOR PLAN = 1 RATIO= .92									
F7	MANE	3.81	720.90	235.71	1.42	5.00	720.05	235.00	1.42

CONTINUITY SUMMARY (AC-FT) - INFLOW= .0000E+00 EXCESS= .1145E+03 OUTFLOW= .1136E+03 BASIN STORAGE= .3308E+00 PERCENT ERROR= .6

FOR PLAN = 1 RATIO= .92									
F7	MANE	4.09	611.10	237.05	1.24	5.00	608.49	240.00	1.24

CONTINUITY SUMMARY (AC-FT) - INFLOW= .0000E+00 EXCESS= .9998E+02 OUTFLOW= .9900E+02 BASIN STORAGE= .3312E+00 PERCENT ERROR= .6

FOR PLAN = 1 RATIO= .90									
F7	MANE	4.07	580.37	239.30	1.19	5.00	578.94	240.00	1.19

CONTINUITY SUMMARY (AC-FT) - INFLOW= .0000E+00 EXCESS= .9639E+02 OUTFLOW= .9548E+02 BASIN STORAGE= .2886E+00 PERCENT ERROR= .6

FOR PLAN = 1 RATIO= .82									
F7	MANE	4.38	474.45	241.34	1.02	5.00	472.59	245.00	1.02

CONTINUITY SUMMARY (AC-FT) - INFLOW= .0000E+00 EXCESS= .8232E+02 OUTFLOW= .8149E+02 BASIN STORAGE= .2837E+00 PERCENT ERROR= .7

FOR PLAN = 1 RATIO= .80									
F7	MANE	4.51	451.32	244.18	.98	5.00	449.83	245.00	.97

CONTINUITY SUMMARY (AC-FT) - INFLOW= .0000E+00 EXCESS= .7887E+02 OUTFLOW= .7800E+02 BASIN STORAGE= .2840E+00 PERCENT ERROR= .7

FOR PLAN = 1 RATIO= .71									
F7	MANE	4.93	335.29	248.69	.79	5.00	334.78	250.00	.79

CONTINUITY SUMMARY (AC-FT) - INFLOW= .0000E+00 EXCESS= .6376E+02 OUTFLOW= .6290E+02 BASIN STORAGE= .3138E+00 PERCENT ERROR= .9

FOR PLAN = 1 RATIO= .68									
F7	MANE	5.00	297.48	253.18	.73	5.00	296.01	255.00	.73

CONTINUITY SUMMARY (AC-FT) - INFLOW= .0000E+00 EXCESS= .5888E+02 OUTFLOW= .5806E+02 BASIN STORAGE= .2785E+00 PERCENT ERROR= .9

FOR PLAN = 1 RATIO= .67

CONTINUITY SUMMARY (AC-FT) - INFLOW= .0000E+00 EXCESS= .7133E+02 OUTFLOW= .6962E+02 BASIN STORAGE= .8414E+00 PERCENT ERROR= 1.2

*** NORMAL END OF HEC-1 ***

Study Contractor: G. C. Wallace, Inc.

HYDRAULIC ANALYSES INDEX

Clark County, Nevada
(COMMUNITY NAME, STATE)

FLOOD INSURANCE STUDY

HYDRAULIC ANALYSES INDEX

FLOODING SOURCE/ STREAM NAME	HYDROLOGIC METHOD/ MODEL USED	METHOD/MODEL ANALYSIS DATE	EXHIBIT NO. PAPER COPY	EXHIBIT NO. FLOPPY DISKETTES
FLAMINGO WASH	HEC-2/BASE0.01	OCTOBER 6, 1997	ENCLOSED	ENCLOSED
FLAMINGO WASH	HEC-2/BASE1.01	"	"	"
FLAMINGO WASH	HEC-2/BASE1.02	OCTOBER 12, 1997	"	"
FLAMINGO WASH	HEC-2/BASE2.01	OCTOBER 6, 1997	"	"
FLAMINGO WASH	HEC-2/BASE3-4.01	"	"	"
FLAMINGO WASH	HEC-2/BASE3-4.02	"	"	"

2.2.1 RAINBOW BLVD. TO JONES BLVD. REACH

APPROXIMATE METHOD
HEC-2 MODEL ANALYSIS
RAINBOW BLVD. TO JONES BLVD. REACH

This reach from Rainbow Boulevard to Jones Boulevard was not flown as part of this project. Therefore, no topography was generated. So, in order to model this area, a survey crew was sent out to pick up cross sections. Based on these surveyed cross sections and the detailed surveyed bridges in this reach, the HEC-2 model was constructed. The starting water surface elevation was taken from the Jones Boulevard to Industrial Road Reach HEC-2 model. The subcritial run was used to determine the floodplain delineation for this reach.

BASE0.D1

```
**********************************************
*  HEC-2 WATER SURFACE PROFILES              *
*                                            *
*  Version   4.6.2;  May 1991                *
*                                            *
*  JN DATE     060CT97     TIME    10:38:01  *
**********************************************
```


```
**************************************
*  U.S. ARMY CORPS OF ENGINEERS      *
*  HYDROLOGIC ENGINEERING CENTER     *
*  609 SECOND STREET, SUITE D        *
*  DAVIS, CALIFORNIA 95616-4687      *
*          (916) 756-1104            *
**************************************
```


```
X     X  XXXXXXX   XXXXX                XXXXX
X     X  X        X     X             X     X
X     X  X        X                         X
XXXXXXX  XXXX     X           XXXXX   XXXXX
X     X  X        X                   X
X     X  X        X     X             X
X     X  XXXXXXX  XXXXX               XXXXXXX
```

THIS RUN EXECUTED 06OCT97 10:38:03

****
HEC-2 WATER SURFACE PROFILES

Version 4.6.2; May 1991
****

T1 550.032
T2 FLAMINGO WASH FIS RESTUDY
T3 FLOODPLAIN DETERMINATION
T3 RAINBOW BLVD. TO JONES BLVD.
T4 FILE: BASE0.D1
T4 STARTING WSE = 2278.74 FROM BASE1.D1
T4 SUBCRITICAL RUN

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
		2						3900	2278.74	

J2	NPROF	IPLOT	PRFVS	XSECV	XSECH	FN	ALLDC	IBW	CHNIM	ITRACE
	1		-1				-2	-6		

J[redacted]RIABLE CODES FOR SUMMARY PRINTOUT

150 100

NC	0.025	0.025	0.03	0.1	0.3					
X1	470	21	1033.6	1139.45	496.29	497.3	497.44			
GR	2287.1	1000	2286.43	1011.63	2286.11	1013.88	2286	1018.25	2285.78	1026.47
GR	2284	1029.84	2282	1033.6	2280	1037.35	2278	1041.08	2276	1044.81
GR	2274.8	1047.02	2274.47	1125.14	2276	1128.04	2278	1131.84	2280	1135.65
GR	2282	1139.45	2284	1143.25	2285.45	1146.01	2286	1157.83	2286.04	1158.7
GR	2286.2	1160.71								
NC	0.025	0.025	.015							
X1	480	27	1037.36	1120.53	314.57	317.78	315.97			
GR	2294.3	1000	2294	1007.37	2293.91	1009.73	2293.01	1023.57	2292.78	1027.28
GR	2292	1028.94	2290	1033.16	2288	1037.36	2286.16	1041.18	2286	1041.54
GR	2284	1045.96	2282	1050.19	2280	1055.11	2279.98	1055.27	2280.03	1060.89
GR	2280	1096.41	2280.31	1101.25	2282	1105.98	2284	1110.71	2286	1115.55
GR	2288	1120.53	2290	1125.3	2292	1129.86	2292.43	1130.82	2292.52	1169.51
GR	2292	1170.97	2291.65	1171.6						
NC	0.02	0.02	0.015							
X1	490	13	1054	1095.75	144.45	149.77	143.95			
X3	10			1054	2294	1095.75	2294			
GR	2294.4	1000	2294.73	1002.88	2294.72	1015.52	2294.6	1027.21	2294	1031.11
[redacted]	294.1	1054	2284.1	1054	2284.1	1095.75	2294.1	1095.75	2294	1107.09
GR	2294.5	1111.08	2294.61	1127.32	2294.51	1131.81				

[redacted]	0.025	0.025	0.015							
SC	.9	1.56	2.6	100	41.75	1.75	320	0	2284.6	2284.1
X1	500	10	1050	1091.75	102	102	102			
X2			1	2292.6	2295.3			1.33		
X3	10			1050	2294	1091.75	2294			
GR	2294.5	1000	2294.88	1008.14	2294.73	1038.02	2294.6	1050	2284.6	1050
GR	2284.6	1091.75	2294.6	1091.75	2294.56	1100.74	2294.86	1121.69	2294.5	1125.84
NC	0.02	0.02	0.02							
X1	510	25	1004.78	1116.38	25	25	25			
GR	2298.8	1000	2298	1000.62	2296.14	1001.97	2296	1004.78	2295.65	1011.7
GR	2294	1018.55	2292	1024.72	2291.3	1026.83	2290	1029.58	2288	1033.81
GR	2286	1038.05	2285.06	1039.94	2285.06	1087.65	2286	1089.57	2288	1093.44
GR	2288.7	1095.14	2290	1097.3	2292	1101.56	2294	1107.37	2295.46	1111.71
GR	2295.5	1116.38	2296	1123.41	2296.51	1129.95	2297.66	1133.29	2297.62	1149.23
NC	0.02	0.02	0.02							
X1	520	6	1000	1086.89	270.2	253.62	261.38			
GR	2304.6	1000	2292.1	1027.64	2287.2	1043.88	2287.1	1068.47	2296.4	1086.89
GR	2299.8	1115.75								
NC	0.02	0.02	0.02							
X1	530	12	1012.73	1091.01	290.28	300.88	292.28			
GR	2306.5	1000	2305.16	1002.59	2304.10	1012.73	2299.36	1021.04	2299.44	1024.50
GR	2289.5	1043.63	2289.31	1058.09	2289.85	1075.82	2296.48	1091.01	2297.34	1100.5
G	2301.5	1118.84	2302.73	1126.28						
NC	0.02	0.02	0.02							
X1	540	10	1011.97	1089	478.99	474.14	474.25			
GR	2308.1	1000	2307.49	1011.97	2293.72	1038.41	2292.99	1056.88	2294.28	1074.36
GR	2301.1	1089	2301.85	1102.44	2305.68	1118.12	2306.02	1122.17	2306.89	1124.57
NC	0.02	0.02	0.02							
X1	550	11	1015.21	1090.47	518.84	523.12	520.66			
GR	2314.3	1000	2312.70	1004.83	2312.22	1015.21	2297.95	1046.16	2297.68	1059.03
GR	2298.0	1071.99	2304.93	1090.47	2307.63	1114.24	2308.23	1126.06	2309.40	1128.02
GR	2309.2	1129.01								
NC	0.02	0.02	0.02							
X1	560	12	1018.03	1090.97	479.65	475.74	479.99			
GR	2319.6	1000	2318.50	1002.59	2317.24	1018.03	2302.47	1045	2302.36	1066.33
GR	2302.6	1077	2304.01	1078.97	2304.21	1081.04	2309.45	1090.97	2313.96	1118.24
GR	2314.8	1127.28	2315.85	1129.28						
NC	0.02	0.02	0.02							
X1	570	6	1000	1075.08	390.27	400.54	397.21			
GR	2316.4	1000	2310.41	1012.38	2306.89	1030.12	2307.49	1041.92	2310.55	1063.27
GR	2316.5	1075.08								

	0.02	0.02	0.015							
X1	580	5	1000	1041.75	120.01	116.82	123.21			
X3	10			1000	2317.8	1041.75	2317.8	2317.8	2317.8	
GR	2317.3	1000	2310.02	1000	2310.02	1041.75	2317.64	1041.75	2317.64	1078.71
SB	.9	1.56	2.6	132	41.75	1.75	320		2312.18	2310.02
NC	0.02	0.02	0.015							
X1	590	4	1000	1041.75	134.38	132.50	125.31			
X2			1	2320.18	2322.01			1.33		
X3	10			1000	2324.1	1041.75	2324.1			
GR	2324.0	1000	2312.18	1000	2312.18	1041.75	2324.0	1041.75		
NC	0.02	0.02	0.02							
X1	600	7	1000	1089.82	133.41	120.42	123.12			
GR	2325.3	1000	2321.55	1005.46	2314.06	1017.49	2314.10	1040.45	2315.06	1068.41
GR	2325.3	1089.82	2325.30	1091.72						
NC	0.02	0.02	0.02							
X1	610	12	1019.65	1108.86	473.98	414.07	443.09			
GR	2328.9	1000	2329.43	1013.76	2327.86	1019.65	2319.17	1036.52	2318.69	1059.47
GR	2318.2	1061.23	2318.72	1063.31	2318.73	1081.16	2319.15	1086.20	2331.00	1108.86
GR	2331.0	1110.79	2330.49	1119.31						
NC	0.02	0.02	0.02							
X1	620	13	1017.50	1108.12	491.57	536.11	512.99			
GR	2333.8	1000	2332.15	1013.04	2330.86	1017.5	2324.57	1028.71	2323.47	1030.25
GR	2323.1	1039.35	2322.65	1041.70	2322.41	1047.74	2323.18	1067.52	2323.13	1084.98
GR	2336.4	1108.12	2336.46	1110.13	2336.14	1116.80				
NC	0.02	0.02	0.02							
X1	630	8	1000	1094.39	383.67	381.50	381.82			
GR	2336.0	1000	2326.15	1025.52	2325.00	1044.64	2324.81	1066.49	2326.92	1071.49
GR	2339.9	1094.39	2339.91	1096.31	2339.69	1112.07				
NC	.015	.02	.015							
X1	640	6	1000	1066	194.78	125.27	87.80			
X3	10			1000	2337.25	1066	2337.25			
GR	2337.2	1000	2333.25	1000	2327.25	1009	2327.25	1057	2333.25	1066
GR	2337.2	1066								
SB	.90	1.56	2.6	184	48	6	426	1.5	2328.41	2327.25
NC	.02	.02	.015							
X1	650	6	1000	1066	188.47	187.44	198.08			
X2			1	2336.41	2339.86			1.33		
X3	10			1000	2336.41	1066	2336.41			
GR	2336.4	1000	2334.41	1000	2328.41	1009	2328.41	1057	2334.41	1066
GR	2336.4	1066								

[redacted]	.03	.03	.025							
X1	660	11	1000	1079.80	99.31	163.20	127.89			
GR	2339.7	1000	2339.59	1000.88	2340.05	1003.49	2334.75	1004.66	2333.26	1007.57
GR	2329.8	1013.92	2329.24	1037.32	2329.67	1058.47	2331.76	1067.91	2338.02	1072.09
GR	2341.3	1079.80								
NC	.03	.03	.025							
X1	670	11	1000	1085.33	503.66	552.77	530.81			
GR	2341.0	1000	2341.07	1003.53	2341.07	1010.83	2341.07	1013.66	2338.05	1015.93
GR	2333.2	1021.71	2332.37	1043.45	2332.59	1053.02	2333.69	1058.39	2342.45	1071.27
GR	2349.4	1085.33								
NC	.03	.03	.025							
X1	680	11	1000	1085.52	483.05	501.60	508.76			
GR	2351	1000	2346.16	1006.72	2345.75	1012.63	2345.23	1015.64	2342.32	1017.51
GR	2335.4	1023.77	2334.72	1035.57	2334.89	1055.45	2336.08	1058.93	2343.65	1071.58
GR	2351.8	1085.52								
NC	.03	.03	.02							
X1	690	4	1000	1082	433	442.93	437.49			
X3	10			1000	2352.4	1082	2352.4			
GR	2352.4	1000	2338.40	1021	2338.40	1061	2352.40	1082		
SB	.90	1.56	2.6	130	40	4	798	1.5	2338.49	2338.40
NC	.03	.03	.02							
[redacted]	700	4	1000	1082	126.98	127.16	119.30			
[redacted]			1	2352.49	2354.36			1.33		
X3	10			1000	2352.49	1082	2352.49			
GR	2352.4	1000	2338.49	1021	2338.49	1061	2352.49	1082		
NC	.03	.03	.025	.1	.3					
X1	710	5	1000	1094.10	41.86	31.18	33.13			
GR	2353.1	1000	2341.58	1036.19	2341.63	1047.76	2341.74	1066.24	2354.06	1094.10

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*PROF 1

CRITICAL DEPTH TO BE CALCULATED AT ALL CROSS SECTIONS
ALLOWABLE ERROR FOR CRITICAL DEPTH DETERMINATION (ALLDC) = 2.000 PERCENT OF THE DEPTH

CCHV= .100 CEHV= .300
*SECNO 470.000
3720 CRITICAL DEPTH ASSUMED

470.000	4.27	2278.74	2278.74	2278.74	2280.64	1.90	.00	.00	2282.00
3900.0	.0	3900.0	.0	.0	352.7	.0	.0	.0	2282.00
.00	.00	11.06	.00	.000	.030	.000	.000	2274.47	1039.69
.008742	496.	497.	497.	0	4	0	.00	93.56	1133.26

*SECNO 480.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

480.000	5.51	2285.49	2285.49	.00	2287.77	2.28	1.19	.11	2288.00
900.0	.0	3900.0	.0	.0	322.0	.0	2.4	.6	2288.00
.01	.00	12.11	.00	.000	.015	.000	.000	2279.98	1042.67
.002096	315.	316.	318.	0	11	0	.00	71.65	1114.32

*SECNO 490.000

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 1054.0 1095.8 TYPE= 1 TARGET= 41.750
ELENCL= 2294.00 ELENCR= 2294.00

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2294.10 ELREA= 2294.10

490.000	6.47	2290.57	2290.57	.00	2293.81	3.23	.33	.29	2294.10
3900.0	.0	3900.0	.0	.0	270.2	.0	3.4	.8	2294.10
.01	.00	14.43	.00	.000	.015	.000	.000	2284.10	1054.00
.002522	144.	144.	150.	0	8	0	.00	41.75	1095.75

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	KLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

SPECIAL BRIDGE

5227 DOWNSTREAM ELEV IS 2289.61 , NOT 2290.57 HYDRAULIC JUMP OCCURS DOWNSTREAM (IF LOW FLOW CONTROLS)

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	.90	1.56	2.60	100.00	41.75	1.75	320.00	.00	2284.60	2284.10

*SECNO 500.000

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.41

CLASS B LOW FLOW

3420 BRIDGE W.S.= 2291.01 BRIDGE VELOCITY= 14.65 CALCULATED CHANNEL AREA= 256.

EGPRS	EGLWC	H3	QWEIR	QLOW	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
94.17	2294.79	.00	0.	3900.	320.	320.	2292.60	2295.30	0.

3470 ENCROACHMENT STATIONS= 1050.0 1091.8 TYPE= 1 TARGET= 41.750
ELENCL= 2294.00 ELENCR= 2294.00

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2294.60 ELREA= 2294.60

500.000	8.16	2292.76	.00	.00	2294.79	2.04	.99	.00	2294.60
3900.0	.0	3900.0	.0	.0	340.6	.0	4.1	.9	2294.60
.01	.00	11.45	.00	.000	.015	.000	.000	2284.60	1050.00
.001263	102.	102.	102.	0	0	0	.00	41.75	1091.75

*SECNO 510.000

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.49

510.000	9.30	2294.36	2290.49	.00	2294.96	.60	.02	.14	2296.00
3900.0	.0	3900.0	.0	.0	627.0	.0	4.4	.9	2295.50
.01	.00	6.22	.00	.000	.020	.000	.000	2285.06	1017.09
00568	25.	25.	25.	3	14	0	.00	91.33	1108.42

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
[redacted]	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 520.000

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

520.000	7.11	2294.21	2294.21	.00	2296.79	2.58	.31	.59	2304.60
3900.0	.0	3900.0	.0	.0	302.6	.0	7.2	1.4	2296.40
.02	.00	12.89	.00	.000	.020	.000	.000	2287.10	1022.98
.003669	270.	261.	254.	0	15	0	.00	59.57	1082.55

*SECNO 530.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

530.000	6.87	2296.18	2296.18	.00	2298.74	2.55	1.06	.00	2304.10
3900.0	.0	3900.0	.0	.0	304.1	.0	9.2	1.8	2296.48
.03	.00	12.83	.00	.000	.020	.000	.000	2289.31	1030.77
.003617	290.	292.	301.	0	8	0	.00	59.57	1090.33

*[redacted] 540.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

540.000	6.97	2299.96	2299.96	.00	2302.51	2.54	1.72	.00	2307.49
3900.0	.0	3900.0	.0	.0	304.7	.0	12.6	2.4	2301.10
.04	.00	12.80	.00	.000	.020	.000	.000	2292.99	1026.42
.003625	479.	474.	474.	0	5	0	.00	60.14	1086.56

*SECNO 550.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

550.000	7.27	2304.95	2304.95	.00	2307.55	2.59	1.90	.01	2312.22
3900.0	.0	3900.0	.0	.0	301.8	.0	16.2	3.1	2304.93
.05	.00	12.92	.05	.000	.020	.020	.000	2297.68	1030.97
.003691	519.	521.	523.	0	8	0	.00	59.72	1090.69

*SECNO 560.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

560.000	6.77	2309.13	2309.13	.00	2311.76	2.63	1.77	.01	2317.24
3900.0	.0	3900.0	.0	.0	299.5	.0	19.5	3.8	2309.45
.06	.00	13.02	.00	.000	.020	.000	.000	2302.36	1032.84
.003674	480.	480.	476.	0	11	0	.00	57.52	1090.36

[redacted]

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	OCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 570.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

570.000	7.19	2314.08	2314.08	.00	2316.51	2.43	1.46	.02	2316.40
3900.0	.0	3900.0	.0	.0	311.9	.0	22.3	4.3	2316.50
.07	.00	12.50	.00	.000	.020	.000	.000	2306.89	1004.80
.003696	390.	397.	401.	0	8	0	.00	65.48	1070.28

*SECNO 580.000

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 1000.0 1041.8 TYPE= 1 TARGET= 41.750
ELENCL= 2317.80 ELENCR= 2317.80

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2317.80 ELREA= 2317.80

.000	6.47	2316.49	2316.49	.00	2319.73	3.24	.37	.24	2367.30
3900.0	.0	3900.0	.0	.0	270.2	.0	23.1	4.5	2317.80
.07	.00	14.44	.00	.000	.015	.000	.000	2310.02	1000.00
.002524	120.	123.	117.	0	12	0	.00	41.75	1041.75

SPECIAL BRIDGE

5227 DOWNSTREAM ELEV IS 2315.53 , NOT 2316.49 HYDRAULIC JUMP OCCURS DOWNSTREAM (IF LOW FLOW CONTROLS)

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	.90	1.56	2.60	132.00	41.75	1.75	320.00	.00	2312.18	2310.02

*SECNO 590.000
6790 POSSIBLE INVALID SOLUTION 20 TRIALS OF EG NOT ENOUGH
FINAL QWEIR + QPR = 4407. DOES NOT EQUAL ACTUAL Q = 3900.

6840, FLOW IS BY WEIR AND LOW FLOW

3301 HV CHANGED MORE THAN HVINS

3420 BRIDGE W.S.= 2319.00 BRIDGE VELOCITY= 13.95 CALCULATED CHANNEL AREA= 273.

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

EGPRS	EGLWC	H3	QWEIR	QLOW	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
2320.09	2322.02	2.51	0.	4407.	320.	320.	2320.18	2322.01	132.

3470 ENCROACHMENT STATIONS= 1000.0 1041.8 TYPE= 1 TARGET= 41.750
ELENCL= 2324.10 ELENCR= 2324.10

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2374.00 ELREA= 2324.10

590.000	7.31	2319.49	.00	.00	2322.02	2.53	2.29	.00	2374.00
3900.0	.0	3900.0	.0	.0	305.5	.0	23.9	4.6	2324.10
.07	.00	12.76	.00	.000	.015	.000	.000	2312.18	1000.00
.001744	134.	125.	133.	4	0	20	.00	41.75	1041.75

*SECNO 600.000

HV CHANGED MORE THAN HVINS

600.000	6.89	2320.95	2319.68	.00	2322.35	1.40	.22	.11	2325.30
3900.0	.0	3900.0	.0	.0	411.0	.0	24.9	4.8	2325.30
.07	.00	9.49	.00	.000	.020	.000	.000	2314.06	1006.41
.001768	133.	123.	120.	5	15	0	.00	74.34	1080.75

*SECNO 610.000

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

610.000	6.04	2324.24	2324.24	.00	2326.56	2.32	1.10	.28	2327.86
3900.0	.0	3900.0	.0	.0	318.9	.0	28.7	5.5	2331.00
.08	.00	12.23	.00	.000	.020	.000	.000	2318.20	1026.68
.003715	474.	443.	414.	0	11	0	.00	69.25	1095.93

*SECNO 620.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST
620.000	5.71	2328.12	2328.12	.00	2330.41	2.29	1.92	.00	2330.86
3900.0	.0	3900.0	.0	.0	321.4	.0	32.4	6.3	2336.40
.10	.00	12.13	.00	.000	.020	.000	.000	2322.41	1022.38
.003761	492.	513.	536.	0	11	0	.00	71.30	1093.68

*SECNO 630.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

630.000	6.28	2331.09	2331.09	.00	2333.49	2.40	1.42	.03	2336.00
3900.0	.0	3900.0	.0	.0	313.7	.0	35.2	6.9	2339.90
.11	.00	12.43	.00	.000	.020	.000	.000	2324.81	1012.72
.003688	384.	382.	382.	0	8	0	.00	66.13	1078.85

*SECNO 640.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 1000.0 1066.0 TYPE= 1 TARGET= 66.000
ICL= 2337.25 ELENCR= 2337.25

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2387.20 ELREA= 2337.25

640.000	5.53	2332.78	2332.78	.00	2335.22	2.43	.24	.01	2387.20
3900.0	.0	3900.0	.0	.0	311.5	.0	35.8	7.1	2337.25
.11	.00	12.52	.00	.000	.015	.000	.000	2327.25	1000.70
.002097	195.	88.	125.	0	11	0	.00	64.60	1065.30

SPECIAL BRIDGE

5227 DOWNSTREAM ELEV IS 2331.67 , NOT 2332.78 HYDRAULIC JUMP OCCURS DOWNSTREAM (IF LOW FLOW CONTROLS)

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	.90	1.56	2.60	184.00	48.00	6.00	426.00	1.50	2328.41	2327.25

*SECNO 650.000

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.74

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

CLASS B LOW FLOW

3420 BRIDGE W.S.= 2333.81 BRIDGE VELOCITY= 12.79 CALCULATED CHANNEL AREA= 271.

EGPRS	EGLWC	H3	QWEIR	QLOW	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
2334.81	2337.18	.00	0.	3900.	426.	432.	2336.41	2339.86	0.

3470 ENCROACHMENT STATIONS= 1000.0 1066.0 TYPE= 1 TARGET= 66.000
ELENCL= 2336.41 ELENCR= 2336.41

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2386.40 ELREA= 2336.41

650.000	7.59	2336.00	.00	.00	2337.18	1.18	1.97	.00	2386.40
3900.0	.0	3900.0	.0	.0	447.1	.0	37.6	7.4	2336.41
.11	.00	8.72	.00	.000	.015	.000	.000	2328.41	1000.00
.000690	188.	198.	187.	0	0	0	.00	66.00	1066.00

*SECNO 660.000

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .43

660.000	6.51	2335.75	2334.97	.00	2337.54	1.78	.17	.18	2339.70
3900.0	.0	3900.0	.0	.0	364.0	.0	38.8	7.6	2341.30
.12	.00	10.72	.00	.000	.025	.000	.000	2329.24	1004.44
.003646	99.	128.	163.	3	15	0	.00	66.14	1070.58

*SECNO 670.000

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

670.000	7.01	2339.38	2339.38	.00	2342.21	2.83	2.41	.31	2341.00
3900.0	.0	3900.0	.0	.0	289.1	.0	42.7	8.3	2349.40
.13	.00	13.49	.00	.000	.025	.000	.000	2332.37	1014.93
.005792	504.	531.	553.	0	8	0	.00	51.83	1066.76

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 680.000

3301 HV CHANGED MORE THAN HVINS

680.000	7.74	2342.46	2341.83	.00	2344.76	2.30	2.50	.05	2351.00
3900.0	.0	3900.0	.0	.0	320.5	.0	46.3	8.9	2351.80
.14	.00	12.17	.00	.000	.025	.000	.000	2334.72	1017.42
.004223	483.	509.	502.	2	5	0	.00	52.18	1069.60

*SECNO 690.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 1000.0 1082.0 TYPE= 1 TARGET= 82.000
ELENCL= 2352.40 ELENCR= 2352.40

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2402.40 ELREA= 2352.40

690.000	6.12	2344.52	2344.52	.00	2347.13	2.61	1.73	.09	2402.40
3900.0	.0	3900.0	.0	.0	300.9	.0	49.4	9.4	2352.40
.15	.00	12.96	.00	.000	.020	.000	.000	2338.40	1011.82
.003708	433.	437.	443.	0	15	0	.00	58.35	1070.18

SPECIAL BRIDGE

5227 DOWNSTREAM ELEV IS 2343.46 , NOT 2344.52 HYDRAULIC JUMP OCCURS DOWNSTREAM (IF LOW FLOW CONTROLS)

SB	XK	XKOR	COFQ	BDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	.90	1.56	2.60	120.00	40.00	4.00	798.00	1.50	2338.49	2338.40

*SECNO 700.000

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.60

CLASS B LOW FLOW

3420 BRIDGE W.S.= 2344.94 BRIDGE VELOCITY= 13.13 CALCULATED CHANNEL AREA= 295.

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

EGPRS	EGLWC	H3	QWEIR	QLOW	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
.00	2347.85	.00	0.	3900.	798.	798.	2352.49	2354.36	0.

3470 ENCROACHMENT STATIONS= 1000.0 1082.0 TYPE= 1 TARGET= 82.000
ELENCL= 2352.49 ELENCR= 2352.49

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2402.40 ELREA= 2352.49

700.000	8.00	2346.49	.00	.00	2347.85	1.36	.73	.00	2402.40
3900.0	.0	3900.0	.0	.0	416.5	.0	50.4	9.6	2352.49
.15	.00	9.36	.00	.000	.020	.000	.000	2338.49	1008.92
.001442	127.	119.	127.	0	0	0	.00	64.09	1073.00

CCHV= .100 CEHV= .300
*SECNO 710.000

3[illegible]HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

710.000	6.61	2348.19	2348.19	.00	2350.62	2.42	.08	.32	2353.10
3900.0	.0	3900.0	.0	.0	312.2	.0	50.7	9.7	2354.06
.15	.00	12.49	.00	.000	.025	.000	.000	2341.58	1015.42
.005765	42.	33.	31.	0	15	0	.00	65.41	1080.83

THIS RUN EXECUTED 06OCT97 10:39:40

****
HEC-2 WATER SURFACE PROFILES

Version 4.6.2; May 1991
****

NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

RAINBOW BLVD. TO JONES B

SUMMARY PRINTOUT TABLE 100

	SECNO	EGLWC	ELLC	EGPRS	ELTRD	QPR	QWEIR	CLASS	H3	DEPTH	CWSEL	VCH	EG
*	500.000	2294.79	2292.60	2294.17	2295.30	3900.00	.00	2.00	.00	8.16	2292.76	11.45	2294.79
*	590.000	2322.02	2320.18	2320.09	2322.01	4406.91	.34	15.00	2.51	7.31	2319.49	12.76	2322.02
*	650.000	2337.18	2336.41	2334.81	2339.86	3900.00	.00	2.00	.00	7.59	2336.00	8.72	2337.18
*	700.000	2347.85	2352.49	.00	2354.36	3900.00	.00	2.00	.00	8.00	2346.49	9.36	2347.85

P [redacted]OW BLVD. TO JONES B

SUMMARY PRINTOUT TABLE 150

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH	AREA	.01K
*	470.000	.00	.00	.00	2274.47	3900.00	2278.74	2278.74	2280.64	87.42	11.06	352.70	417.11
*	480.000	315.97	.00	.00	2279.98	3900.00	2285.49	2285.49	2287.77	20.96	12.11	322.04	851.87
*	490.000	143.95	.00	.00	2284.10	3900.00	2290.57	2290.57	2293.81	25.22	14.43	270.24	776.67
*	500.000	102.00	2295.30	2292.60	2284.60	3900.00	2292.76	.00	2294.79	12.63	11.45	340.59	1097.48
*	510.000	25.00	.00	.00	2285.06	3900.00	2294.36	2290.49	2294.96	5.68	6.22	627.03	1636.48
*	520.000	261.38	.00	.00	2287.10	3900.00	2294.21	2294.21	2296.79	36.69	12.89	302.60	643.85
*	530.000	292.28	.00	.00	2289.31	3900.00	2296.18	2296.18	2298.74	36.17	12.83	304.07	648.48
*	540.000	474.25	.00	.00	2292.99	3900.00	2299.96	2299.96	2302.51	36.25	12.80	304.74	647.74
*	550.000	520.66	.00	.00	2297.68	3900.00	2304.95	2304.95	2307.55	36.91	12.92	301.79	641.97
*	560.000	479.99	.00	.00	2302.36	3900.00	2309.13	2309.13	2311.76	36.74	13.02	299.48	643.40
*	570.000	397.21	.00	.00	2306.89	3900.00	2314.08	2314.08	2316.51	36.96	12.50	311.92	641.50
*	580.000	123.21	.00	.00	2310.02	3900.00	2316.49	2316.49	2319.73	25.24	14.44	270.16	776.32
*	590.000	125.31	2322.01	2320.18	2312.18	3900.00	2319.49	.00	2322.02	17.44	12.76	305.54	933.85
	600.000	123.12	.00	.00	2314.06	3900.00	2320.95	2319.68	2322.35	17.68	9.49	411.00	927.39
*	610.000	443.09	.00	.00	2318.20	3900.00	2324.24	2324.24	2326.56	37.15	12.23	318.95	639.89
*	620.000	512.99	.00	.00	2322.41	3900.00	2328.12	2328.12	2330.41	37.61	12.13	321.44	635.96
*	630.000	381.82	.00	.00	2324.81	3900.00	2331.09	2331.09	2333.49	36.88	12.43	313.74	642.22
*	640.000	87.80	.00	.00	2327.25	3900.00	2332.78	2332.78	2335.22	20.97	12.52	311.48	851.58
*	650.000	198.08	2339.86	2336.41	2328.41	3900.00	2336.00	.00	2337.18	6.90	8.72	447.09	1485.20
*	660.000	127.89	.00	.00	2329.24	3900.00	2335.75	2334.97	2337.54	36.46	10.72	363.96	645.89
*	670.000	530.81	.00	.00	2332.37	3900.00	2339.38	2339.38	2342.21	57.92	13.49	289.08	512.43
	680.000	508.76	.00	.00	2334.72	3900.00	2342.46	2341.83	2344.76	42.23	12.17	320.47	600.15
*	690.000	437.49	.00	.00	2338.40	3900.00	2344.52	2344.52	2347.13	37.08	12.96	300.89	640.44
*	700.000	119.30	2354.36	2352.49	2338.49	3900.00	2346.49	.00	2347.85	14.42	9.36	416.54	1026.94

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH	AREA	.01K
*	710.000	33.13	.00	.00	2341.58	3900.00	2348.19	2348.19	2350.62	57.65	12.49	312.19	513.63

R [illegible]OW BLVD. TO JONES B

SUMMARY PRINTOUT TABLE 150

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
*	470.000	3900.00	2278.74	.00	.00	.00	93.56	.00
*	480.000	3900.00	2285.49	.00	6.75	.00	71.65	315.97
*	490.000	3900.00	2290.57	.00	5.08	.00	41.75	143.95
*	500.000	3900.00	2292.76	.00	2.19	.00	41.75	102.00
*	510.000	3900.00	2294.36	.00	1.60	.00	91.33	25.00
*	520.000	3900.00	2294.21	.00	-.15	.00	59.57	261.38
*	530.000	3900.00	2296.18	.00	1.97	.00	59.57	292.28
*	540.000	3900.00	2299.96	.00	3.78	.00	60.14	474.25
*	550.000	3900.00	2304.95	.00	4.99	.00	59.72	520.66
*	560.000	3900.00	2309.13	.00	4.18	.00	57.52	479.99
*	570.000	3900.00	2314.08	.00	4.95	.00	65.48	397.21
*	580.000	3900.00	2316.49	.00	2.41	.00	41.75	123.21
*	590.000	3900.00	2319.49	.00	3.00	.00	41.75	125.31
	600.000	3900.00	2320.95	.00	1.46	.00	74.34	123.12
*	610.000	3900.00	2324.24	.00	3.29	.00	69.25	443.09
*	620.000	3900.00	2328.12	.00	3.88	.00	71.30	512.99
*	630.000	3900.00	2331.09	.00	2.97	.00	66.13	381.82
*	640.000	3900.00	2332.78	.00	1.69	.00	64.60	87.80
*	650.000	3900.00	2336.00	.00	3.22	.00	66.00	198.08
*	660.000	3900.00	2335.75	.00	-.25	.00	66.14	127.89
*	670.000	3900.00	2339.38	.00	3.63	.00	51.83	530.81
	680.000	3900.00	2342.46	.00	3.08	.00	52.18	508.76
*	690.000	3900.00	2344.52	.00	2.06	.00	58.35	437.49
*	700.000	3900.00	2346.49	.00	1.98	.00	64.09	119.30

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
*	710.000	3900.00	2348.19	.00	1.70	.00	65.41	33.13

SUMMARY OF ERRORS AND SPECIAL NOTES

CAUTION SECNO= 470.000 PROFILE= 1 CRITICAL DEPTH ASSUMED

CAUTION SECNO= 480.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 480.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 490.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 490.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 500.000 PROFILE= 1 HYDRAULIC JUMP D.S.
WARNING SECNO= 500.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 510.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO= 520.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 520.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 530.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 530.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 540.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
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CAUTION SECNO= 570.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 570.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 580.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 580.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 590.000 PROFILE= 1 HYDRAULIC JUMP D.S.
CAUTION SECNO= 590.000 PROFILE= 1 20 TRIALS OF EG NOT ENOUGH

CAUTION SECNO= 610.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 610.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 620.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 620.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 630.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 630.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 640.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 640.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 650.000 PROFILE= 1 HYDRAULIC JUMP D.S.
WARNING SECNO= 650.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

G SECNO= 660.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO= 670.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 670.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 690.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 690.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 700.000 PROFILE= 1 HYDRAULIC JUMP D.S.
WARNING SECNO= 700.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO= 710.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 710.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

2.2.2 JONES BLVD. TO INDUSTRIAL RD. REACH

APPROXIMATE METHOD
HEC-2 MODEL ANALYSIS
JONES BLVD. TO INDUSTRIAL RD. REACH

This reach from Jones Boulevard to Industrial Road was flown as part of this project. Therefore, topography was generated. However, the extent of the topography east of Industrial Road does not include the terminus of the culvert. So, a survey crew was sent out to pick up shots. Based on these survey shots, the HEC-2 model was constructed for the Industrial Road Culvert. The starting water surface elevation was computed using normal depth. The subcritial run was used to determine the floodplain delineation for this reach. Based on the above information, the floodplain is confined to a culvert from Industrial Road to the Imperial Palace Hotel and Casino Parking Garage.

A supplemental HEC-2 model analysis was performed to estimate the limits of flooding due to a spillover at the Cameron Street Culvert/Orleans Culvert. Cross sections were developed from Arville Street to Cameron Street along Harmon Avenue and Cameron Street. The Cameron Street cross sections show a limited conveyance capacity due the ground falling away to the east at the top of curb. Therefore, the majority of the storm water would spillover the Cameron Street curb to the east across the Orleans Hotel and Casino property. The remainder of the Cameron Street storm water would travel north to Harmon Avenue where it would then travel east to Arville Street. At Arville Street, the storm water would return to the Flamingo Wash.

In order to establish the worst case floodplain delineation west of Cameron Street, the full spillover flow was calculated as being effective flow area in the roadway only to Harmon Avenue. In order to establish the floodplain delineation due to the Flamingo Wash north of Harmon Avenue, the approximate Cameron Street conveyance capacity was used in the HEC-2 model along Harmon Avenue cross sections. The starting water surface elevation was computed using critical depth. The subcritial run was used to determine the floodplain delineation.

BASE1.D1

```
*******************************************
*  HEC-2 WATER SURFACE PROFILES           *
*                                         *
*  Version   4.6.2;  May 1991             *
*                                         *
*  DATE     06OCT97     TIME    10:40:55  *
*******************************************
```


```
*****************************************
*  U.S. ARMY CORPS OF ENGINEERS         *
*  HYDROLOGIC ENGINEERING CENTER        *
*  609 SECOND STREET, SUITE D           *
*  DAVIS, CALIFORNIA 95616-4687         *
*           (916) 756-1104              *
*****************************************
```


```
X     X  XXXXXXX   XXXXX              XXXXX
X     X  X        X     X           X     X
X     X  X        X                       X
XXXXXXX  XXXX     X          XXXXX    XXXXX
X     X  X        X                  X
X     X  X        X     X            X
X     X  XXXXXXX  XXXXX              XXXXXXX
```

THIS RUN EXECUTED 06OCT97 10:40:57

```
**************************************
 HEC-2 WATER SURFACE PROFILES

 Version  4.6.2;  May 1991
**************************************


T1      550.032
T2      FLAMINGO WASH FIS RESTUDY
T3      FLOODPLAIN DETERMINATION
T4      FILES: BASE1.DWG, BASE1.D1
T4      STARTING WSE = NORMAL DEPTH
T4      SUBCRITICAL RUN

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

                2                             0.005                         3900      2110

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

     -1                 -1                                      -2        -6

J   RIABLE CODES FOR SUMMARY PRINTOUT

    150                100

NC      0.02      0.02      0.025     0.1       0.3
X1        10         9       1016      1080
GR      2116      1000       2116      1016    2106.8      1016    2106.8      1080      2116      1080
GR      2116   1137.78       2116   1138.63      2116   1190.21      2116   1211.89

NC      0.02      0.02      0.015
X1        20        10     1086.5    1150.5        50        50        50
X3        10                        1086.5    2118.3    1150.5    2118.3
GR    2118.3      1000    2118.3    1010.55   2118.3    1021.18   2118.3    1023.97   2118.3    1031.95
GR    2118.3    1086.5    2108.8    1086.5    2108.8    1150.5    2118.2    1150.5    2118.2    1220.07

NC      0.02      0.02      0.015
SB       0.9      1.56        2.6       150        64         4       480         0   2121.26    2108.8
X1        30         7       1076      1140      1071      1071      1071
X2                             1   2129.26    2133.8                          1.33
X3        10                        1076      2132      1140      2132
GR    2132.6      1000       2132    1056.5      2132      1076   2121.26      1076   2121.26      1140
GR      2132      1140    2132.17   1150.66

NC      0.02      0.02      0.025
X1        40        21    1052.22   1141.81     32.57     38.38     32.95
GR    2133.2      1000    2132.19   1052.02      2132   1052.22      2130   1055.81      2128   1059.25
GR      2126   1062.68       2124    1066.1      2122   1069.51   2121.46   1070.43      2122   1091.59
GR    2122.1   1094.59       2122   1098.78    2121.3   1127.39      2122   1128.18      2124   1130.46
GR      2126   1132.79       2128   1135.17    2129.3   1136.76      2130   1141.81   2131.92   1177.78
GR      2132   1180.46
```

NC	0.02	0.02	0.025							
X1	50	18	1027.63	1147.95	126.7	156.74	141.28			
GR	2132.9	1000	2133.85	1027.63	2132	1033.15	2130	1039.07	2128	1044.87
GR	2126	1050.43	2124	1055.87	2123.68	1056.72	2122.57	1090.43	2123.44	1124.77
GR	2124	1126.19	2126	1131.26	2128	1136.26	2130	1141.18	2132	1146.07
GR	2132.5	1147.95	2133.09	1166.81	2132	1176.95				
NC	0.02	0.02	0.015							
X1	60	23	1033.24	1170.76	113.71	161.62	141.88			
GR	2136.4	1000	2136	1010.12	2135.69	1014.32	2135.24	1025.25	2134	1033.24
GR	2133.5	1037.42	2132	1041.89	2130	1047.66	2128	1053.19	2125.93	1058.66
GR	2125.5	1088.8	2126	1150.33	2126.23	1152.33	2126.23	1152.45	2128	1156.38
GR	2130	1161.1	2132	1165.84	2134.05	1170.76	2134	1171.21	2134.73	1200.08
GR	2134	1226.15	2133.94	1228.76	2134	1229.76				
NC	0.02	0.02	0.015							
X1	70	20	1014.79	1150.21	16.29	15.67	15.47			
GR	2138	1000	2136	1012.21	2135.48	1014.79	2134	1018.04	2132	1022.21
GR	2130	1026.4	2128.03	1031.18	2128	1034.97	2126	1040.8	2126	1052.79
GR	2125.3	1092.6	2126	1117.02	2128	1134.14	2128.47	1135.71	2130	1139.13
GR	2132	1144.01	2134	1148.95	2134.64	1150.21	2134.98	1178.85	2134	1204.81
NC	0.02	0.02	0.015							
X1	80	15	1011.19	1144.98	1	1	1			
GR	2138	1000	2136	1011.19	2136.04	1011.25	2134	1015.55	2132	1019.82
GR	2130	1024.39	2129.56	1025.14	2130	1128.98	2130.72	1135.47	2132	1139.51
GR	2134	1143.5	2134.77	1144.98	2135.02	1173.67	2134	1202.29	2134	1202.8
NC	0.02	0.02	0.015							
X1	90	11	1028.36	1125.36	11.72	30.41	24.79			
X3	10			1028.36	2142	1125.36	2142			
GR	2139.6	1000	2139.44	1013.51	2140	1028.36	2130.5	1028.36	2130.5	1125.36
GR	2140	1125.36	2140	1138.33	2142	1142.36	2142.29	1142.96	2142	1149.65
GR	2142	1150.07								
NC	0.02	0.02	0.015							
SB	1.25	1.56	2.6	100	97	6	546	0	2131	2130.5
X1	100	7	1002.38	1099.38	45.06	45.75	44.67			
X2			1	2137	2142			2		
X3	10			1002.38	2142	1099.38	2142			
GR	2141.2	1000	2141	1002.38	2131	1002.38	2131	1099.38	2141	1099.38
GR	2142	1109.94	2142.16	1110.14						
NC	0.02	0.02	0.025							
X1	110	23	1040.32	1195.62	423.53	274.8	320.85			
GR	2160	1000	2158	1004.62	2156	1009.22	2154	1013.75	2152	1018.62
GR	2150	1023.47	2148	1027.89	2146	1033.89	2144	1040.32	2142	1046.87
GR	2140	1053.57	2139.06	1056.63	2138	1067.36	2136	1085.25	2135.01	1094.93
GR	2134.6	1123.91	2133.89	1145.21	2136	1154.49	2138	1160.35	2140	1166.38
GR	2141.7	1172.23	2142	1173.03	2144	1195.62				

NC	0.02	0.02	0.025							
X1	120	28	1038.13	1156.1	152.47	136.53	140.52			
GR	2160	1000	2160.02	1000.79	2158	1006.99	2156	1011.78	2154	1016.17
GR	2152	1020.69	2150	1025.11	2148	1029.32	2146	1033.22	2144	1038.13
GR	2142	1043.2	2140	1048.11	2138	1052.93	2136.67	1056.07	2136.29	1063.51
GR	2136	1083.19	2135.07	1129.31	2136	1132.1	2138	1137.23	2140	1142.97
GR	2142	1148.93	2144	1155.67	2144.09	1156.1	2144	1168.63	2143.69	1177.28
GR	2144	1179.56	2145.21	1188.63	2144.27	1199.36				
NC	0.02	0.02	0.015							
X1	130	23	1043	1093.53	147.26	217.54	200.57			
X3	10			1043	2147	1093.5	2147			
GR	2147	1000	2147	1043	2136.35	1043	2136.35	1093.5	2145	1093.5
GR	2148	1093.53	2150	1093.67	2152	1093.8	2154	1093.92	2156	1094.04
GR	2158	1094.16	2160	1094.28	2162	1094.4	2164	1094.52	2166	1094.64
GR	2168	1094.76	2170	1094.88	2172	1095	2174	1095.12	2176	1095.25
GR	2176.2	1095.25	2176.14	1097.06	2177.18	1126.26				
NC	0.02	0.02	0.015							
SB	0.9	1.56	2.6	50	50.5	2.5	480	0	2138.63	2136.35
X1	140	18	1051.5	1102	221.59	232.92	227.79			
X2			1	2148.63	2150			1.33		
X3	10			1051.5	2149	1102	2149			
GR	2164	1000	2165.34	1027.56	2165.6	1038.1	2164	1043.89	2163.14	1046.04
GR	2162	1046.09	2160	1046.17	2158	1046.26	2156	1046.37	2154	1046.49
GR	2152	1046.65	2150	1046.99	2148	1047.66	2148.63	1051.5	2138.63	1051.5
GR	2138.6	1102	2148.63	1102	2150	1165.37				
NC	0.02	0.02	0.02							
X1	150	19	1143.85	1228.03	459.97	478.08	470.1			
GR	2151.8	1000	2150.92	1143.85	2150	1145.3	2148	1148.47	2146	1151.66
GR	2144	1154.86	2142	1158.07	2140.29	1160.81	2140	1165.05	2139.72	1169.9
GR	2140	1179.41	2140.27	1187.17	2142	1190.4	2144	1194.14	2146	1197.88
GR	2147.5	1200.77	2147.59	1208.51	2148	1228.03	2153	1228.03		
NC	0.03	0.03	0.02							
X1	160	19	1031.53	1116.81	269.26	239.99	254.22			
GR	2150.7	1000	2151.66	1031.53	2151.82	1032.4	2150	1035.78	2148	1039.52
GR	2146	1043.28	2144	1047.06	2142	1050.83	2141.2	1051.85	2141.2	1058.21
GR	2141.2	1078.5	2142	1096.8	2142.04	1098.03	2144	1101.8	2146	1105.66
GR	2148	1109.54	2150	1113.43	2151.73	1116.81	2150.73	1228.05		
NC	0.03	0.03	0.015							
X1	170	8	1027	1090.33	226.48	200.55	215.74			
X3	10			1027	2152	1090.33	2152			
GR	2151.2	1000	2152	1027	2141.3	1027	2141.3	1090.33	2152	1090.33
GR	2152.1	1106.59	2152	1107.25	2152	1128.85				

	0.03	0.03	0.015							
SB	1.25	1.56	2.6	100	63.33	3.33	375	0	2142	2141.3
X1	180	6	1028	1091.33	103.52	100.65	102.34			
X2			1	2148.25	2152			2		
X3	10			1028	2153	1091.33	2153			
GR	2152	1000	2152	1028	2142	1028	2142	1091.33	2152	1091.33
GR	2152.7	1101.65								
NC	0.03	0.03	0.025							
X1	190	26	1057.63	1159.62	500.04	500.52	500.57			
GR	2161.8	1000	2161.15	1037.1	2160	1057.63	2158	1066.33	2156	1070.52
GR	2154	1074.32	2152	1078.82	2150	1087.6	2149.23	1092.96	2148	1097.4
GR	2146	1105.61	2145.96	1105.64	2146	1106.89	2146.62	1129.48	2148	1132.61
GR	2150	1137.11	2152	1141.61	2154	1146.11	2156	1150.62	2158	1155.12
GR	2160	1159.62	2162	1164.12	2164	1168.62	2165.24	1171.43	2165.44	1173.81
GR	2164.9	1304.26								
NC	0.03	0.03	0.025							
X1	200	29	1081.32	1206.85	418.92	454.91	440.55			
GR	2166	1000	2163.87	1007.72	2164	1009.02	2164	1018.08	2164	1057.09
GR	2163.8	1081.32	2163.68	1085.02	2163.1	1100.9	2162	1105.12	2160	1112.09
GR	2158.5	1116.91	2158	1125.2	2157.92	1126.57	2157.3	1157.54	2156.61	1186.3
GR	2158	1189.66	2160	1194.48	2162	1199.28	2164	1204.07	2165.16	1206.85
GR	2166	1214.07	2166.27	1216.22	2166	1221.85	2166.58	1255.95	2167.34	1280.88
GR	2168	1294.63	2168.26	1300	2170	1311.97	2171.9	1324.88		
NC	0.03	0.03	0.025							
X1	210	28	1100.8	1215.9	500.22	499.61	499.61			
GR	2172.4	1000	2173.9	1065.74	2173.31	1085.11	2172	1100.8	2171.94	1101.34
GR	2170	1105.9	2168	1110.73	2166	1115.57	2164.77	1118.64	2164	1126.5
GR	2163.5	1131.43	2162	1138.59	2161.45	1140.84	2162	1156.97	2162.31	1169.45
GR	2164	1190.56	2164.01	1190.96	2166	1196.6	2168	1202.2	2169.6	1206.63
GR	2169.6	1215.9	2169.17	1223.35	2169.89	1261.96	2170	1264.25	2170.46	1282.17
GR	2170.9	1301	2172	1309.55	2173.98	1327.16				
NC	0.03	0.03	0.025							
X1	220	20	1141.31	1259.83	493.09	465.08	485.49			
GR	2176.5	1000	2176.38	1031.14	2177.52	1116.69	2176.83	1123.53	2176.6	1141.31
GR	2176	1143.04	2174	1148.79	2172	1154.59	2170	1160.45	2169.1	1163.13
GR	2169.4	1192.93	2169.83	1203.88	2169.62	1216.41	2169.67	1234.76	2170	1236.45
GR	2172	1245.12	2174	1252.8	2174.01	1252.83	2175.96	1259.83	2174.94	1388.6
NC	0.03	0.03	0.025							
X1	230	17	1075.04	1182.23	500.61	500.8	501.36			
GR	2182	1000	2181.88	1014.68	2181.94	1042.68	2181.66	1049.4	2181.39	1075.04
GR	2180	1078.73	2178	1084.05	2176	1089.39	2174.04	1094.65	2175.34	1119.23
GR	2175.6	1163.67	2176	1164.88	2178	1172.81	2180	1180.59	2180.35	1181.79
GR	2180.9	1182.23	2180	1249.38						

[redacted]	0.03	0.03	0.025							
X1	240	23	1147.52	1248.81	500.99	499.84	499.89			
GR	2186.5	1000	2186.56	1129.61	2188	1133.51	2188.96	1135.99	2188.71	1147.52
GR	2188	1149.52	2186	1155.1	2184	1160.7	2182	1166.3	2181.36	1168.1
GR	2180.9	1188.89	2182	1207.98	2183.07	1232.59	2184	1235.33	2186	1240.96
GR	2188	1246.09	2189.09	1248.81	2188.75	1269.8	2188	1286.33	2187.56	1294.31
GR	2188	1298.97	2188.86	1306.71	2190	1428.37				
NC	0.03	0.03	0.025							
X1	250	18	1025.38	1133.09	282	280.83	282.34			
GR	2194	1000	2193.61	1014.56	2193.05	1025.38	2192	1027.7	2190	1031.99
GR	2188	1036.21	2186	1040.39	2184.99	1042.43	2184.97	1079.5	2185.25	1112.07
GR	2186	1114.07	2188	1119.44	2190	1124.87	2192	1130.41	2192.94	1133.09
GR	2194	1147.97	2194	1152.06	2194	1182.85				
NC	0.03	0.03	0.015							
X1	260	8	1005	1093	270.66	272.26	271.17			
X3	10			1005	2197	1093	2197			
GR	2195.4	1000	2196	1005	2189.1	1005	2189.1	1093	2196	1093
GR	2195.6	1109.61	2195	1129.86	2195	1159.81				
NC	0.03	0.03	0.015							
SB	0.9	1.56	2.6	100	88	4	420	0	2190.4	2189.1
X1	270	8	1035.5	1123.5	197.48	195.43	195.33			
X2			1	2195.4	2197			1.33		
X[redacted]	10			1035.5	2198	1123.5	2198			
GR	2197.3	1013.74	2196.91	1026.08	2197	1035.5	2190.4	1035.5	2190.4	1123.5
GR	2197	1123.5	2197.23	1126.89	2196.99	1135.18				
NC	0.03	0.03	0.025							
X1	280	22	1022.84	1209.93	327.18	307.59	311.22			
GR	2212	1000	2210	1004.36	2208	1008.65	2206	1012.92	2204	1017.17
GR	2202	1021.41	2201.33	1022.84	2200.09	1051.83	2200	1052.46	2198	1066.54
GR	2196	1079.93	2195.64	1082.2	2195.49	1123.58	2194.51	1159.45	2195.13	1190.53
GR	2196	1192.92	2197.41	1196.24	2198	1198.98	2200	1208.4	2200.32	1209.93
GR	2200.2	1230.54	2200	1392.7						
NC	0.03	0.03	0.025							
X1	290	23	1028.04	1218.24	326.63	318.08	320.59			
GR	2209.5	1000	2209.88	1021.04	2210	1021.87	2210.71	1028.04	2210	1031.4
GR	2208	1039.44	2206	1048.06	2204	1056.67	2202	1070.78	2200.78	1093.78
GR	2200	1118.06	2199.43	1178.79	2200	1180.89	2201.44	1186.08	2202	1189.02
GR	2204	1195.63	2206	1202.35	2208	1209.9	2210	1216.48	2210.45	1218.24
GR	2210.1	1247.59	2210.63	1261.39	2211.47	1295.01				
NC	0.03	0.03	0.015							
X1	300	19	1124.77	1156.11	45.92	47.38	43.68			
X3	10			1124.77	2212	1156.11	2212			
GR	2210	1000	2210.54	1007.79	2210.76	1030.34	2207.9	1124.77	2199.9	1124.77
GR	2199.9	1134.77	2207.9	1134.77	2207.9	1135.44	2199.9	1135.44	2199.9	1145.44
GR	2207.9	1145.44	2207.9	1146.11	2199.9	1146.11	2199.9	1156.11	2207.9	1156.11
[redacted]	210.8	1191.34	2212	1212.68	2212.08	1212.9	2212.31	1248.99		

[redacted]	0.03	0.03	0.015							
X1	310	14	1073.5	1104.83	1075	1075	1075			
X3	10			1073.5	2224	1104.83	2224			
GR	2224.5	1000	2222.1	1073.5	2214.1	1073.5	2214.1	1083.5	2222.1	1083.5
GR	2222.1	1084.17	2214.1	1084.17	2214.1	1094.17	2222.1	1094.17	2222.1	1094.83
GR	2214.1	1094.83	2214.1	1104.83	2222.1	1104.83	2224.2	1149.59		
NC	0.03	0.03	0.015							
X1	320	7	1036	1109.5	175	175	175			
X3	10			1036	2226.5	1109.5	2226.5			
GR	2224	1000	2226	1015.17	2226.2	1036	2216.4	1036	2216.4	1109.5
GR	2226.1	1109.5	2226.13	1177.15						
NC	0.03	0.03	0.015							
SB	1.25	1.56	2.6	155	73.5	3.5	350	0	2216.9	2216.4
X1	330	10	1039.5	1113	80	80	80			
X2			1	2221.9	2223.5			2		
X3	10			1000	2227	1155.22	2227			
GR	2224	1000	2224.17	1008.15	2224	1017.14	2224	1022.44	2224	1029.33
GR	2223.6	1039.5	2216.9	1039.5	2216.9	1113	2223.6	1113	2223.9	1155.22
NC	0.03	0.03	0.025							
X1	340	28	1113.73	1213.19	419.71	407.27	419.1			
GR	2232.6	1013.83	2233.16	1037.81	2232	1047.28	2230.89	1056.62	2230.93	1113.73
GR	2230	1117.51	2228	1126.01	2227.07	1130.01	2228.06	1137.71	2226	1143.9
[redacted]	2224	1150.1	2223.46	1151.78	2223.73	1172.32	2223.77	1186.22	2224	1187.11
[redacted]	2225.6	1193.01	2226	1196.12	2227.15	1202.25	2228	1204.18	2230	1208.68
GR	2232	1213.19	2234	1217.7	2236	1222.21	2238	1226.72	2240	1231.3
GR	2240	1231.35	2240.25	1235.29	2240.99	1283.05				
NC	0.03	0.03	0.03							
X1	350	28	1008.56	1115.53	517.98	492.5	503.6			
GR	2240	1000	2238	1008.56	2236	1015.17	2234.78	1018.96	2234.8	1028.78
GR	2234	1033.67	2234.05	1033.82	2232	1039.06	2230	1044.76	2228	1050.92
GR	2226	1054.07	2226.68	1070.18	2226.01	1092.35	2228	1095.8	2230	1099.29
GR	2232	1102.78	2234	1106.34	2236	1109.93	2238	1113.56	2239.09	1115.53
GR	2240	1172.34	2240	1184.24	2239.85	1197.26	2239.33	1209.01	2239.55	1235.1
GR	2240	1236.65	2242	1244.14	2243.19	1249.26				
NC	0.03	0.03	0.015							
X1	360	14	1033	1070.33	209.2	235.77	221.39			
X3	10			1033	2243	1070.33	2243			
GR	2243.6	1000	2243.29	1021.16	2242	1026.31	2241.85	1027.26	2240	1028.17
GR	2240.1	1033	2230.1	1033	2230.1	1070.33	2240.1	1070.33	2240	1070.43
GR	2241.9	1070.76	2242	1072.09	2242.95	1077.63	2243.29	1096.74		
NC	0.03	0.03	0.015							
SB	0.9	1.56	2.6	80	37.33	1.33	360	0	2230.8	2230.1
X1	370	9	1032	1069.33	100	100	100			
X2			1	2240.8	2243.5			1.33		
X3	10			1032	2244	1069.33	2244			
[redacted]	243.8	1000	2243.58	1017.41	2240.8	1032	2230.8	1032	2230.8	1069.33
GR	2240.8	1069.33	2242.76	1069.89	2243.39	1075.02	2243.58	1093.4		

[redacted]	0.035	0.035	0.035							
X1	380	35	1013.23	1363.45	427.09	513.18	471.93			
GR	2250	1000	2250.67	1000.49	2248	1003.91	2246	1006.44	2244	1008.93
GR	2242	1013.12	2242	1013.23	2240	1018.26	2238	1023.36	2237.17	1025.48
GR	2238	1054.84	2237.74	1073.55	2236.8	1085.66	2237.13	1097.22	2238	1100.28
GR	2240	1107.3	2241.8	1113.54	2240	1124.51	2239.45	1127.66	2238.39	1149.36
GR	2238.3	1188.93	2238	1191.99	2236.07	1219.66	2236.06	1233.58	2238	1239.38
GR	2239.5	1244.57	2238.39	1271.19	2238.04	1289.7	2238	1293.55	2237.28	1317.23
GR	2238	1328.23	2240	1349.71	2241.69	1357.02	2242	1363.45	2242.74	1368.17
NC	0.035	0.035	0.035							
X1	390	59	1050.07	1378.76	386.3	404.15	382.37			
X3	10			1044.58	2252.14	1418.51	2247.61			
GR	2250	1000	2248	1011.21	2246.98	1016.42	2248	1024.34	2250	1035.43
GR	2251.2	1044.9	2250	1046.64	2248	1050.07	2246	1052.93	2245.7	1053.17
GR	2244	1070.43	2243.01	1079.72	2243.1	1095.84	2242	1123.66	2241.76	1128.59
GR	2240	1153.99	2241.27	1165.1	2241.41	1178.87	2241.62	1197.62	2242	1204.93
GR	2242.4	1219.22	2243.95	1242.77	2242	1256.79	2240.72	1265.9	2242	1287.79
GR	2242	1288.72	2242	1289	2240.02	1308.54	2241.7	1318.38	2241.22	1326.28
GR	2242	1336.21	2242.6	1343.76	2242.5	1355	2244	1361.04	2246	1370.53
GR	2247.2	1378.76	2246.2	1391.53	2246	1418.98	2244.89	1427.27	2244	1431.85
GR	2242.3	1441.24	2244	1451.27	2245.16	1462.62	2244.39	1497.54	2244	1500.79
GR	2243.4	1506.28	2244	1509.13	2245.08	1514.35	2244.72	1531.13	2246	1563.65
GR	2246.3	1577.24	2246.7	1599.57	2248	1603.19	2250	1608.63	2252	1613.39
GR	2254	1617.98	2256	1621.98	2258	1625.38	2259.93	1633.51		
N[redacted]	0.035	0.035	0.035							
X1	400	46	1023.16	1356.91	357.39	423.51	403.29			
X3	10			1013.57	2259.43	1382.04	2250.46			
GR	2260	1000	2258	1008.69	2256	1015.97	2254	1023.16	2253.09	1026.48
GR	2252	1039.65	2252	1040.17	2250	1047.03	2248	1053.81	2247.01	1057.15
GR	2246.4	1071.09	2246.56	1090.04	2246	1106.57	2245.87	1107.4	2246	1107.62
GR	2246.8	1126.94	2246	1139.05	2245.11	1163.93	2246	1168.44	2247.12	1174.45
GR	2246.7	1188.29	2246.89	1217.85	2246.3	1248.39	2246	1255.13	2245.64	1262.42
GR	2244.3	1273.11	2244.8	1288.21	2246	1293.21	2248	1301.76	2248.44	1303.77
GR	2249.5	1356.91	2249.63	1381.12	2248.69	1404.01	2248	1412.38	2247.76	1415.35
GR	2248	1416.79	2250	1423.57	2252	1429.32	2253.45	1432.88	2252	1442.3
GR	2250.7	1450.29	2252	1456.01	2254	1462.94	2256	1469.23	2258	1475.53
GR	2260	1479.71								
NC	0.035	0.035	0.035							
X1	410	53	1079.98	1436.42	511.96	536.05	493.17			
GR	2261.2	1000	2260.85	1010.56	2262	1018.5	2263.66	1030.28	2262	1036.14
GR	2260	1043.4	2258.93	1047.29	2258.35	1079.98	2258	1082.4	2256	1094.87
GR	2254.7	1103.75	2254	1107.46	2252	1116.99	2251.16	1120.97	2250.58	1139.86
GR	2251.4	1150.58	2250.98	1162.54	2252	1177.62	2252.47	1184.63	2253.54	1190.7
GR	2253.4	1207.87	2252	1221.88	2251.33	1228.11	2250.56	1240.96	2250	1264.15
GR	2249.6	1283.08	2249.96	1310.37	2249.64	1321.48	2250	1326.94	2250.15	1329.41
GR	2251.9	1343.09	2250.52	1382.69	2250.15	1403.48	2251.1	1416.28	2252	1421.53
GR	2254	1433.67	2254.37	1436.42	2254.63	1474.39	2254	1517.79	2253.8	1520.28
GR	2254	1542.07	2254.2	1557.59	2254	1560.09	2253.13	1574.67	2254	1592.54
[redacted]	2254	1593.69	2256	1597.8	2258	1601.83	2260	1605.86	2261.86	1609.04
GR	2262	1611.84	2262	1616.31	2260.25	1659.18				

[redacted]	0.035	0.035	0.035							
X1	420	51	1008.24	1232.99	501.17	502.99	503.19			
X3	10			1004.92	2265	1248.31	2265			
GR	2264.6	1000	2264	1008.24	2263.73	1013.07	2262	1017.85	2260	1023.35
GR	2258	1028.83	2256	1034.32	2254.72	1037.84	2255.35	1052.61	2255.35	1092.02
GR	2254.8	1147.28	2254	1151.52	2253.89	1151.8	2253.86	1158.35	2254	1158.49
GR	2255.6	1162.54	2256	1173.57	2255.98	1174.16	2256.41	1185.53	2257.46	1210.3
GR	2258	1212.88	2260	1221.9	2262	1229.76	2262.89	1232.99	2262	1257.02
GR	2261.8	1260.52	2260	1270.99	2257.9	1283.64	2258	1284.2	2258.07	1295.17
GR	2257.2	1313.8	2258	1320.92	2259.27	1332.65	2258	1340.9	2257.52	1344
GR	2258	1345.08	2260	1349.56	2261.44	1353.07	2262	1361.49	2262.67	1375.99
GR	2264	1377.64	2266	1380.12	2268	1382.63	2270	1385.18	2272	1387.88
GR	2274	1390.69	2276	1393.65	2278	1396.69	2280	1399.79	2282	1402.92
GR	2284	1406.26								
NC	0.025	0.025	0.03							
X1	430	20	1020.56	1141.52	451.72	360.45	397.81			
GR	2268	1000	2267.22	1009.19	2267.01	1020.56	2266	1022.85	2264	1027.33
GR	2262	1031.68	2260	1036.05	2258	1040.53	2257.13	1042.53	2257.63	1100.12
GR	2258	1108.31	2258.44	1119.41	2260	1123.24	2262	1128.03	2264	1132.61
GR	2266	1137.09	2268	1141.52	2270	1145.95	2271.86	1150.4	2272	1153.95
NC	0.025	0.025	0.03							
X1	440	22	1024.31	1127.91	501.16	499.74	501.58			
GR	2273.7	1000	2272.37	1003.19	2272	1010.02	2271.59	1017.57	2270	1020.56
[redacted]	2268	1024.31	2266	1028.06	2264	1031.79	2262	1035.49	2261.24	1036.88
[redacted]	2261.2	1114.98	2262	1116.44	2264	1120.26	2266	1124.08	2268	1127.91
GR	2270	1131.74	2272	1135.58	2274	1139.43	2274.82	1141.03	2275.65	1157.04
GR	2276	1160.11	2276.04	1160.56						
NC	0.025	0.025	0.03							
X1	450	23	1037.19	1147.24	500.22	501.51	500.9			
GR	2276.5	1000	2276.13	1004.33	2276.63	1008.45	2276.36	1017.9	2276.34	1019.61
GR	2276	1026.95	2275.66	1034.06	2274	1037.19	2272	1040.95	2270	1044.71
GR	2268	1048.47	2266	1052.23	2265.72	1052.75	2265.65	1128.63	2266	1129.1
GR	2268	1133.93	2270	1138.39	2272	1142.83	2274	1147.24	2276	1151.65
GR	2276.4	1152.65	2277.4	1173.14	2277.8	1176.29				
NC	0.025	0.025	0.03							
X1	460	23	1055.27	1163.26	500.54	498.01	499.73			
GR	2282	1000	2281.54	1003.62	2281.29	1022.08	2280.89	1034.68	2281.11	1036.99
GR	2280.2	1051.03	2280	1051.55	2278	1055.27	2276	1058.93	2274	1062.57
GR	2272	1066.16	2270.09	1069.53	2270	1081.64	2270	1127.37	2270.2	1148.18
GR	2272	1151.65	2274	1155.5	2276	1159.37	2278	1163.26	2280	1167.16
GR	2281	1169.18	2281	1183.48	2281.14	1188.29				
NC	0.025	0.025	0.03							
X1	470	21	1033.6	1139.45	496.29	497.3	497.44			
GR	2287.1	1000	2286.43	1011.63	2286.11	1013.88	2286	1018.25	2285.78	1026.47
GR	2284	1029.84	2282	1033.6	2280	1037.35	2278	1041.08	2276	1044.81
GR	2274.8	1047.02	2274.47	1125.14	2276	1128.04	2278	1131.84	2280	1135.65
[redacted]	2282	1139.45	2284	1143.25	2285.45	1146.01	2286	1157.83	2286.04	1158.7
GR	2286.2	1160.71								

[redacted]	0.025	0.025	0.015							
X1	480	27	1037.36	1120.53	314.57	317.78	315.97			
GR	2294.3	1000	2294	1007.37	2293.91	1009.73	2293.01	1023.57	2292.78	1027.28
GR	2292	1028.94	2290	1033.16	2288	1037.36	2286.16	1041.18	2286	1041.54
GR	2284	1045.96	2282	1050.19	2280	1055.11	2279.98	1055.27	2280.03	1060.89
GR	2280	1096.41	2280.31	1101.25	2282	1105.98	2284	1110.71	2286	1115.55
GR	2288	1120.53	2290	1125.3	2292	1129.86	2292.43	1130.82	2292.52	1169.51
GR	2292	1170.97	2291.65	1171.6						
NC	0.02	0.02	0.015							
X1	490	13	1054	1095.75	144.45	149.77	143.95			
X3	10			1054	2294	1095.75	2294			
GR	2294.4	1000	2294.73	1002.88	2294.72	1015.52	2294.6	1027.21	2294	1031.11
GR	2294.1	1054	2284.1	1054	2284.1	1095.75	2294.1	1095.75	2294	1107.09
GR	2294.5	1111.08	2294.61	1127.32	2294.51	1131.81				
NC	0.02	0.02	0.015							
SB	0.9	1.56	2.6	100	41.75	1.75	320	0	2284.6	2284.1
X1	500	10	1050	1091.75	102	102	102			
X2			1	2292.6	2295.3			1.33		
X3	10			1050	2294	1091.75	2294			
GR	2294.5	1000	2294.88	1008.14	2294.73	1038.02	2294.6	1050	2284.6	1050
GR	2284.6	1091.75	2294.6	1091.75	2294.56	1100.74	2294.86	1121.69	2294.5	1125.84
NC	0.02	0.02	0.02							
X1	510	25	1004.78	1116.38	25	25	25			
GR	2298.8	1000	2298	1000.62	2296.14	1001.97	2296	1004.78	2295.65	1011.7
GR	2294	1018.55	2292	1024.72	2291.3	1026.83	2290	1029.58	2288	1033.81
GR	2286	1038.05	2285.06	1039.94	2285.06	1087.65	2286	1089.57	2288	1093.44
GR	2288.7	1095.14	2290	1097.3	2292	1101.56	2294	1107.37	2295.46	1111.71
GR	2295.5	1116.38	2296	1123.41	2296.51	1129.95	2297.66	1133.29	2297.62	1149.23
NC	0.02	0.02	0.02	0.1	0.3					
X1	520	6	1000	1086.89	270.2	253.62	261.38			
GR	2304.6	1000	2292.1	1027.64	2287.2	1043.88	2287.1	1068.47	2296.4	1086.89
GR	2299.8	1115.75								

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*PROF 1

CRITICAL DEPTH TO BE CALCULATED AT ALL CROSS SECTIONS
ALLOWABLE ERROR FOR CRITICAL DEPTH DETERMINATION (ALLDC) = 2.000 PERCENT OF THE DEPTH

CCHV= .100 CEHV= .300

*SECNO 10.000

10.000	5.30	2112.10	2111.65	2110.00	2114.15	2.05	.00	.00	2116.00
3900.0	.0	3900.0	.0	.0	339.2	.0	.0	.0	2116.00
.00	.00	11.50	.00	.000	.025	.000	.000	2106.80	1016.00
.004966	0.	0.	0.	0	14	3	.00	64.00	1080.00

*SECNO 20.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 1086.5 1150.5 TYPE= 1 TARGET= 64.000
ELENCL= 2118.30 ELENCR= 2118.30

3 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2118.30 ELREA= 2118.30

20.000	4.85	2113.65	2113.65	.00	2116.10	2.45	.17	.12	2118.30
3900.0	.0	3900.0	.0	.0	310.5	.0	.4	.1	2118.30
.00	.00	12.56	.00	.000	.015	.000	.000	2108.80	1086.50
.002363	50.	50.	50.	0	11	0	.00	64.00	1150.50

SPECIAL BRIDGE

5227 DOWNSTREAM ELEV IS 2112.80 , NOT 2113.65 HYDRAULIC JUMP OCCURS DOWNSTREAM (IF LOW FLOW CONTROLS)

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	.90	1.56	2.60	150.00	64.00	4.00	480.00	.00	2121.26	2108.80

*SECNO 30.000

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.57

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

CLASS B LOW FLOW

3420 BRIDGE W.S.= 2120.11 BRIDGE VELOCITY= 12.79 CALCULATED CHANNEL AREA= -69.

EGPRS	EGLWC	H3	QWEIR	QLOW	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
.00	2129.11	.00	0.	3900.	480.	480.	2129.26	2133.80	0.

3470 ENCROACHMENT STATIONS= 1076.0 1140.0 TYPE= 1 TARGET= 64.000
ELENCL= 2132.00 ELENCR= 2132.00

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2132.00 ELREA= 2132.00

30.000	6.47	2127.73	.00	.00	2129.11	1.38	13.01	.00	2132.00
3900.0	.0	3900.0	.0	.0	414.2	.0	9.3	1.6	2132.00
.03	.00	9.42	.00	.000	.015	.000	.000	2121.26	1076.00
.000957	1071.	1071.	1071.	0	0	0	.00	64.00	1140.00

*SECNO 40.000

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .55

40.000	6.40	2127.70	2126.69	.00	2129.20	1.50	.05	.04	2132.00
3900.0	.0	3900.0	.0	.0	396.6	.0	9.6	1.7	2130.00
.03	.00	9.83	.00	.000	.025	.000	.000	2121.30	1059.77
.003191	33.	33.	38.	2	15	0	.00	75.04	1134.81

*SECNO 50.000

50.000	5.76	2128.33	2127.54	.00	2129.68	1.35	.47	.01	2133.85
3900.0	.0	3900.0	.0	.0	417.9	.0	10.9	2.0	2132.50
.04	.00	9.33	.00	.000	.025	.000	.000	2122.57	1043.92
.003417	127.	141.	157.	3	15	0	.00	93.15	1137.07

*SECNO 60.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

60.000	3.92	2129.42	2129.42	.00	2131.13	1.70	.39	.10	2134.00
3900.0	.0	3900.0	.0	.0	372.5	.0	12.2	2.3	2134.05
.04	.00	10.47	.00	.000	.015	.000	.000	2125.50	1049.26
.002245	114.	142.	162.	0	14	0	.00	110.48	1159.74

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 70.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

70.000	4.33	2129.63	2129.63	.00	2131.33	1.70	.03	.00	2135.48
3900.0	.0	3900.0	.0	.0	372.9	.0	12.3	2.3	2134.64
.04	.00	10.46	.00	.000	.015	.000	.000	2125.30	1027.29
.002244	16.	15.	16.	0	8	0	.00	111.03	1138.31

*SECNO 80.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

80.000	3.56	2133.12	2133.12	.00	2134.70	1.58	.00	.01	2136.00
3900.0	.0	3900.0	.0	.0	387.0	.0	12.3	2.3	2134.77
.04	.00	10.08	.00	.000	.015	.000	.000	2129.56	1017.42
.002309	1.	1.	1.	0	15	0	.00	124.33	1141.75

*SECNO 90.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 1028.4 1125.4 TYPE= 1 TARGET= 97.000
ELENCL= 2142.00 ELENCR= 2142.00

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2140.00 ELREA= 2142.00

90.000	3.67	2134.17	2134.17	.00	2136.03	1.86	.06	.09	2140.00
3900.0	.0	3900.0	.0	.0	356.3	.0	12.5	2.4	2142.00
.04	.00	10.95	.00	.000	.015	.000	.000	2130.50	1028.36
.002375	12.	25.	30.	0	8	0	.00	97.00	1125.36

SPECIAL BRIDGE

5227 DOWNSTREAM ELEV IS 2133.54 , NOT 2134.17 HYDRAULIC JUMP OCCURS DOWNSTREAM (IF LOW FLOW CONTROLS)

SB XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
1.25	1.56	2.60	100.00	97.00	6.00	546.00	.00	2131.00	2130.50

*SECNO 100.000

3301 HV CHANGED MORE THAN HVINS

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.54

CLASS B LOW FLOW

3420 BRIDGE W.S.= 2134.60 BRIDGE VELOCITY= 11.13 CALCULATED CHANNEL AREA= 328.

EGPRS	EGLWC	H3	QWEIR	QLOW	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
.00	2136.89	.00	0.	3900.	546.	546.	2137.00	2142.00	0.

3470 ENCROACHMENT STATIONS= 1002.4 1099.4 TYPE= 1 TARGET= 97.000
ELENCL= 2142.00 ELENCR= 2142.00

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2141.00 ELREA= 2142.00

100.000	4.81	2135.81	.00	.00	2136.89	1.09	.86	.00	2141.00
3900.0	.0	3900.0	.0	.0	466.2	.0	13.0	2.5	2142.00
.04	.00	8.36	.00	.000	.015	.000	.000	2131.00	1002.38
.000997	45.	45.	46.	0	0	0	.00	97.00	1099.38

*SECNO 110.000

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

110.000	5.30	2139.19	2139.19	.00	2140.93	1.74	.65	.20	2144.00
3900.0	.0	3900.0	.0	.0	368.5	.0	16.0	3.3	2144.00
.05	.00	10.58	.00	.000	.025	.000	.000	2133.89	1056.21
.006225	424.	321.	275.	0	8	0	.00	107.72	1163.93

*SECNO 120.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

120.000	4.91	2139.98	2139.98	.00	2141.88	1.89	.87	.05	2144.00
3900.0	.0	3900.0	.0	.0	353.1	.0	17.2	3.6	2144.09
.06	.00	11.04	.00	.000	.025	.000	.000	2135.07	1048.15
.006107	152.	141.	137.	0	11	0	.00	94.77	1142.92

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	WROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 130.000

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 1043.0 1093.5 TYPE= 1 TARGET= 50.500
ELENCL= 2147.00 ELENCR= 2147.00

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2147.00 ELREA= 2148.00

130.000	5.70	2142.05	2142.05	.00	2144.90	2.85	.73	.29	2147.00
3900.0	.0	3900.0	.0	.0	287.6	.0	18.7	3.9	2148.00
.06	.00	13.56	.00	.000	.015	.000	.000	2136.35	1043.00
.002415	147.	201.	218.	0	8	0	.00	50.50	1093.50

SPECIAL BRIDGE

5220 DOWNSTREAM ELEV IS 2141.14 , NOT 2142.05 HYDRAULIC JUMP OCCURS DOWNSTREAM (IF LOW FLOW CONTROLS)

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	.90	1.56	2.60	50.00	50.50	2.50	480.00	.00	2138.63	2136.35

*SECNO 140.000

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.48

CLASS B LOW FLOW

3420 BRIDGE W.S.= 2143.39 BRIDGE VELOCITY= 13.78 CALCULATED CHANNEL AREA= 228.

EGPRS	EGLWC	H3	QWEIR	QLOW	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
.00	2147.68	.00	0.	3900.	480.	480.	2148.63	2150.00	0.

3470 ENCROACHMENT STATIONS= 1051.5 1102.0 TYPE= 1 TARGET= 50.500
ELENCL= 2149.00 ELENCR= 2149.00

[redacted]ECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2148.63 ELREA= 2149.00

140.000	7.36	2145.96	.00	.00	2147.68	1.71	2.78	.00	2148.63
3900.0	.0	3900.0	.0	.0	371.1	.0	20.4	4.2	2149.00
.07	.00	10.51	.00	.000	.015	.000	.000	2138.60	1051.50
.001107	222.	228.	233.	0	0	0	.00	50.50	1102.00

*SECNO 150.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

150.000	8.40	2148.12	2148.12	.00	2150.27	2.14	.89	.13	2150.92
3900.0	.0	3900.0	.0	.0	331.8	.0	24.2	4.9	2153.00
.08	.00	11.75	.00	.000	.020	.000	.000	2139.72	1148.28
.004003	460.	470.	478.	0	14	0	.00	79.75	1228.03

*SECNO 160.000

3[redacted]V CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 2.18

160.000	8.74	2149.94	2147.02	.00	2150.80	.86	.40	.13	2151.66
3900.0	.0	3900.0	.0	.0	523.1	.0	26.7	5.3	2151.73
.09	.00	7.46	.00	.000	.020	.000	.000	2141.20	1035.90
.000846	269.	254.	240.	3	19	0	.00	77.40	1113.30

*SECNO 170.000

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.51

3470 ENCROACHMENT STATIONS= 1027.0 1090.3 TYPE= 1 TARGET= 63.330
ELENCL= 2152.00 ELENCR= 2152.00

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2152.00 ELREA= 2152.00

170.000	8.88	2150.18	2146.19	.00	2150.93	.75	.12	.01	2152.00
3900.0	.0	3900.0	.0	.0	562.4	.0	29.4	5.7	2152.00
.10	.00	6.93	.00	.000	.015	.000	.000	2141.30	1027.00
.000370	226.	216.	201.	2	11	0	.00	63.33	1090.33

[redacted]

[illegible]CNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

SPECIAL BRIDGE

SB XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
1.25	1.56	2.60	100.00	63.33	3.33	375.00	.00	2142.00	2141.30

*SECNO 180.000
PRESSURE AND WEIR FLOW, Weir Submergence Based on TRAPEZOIDAL Shape

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
2152.80	2151.18	.15	128.	3765.	375.	375.	2148.25	2152.00	100.

3470 ENCROACHMENT STATIONS= 1028.0 1091.3 TYPE= 1 TARGET= 63.330
ELENCL= 2153.00 ELENCR= 2153.00

3405 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2152.00 ELREA= 2153.00

180.000	10.04	2152.04	.00	.00	2152.62	.58	1.70	.00	2152.00
3900.0	.0	3900.0	.0	.0	635.9	.0	30.8	5.8	2153.00
.10	.00	6.13	.00	.000	.015	.000	.000	2142.00	1028.00
.000255	104.	102.	101.	2	0	2	.00	63.33	1091.33

*SECNO 190.000

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

190.000	7.09	2153.05	2153.05	.00	2155.43	2.38	.35	.54	2160.00
3900.0	.0	3900.0	.0	.0	315.2	.0	36.3	6.6	2160.00
.11	.00	12.37	.00	.000	.025	.000	.000	2145.96	1076.45
.005811	500.	501.	501.	0	19	0	.00	67.53	1143.98

*SECNO 200.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

200.000	5.15	2161.76	2161.76	.00	2163.68	1.92	2.62	.05	2163.80
3900.0	.0	3900.0	.0	.0	350.4	.0	39.6	7.4	2165.16
.12	.00	11.13	.00	.000	.025	.000	.000	2156.61	1105.96
.006090	419.	441.	455.	0	19	0	.00	92.74	1198.70

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 210.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

210.000	5.77	2167.22	2167.22	.00	2169.21	1.99	3.00	.02	2172.00
3900.0	.0	3900.0	.0	.0	344.7	.0	43.6	8.4	2169.60
.13	.00	11.31	.00	.000	.025	.000	.000	2161.45	1112.62
.005939	500.	500.	500.	0	8	0	.00	87.40	1200.02

*SECNO 220.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

220.000	4.53	2173.63	2173.63	.00	2175.44	1.81	2.94	.02	2176.60
3900.0	.0	3900.0	.0	.0	361.3	.0	47.5	9.5	2175.96
.15	.00	10.79	.00	.000	.025	.000	.000	2169.10	1149.86
.006167	493.	485.	465.	0	15	0	.00	101.53	1251.39

*SECNO 230.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

230.000	5.37	2179.41	2179.41	.00	2181.26	1.86	3.09	.01	2181.39
3900.0	.0	3900.0	.0	.0	356.8	.0	51.7	10.6	2180.90
.16	.00	10.93	.00	.000	.025	.000	.000	2174.04	1080.31
.006159	501.	501.	501.	0	11	0	.00	97.98	1178.28

*SECNO 240.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

240.000	5.29	2186.19	2186.19	.00	2188.33	2.13	3.19	.08	2188.71
3900.0	.0	3900.0	.0	.0	332.7	.0	55.6	11.7	2189.09
.17	.00	11.72	.00	.000	.025	.000	.000	2180.90	1154.56
.006633	501.	500.	500.	0	8	0	.00	86.90	1241.46

*SECNO 250.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

250.000	4.44	2189.41	2189.41	.00	2191.36	1.95	1.78	.02	2193.05
3900.0	.0	3900.0	.0	.0	347.9	.0	57.8	12.3	2192.94
.18	.00	11.21	.00	.000	.025	.000	.000	2184.97	1033.23
.006021	282.	282.	281.	0	15	0	.00	90.05	1123.28

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 260.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 1005.0 1093.0 TYPE= 1 TARGET= 88.000
ELENCL= 2197.00 ELENCR= 2197.00

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2196.00 ELREA= 2197.00

260.000	3.92	2193.02	2193.02	.00	2195.00	1.98	.97	.01	2196.00
3900.0	.0	3900.0	.0	.0	345.3	.0	60.0	12.8	2197.00
.19	.00	11.29	.00	.000	.015	.000	.000	2189.10	1005.00
.002353	271.	271.	272.	0	11	0	.00	88.00	1093.00

SPECIAL BRIDGE

5227 DOWNSTREAM ELEV IS 2192.43 , NOT 2193.02 HYDRAULIC JUMP OCCURS DOWNSTREAM (IF LOW FLOW CONTROLS)

K	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
.90	1.56	2.60	100.00	88.00	4.00	420.00	.00	2190.40	2189.10

*SECNO 270.000

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.48

CLASS B LOW FLOW

3420 BRIDGE W.S.= 2193.81 BRIDGE VELOCITY= 11.44 CALCULATED CHANNEL AREA= 286.

EGPRS	EGLWC	H3	QWEIR	QLOW	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
2195.11	2196.63	.00	0.	3900.	420.	420.	2195.40	2197.00	0.

3470 ENCROACHMENT STATIONS= 1035.5 1123.5 TYPE= 1 TARGET= 88.000
ELENCL= 2198.00 ELENCR= 2198.00

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2197.00 ELREA= 2198.00

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST
270.000	5.01	2195.41	.00	.00	2196.63	1.21	1.62	.00	2197.00
3900.0	.0	3900.0	.0	.0	441.0	.0	61.8	13.2	2198.00
.19	.00	8.84	.00	.000	.015	.000	.000	2190.40	1035.50
.001073	197.	195.	195.	0	0	0	.00	88.00	1123.50

*SECNO 280.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

280.000	3.96	2198.47	2198.47	.00	2199.95	1.48	.68	.08	2201.33
3900.0	.0	3900.0	.0	.0	400.0	.0	64.8	14.0	2200.32
.20	.00	9.75	.00	.000	.025	.000	.000	2194.51	1063.23
.006554	327.	311.	308.	0	15	0	.00	137.96	1201.19

*SECNO 290.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

290.000	4.09	2203.52	2203.52	.00	2205.03	1.50	2.09	.01	2210.71
3900.0	.0	3900.0	.0	.0	396.2	.0	67.7	15.0	2210.45
.21	.00	9.84	.00	.000	.025	.000	.000	2199.43	1060.04
.006509	327.	321.	318.	0	8	0	.00	134.01	1194.05

*SECNO 300.000

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 1124.8 1156.1 TYPE= 1 TARGET= 31.340
ELENCL= 2212.00 ELENCR= 2212.00

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2207.90 ELREA= 2212.00

300.000	8.15	2208.05	2208.05	.00	2211.99	3.94	.27	.73	2207.90
3900.0	.0	3900.0	.0	.0	244.7	.0	68.0	15.1	2212.00
.21	.00	15.94	.00	.000	.015	.000	.000	2199.90	1124.77
.005791	46.	44.	47.	0	17	0	.00	31.34	1156.11

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 310.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 1073.5 1104.8 TYPE= 1 TARGET= 31.330
ELENCL= 2224.00 ELENCR= 2224.00

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2222.10 ELREA= 2224.00

310.000	8.15	2222.25	2222.25	.00	2226.19	3.94	6.21	.00	2222.10
3900.0	.0	3900.0	.0	.0	244.8	.0	74.1	15.9	2224.00
.23	.00	15.93	.00	.000	.015	.000	.000	2214.10	1073.50
.005768	1075.	1075.	1075.	0	5	0	.00	31.33	1104.83

*SECNO 320.000
3280 CROSS SECTION 320.00 EXTENDED .05 FEET

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 5.42

3470 ENCROACHMENT STATIONS= 1036.0 1109.5 TYPE= 1 TARGET= 73.500
ELENCL= 2226.50 ELENCR= 2226.50

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2226.20 ELREA= 2226.50

320.000	9.78	2226.18	2220.82	.00	2226.64	.46	.10	.35	2226.20
3900.0	.0	3900.0	.0	.0	718.9	.0	76.0	16.1	2226.50
.24	.00	5.43	.00	.000	.015	.000	.000	2216.40	1036.00
.000196	175.	175.	175.	3	11	0	.00	73.50	1109.50

SPECIAL BRIDGE

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	1.25	1.56	2.60	155.00	73.50	3.50	350.00	.00	2216.90	2216.40

*SECNO 330.000
3280 CROSS SECTION 330.00 EXTENDED 2.40 FEET

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

PRESSURE AND WEIR FLOW, Weir Submergence Based on TRAPEZOIDAL Shape

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
2229.19	2226.70	.06	2282.	1627.	350.	350.	2221.90	2223.50	155.

3470 ENCROACHMENT STATIONS= 1000.0 1155.2 TYPE= 1 TARGET= 155.220
ELENCL= 2227.00 ELENCR= 2227.00

330.000	9.39	2226.29	.00	.00	2226.71	.41	.07	.00	2223.60
3900.0	103.4	3667.7	128.8	91.3	690.7	107.5	77.5	16.3	2223.60
.24	1.13	5.31	1.20	.030	.015	.030	.000	2216.90	1000.00
.000181	80.	80.	80.	2	0	4	.00	155.22	1155.22

*SECNO 340.000

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

340.000	5.97	2229.43	2229.43	.00	2231.43	2.00	.22	.48	2230.93
3900.0	.0	3900.0	.0	.0	343.6	.0	83.4	17.5	2232.00
.25	.00	11.35	.00	.000	.025	.000	.000	2223.46	1119.95
.006055	420.	419.	407.	0	14	0	.00	87.44	1207.39

*SECNO 350.000

350.000	6.63	2232.63	2232.38	.00	2234.82	2.19	3.33	.06	2238.00
3900.0	.0	3900.0	.0	.0	328.4	.0	87.3	18.4	2239.09
.26	.00	11.88	.00	.000	.030	.000	.000	2226.00	1037.46
.007258	518.	504.	493.	2	8	0	.00	66.43	1103.89

*SECNO 360.000

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

CNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

3470 ENCROACHMENT STATIONS= 1033.0 1070.3 TYPE= 1 TARGET= 37.330
ELENCL= 2243.00 ELENCR= 2243.00

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2240.10 ELREA= 2243.00

360.000	6.95	2237.05	2237.05	.00	2240.56	3.51	.91	.40	2240.10
3900.0	.0	3900.0	.0	.0	259.3	.0	88.8	18.6	2243.00
.27	.00	15.04	.00	.000	.015	.000	.000	2230.10	1033.00
.002652	209.	221.	236.	0	8	0	.00	37.33	1070.33

SPECIAL BRIDGE

5227 DOWNSTREAM ELEV IS 2236.11 , NOT 2237.05 HYDRAULIC JUMP OCCURS DOWNSTREAM (IF LOW FLOW CONTROLS)

SB	XK	XKOR	COFQ	RCLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	.90	1.56	2.60	80.00	37.33	1.33	360.00	.00	2230.80	2230.10

370.000

3301 HV CHANGED MORE THAN HVINS

CLASS B LOW FLOW

3420 BRIDGE W.S.= 2237.59 BRIDGE VELOCITY= 15.17 CALCULATED CHANNEL AREA= 245.

EGPRS	EGLWC	H3	QWEIR	QLOW	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
2239.89	2241.71	.00	0.	3900.	360.	360.	2240.80	2243.50	0.

3470 ENCROACHMENT STATIONS= 1032.0 1069.3 TYPE= 1 TARGET= 37.330
ELENCL= 2244.00 ELENCR= 2244.00

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2240.80 ELREA= 2244.00

370.000	8.63	2239.43	.00	.00	2241.71	2.28	1.15	.00	2240.80
3900.0	.0	3900.0	.0	.0	322.2	.0	89.4	18.7	2244.00
.27	.00	12.10	.00	.000	.015	.000	.000	2230.80	1032.00
.001400	100.	100.	100.	0	0	0	.00	37.33	1069.33

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 380.000

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.40

380.000	6.20	2242.26	2239.63	.00	2242.38	.12	.46	.22	2242.00
3900.0	.0	3899.9	.1	.1	1383.3	.2	98.7	20.8	2242.00
.32	.01	2.82	.29	.035	.035	.035	.000	2236.06	1012.58
.000714	427.	472.	513.	3	18	0	.00	352.50	1365.09

*SECNO 390.000

3265 DIVIDED FLOW

3301 HV CHANGED MORE THAN HVINS

3720 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 1044.6 1418.5 TYPE= 1 TARGET= 373.930
ELENCL= 2252.14 ELENCR= 2247.61

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2248.00 ELREA= 2247.20

390.000	3.67	2243.67	2243.67	.00	2244.60	.93	.74	.24	2248.00
3900.0	.0	3900.0	.0	.0	503.0	.0	106.9	23.6	2247.20
.33	.00	7.75	.00	.000	.035	.000	.000	2240.00	1073.52
.015336	386.	382.	404.	0	14	0	.00	279.95	1359.71

*SECNO 400.000

3470 ENCROACHMENT STATIONS= 1013.6 1382.0 TYPE= 1 TARGET= 368.470
ELENCL= 2259.43 ELENCR= 2250.46

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2254.00 ELREA= 2249.50

400.000	4.24	2248.54	2248.18	.00	2249.26	.72	4.63	.02	2254.00
3900.0	.0	3900.0	.0	.0	571.5	.0	111.9	26.1	2249.50
.35	.00	6.82	.00	.000	.035	.000	.000	2244.30	1052.00
.008926	357.	403.	424.	4	8	0	.00	256.44	1308.45

'ECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 410.000

3265 DIVIDED FLOW

410.000	3.34	2252.94	2252.57	.00	2253.58	.64	4.31	.01	2258.35
3900.0	.0	3900.0	.0	.0	607.0	.0	118.6	29.2	2254.37
.37	.00	6.42	.00	.000	.035	.000	.000	2249.60	1112.54
.008559	512.	493.	536.	4	19	0	.00	289.39	1427.20

*SECNO 420.000

3301 HV CHANGED MORE THAN HVINS

3470 ENCROACHMENT STATIONS= 1004.9 1248.3 TYPE= 1 TARGET= 243.390
ELENCL= 2265.00 ELENCR= 2265.00

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2264.00 ELREA= 2262.89

0.000	4.06	2257.92	2257.91	.00	2259.14	1.23	5.39	.18	2264.00
900.0	.0	3900.0	.0	.0	439.0	.0	124.6	31.9	2262.89
.38	.00	8.88	.00	.000	.035	.000	.000	2253.86	1029.06
.013787	501.	503.	503.	2	11	0	.00	183.41	1212.47

*SECNO 430.000

3301 HV CHANGED MORE THAN HVINS

430.000	4.59	2261.72	2261.69	.00	2263.56	1.84	4.23	.19	2267.01
3900.0	.0	3900.0	.0	.0	357.8	.0	128.3	33.2	2268.00
.39	.00	10.90	.00	.000	.030	.000	.000	2257.13	1032.29
.008462	452.	398.	360.	2	8	0	.00	95.08	1127.36

*SECNO 440.000

440.000	4.52	2265.72	2265.32	.00	2267.28	1.56	3.69	.03	2268.00
3900.0	.0	3900.0	.0	.0	388.9	.0	132.6	34.3	2268.00
.41	.00	10.03	.00	.000	.030	.000	.000	2261.20	1028.59
.006451	501.	502.	500.	3	11	0	.00	94.95	1123.54

ECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	X_OBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 450.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

450.000	4.20	2269.85	2269.85	.00	2271.76	1.91	3.74	.10	2274.00
3900.0	.0	3900.0	.0	.0	351.7	.0	136.8	35.4	2274.00
.42	.00	11.09	.00	.000	.030	.000	.000	2265.65	1044.99
.008750	500.	501.	502.	0	11	0	.00	93.07	1138.06

*SECNO 460.000

460.000	4.19	2274.19	2274.12	.00	2276.03	1.84	4.27	.01	2278.00
3900.0	.0	3900.0	.0	.0	358.0	.0	140.9	36.4	2278.00
.43	.00	10.89	.00	.000	.030	.000	.000	2270.00	1062.21
.008333	501.	500.	498.	1	5	0	.00	93.68	1155.88

*SECNO 470.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

470.000	4.27	2278.74	2278.74	.00	2280.64	1.91	4.26	.02	2282.00
3900.0	.0	3900.0	.0	.0	352.1	.0	145.0	37.5	2282.00
.45	.00	11.08	.00	.000	.030	.000	.000	2274.47	1039.71
.008792	496.	497.	497.	0	8	0	.00	93.54	1133.24

*SECNO 480.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

480.000	5.51	2285.49	2285.49	.00	2287.77	2.28	1.20	.11	2288.00
3900.0	.0	3900.0	.0	.0	322.0	.0	147.4	38.1	2288.00
.45	.00	12.11	.00	.000	.015	.000	.000	2279.98	1042.67
.002096	315.	316.	318.	0	11	0	.00	71.65	1114.32

*SECNO 490.000

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 1054.0 1095.8 TYPE= 1 TARGET= 41.750
ELENCL= 2294.00 ELENCR= 2294.00

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	*XLOBL*	*XLCH*	*XLOBR*	*ITRIAL*	*IDC*	*ICONT*	*CORAR*	*TOPWID*	*ENDST*

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2294.10 ELREA= 2294.10

490.000	6.47	2290.57	2290.57	.00	2293.81	3.23	.33	.29	2294.10
3900.0	.0	3900.0	.0	.0	270.2	.0	148.4	38.3	2294.10
.46	.00	14.43	.00	.000	.015	.000	.000	2284.10	1054.00
.002522	144.	144.	150.	0	8	0	.00	41.75	1095.75

SPECIAL BRIDGE

5227 DOWNSTREAM ELEV IS 2289.61 , NOT 2290.57 HYDRAULIC JUMP OCCURS DOWNSTREAM (IF LOW FLOW CONTROLS)

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	.90	1.56	2.60	100.00	41.75	1.75	320.00	.00	2284.60	2284.10

*SECNO 500.000

3401 HV CHANGED MORE THAN HVINS

CL[illegible] B LOW FLOW

3420 BRIDGE W.S.= 2291.01 BRIDGE VELOCITY= 14.65 CALCULATED CHANNEL AREA= 256.

EGPRS	EGLWC	H3	QWEIR	QLOW	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
2294.17	2294.73	.00	0.	3900.	320.	320.	2292.60	2295.30	0.

3470 ENCROACHMENT STATIONS= 1050.0 1091.8 TYPE= 1 TARGET= 41.750
ELENCL= 2294.00 ELENCR= 2294.00

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2294.60 ELREA= 2294.60

500.000	8.03	2292.63	.00	.00	2294.73	2.10	.93	.00	2294.60
3900.0	.0	3900.0	.0	.0	335.3	.0	149.1	38.4	2294.60
.46	.00	11.63	.00	.000	.015	.000	.000	2284.60	1050.00
.001322	102.	102.	102.	0	0	0	.00	41.75	1091.75

*SECNO 510.000

	'CNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
		QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
	TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
	SLOPE	XLOBL	XLCH	XLOBR	.ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.51

510.000	9.23	2294.29	2290.50	.00	2294.90	.61	.02	.15	2296.00
3900.0	.0	3900.0	.0	.0	620.8	.0	149.4	38.4	2295.50
.46	.00	6.28	.00	.000	.020	.000	.000	2285.06	1017.37
.000583	25.	25.	25.	3	14	0	.00	90.84	1108.21

CCHV= .100 CEHV= .300
*SECNO 520.000

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

520.000	7.11	2294.21	2294.21	.00	2296.79	2.58	.31	.59	2304.60
3900.0	.0	3900.0	.0	.0	302.5	.0	152.1	38.9	2296.40
.47	.00	12.89	.00	.000	.020	.000	.000	2287.10	1022.98
.003671	270.	261.	254.	0	15	0	.00	59.57	1082.55

THIS RUN EXECUTED 06OCT97 10:44:25

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HEC-2 WATER SURFACE PROFILES

Version 4.6.2; May 1991
****

NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

FLOODPLAIN DETERMINATION

SUMMARY PRINTOUT TABLE 100

	SECNO	EGLWC	ELLC	EGPRS	ELTRD	QPR	QWEIR	CLASS	H3	DEPTH	CWSEL	VCH	EG
*	30.000	2129.11	2129.26	.00	2133.80	3900.00	.00	2.00	.00	6.47	2127.73	9.42	2129.11
*	100.000	2136.89	2137.00	.00	2142.00	3900.00	.00	2.00	.00	4.81	2135.81	8.36	2136.89
*	140.000	2147.68	2148.63	.00	2150.00	3900.00	.00	2.00	.00	7.36	2145.96	10.51	2147.68
	180.000	2151.18	2148.25	2152.80	2152.00	3765.47	127.64	30.00	.15	10.04	2152.04	6.13	2152.62
*	270.000	2196.63	2195.40	2195.11	2197.00	3900.00	.00	2.00	.00	5.01	2195.41	8.84	2196.63
	330.000	2226.70	2221.90	2229.19	2223.50	1627.36	2281.74	30.00	.06	9.39	2226.29	5.31	2226.71
*	370.000	2241.71	2240.80	2239.89	2243.50	3900.00	.00	2.00	.00	8.63	2239.43	12.10	2241.71
*	500.000	2294.73	2292.60	2294.17	2295.30	3900.00	.00	2.00	.00	8.03	2292.63	11.63	2294.73

F PLAIN DETERMINATION

SUMMARY PRINTOUT TABLE 150

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH	AREA	.01K
	10.000	.00	.00	.00	2106.80	3900.00	2112.10	2111.65	2114.15	49.66	11.50	339.22	553.44
*	20.000	50.00	.00	.00	2108.80	3900.00	2113.65	2113.65	2116.10	23.63	12.56	310.47	802.27
*	30.000	1071.00	2133.80	2129.26	2121.26	3900.00	2127.73	.00	2129.11	9.57	9.42	414.18	1260.36
*	40.000	32.95	.00	.00	2121.30	3900.00	2127.70	2126.69	2129.20	31.91	9.83	396.59	690.43
	50.000	141.28	.00	.00	2122.57	3900.00	2128.33	2127.54	2129.68	34.17	9.33	417.87	667.14
*	60.000	141.88	.00	.00	2125.50	3900.00	2129.42	2129.42	2131.13	22.45	10.47	372.47	823.15
*	70.000	15.47	.00	.00	2125.30	3900.00	2129.63	2129.63	2131.33	22.44	10.46	372.94	823.25
*	80.000	1.00	.00	.00	2129.56	3900.00	2133.12	2133.12	2134.70	23.09	10.08	386.98	811.68
*	90.000	24.79	.00	.00	2130.50	3900.00	2134.17	2134.17	2136.03	23.75	10.95	356.26	800.30
*	100.000	44.67	2142.00	2137.00	2131.00	3900.00	2135.81	.00	2136.89	9.97	8.36	466.24	1235.27
*	110.000	320.85	.00	.00	2133.89	3900.00	2139.19	2139.19	2140.93	62.25	10.58	368.53	494.31
*	120.000	140.52	.00	.00	2135.07	3900.00	2139.98	2139.98	2141.88	61.07	11.04	353.11	499.05
*	130.000	200.57	.00	.00	2136.35	3900.00	2142.05	2142.05	2144.90	24.15	13.56	287.65	793.65
*	140.000	227.79	2150.00	2148.63	2138.60	3900.00	2145.96	.00	2147.68	11.07	10.51	371.14	1172.26
*	150.000	470.10	.00	.00	2139.72	3900.00	2148.12	2148.12	2150.27	40.03	11.75	331.84	616.39
*	160.000	254.22	.00	.00	2141.20	3900.00	2149.94	2147.02	2150.80	8.46	7.46	523.06	1341.21
*	170.000	215.74	.00	.00	2141.30	3900.00	2150.18	2146.19	2150.93	3.70	6.93	562.40	2026.40
	180.000	102.34	2152.00	2148.25	2142.00	3900.00	2152.04	.00	2152.62	2.55	6.13	635.89	2440.32
*	190.000	500.57	.00	.00	2145.96	3900.00	2153.05	2153.05	2155.43	58.11	12.37	315.16	511.63
*	200.000	440.55	.00	.00	2156.61	3900.00	2161.76	2161.76	2163.68	60.90	11.13	350.39	499.76
*	210.000	499.61	.00	.00	2161.45	3900.00	2167.22	2167.22	2169.21	59.39	11.31	344.69	506.08
*	220.000	485.49	.00	.00	2169.10	3900.00	2173.63	2173.63	2175.44	61.67	10.79	361.32	496.60
*	230.000	501.36	.00	.00	2174.04	3900.00	2179.41	2179.41	2181.26	61.59	10.93	356.78	496.94
*	240.000	499.89	.00	.00	2180.90	3900.00	2186.19	2186.19	2188.33	66.33	11.72	332.75	478.86

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH	AREA	.01K
*	250.000	282.34	.00	.00	2184.97	3900.00	2189.41	2189.41	2191.36	60.21	11.21	347.87	502.61
*	260.000	271.17	.00	.00	2189.10	3900.00	2193.02	2193.02	2195.00	23.53	11.29	345.34	804.08
*	270.000	195.33	2197.00	2195.40	2190.40	3900.00	2195.41	.00	2196.63	10.73	8.84	440.96	1190.53
*	280.000	311.22	.00	.00	2194.51	3900.00	2198.47	2198.47	2199.95	65.54	9.75	400.05	481.73
*	290.000	320.59	.00	.00	2199.43	3900.00	2203.52	2203.52	2205.03	65.09	9.84	396.18	483.39
*	300.000	43.68	.00	.00	2199.90	3900.00	2208.05	2208.05	2211.99	57.91	15.94	244.74	512.49
*	310.000	1075.00	.00	.00	2214.10	3900.00	2222.25	2222.25	2226.19	57.68	15.93	244.83	513.49
*	320.000	175.00	.00	.00	2216.40	3900.00	2226.18	2220.82	2226.64	1.96	5.43	718.86	2783.08
	330.000	80.00	2223.50	2221.90	2216.90	3900.00	2226.29	.00	2226.71	1.81	5.31	889.47	2897.66
*	340.000	419.10	.00	.00	2223.46	3900.00	2229.43	2229.43	2231.43	60.55	11.35	343.56	501.18
	350.000	503.60	.00	.00	2226.00	3900.00	2232.63	2232.38	2234.82	72.58	11.88	328.41	457.77
*	360.000	221.39	.00	.00	2230.10	3900.00	2237.05	2237.05	2240.56	26.52	15.04	259.28	757.31
*	370.000	100.00	2243.50	2240.80	2230.80	3900.00	2239.43	.00	2241.71	14.00	12.10	322.19	1042.47
*	380.000	471.93	.00	.00	2236.06	3900.00	2242.26	2239.63	2242.38	7.14	2.82	1383.62	1459.82
*	390.000	382.37	.00	.00	2240.00	3900.00	2243.67	2243.67	2244.60	153.36	7.75	503.01	314.93
	400.000	403.29	.00	.00	2244.30	3900.00	2248.54	2248.18	2249.26	89.26	6.82	571.46	412.79
	410.000	493.17	.00	.00	2249.60	3900.00	2252.94	2252.57	2253.58	85.59	6.42	607.01	421.55
	420.000	503.19	.00	.00	2253.86	3900.00	2257.92	2257.91	2259.14	137.87	8.88	438.99	332.15
	430.000	397.81	.00	.00	2257.13	3900.00	2261.72	2261.69	2263.56	84.62	10.90	357.83	423.98
	440.000	501.58	.00	.00	2261.20	3900.00	2265.72	2265.32	2267.28	64.51	10.03	388.92	485.56
*	450.000	500.90	.00	.00	2265.65	3900.00	2269.85	2269.85	2271.76	87.50	11.09	351.72	416.92
	460.000	499.73	.00	.00	2270.00	3900.00	2274.19	2274.12	2276.03	83.33	10.89	357.98	427.22
*	470.000	497.44	.00	.00	2274.47	3900.00	2278.74	2278.74	2280.64	87.92	11.08	352.06	415.93
*	480.000	315.97	.00	.00	2279.98	3900.00	2285.49	2285.49	2287.77	20.96	12.11	322.04	851.87
*	490.000	143.95	.00	.00	2284.10	3900.00	2290.57	2290.57	2293.81	25.22	14.43	270.24	776.67
*	500.000	102.00	2295.30	2292.60	2284.60	3900.00	2292.63	.00	2294.73	13.22	11.63	335.34	1072.54

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH	AREA	.01K
*	510.000	25.00	.00	.00	2285.06	3900.00	2294.29	2290.50	2294.90	5.83	6.28	620.78	1615.14
*	520.000	261.38	.00	.00	2287.10	3900.00	2294.21	2294.21	2296.79	36.71	12.89	302.54	643.68

F' PLAIN DETERMINATION

SUMMARY PRINTOUT TABLE 150

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
	10.000	3900.00	2112.10	.00	.00	2.10	64.00	.00
*	20.000	3900.00	2113.65	.00	1.55	.00	64.00	50.00
*	30.000	3900.00	2127.73	.00	14.08	.00	64.00	1071.00
*	40.000	3900.00	2127.70	.00	-.03	.00	75.04	32.95
	50.000	3900.00	2128.33	.00	.63	.00	93.15	141.28
*	60.000	3900.00	2129.42	.00	1.10	.00	110.48	141.88
*	70.000	3900.00	2129.63	.00	.21	.00	111.03	15.47
*	80.000	3900.00	2133.12	.00	3.49	.00	124.33	1.00
*	90.000	3900.00	2134.17	.00	1.05	.00	97.00	24.79
*	100.000	3900.00	2135.81	.00	1.63	.00	97.00	44.67
*	110.000	3900.00	2139.19	.00	3.38	.00	107.72	320.85
*	120.000	3900.00	2139.98	.00	.79	.00	94.77	140.52
*	130.000	3900.00	2142.05	.00	2.06	.00	50.50	200.57
*	140.000	3900.00	2145.96	.00	3.92	.00	50.50	227.79
*	150.000	3900.00	2148.12	.00	2.16	.00	79.75	470.10
*	160.000	3900.00	2149.94	.00	1.81	.00	77.40	254.22
*	170.000	3900.00	2150.18	.00	.24	.00	63.33	215.74
	180.000	3900.00	2152.04	.00	1.86	.00	63.33	102.34
*	190.000	3900.00	2153.05	.00	1.01	.00	67.53	500.57
*	200.000	3900.00	2161.76	.00	8.71	.00	92.74	440.55
*	210.000	3900.00	2167.22	.00	5.46	.00	87.40	499.61
*	220.000	3900.00	2173.63	.00	6.41	.00	101.53	485.49
*	230.000	3900.00	2179.41	.00	5.77	.00	97.98	501.36
*	240.000	3900.00	2186.19	.00	6.79	.00	86.90	499.89

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
*	250.000	3900.00	2189.41	.00	3.22	.00	90.05	282.34
*	260.000	3900.00	2193.02	.00	3.61	.00	88.00	271.17
*	270.000	3900.00	2195.41	.00	2.39	.00	88.00	195.33
*	280.000	3900.00	2198.47	.00	3.06	.00	137.96	311.22
*	290.000	3900.00	2203.52	.00	5.05	.00	134.01	320.59
*	300.000	3900.00	2208.05	.00	4.53	.00	31.34	43.68
*	310.000	3900.00	2222.25	.00	14.20	.00	31.33	1075.00
*	320.000	3900.00	2226.18	.00	3.93	.00	73.50	175.00
	330.000	3900.00	2226.29	.00	.11	.00	155.22	80.00
*	340.000	3900.00	2229.43	.00	3.13	.00	87.44	419.10
	350.000	3900.00	2232.63	.00	3.20	.00	66.43	503.60
*	360.000	3900.00	2237.05	.00	4.42	.00	37.33	221.39
*	370.000	3900.00	2239.43	.00	2.39	.00	37.33	100.00
*	380.000	3900.00	2242.26	.00	2.83	.00	352.50	471.93
*	390.000	3900.00	2243.67	.00	1.41	.00	279.95	382.37
	400.000	3900.00	2248.54	.00	4.86	.00	256.44	403.29
	410.000	3900.00	2252.94	.00	4.40	.00	289.39	493.17
	420.000	3900.00	2257.92	.00	4.98	.00	183.41	503.19
	430.000	3900.00	2261.72	.00	3.80	.00	95.08	397.81
	440.000	3900.00	2265.72	.00	4.00	.00	94.95	501.58
*	450.000	3900.00	2269.85	.00	4.14	.00	93.07	500.90
	460.000	3900.00	2274.19	.00	4.34	.00	93.68	499.73
*	470.000	3900.00	2278.74	.00	4.55	.00	93.54	497.44
*	480.000	3900.00	2285.49	.00	6.75	.00	71.65	315.97
*	490.000	3900.00	2290.57	.00	5.08	.00	41.75	143.95
*	500.000	3900.00	2292.63	.00	2.06	.00	41.75	102.00

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
*	510.000	3900.00	2294.29	.00	1.66	.00	90.84	25.00
*	520.000	3900.00	2294.21	.00	-.08	.00	59.57	261.38

SUMMARY OF ERRORS AND SPECIAL NOTES

CAUTION SECNO= 20.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 20.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 30.000 PROFILE= 1 HYDRAULIC JUMP D.S.
WARNING SECNO= 30.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 40.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO= 60.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 60.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 70.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 70.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 80.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 80.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 90.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 90.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 100.000 PROFILE= 1 HYDRAULIC JUMP D.S.
WARNING SECNO= 100.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO= 110.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 110.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 120.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 120.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 130.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 130.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 140.000 PROFILE= 1 HYDRAULIC JUMP D.S.
WARNING SECNO= 140.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO= 150.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 150.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

WARNING SECNO= 160.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 170.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO= 190.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 190.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 200.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 200.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 210.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 210.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

[redacted] SECNO= 220.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 220.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 230.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 230.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 240.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 240.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 250.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 250.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 260.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 260.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 270.000 PROFILE= 1 HYDRAULIC JUMP D.S.
WARNING SECNO= 270.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO= 280.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 280.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 290.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 290.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

[redacted] SECNO= 300.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
[redacted] SECNO= 300.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 310.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 310.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

WARNING SECNO= 320.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO= 340.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 340.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 360.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 360.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 370.000 PROFILE= 1 HYDRAULIC JUMP D.S.

WARNING SECNO= 380.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO= 390.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 390.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 450.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 450.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 470.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 470.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

[redacted] SECNO= 480.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 480.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 490.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 490.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 500.000 PROFILE= 1 HYDRAULIC JUMP D.S.

WARNING SECNO= 510.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO= 520.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 520.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

BASE1.D2

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*******************************************
*  HEC-2 WATER SURFACE PROFILES           *
*                                         *
*  Version  4.6.2;  May 1991              *
*                                         *
*  DATE    12OCT97    TIME    15:57:16    *
*******************************************
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*************************************
*  U.S. ARMY CORPS OF ENGINEERS     *
*  HYDROLOGIC ENGINEERING CENTER    *
*  609 SECOND STREET, SUITE D       *
*  DAVIS, CALIFORNIA 95616-4687     *
*          (916) 756-1104           *
*************************************
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X     X  XXXXXXX   XXXXX              XXXXX
X     X  X        X     X           X     X
X     X  X        X                       X
XXXXXXX  XXXX     X          XXXXX    XXXXX
X     X  X        X                  X
X     X  X        X     X            X
X     X  XXXXXXX  XXXXX              XXXXXXX
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THIS RUN EXECUTED 12OCT97 15:57:17

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************************************
 HEC-2 WATER SURFACE PROFILES

 Version  4.6.2;  May 1991
************************************


T1      550.032
T2      FLAMINGO WASH FIS RESTUDY
T3      FLOODPLAIN DETERMINATION
T4      BREAKOUT ANALYSIS AT CAMERON STREET BRIDGE
T4      FILES: BASE1.DWG, BASE1.D2  JOB 2
T4      STARTING WSE = CRITICAL DEPTH
T4      SUBCRITICAL RUN

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

                2                             -1                            100       2192

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

     -1                  -1                                      -2        -6

J3  VARIABLE CODES FOR SUMMARY PRINTOUT

    150                 100

NC    0.016     0.016     0.016       0.1       0.3
X1     1001         6      1000   1252.87
GR     2194    736.46   2192.73      1000      2192   1115.64   2191.42   1167.88      2192   1252.87
GR     2194   1379.59

NC      0.1      0.03     0.016
X1     1002        34   1093.19   1173.61    396.14    396.14    398.76
GR     2196      1000   2195.91   1020.82   2195.34   1083.67      2196   1085.98   2197.93   1093.19
GR     2196   1102.07   2194.89   1106.98   2194.57   1111.61   2194.87   1136.25   2194.83   1160.73
GR   2195.7   1172.16      2196   1173.61      2196   1195.83   2195.92    1200.9      2196    1201.1
GR     2198   1206.19      2200   1211.28      2202   1216.32      2204   1221.04      2206    1225.4
GR     2208   1231.88      2208   1238.27      2208   1256.52      2210      1269      2212   1275.37
GR     2214   1281.08      2216   1286.87   2217.78   1293.42      2216   1298.92      2214   1304.49
GR     2212   1310.11      2210    1315.7      2208   1321.05      2206   1325.65

NC      0.1      0.03     0.016
X1     1003        18   1084.49   1163.07    403.99    403.99    402.69
GR   2204.5      1000   2204.21      1068   2204.41   1084.49      2204   1090.88   2203.72   1095.73
GR     2204   1109.76    2204.1   1120.33      2204   1123.03   2203.63   1144.65      2204   1148.46
GR     2205   1163.07   2204.81   1176.08   2206.04   1184.12      2206   1185.17   2207.37   1213.67
GR   2207.3   1334.41      2208   1337.75      2210    1347.9
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NC	0.1	0.03	0.016							
X1	1004	11	1069.86	1152.2	396.18	397.46	397.45			
GR	2212	1000	2211.45	1069.86	2210.42	1086.92	2210.56	1091.71	2210.68	1114.66
GR	2210.3	1141.05	2211.04	1152.2	2210.52	1171.77	2210.96	1180.82	2212	1251.53
GR	2214	1356.13								
NC	0.1	0.03	0.016							
QT	1	2300								
X1	1005	16	1175.48	1250.08	447.05	247.06	368.62			
X3	10					1250.08	2222			
GR	2222	1000	2220	1122.12	2219.9	1125.13	2218	1157.65	2217.23	1175.48
GR	2216	1180.21	2215.55	1181.89	2215.16	1186.75	2215.36	1212.46	2215.11	1235.65
GR	2215.2	1250.08	2214	1267.24	2213.97	1267.62	2213.54	1279.82	2213.78	1296.9
GR	2212	1455.04								
NC	0.1	0.03	0.016							
X1	1006	34	1246.85	1327.45	399.92	399.92	399.92			
X3	10					1327.45	2224			
GR	2224	1000	2222	1173.08	2221.67	1183.57	2220.65	1240.64	2220.42	1246.85
GR	2220	1246.97	2218.53	1247.7	2217.96	1252.56	2218	1256.83	2218	1258.12
GR	2218.2	1278.51	2218	1293.05	2217.88	1301.36	2218	1305.33	2219.15	1327.45
GR	2218.2	1339.57	2218.6	1351.55	2218	1385.23	2218	1441.87	2218.5	1466.76
GR	2218	1519.03	2218	1555.03	2218.63	1580.22	2220	1581.93	2222	1584.43
GR	2224	1586.92	2226	1589.41	2228	1591.88	2230	1594.35	2232	1596.79
GR	2234	1599.19	2236	1601.55	2238	1603.87	2240	1606.17		
NC	0.1	0.03	0.016							
X1	1007	13	1219.96	1307.75	399.92	397.3	397.3			
X3	10					1307.75	2224			
GR	2224	1000	2222	1167.09	2221.36	1219.96	2220.4	1230.89	2220	1235.15
GR	2219.9	1236.2	2219.95	1263.27	2219.63	1286.33	2219.91	1291.18	2220	1296.23
GR	2220.4	1307.75	2220	1369.33	2218	1549.19				
NC	0.1	0.03	0.016							
X1	1008	21	1095.7	1168.83	381.62	382.92	382.92			
X3	10					1168.83	2225			
GR	2226	1000	2225.34	1042.04	2224	1069.25	2223.92	1070.89	2223.06	1083.88
GR	2222	1095.7	2221.71	1098.65	2221.43	1104.31	2221.67	1129.72	2221.34	1154.01
GR	2221.6	1168.83	2221.49	1223.01	2220	1403.44	2218.56	1538.23	2219.03	1572.3
GR	2219	1647.26	2219.44	1714.27	2220	1730.05	2222	1730.99	2224	1731.92
GR	2225.9	1733.04								
NC	0.1	0.03	0.016							
X1	1009	10	1200.81	1279.23	424.75	422.13	422.13			
X3	10			1200.81	2229	1279.23	2229			
GR	2226	1000	2224	1172.14	2223.65	1200.81	2223.64	1206.6	2223.25	1232.85
GR	2223.3	1258.66	2223.57	1279.23	2224	1318.85	2224.57	1434.22	2224.07	1518.77

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	OLOB	OCH	OROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*PROF 1

CRITICAL DEPTH TO BE CALCULATED AT ALL CROSS SECTIONS
ALLOWABLE ERROR FOR CRITICAL DEPTH DETERMINATION (ALLDC) = 2.000 PERCENT OF THE DEPTH

CCHV= .100 CEHV= .300

*SECNO 1001.000

3720 CRITICAL DEPTH ASSUMED

1001.000	.54	2191.96	2191.96	2192.00	2192.09	.14	.00	.00	2192.73
100.0	.0	100.0	.0	.0	33.9	.0	.0	.0	2192.00
.00	.00	2.95	.00	.000	.016	.000	.000	2191.42	1119.66
.005845	0.	0.	0.	0	11	0	.00	126.66	1246.32

*SECNO 1002.000

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

1002.000	.67	2195.24	2195.24	.00	2195.47	.22	2.17	.03	2197.93
100.0	.0	100.0	.0	.0	26.4	.0	.3	.9	2196.00
.03	.00	3.79	.00	.000	.016	.000	.000	2194.57	1105.41
.005080	396.	399.	396.	0	11	0	.00	60.77	1166.18

*SECNO 1003.000

3265 DIVIDED FLOW

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

1003.000	.71	2204.33	2204.33	.00	2204.54	.20	2.02	.00	2204.41
100.0	.4	99.6	.0	2.5	27.7	.0	.5	1.6	2205.00
.06	.16	3.60	.00	.100	.016	.000	.000	2203.63	1038.69
.004959	404.	403.	404.	0	8	0	.00	107.31	1153.35

*SECNO 1004.000

3265 DIVIDED FLOW

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

1004.000	.64	2210.94	2210.94	.00	2211.12	.18	2.03	.00	2211.45
100.0	.0	93.4	6.6	.0	26.9	5.2	.8	2.6	2211.04
.09	.00	3.48	1.27	.000	.016	.030	.000	2210.30	1078.27
005259	396.	397.	397.	0	11	0	.00	97.05	1180.46

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 1005.000
3280 CROSS SECTION 1005.00 EXTENDED 6.43 FEET

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= .0 1250.1 TYPE= 1 TARGET= 1250.079

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2217.23 ELREA= 2222.00

1005.000	3.32	2218.43	2218.43	.00	2219.95	1.52	1.00	.40	2217.23
2300.0	10.3	2289.7	.0	16.2	231.1	.0	2.0	3.4	2222.00
.10	.63	9.91	.00	.100	.016	.000	.000	2215.11	1150.23
.002677	447.	369.	247.	0	26	0	.00	99.85	1250.08

*SECNO 1006.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= .0 1327.4 TYPE= 1 TARGET= 1327.449

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2220.42 ELREA= 2224.00

1006.000	3.28	2221.16	2221.16	.00	2222.61	1.45	1.08	.01	2220.42
2300.0	4.5	2295.5	.0	11.3	237.2	.0	4.3	4.4	2224.00
.12	.40	9.68	.00	.100	.016	.000	.000	2217.88	1211.89
.002715	400.	400.	400.	0	5	0	.00	115.56	1327.45

*SECNO 1007.000
3280 CROSS SECTION 1007.00 EXTENDED 4.85 FEET

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= .0 1307.8 TYPE= 1 TARGET= 1307.749

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2221.36 ELREA= 2224.00

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST
1007.000	3.22	2222.85	2222.85	.00	2224.10	1.25	1.04	.02	2221.36
2300.0	64.1	2235.9	.0	92.1	245.8	.0	7.0	5.9	2224.00
.13	.70	9.10	.00	.100	.016	.000	.000	2219.63	1096.03
.002526	400.	397.	397.	0	17	0	.00	211.72	1307.75

*SECNO 1008.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= .0 1168.8 TYPE= 1 TARGET= 1168.829

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2222.00 ELREA= 2225.00

1008.000	3.31	2224.65	2224.65	.00	2226.14	1.49	.99	.07	2222.00
2300.0	46.2	2253.8	.0	45.4	227.6	.0	9.6	7.3	2225.00
.14	1.02	9.90	.00	.100	.016	.000	.000	2221.34	1056.15
.002642	382.	383.	383.	0	32	0	.00	112.68	1168.83

*SECNO 1009.000
3220 CROSS SECTION 1009.00 EXTENDED 2.31 FEET

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 1200.8 1279.2 TYPE= 1 TARGET= 78.420
ELENCL= 2229.00 ELENCR= 2229.00

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2223.65 ELREA= 2229.00

1009.000	3.13	2226.38	2226.38	.00	2227.89	1.51	1.14	.00	2223.65
2300.0	.0	2300.0	.0	.0	233.5	.0	12.1	8.2	2229.00
.15	.00	9.85	.00	.000	.016	.000	.000	2223.25	1200.81
.002750	425.	422.	422.	0	11	0	.00	78.42	1279.23

THIS RUN EXECUTED 12OCT97 15:57:55

****
HEC-2 WATER SURFACE PROFILES

Version 4.6.2; May 1991
****

NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

FLOODPLAIN DETERMINATION

SUMMARY PRINTOUT TABLE 100

SECNO	EGLWC	ELLC	EGPRS	ELTRD	QPR	QWEIR	CLASS	H3	DEPTH	CWSEL	VCH	EG

FLOODPLAIN DETERMINATION

SUMMARY PRINTOUT TABLE 150

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH	AREA	.01K
*	1001.000	.00	.00	.00	2191.42	100.00	2191.96	2191.96	2192.09	58.45	2.95	33.91	13.08
*	1002.000	398.76	.00	.00	2194.57	100.00	2195.24	2195.24	2195.47	50.80	3.79	26.37	14.03
*	1003.000	402.69	.00	.00	2203.63	100.00	2204.33	2204.33	2204.54	49.59	3.60	30.14	14.20
*	1004.000	397.45	.00	.00	2210.30	100.00	2210.94	2210.94	2211.12	52.59	3.48	32.06	13.79
*	1005.000	368.62	.00	.00	2215.11	2300.00	2218.43	2218.43	2219.95	26.77	9.91	247.31	444.52
*	1006.000	399.92	.00	.00	2217.88	2300.00	2221.16	2221.16	2222.61	27.15	9.68	248.53	441.43
*	1007.000	397.30	.00	.00	2219.63	2300.00	2222.85	2222.85	2224.10	25.26	9.10	337.86	457.59
*	1008.000	382.92	.00	.00	2221.34	2300.00	2224.65	2224.65	2226.14	26.42	9.90	272.98	447.48
*	1009.000	422.13	.00	.00	2223.25	2300.00	2226.38	2226.38	2227.89	27.50	9.85	233.55	438.59

FLOODPLAIN DETERMINATION

SUMMARY PRINTOUT TABLE 150

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
*	1001.000	100.00	2191.96	.00	.00	-.04	126.66	.00
*	1002.000	100.00	2195.24	.00	3.29	.00	60.77	398.76
*	1003.000	100.00	2204.33	.00	9.09	.00	107.31	402.69
*	1004.000	100.00	2210.94	.00	6.61	.00	97.05	397.45
*	1005.000	2300.00	2218.43	.00	7.49	.00	99.85	368.62
*	1006.000	2300.00	2221.16	.00	2.73	.00	115.56	399.92
*	1007.000	2300.00	2222.85	.00	1.69	.00	211.72	397.30
*	1008.000	2300.00	2224.65	.00	1.79	.00	112.68	382.92
*	1009.000	2300.00	2226.38	.00	1.73	.00	78.42	422.13

SUMMARY OF ERRORS AND SPECIAL NOTES

CAUTION SECNO= 1001.000 PROFILE= 1 CRITICAL DEPTH ASSUMED

CAUTION SECNO= 1002.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 1002.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 1003.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 1003.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 1004.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 1004.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 1005.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 1005.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 1006.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 1006.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 1007.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 1007.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 1008.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 1008.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 1009.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 1009.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

2.2.3 IMPERIAL PALACE TO SPENER ST. REACH

APPROXIMATE METHOD
HEC-2 MODEL ANALYSIS
IMPERIAL PALACE TO SPENCER ST. REACH

This reach from Imperial Palace to Spencer Street was flown as part of this project. Therefore, topography was generated. The starting water surface elevation was computed using normal depth. The subcritial run was used to determine the floodplain delineation for this reach.

As discussed in the report, the Winnick Avenue Culvert will intercept approximately 50 percent of the flow. Therefore, the HEC-2 model was constructed in this area along Winnick Avenue to determine the floodplain caused by the remaining surface flows.

BASE2.D1

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*****************************************
*  HEC-2 WATER SURFACE PROFILES         *
*                                       *
*  Version   4.6.2;  May 1991           *
*                                       *
*  RUN DATE    06OCT97    TIME   11:03:27 *
*****************************************
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*************************************
*  U.S. ARMY CORPS OF ENGINEERS     *
*  HYDROLOGIC ENGINEERING CENTER    *
*  609 SECOND STREET, SUITE D       *
*  DAVIS, CALIFORNIA 95616-4687     *
*          (916) 756-1104           *
*************************************
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X     X  XXXXXXX   XXXXX              XXXXX
X     X  X        X     X           X     X
X     X  X        X                       X
XXXXXXX  XXXX     X          XXXXX   XXXXX
X     X  X        X                  X
X     X  X        X     X            X
X     X  XXXXXXX  XXXXX              XXXXXXX
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GR	1936	1214.92	1938	1218.84	1939.89	1222.54	1940	1224.83	1941.2	1249.47

C	1942	1260.06	1942.66	1268.85	1944	1274.05				
NC	0.025	0.025	0.015							
X1	40	12	1133.81	1184.19	10	10	10			
X3	10			1133.81	1942	1184.19	1942			
GR	1941.3	1000	1941.45	1090.13	1941.22	1104.02	1940	1133.81	1933.6	1133.81
GR	1933.6	1184.19	1940	1184.19	1940	1206.88	1941.22	1232.32	1942	1242.6
GR	1942.6	1251.47	1944	1256.84						
NC	0.025	0.025	0.015							
SB	0.9	1.56	2.6	170	50.38	2.38	240	0	1934.6	1933.6
X1	50	12	1184.49	1234.87	112.85	117.18	115.08			
X2			1	1939.599	1943.13			1.33		
X3	10			1184.49	1945	1234.87	1945			
GR	1942.5	1000	1943.06	1093.5	1942.65	1100.84	1942.61	1115.98	1942	1129.89
GR	1942	1184.49	1934.6	1184.49	1934.6	1234.87	1943	1234.87	1943	1239.96
GR	1943.2	1254.01	1943.64	1350.42						
NC	0.025	0.025	0.015							
QT	1	4600								
X1	60	27	1059.71	1149.4	375.8	397.17	387.41			
GR	1949.4	1000	1948	1015.95	1947.88	1017.39	1946.17	1047.07	1946	1049.22
GR	1945.2	1059.71	1944	1062.77	1942	1067.82	1940	1072.95	1939.77	1073.57
GR	1939.5	1090.82	1938	1094.84	1936.76	1097.96	1936.87	1110.33	1938	1113.23
GR	1939.2	1116.15	1939.37	1137.83	1940	1138.84	1942	1142.41	1944	1145.9
GR	1946	1149.4	1947.75	1152.54	1948	1155.14	1949.08	1165.1	1949.24	1192.51
C	1950	1202.7	1950.32	1206.97						
NC	0.025	0.025	0.015							
X1	70	23	1062.67	1154.22	427.31	406.33	417.23			
GR	1952	1000	1951.01	1048.35	1950	1062.67	1949.99	1063.36	1948	1067.18
GR	1946	1070.79	1944	1074.17	1942.83	1076	1943.1	1084.29	1942	1099.07
GR	1941.8	1099.92	1941.57	1112.55	1942	1115.39	1943.17	1121.4	1943.35	1139.21
GR	1944	1140.31	1946	1143.61	1948	1146.85	1950	1149.96	1951.72	1152.28
GR	1952	1154.22	1953.75	1165.11	1953.84	1194.64				
NC	0.025	0.025	0.015							
X1	80	19	1056.35	1140.68	1	1	1			
GR	1952	1000	1952	1002.13	1951.45	1036.88	1950.33	1056.35	1950	1056.92
GR	1948	1060.33	1946	1063.74	1944	1067.15	1942.6	1068.83	1942.6	1132.22
GR	1944	1132.98	1946	1136.05	1948	1138.66	1950	1140.68	1951.88	1142.98
GR	1952	1143.96	1954	1156.72	1954	1157.77	1954.38	1201.02		
NC	0.025	0.025	0.015							
X1	90	23	1052.98	1113.6	53.02	56.59	51.93			
GR	1955.2	1000	1954	1006.02	1953.68	1007.66	1952.47	1022.15	1952	1035.65
GR	1951.6	1045.56	1951.07	1052.98	1950	1054.57	1948	1057.59	1946	1060.63
GR	1944	1063.71	1943.1	1065.06	1943.1	1105.06	1944	1109.3	1946	1110.15
GR	1948	1110.99	1950	1111.87	1952	1112.94	1953.03	1113.6	1954	1119.02
GR	1954.3	1121.63	1954	1145.66	1953.67	1187.07				

NC	0.025	0.025	0.015							
X1	100	27	1068.7	1129.14	346.14	339.84	342.73			
GR	1958.9	1000	1959.19	1057.4	1958.29	1068.55	1958	1068.7	1956	1070.39
GR	1954	1071.98	1952	1073.58	1950	1075.17	1948	1076.75	1946	1078.32
GR	1944.7	1079	1944.7	1119	1946	1119.77	1948	1121.07	1950	1122.37
GR	1952	1123.68	1954	1124.99	1956	1126.31	1956.84	1126.86	1958	1129.14
GR	1960	1133.08	1961.7	1136.43	1962	1161.01	1962	1164.12	1962	1169.92
GR	1962.1	1180.79	1963.48	1218.41						
NC	0.025	0.025	0.015							
X1	110	25	1070.23	1130.3	1	1	1			
GR	1958	1000	1959.26	1058.72	1958.52	1069.8	1958	1070.23	1956	1071.86
GR	1954	1073.49	1952	1075.13	1950	1076.77	1948	1078.41	1947.23	1079.37
GR	1947.2	1119.37	1948	1122.31	1950	1123.63	1952	1124.96	1954	1126.29
GR	1956	1127.61	1956.94	1128.23	1958	1130.3	1960	1134.23	1961.78	1137.72
GR	1962	1156.11	1962	1162.57	1962	1167.55	1962.22	1180.81	1963.53	1218.4
NC	0.025	0.025	0.015							
X1	120	27	1082.95	1140.72	25.32	22.42	24.78			
GR	1959.7	1000	1960	1034.06	1960.7	1069.3	1960	1077.37	1959.54	1081.8
GR	1958	1082.95	1956	1084.44	1954	1085.94	1952	1087.44	1950	1088.93
GR	1948	1090.43	1947.5	1090.88	1947.5	1130.88	1948	1133.47	1950	1134.85
GR	1952	1136.24	1954	1137.62	1956	1138.99	1957.22	1139.81	1958	1140.72
GR	1960	1142.7	1962	1144.46	1962.02	1148.81	1962	1152.73	1962	1157.77
GR	1962.4	1185.25	1963.78	1223.58						
NC	0.025	0.025	0.015							
X1	130	24	1091.34	1145.53	125.29	125.61	125.31			
GR	1963	1000	1962	1082.33	1960	1086.89	1958.57	1090.09	1958	1091.34
GR	1956	1092.89	1954	1094.44	1952	1095.99	1950	1097.54	1948	1099.5
GR	1948	1139.5	1950	1141.65	1952	1142.63	1954	1143.6	1956	1144.57
GR	1958	1145.53	1960	1147.33	1961.39	1148.78	1962	1151.72	1962.83	1155.18
GR	1964	1156.8	1964.47	1157.37	1965.16	1174.08	1965.71	1213.65		
NC	0.025	0.025	0.015							
X1	140	25	1123.53	1181.8	57.23	56.76	55.76			
GR	1965.1	1000	1964	1109.48	1964.09	1112.94	1962	1117.49	1960	1121.87
GR	1959.2	1123.53	1958	1124.74	1956	1126.67	1954	1128.54	1952	1130.26
GR	1950	1131.84	1948.5	1132.5	1948.5	1172.5	1950	1175.19	1952	1176.29
GR	1954	1177.52	1956	1178.95	1958	1180.42	1959.86	1181.8	1960	1182.12
GR	1962	1186.57	1964	1191.03	1966	1195.47	1966.85	1197.34	1966.36	1258.33
NC	0.025	0.025	0.015							
X1	150	24	1135	1193.6	1	1	1			
GR	1965.4	1000	1964.25	1124.53	1964	1124.8	1962	1129.47	1960	1133.87
GR	1959.5	1135	1958	1136.46	1956	1138.43	1954	1140.4	1952	1142.4
GR	1950.5	1143.5	1950.5	1183.5	1952	1187.45	1954	1189.03	1956	1190.57
GR	1958	1192.09	1959.99	1193.6	1960	1193.68	1962	1198.04	1964	1202.42
GR	1966	1206.72	1966.89	1208.61	1967.17	1222.54	1966.39	1280.29		

	0.025	0.025	0.015							
X1	160	21	1022.9	1081.97	119.51	110.97	114.85			
GR	1964	1000	1962	1020.85	1961.14	1022.9	1960	1024.28	1958	1026.68
GR	1956	1029.05	1954	1031.39	1952	1033.69	1951.76	1033.96	1951.77	1074.55
GR	1952	1074.73	1954	1076.3	1956	1077.86	1958	1079.44	1960	1081.05
GR	1961.1	1081.97	1962	1085.8	1964	1091.98	1966	1097.23	1966.68	1098.86
GR	1967.1	1124.37								
NC	0.025	0.025	0.015							
X1	170	24	1021.94	1098.85	98.31	96.38	97.13			
GR	1967	1000	1966	1012.58	1965.99	1012.86	1964	1017.32	1962	1021.94
GR	1961.3	1023.53	1960	1025.98	1958	1029.63	1956	1033.27	1954	1036.91
GR	1952.3	1039.96	1952.49	1078.78	1952.8	1090.15	1954	1091.24	1956	1093.09
GR	1958	1094.94	1960	1096.8	1961.88	1098.54	1962	1098.85	1964	1103.45
GR	1966	1107.87	1968	1112.15	1968.22	1112.6	1968.32	1119.73		
NC	0.03	0.03	0.025							
X1	180	37	1105.54	1192.93	358.08	374.39	363.91			
GR	1970	1000	1969.41	1028.94	1968.36	1064.62	1968.63	1086	1970	1087.29
GR	1970.1	1087.42	1970	1100.03	1969.97	1105.54	1968	1109.38	1966	1113.23
GR	1964	1117.01	1962	1120.79	1960	1124.58	1958	1128.36	1956.15	1131.88
GR	1956.8	1143	1956	1147.31	1955.07	1152.03	1956	1170.74	1955.93	1170.74
GR	1958	1176.71	1959.49	1180.23	1960	1180.82	1962	1183.17	1964	1185.58
GR	1966	1188.01	1968	1190.47	1970	1192.93	1972	1195.38	1974	1197.84
GR	1975.3	1199.53	1976	1202.18	1976.53	1204.15	1978	1230.41	1978.06	1230.73
GR	1979.6	1268.21	1980	1278.63						
NC	0.03	0.03	0.025							
X1	190	42	1045.63	1134.18	349.99	362.07	356.25			
GR	1980	1000	1979.83	1002.64	1978.63	1026.03	1978	1042.24	1977.86	1045.63
GR	1976	1048.01	1974.65	1049.5	1974	1051.69	1972.2	1057.64	1972	1057.83
GR	1970	1059.68	1968	1061.56	1966	1063.46	1964	1065.36	1962	1067.28
GR	1960.4	1068.9	1960.4	1079.82	1960	1081.62	1958	1090.14	1957.64	1091.57
GR	1957.9	1101.67	1958	1101.76	1960	1106.43	1960.85	1108.4	1962	1111.96
GR	1963.3	1116.18	1964	1117.03	1966	1119.5	1968	1121.97	1970	1124.43
GR	1972	1126.89	1974	1129.33	1976	1131.76	1978	1134.18	1980	1136.59
GR	1980.8	1137.6	1981.5	1143.92	1982	1150.97	1982.99	1166.12	1984	1176.63
GR	1984.3	1179.97	1984.45	1222.66						
NC	0.03	0.03	0.025							
X1	200	35	1081.17	1169.9	344.1	367.63	357.38			
GR	1979.8	1000	1979.18	1029.49	1979.12	1052.59	1978.6	1067.43	1978	1077.24
GR	1977.7	1081.17	1976	1083.12	1974	1085.36	1972	1087.6	1970	1089.84
GR	1968	1092.07	1966	1094.26	1964	1096.33	1963.25	1097.1	1962.44	1108.96
GR	1963.4	1118.36	1963.2	1132.05	1964	1134.42	1965.81	1139.65	1966	1140.91
GR	1968	1152.85	1968.07	1153.21	1970	1155.03	1972	1156.9	1974	1158.74
GR	1976	1160.58	1978	1162.42	1980	1164.26	1982	1166.1	1984	1167.93
GR	1986	1169.8	1986.14	1169.9	1985.91	1175.55	1988	1199.66	1988.33	1203.15

[redacted]	0.025	0.025	0.015							
X1	210	28	1020.72	1112.24	218.28	223.05	220.26			
GR	1984	1000	1984.02	1005.21	1982.67	1015.97	1982	1020.72	1980	1024.38
GR	1978	1026.77	1976	1029.13	1974	1031.45	1972	1033.74	1970	1036.02
GR	1968	1038.3	1966	1040.57	1965.48	1041.23	1965.56	1087.58	1966	1088.46
GR	1968	1090.47	1970	1092.59	1972	1094.71	1974	1096.83	1976	1098.95
GR	1978	1101.07	1980	1103.2	1982	1105.33	1984	1107.49	1986	1109.84
GR	1986.9	1112.24	1987.25	1118.07	1988	1138.44				
NC	0.025	0.025	0.015							
X1	220	7	1044.15	1104.44	96.67	97.77	95.38			
X3	10			1044.15	1987	1104.44	1987			
GR	1986.2	1000	1986.57	1044.15	1968.66	1044.15	1968.66	1094.4	1986	1094.4
GR	1986.8	1104.44	1986.9	1141.04						
NC	0.025	0.025	0.015							
SB	0.9	1.56	2.6	115	50.25	2.25	576	0	1969.76	1968.66
X1	230	6	1059.76	1110.01	105.83	104.98	106.05			
X2			1	1981.76	1987.6			1.33		
X3	10			1059.76	1987.2	1110.01	1987.2			
GR	1987.1	1000	1987.1	1059.76	1969.76	1059.76	1969.76	1110.01	1987.1	1110.01
GR	1987.1	1161.77								
NC	0.025	0.025	0.025							
X1	240	24	1023.48	1114.49	100.09	99.49	98.95			
[redacted]	1986	1000	1985.03	1014.57	1984.8	1023.48	1984	1025.31	1982	1030.02
[redacted]	1980	1034.87	1978	1039.77	1976	1044.7	1975.59	1045.71	1975.71	1065.01
GR	1975.9	1076.65	1976	1079.47	1976.57	1085.82	1978	1090.42	1980	1094.27
GR	1982	1098.12	1984	1101.96	1986	1105.8	1988	1109.64	1990	1113.5
GR	1990.5	1114.49	1992.03	1119.47	1992	1119.74	1992.15	1125.82		
NC	0.025	0.025	0.025							
X1	250	29	1057.08	1169.75	483.82	467.47	478.12			
GR	1997.3	1000	1996	1025.03	1994	1057.08	1993.84	1059.01	1992	1061.82
GR	1990	1064.74	1988	1067.62	1986	1070.5	1984.57	1072.52	1984.32	1091.51
GR	1984	1092.06	1982	1095.54	1980	1099.12	1978.65	1101.59	1979.52	1114.22
GR	1980	1115.21	1982	1119.32	1982.68	1120.71	1982.27	1141.82	1984	1145.49
GR	1986	1149.77	1988	1154.11	1990	1158.51	1992	1162.95	1994	1167.41
GR	1995	1169.75	1994.48	1179.68	1996	1217.96	1998	1250.87		
NC	0.025	0.025	0.025							
X1	260	32	1125.84	1217.45	458.42	414.37	437.75			
GR	2002	1000	2000	1099.97	1999.98	1125.84	1998	1129.08	1996	1132.43
GR	1994	1135.78	1992	1139.14	1990.39	1141.83	1990.13	1157.45	1990	1157.66
GR	1988	1160.93	1986	1164.19	1984	1167.44	1982.24	1170.27	1982.12	1181.56
GR	1984	1184.35	1984.49	1185.06	1986	1192.93	1986.42	1195.31	1986.94	1204.85
GR	1988	1205.87	1990	1207.79	1992	1209.67	1994	1211.5	1996	1213.28
GR	1998	1214.99	2000	1216.64	2001.02	1217.45	2002	1230.77	2002.83	1241.5
GR	2002.6	1268.79	2003.91	1441.11						

[redacted]	0.025	0.025	0.02							
X1	270	16	1119.93	1157.26	213.44	213.44	213.69			
X3	10			1119.93	1999	1157.26	1999			
GR	1998.6	1000	1998.21	1067.08	1998	1077.71	1997.87	1089.69	1998	1095.71
GR	1998.1	1098.35	1998	1119.93	1983.4	1119.93	1983.4	1157.26	1998	1157.26
GR	2000	1175.33	2000.38	1176.08	2002	1184.44	2002.72	1188.02	2002.76	1209.37
GR	2004	1230.11								
NC	0.025	0.025	0.02							
SB	0.9	1.56	2.6	94	37.33	1.33	360	0	1984.3	1983.4
X1	280	17	1088.14	1124.47	110.45	115.15	110.04			
X2			1	1994.3	1997.3			1.33		
X3	10			1088.14	1999	1124.47	1999			
GR	2006	1000	2005.55	1016.53	2004	1023.84	2002	1033.33	2000.41	1040.84
GR	2000	1045.99	1999.38	1053.66	1998	1071.53	1997.96	1088.14	1984.3	1088.14
GR	1984.3	1124.47	1997.88	1124.47	1998	1130.07	1998.01	1135.33	1998	1135.45
GR	1997.3	1158.85	1998	1171.46						
NC	0.025	0.025	0.025							
QT	1	3900								
X1	290	27	1087.68	1216.15	402.5	479.38	451.82			
GR	2012.9	1000	2012.48	1087.68	2012	1088.64	2010	1092.64	2008	1096.63
GR	2006	1100.61	2004	1104.6	2002	1108.58	2000.01	1112.53	2000	1112.78
GR	1999.1	1129	1998	1131.23	1996	1134.95	1994	1138.62	1993.63	1139.29
GR	1993.7	1156.13	1994	1156.77	1996	1161.74	1998	1166.26	1998.4	1167.13
[redacted]	2000	1187.26	2001.03	1198.95	2002	1203.24	2004	1211.29	2005.27	1216.15
GR	2006	1237.37	2006	1253.12						
NC	0.025	0.025	0.025							
X1	300	38	1101.61	1253.69	445.34	406.87	430.29			
GR	2022	1000	2023.2	1052.04	2023.19	1099.68	2022	1101.61	2020	1104.85
GR	2018	1108.13	2016	1111.46	2014	1114.82	2012	1118.18	2010.62	1120.51
GR	2010.6	1138.37	2010	1139.8	2008	1144.21	2006	1148.61	2004	1153
GR	2003.1	1154.97	2002	1161.54	2001.94	1161.9	2002	1162.1	2003.16	1166.76
GR	2004	1168.39	2006	1172.05	2008	1175.68	2010	1179.14	2012	1182.49
GR	2012.8	1183.85	2012.62	1222.77	2013.26	1227.82	2014	1230.57	2016	1238.32
GR	2016.5	1240.47	2018	1243.56	2020	1247.79	2022	1252.02	2022.49	1253.69
GR	2022.9	1271	2024	1310.6	2024.22	1318.33				
NC	0.025	0.025	0.015							
X1	310	9	1036.87	1067.87	360.41	351.83	353.38			
X3	10			1036.87	2020	1067.87	2020			
GR	2020.2	1000	2020	1012.51	2019.76	1026.57	2018	1036.87	2008	1036.87
GR	2008	1067.87	2018	1067.87	2018.74	1089.14	2020	1105.23		
NC	0.025	0.025	0.015							
SB	0.9	1.56	2.6	58	31	1	210	0	2008.4	2008
X1	320	6	1074.88	1105.88	89.08	89.25	86.84			
X2			1	2015.4	2020.2			1.33		
X3	10			1074.88	2021	1105.88	2021			
GR	2022	1000	2020	1074.88	2008.4	1074.88	2008.4	1105.88	2020	1105.88
[redacted]	020.4	1120.7								

[redacted]	0.035	0.035	0.03							
X1	330	32	1073.22	1159.42	407.14	409.75	409.02			
GR	2028.2	1000	2028	1028.29	2027.94	1033.37	2026.74	1044.04	2028	1061.85
GR	2028.6	1070.03	2028	1073.22	2027.23	1077.02	2026	1081.25	2024	1088.07
GR	2022	1094.83	2020	1101.57	2019.81	1102.13	2018	1104.59	2016	1107.4
GR	2015.2	1108.46	2014.22	1116.23	2015.11	1124.64	2016	1126.01	2018	1129.12
GR	2020	1132.3	2020.97	1133.92	2021.77	1151.67	2022	1152.07	2024	1155.53
GR	2026	1158.82	2026.16	1159.42	2026.49	1168.36	2026.56	1198.52	2028	1224.16
GR	2028	1226.25	2028	1243.69						
NC	0.035	0.035	0.03							
X1	340	23	1056.91	1165.92	416.01	411.16	414.66			
GR	2034	1000	2033.54	1041.15	2032.89	1056.91	2032	1071.73	2031.99	1071.84
GR	2030	1076.76	2028	1081.57	2026	1086.12	2024	1090.12	2023.05	1093.65
GR	2022	1113.5	2021.92	1114.5	2022	1115.38	2022.98	1128.04	2024	1134.12
GR	2025.2	1141.02	2026	1143.48	2028	1149.7	2030	1155.88	2031.85	1161.5
GR	2032	1165.92	2032.4	1227.24	2032.47	1306.6				
NC	0.025	0.025	0.015							
X1	350	8	1014	1077.2	391.21	407.9	400.22			
X3	10			1014	2036	1077.2	2036			
GR	2035.1	1000	2034	1014	2025.9	1014	2025.9	1077.2	2034	1077.2
GR	2036	1086.37	2036.2	1094.88	2036.44	1095.33				
NC	0.025	0.025	0.015							
S	0.9	1.56	2.6	70	63.2	3.2	480	0	2025.9	2025.9
X1	360	8	1023.92	1087.12	69.15	67.58	69.23			
X2			1	2033.9	2036.06			1.33		
X3	10			1023.92	2037	1087.12	2037			
GR	2036	1000	2036.27	1011.98	2036	1023.92	2025.9	1023.92	2025.9	1087.12
GR	2036	1087.12	2036.11	1091.98	2036.81	1114.07				
NC	0.025	0.025	0.015							
X1	370	23	1037.84	1109.55	67.22	66.57	66.95			
GR	2039.2	1000	2039.54	1028.04	2038	1035.22	2037.44	1037.84	2036	1044.09
GR	2034	1048.46	2032	1052.89	2030	1057.17	2028	1060.8	2028	1064.5
GR	2028	1081.98	2028	1089.63	2028	1099.06	2028	1106.03	2030	1106.68
GR	2032	1107.62	2034	1108.62	2035.81	1109.55	2036	1112.07	2036.77	1118.39
GR	2037.6	1131.72	2038	1190.66	2038	1190.72				
NC	0.025	0.025	0.015							
X1	380	17	1037.66	1118.27	1	1	1			
GR	2039.3	1000	2039.67	1028.22	2038	1035.96	2037.63	1037.66	2036	1043.96
GR	2034	1049.96	2032	1055.19	2030	1060.04	2030	1066.79	2030	1104.28
GR	2032	1106.78	2034	1108.4	2035.83	1109.57	2036	1111.36	2036.85	1118.27
GR	2037.7	1131.66	2038	1190.48						
NC	0.035	0.035	0.03							
X1	390	28	1040.49	1129.17	384.6	427.73	409.92			
GR	2043.5	1000	2043.12	1008.96	2044	1038.32	2044.06	1040.22	2044	1040.49
GR	2043.9	1040.61	2044	1040.96	2044.44	1044.41	2044	1045.36	2042	1049.72
G	2040	1054.05	2038	1058.31	2036	1062.53	2034	1066.73	2033.2	1068.42
GR	2033.1	1081	2032.17	1087.19	2033.73	1092.76	2033.91	1107.36	2034	1107.55

G	2036	1112.48	2038	1117.34	2040	1122.11	2042	1126.83	2042.99	1129.17
[redacted]	2042	1141.02	2042.83	1171.51	2042.75	1213.88				
NC	0.025	0.025	0.015							
X1	400	26	1023.26	1125.1	427.56	379.77	400.26			
GR	2043.4	1000	2044	1008.84	2044.48	1016.77	2044.6	1018.87	2044.76	1023.26
GR	2044	1029.09	2043.84	1030.28	2042	1035.42	2040	1041	2038	1046.59
GR	2036	1052.17	2034.55	1056.13	2034	1071.56	2033.36	1076.02	2034	1078.19
GR	2034.8	1081.88	2035.08	1097.23	2036	1100.89	2036.84	1104.16	2038	1107.49
GR	2040	1113.12	2042	1118.75	2043.92	1124.26	2044	1125.1	2046	1147.4
GR	2048	1170.4								
NC	0.025	0.025	0.015							
X1	410	27	1023.15	1123.94	1	1	1			
GR	2043.5	1000	2044	1007.48	2044.57	1016.63	2044.79	1018.64	2044.89	1023.15
GR	2044	1030.2	2044.01	1030.29	2042	1035.51	2040	1040.71	2038	1045.88
GR	2036	1051.03	2035.83	1051.5	2034.27	1053.8	2034	1065.18	2033.41	1076.18
GR	2033.8	1083.76	2034	1088.34	2034.44	1098.59	2035.86	1100.44	2036	1101.24
GR	2038	1106.68	2040	1112.44	2042	1118.2	2043.99	1123.94	2044	1124.08
GR	2046	1146.2	2048	1169.51						
NC	0.025	0.025	0.015							
X1	420	24	1043.78	1135.75	57.42	58.75	57.86			
GR	2044.5	1000	2044.02	1013.17	2045.14	1029.1	2045.24	1031.49	2045.15	1043.78
GR	2044	1044.56	2042	1045.39	2040	1046.21	2038	1047.01	2036	1047.78
GR	2034.3	1048.4	2034	1070.27	2033.65	1090.96	2034	1102.69	2034.75	1134.3
G[redacted]	2036	1134.46	2038	1134.73	2040	1135	2042	1135.29	2044	1135.59
G[redacted]	2045	1135.75	2046	1151.17	2048	1177.91	2048.44	1184.02		
NC	0.025	0.025	0.015							
X1	430	11	1060.08	1090.66	208.31	211.94	208.45			
X3	10			1060.08	2048	1090.66	2048			
GR	2049	1000	2048	1009.5	2047.54	1017.61	2046.6	1060.08	2034.15	1060.08
GR	2034.1	1090.66	2046.6	1090.66	2046.27	1095.89	2046.88	1121.19	2047.37	1136.94
GR	2047.3	1157.66								
NC	0.025	0.025	0.015							
SB	1.25	1.56	2.6	31.5	30.58	0.58	300	0	2048.53	2034.15
X1	440	15	1046.07	1076.65	1470.06	1457.21	1463.68			
X2			1	2058.53	2060.53			2		
X3	10			1046.07	2060	1076.65	2060			
GR	2058.6	1000	2059.32	1015.39	2058.81	1046.07	2048.53	1046.07	2048.53	1076.65
GR	2058.8	1076.65	2060	1087.37	2062	1090.99	2064	1094.51	2065.63	1098.52
GR	2066	1100.87	2066.3	1103.82	2066	1113.26	2065.91	1115.86	2065.96	1135.4
NC	0.025	0.025	0.015							
X1	450	21	1069.16	1100.27	388.92	404.9	397.95			
GR	2063.1	1000	2062.46	1062.1	2062.1	1069.08	2062	1069.16	2060	1070.84
GR	2058	1072.51	2056	1074.19	2054	1075.87	2052.22	1077.38	2052.71	1098.84
GR	2054	1099.01	2056	1099.27	2058	1099.53	2060	1099.79	2062	1100.06
GR	2062.4	1100.27	2062.24	1102.13	2064	1106.77	2065.41	1110.3	2066	1138.35
GP	2068	1229.16								
[redacted]										

N	0.025	0.025	0.015							
X1	460	23	1069.93	1105.01	393.56	408.01	401.61			
GR	2067.7	1000	2067.03	1064.15	2068	1069.93	2068.18	1070.53	2068	1070.67
GR	2066	1072.3	2064	1073.93	2062	1075.55	2060	1077.18	2058	1078.81
GR	2057.4	1079.29	2057.56	1100.18	2058	1100.27	2060	1100.7	2062	1101.09
GR	2064	1101.46	2066	1101.81	2066.59	1101.91	2068	1105.01	2068.95	1107
GR	2070	1116.39	2070.87	1124.41	2070	1214.9				
NC	0.025	0.025	0.015							
X1	470	21	1076.93	1115.33	402.75	394.14	398.77			
GR	2073.8	1000	2072.77	1065.9	2073.13	1076.93	2072	1077.24	2070	1078.56
GR	2068	1079.79	2066	1080.99	2064	1082.22	2062.67	1083.04	2062.71	1107.09
GR	2064	1107.31	2066	1107.65	2068	1108.01	2070	1108.51	2071.42	1108.98
GR	2072	1110.03	2074	1114.41	2074.36	1115.33	2074	1124.29	2073.8	1135.27
GR	2074	1315.22								
NC	0.025	0.025	0.015							
X1	480	21	1026.66	1163.79	213.66	185.9	192.99			
X3	10			1026.66	2076	1163.79	2076			
GR	2073.6	1000	2073.75	1014.61	2074	1017.95	2074.97	1026.66	2074	1030.55
GR	2072	1042.8	2070	1054.27	2068	1065.84	2066	1074.47	2064.18	1079.6
GR	2064.2	1126.09	2066	1130.87	2068	1136.31	2070	1145.62	2072	1154.99
GR	2073.1	1163.79	2073.64	1179.89	2074	1182.32	2074	1184.45	2073.75	1196.44
GR	2073.7	1218.52								
N	0.1	0.1	0.016							
NH	5	0.1	1078.9	0.016	1133.91	0.1	1380	0.016	1473.5	0.1
NH	1592.8									
QT	1	1950								
X1	490	26	1380	1473.5	137.94	134.7	133.56			
X3	10			1380	2077	1473.5	2077			
GR	2076.2	1000	2076	1070.44	2075.7	1078.9	2075.65	1093.59	2074.77	1095.59
GR	2075.1	1113.21	2074.62	1131.24	2075.52	1133.91	2075.42	1139.4	2074.8	1147.24
GR	2074.6	1237.96	2074.44	1262.26	2075.25	1380	2074	1384.16	2072.88	1388.18
GR	2073.4	1392.2	2072.56	1396.28	2072.65	1422.63	2072.87	1453.13	2073.88	1455.88
GR	2074	1460.2	2074.02	1460.41	2075.24	1473.5	2076	1489.31	2076.27	1548.19
GR	2076.6	1592.8								
NC	0.1	0.1	0.016							
NH	5	0.1	1085.11	0.016	1149.87	0.1	1383.37	0.016	1469.12	0.1
NH	1584.8									
X1	500	29	1383.37	1469.12	201.63	205.58	201.53			
X3	10			1383.37	2079	1469.12	2079			
GR	2077.9	1000	2078	1079.54	2078.04	1084.64	2078	1085.11	2077.79	1096.49
GR	2077	1098.93	2076.88	1117.48	2076.69	1135.33	2077.46	1137.07	2076.9	1141.08
GR	2078	1148.66	2078.19	1149.87	2078	1161.08	2077.06	1239.92	2076.66	1266.66
GR	2076	1383.37	2076	1383.6	2075.41	1391.31	2075.55	1394.62	2074.64	1397.49
GR	2074.8	1425.39	2074.83	1456.48	2075.69	1459.45	2075.8	1463.28	2076	1464.24
GR	2076.8	1469.12	2077.99	1555.71	2078	1559.68	2078	1584.8		

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N[redacted]  0.1      0.1      0.016
NH      5      0.1      1084.93      0.016      1136.15      0.1      1383.68      0.016      1470.61      0.1
NH   1543.7
X1     510       28      1383.68      1470.61      200.34      198.87      199.21
X3      10                         1383.68      2081      1470.61      2081
GR  2080.5     1000      2080      1069.72      2079.8      1084.93      2079.47      1096.82      2078.88      1098.95
GR  2079.3  1116.36   2078.64      1134.53      2079.78      1136.15      2079.18      1140.94      2079.36      1149.29
GR    2080  1183.52      2080      1201.45      2078.71      1236.9      2078.59      1265.15      2079.65      1292.21
GR  2078.4  1383.68      2078      1386.37      2077.43      1390      2077.38      1394.06      2076.69      1397.95
GR  2076.7  1425.28   2076.58      1455.81      2077.08      1458.62      2077.38      1463.12      2078      1465.32
GR  2079.5  1470.61      2080      1485.7      2080.44      1543.7

NC      0.1      0.1      0.016
NH      5      0.1      1084.05      0.016      1123.94      0.1      1366.83      0.016      1457.45      0.1
NH   1523
X1     520       29      1366.83      1457.45      198.12      199.29      199.24
X3      10                         1366.83      2082      1457.45      2082
GR  2081.5     1000   2081.42      1074.05      2081.73      1084.05      2080.98      1087.47      2081.18      1103.48
GR    2081  1121.11   2081.86      1123.94      2081.43      1128.1      2082.01      1134.95      2081.95      1146.76
GR    2082  1147.04      2082      1203.66      2081.83      1213.57      2081.16      1228.52      2080.95      1263.15
GR  2080.5  1366.83      2080      1370.04      2078.47      1378.27      2079.13      1381.53      2078.01      1385.19
GR    2078  1386.82      2078      1398.81      2078.24      1413.06      2078.26      1444.5      2079.01      1446.85
GR  2079.4  1450.39      2080      1453.11      2080.92      1457.45      2081.93      1523

NC      0.1      0.1      0.016
N[redacted]      5      0.1      1082.96      0.016      1123.08      0.1      1346.74      0.016      1431.3      0.1
NH   1601
X1     530       22      1346.74      1431.3      210.23      241.33      227.48
X3      10                         1346.74      2084      1431.3      2084
GR  2083.2     1000   2083.7      1072.53      2083.71      1082.96      2082.35      1086.89      2082.9      1102.27
GR  2082.6  1119.01   2083.62      1123.08      2083.29      1128.26      2083.02      1136.13      2083.01      1241.73
GR  2082.6  1346.74      2082      1350.59      2080.52      1359.41      2081.3      1362.33      2079.98      1367.32
GR  2080.1  1393.44   2080.61      1421.98      2081.51      1425.57      2081.9      1430.88      2082      1431.3
GR    2084  1513.51      2084      1601

NC      0.1      0.1      0.016
NH      5      0.1      1034.63      0.016      1082.12      0.1      1155.7      0.016      1242.61      0.1
NH   1662.5
X1     540       30      1155.7      1235.18      173.09      201.13      189.3
X3      10                         1155.7      2085      1235.18      2085
GR  2085.3     1000   2084.14      1027.87      2084.28      1034.63      2084      1036.59      2083.69      1038.99
GR  2083.3  1056.98   2083.17      1073.21      2084      1074.74      2084.32      1075.3      2084      1077.59
GR  2083.7  1080.12      2084      1081.27      2084.31      1082.12      2084.15      1103.24      2084      1125.27
GR    2083      1155.7   2082.23      1161.51      2082.99      1165.34      2082.14      1167.92      2082      1174.17
GR  2081.4  1199.23      2082      1213.92      2082.61      1230.67      2083.48      1235.18      2083.43      1242.61
GR    2084  1265.06   2083.87      1279.58      2084      1288.94      2086      1635.3      2086.16      1662.5

NC      0.1      0.1      0.016
X1     550       11      1113.83      1286.4      237.87      248.39      244.36
X3      10                         1113.83      2087      1286.4      2087
GR    2086     1000      2086      1006.83      2085.22      1113.83      2084.16      1169.33      2084.02      1177.67
G[redacted]  2084  1177.78      2084      1240.62      2084.59      1242.98      2084.41      1250.04      2086      1277.72
GR  2086.6  1286.4
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N	0.016	0.016	0.015							
QT	1	3900								
X1	560	19	1011.29	1090.36	63.57	64.65	67.51			
GR	2090.9	1009.62	2084.97	1009.62	2084	1011.29	2082	1014.16	2080	1017.23
GR	2078	1020.53	2077.65	1021.06	2076	1034.43	2076	1048.77	2076.12	1053.14
GR	2078	1053.74	2080	1054.61	2082	1055.47	2083.53	1056.15	2083.54	1085.21
GR	2084	1086.7	2085.15	1090.36	2085.23	1098.87	2088.23	1098.87		

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*PROF 1

CRITICAL DEPTH TO BE CALCULATED AT ALL CROSS SECTIONS
ALLOWABLE ERROR FOR CRITICAL DEPTH DETERMINATION (ALLDC) = 2.000 PERCENT OF THE DEPTH

CCHV= .100 CEHV= .300
*SECNO 10.000
3720 CRITICAL DEPTH ASSUMED

10.000	8.50	1930.20	1930.20	1930.00	1931.98	1.78	.00	.00	1928.13
5500.0	291.9	5142.0	66.1	87.1	466.3	19.1	.0	.0	1928.00
.00	3.35	11.03	3.45	.035	.030	.035	.000	1921.70	1139.32
.005307	0.	0.	0.	0	8	5	.00	184.60	1323.92

*SECNO 20.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

20.000	8.92	1933.32	1933.32	.00	1935.22	1.90	1.56	.04	1931.19
5500.0	290.5	5185.3	24.2	95.9	456.1	10.5	3.9	1.4	1932.00
.01	3.03	11.37	2.31	.035	.030	.035	.000	1924.40	1113.63
.5174	314.	298.	276.	0	8	0	.00	208.12	1321.75

*SECNO 30.000

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

30.000	6.93	1935.76	1935.76	.00	1938.47	2.71	1.29	.24	1940.00
5500.0	.0	5500.0	.0	.0	416.7	.0	8.6	2.7	1938.00
.02	.00	13.20	.00	.000	.015	.000	.000	1928.83	1136.18
.002049	407.	418.	430.	0	15	0	.00	78.28	1214.46

*SECNO 40.000

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 1133.8 1184.2 TYPE= 1 TARGET= 50.380

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

ELENCL= 1942.00 ELENCR= 1942.00

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1940.00 ELREA= 1942.00

40.000	7.15	1940.75	1940.75	.00	1944.37	3.62	.02	.27	1940.00
5500.0	.0	5500.0	.0	.0	360.4	.0	8.7	2.7	1942.00
.02	.00	15.26	.00	.000	.015	.000	.000	1933.60	1133.81
.002365	10.	10.	10.	0	8	0	.00	50.38	1184.19

SPECIAL BRIDGE

5227 DOWNSTREAM ELEV IS 1939.65 , NOT 1940.75 HYDRAULIC JUMP OCCURS DOWNSTREAM (IF LOW FLOW CONTROLS)

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	.90	1.56	2.60	170.00	50.38	2.38	240.00	.00	1934.60	1933.60

*SECNO 50.000

3 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.42

PRESSURE AND WEIR FLOW, Weir Submergence Based on TRAPEZOIDAL Shape

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
1953.48	1947.40	.00	2011.	3490.	240.	240.	1939.60	1943.13	170.

3470 ENCROACHMENT STATIONS= 1184.5 1234.9 TYPE= 1 TARGET= 50.380
ELENCL= 1945.00 ELENCR= 1945.00

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1942.00 ELREA= 1945.00

50.000	8.98	1943.58	.00	.00	1945.88	2.29	1.51	.00	1942.00
5500.0	.0	5500.0	.0	.0	452.5	.0	9.8	2.9	1945.00
.02	.00	12.16	.00	.000	.015	.000	.000	1934.60	1184.49
.001174	113.	115.	117.	5	0	4	.00	50.38	1234.87

ECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 60.000

3301 HV CHANGED MORE THAN HVINS

60.000	8.04	1944.80	1943.89	.00	1946.41	1.60	.46	.07	1945.20
4600.0	.0	4600.0	.0	.0	452.6	.0	13.8	3.5	1946.00
.03	.00	10.16	.00	.000	.015	.000	.000	1936.76	1060.72
.001220	376.	387.	397.	4	15	0	.00	86.58	1147.31

*SECNO 70.000

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

70.000	6.30	1947.87	1947.87	.00	1950.25	2.38	.65	.23	1950.00
4600.0	.0	4600.0	.0	.0	371.2	.0	17.7	4.3	1952.00
.04	.00	12.39	.00	.000	.015	.000	.000	1941.57	1067.42
.002092	427.	417.	406.	0	15	0	.00	79.21	1146.63

*SECNO 80.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

80.000	5.28	1947.88	1947.88	.00	1950.28	2.40	.00	.00	1950.33
4600.0	.0	4600.0	.0	.0	370.1	.0	17.7	4.3	1950.00
.04	.00	12.43	.00	.000	.015	.000	.000	1942.60	1060.53
.002096	1.	1.	1.	0	14	0	.00	77.98	1138.51

*SECNO 90.000

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

90.000	6.65	1949.75	1949.75	.00	1952.71	2.97	.11	.17	1951.07
4600.0	.0	4600.0	.0	.0	332.8	.0	18.2	4.4	1953.03
.04	.00	13.82	.00	.000	.015	.000	.000	1943.10	1054.95
.002102	53.	52.	57.	0	11	0	.00	56.81	1111.76

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 100.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

100.000	7.13	1951.82	1951.82	.00	1955.06	3.23	.73	.08	1958.00
4600.0	.0	4600.0	.0	.0	318.8	.0	20.7	4.8	1958.00
.05	.00	14.43	.00	.000	.015	.000	.000	1944.70	1073.72
.002155	346.	343.	340.	0	8	0	.00	49.85	1123.57

*SECNO 110.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

110.000	6.86	1954.06	1954.06	.00	1957.15	3.09	.00	.01	1958.00
4600.0	.0	4600.0	.0	.0	326.1	.0	20.7	4.8	1958.00
.05	.00	14.11	.00	.000	.015	.000	.000	1947.20	1073.44
.002092	1.	1.	1.	0	8	0	.00	52.89	1126.33

*SECNO 120.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

120.000	6.87	1954.37	1954.37	.00	1957.50	3.13	.05	.01	1958.00
4600.0	.0	4600.0	.0	.0	324.1	.0	20.9	4.8	1958.00
.05	.00	14.19	.00	.000	.015	.000	.000	1947.50	1085.66
.002118	25.	25.	22.	0	5	0	.00	52.21	1137.87

*SECNO 130.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

130.000	6.99	1954.99	1954.99	.00	1958.20	3.21	.27	.02	1958.00
4600.0	.0	4600.0	.0	.0	320.0	.0	21.8	5.0	1958.00
.05	.00	14.38	.00	.000	.015	.000	.000	1948.00	1093.67
.002141	125.	125.	126.	0	8	0	.00	50.41	1144.08

*SECNO 140.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

140.000	7.01	1955.51	1955.51	.00	1958.66	3.16	.12	.01	1959.20
4600.0	.0	4600.0	.0	.0	322.5	.0	22.2	5.0	1959.86
.05	.00	14.26	.00	.000	.015	.000	.000	1948.50	1127.13
.002125	57.	56.	57.	0	5	0	.00	51.46	1178.60

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 150.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

150.000	6.83	1957.33	1957.33	.00	1960.36	3.03	.00	.01	1959.50
4600.0	.0	4600.0	.0	.0	329.0	.0	22.3	5.0	1959.99
.05	.00	13.98	.00	.000	.015	.000	.000	1950.50	1137.12
.002074	1.	1.	1.	0	8	0	.00	54.46	1191.58

*SECNO 160.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

160.000	6.95	1958.71	1958.71	.00	1961.75	3.04	.24	.00	1961.14
4600.0	.0	4600.0	.0	.0	328.9	.0	23.1	5.2	1961.10
.05	.00	13.99	.00	.000	.015	.000	.000	1951.76	1025.83
.002067	120.	115.	111.	0	5	0	.00	54.19	1080.01

*SECNO 170.000

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.75

170.000	8.48	1960.78	1958.47	.00	1962.03	1.25	.11	.18	1962.00
4600.0	.0	4600.0	.0	.0	512.9	.0	24.1	5.3	1962.00
.06	.00	8.97	.00	.000	.015	.000	.000	1952.30	1024.50
.000673	98.	97.	96.	5	11	0	.00	73.03	1097.53

*SECNO 180.000

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

180.000	7.43	1962.50	1962.50	.00	1965.24	2.74	.54	.45	1969.97
4600.0	.0	4600.0	.0	.0	346.6	.0	27.6	5.9	1970.00
.06	.00	13.27	.00	.000	.025	.000	.000	1955.07	1119.84
.005634	358.	364.	374.	0	11	0	.00	63.94	1183.78

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 190.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

190.000	8.59	1966.23	1966.23	.00	1969.18	2.95	2.01	.07	1977.86
4600.0	.0	4600.0	.0	.0	333.6	.0	30.4	6.4	1978.00
.07	.00	13.79	.00	.000	.025	.000	.000	1957.64	1063.24
.005631	350.	356.	362.	0	8	0	.00	56.54	1119.78

*SECNO 200.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

200.000	7.48	1969.92	1969.92	.00	1972.64	2.72	2.04	.02	1977.70
4600.0	.0	4600.0	.0	.0	347.4	.0	33.2	6.9	1986.14
.08	.00	13.24	.00	.000	.025	.000	.000	1962.44	1089.93
.005766	344.	357.	368.	0	15	0	.00	65.03	1154.96

*SECNO 210.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

210.000	6.39	1971.87	1971.87	.00	1974.69	2.82	.71	.03	1982.00
4600.0	.0	4600.0	.0	.0	341.1	.0	35.0	7.2	1986.90
.08	.00	13.49	.00	.000	.015	.000	.000	1965.48	1033.89
.002055	218.	220.	223.	0	11	0	.00	60.69	1094.57

*SECNO 220.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 1044.2 1104.4 TYPE= 1 TARGET= 60.290
ELENCL= 1987.00 ELENCR= 1987.00

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1986.57 ELREA= 1987.00

220.000	6.36	1975.02	1975.02	.00	1978.24	3.21	.21	.12	1986.57
4600.0	.0	4600.0	.0	.0	319.7	.0	35.7	7.3	1987.00
.08	.00	14.39	.00	.000	.015	.000	.000	1968.66	1044.15
.002418	97.	95.	98.	0	5	0	.00	50.25	1094.40

[redacted]CNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

SPECIAL BRIDGE

5227 DOWNSTREAM ELEV IS 1974.07 , NOT 1975.02 HYDRAULIC JUMP OCCURS DOWNSTREAM (IF LOW FLOW CONTROLS)

SB	XK	XKOR	COFQ	ROLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	.90	1.56	2.60	115.00	50.25	2.25	576.00	.00	1969.76	1968.66

*SECNO 230.000

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.41

CLASS B LOW FLOW

3420 BRIDGE W.S.= 1975.79 BRIDGE VELOCITY= 14.56 CALCULATED CHANNEL AREA= 290.

[redacted]S	EGLWC	H3	QWEIR	QLOW	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
.00	1979.79	.00	0.	4600.	576.	576.	1981.76	1987.60	0.

3470 ENCROACHMENT STATIONS= 1059.8 1110.0 TYPE= 1 TARGET= 50.250
ELENCL= 1987.20 ELENCR= 1987.20

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1987.10 ELREA= 1987.20

230.000	7.98	1977.74	.00	.00	1979.79	2.04	1.55	.00	1987.10
4600.0	.0	4600.0	.0	.0	401.2	.0	36.6	7.4	1987.20
.09	.00	11.47	.00	.000	.015	.000	.000	1969.76	1059.76
.001213	106.	106.	105.	0	0	0	.00	50.25	1110.01

*SECNO 240.000

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

240.000	6.70	1982.29	1982.29	.00	1984.89	2.60	.22	.17	1984.80
4600.0	.0	4600.0	.0	.0	355.4	.0	37.4	7.6	1990.50
.09	.00	12.94	.00	.000	.025	.000	.000	1975.59	1029.34
[redacted]05636	100.	99.	99.	0	15	0	.00	69.33	1098.67

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 250.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

250.000	8.47	1987.12	1987.12	.00	1989.44	2.32	2.79	.03	1994.00
4600.0	.0	4600.0	.0	.0	376.5	.0	41.4	8.4	1995.00
.10	.00	12.22	.00	.000	.025	.000	.000	1978.65	1068.88
.006085	484.	478.	467.	0	11	0	.00	83.32	1152.21

*SECNO 260.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

260.000	9.63	1991.75	1991.75	.00	1994.32	2.57	2.61	.07	1999.98
4600.0	.0	4600.0	.0	.0	357.7	.0	45.1	9.2	2001.02
.11	.00	12.86	.00	.000	.025	.000	.000	1982.12	1139.55
.005882	458.	438.	414.	0	8	0	.00	69.88	1209.44

*SECNO 270.000

3[illegible]NCROACHMENT STATIONS= 1119.9 1157.3 TYPE= 1 TARGET= 37.330
ELENCL= 1999.00 ELENCR= 1999.00

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1998.00 ELREA= 1999.00

270.000	9.00	1992.40	1991.16	.00	1995.31	2.91	.88	.10	1998.00
4600.0	.0	4600.0	.0	.0	335.9	.0	46.8	9.4	1999.00
.11	.00	13.70	.00	.000	.020	.000	.000	1983.40	1119.93
.003068	213.	214.	213.	2	15	0	.00	37.33	1157.26

SPECIAL BRIDGE

5227 DOWNSTREAM ELEV IS 1990.11 , NOT 1992.40 HYDRAULIC JUMP OCCURS DOWNSTREAM (IF LOW FLOW CONTROLS)

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	.90	1.56	2.60	94.00	37.33	1.33	360.00	.00	1984.30	1983.40

*SECNO 280.000
CLASS B LOW FLOW

3420 BRIDGE W.S.= 1991.83 BRIDGE VELOCITY= 16.02 CALCULATED CHANNEL AREA= 271.

CNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

EGPRS	EGLWC	H3	QWEIR	QLOW	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
1996.35	1996.56	.00	0.	4600.	360.	360.	1994.30	1997.30	0.

3470 ENCROACHMENT STATIONS= 1083.1 1124.5 TYPE= 1 TARGET= 36.330
ELENCL= 1999.00 ELENCR= 1999.00

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1997.96 ELREA= 1999.00

280.000	9.50	1993.80	.00	.00	1996.56	2.76	1.25	.00	1997.96
4600.0	.0	4600.0	.0	.0	345.0	.0	47.7	9.5	1999.00
.12	.00	13.33	.00	.000	.020	.000	.000	1984.30	1088.14
.002805	110.	110.	115.	0	0	0	.00	36.33	1124.47

*SECNO 290.000

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

290.000	7.98	2001.61	2001.61	.00	2003.57	1.96	1.77	.08	2012.48
3900.0	.0	3900.0	.0	.0	346.9	.0	51.3	10.2	2005.27
.13	.00	11.24	.00	.000	.025	.000	.000	1993.63	1109.36
.006364	403.	452.	479.	0	15	0	.00	92.14	1201.50

*SECNO 300.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

300.000	10.57	2012.51	2012.51	.00	2014.71	2.20	2.47	.07	2022.00
3900.0	.0	3900.0	.0	.0	327.6	.0	54.6	11.0	2022.49
.14	.00	11.90	.00	.000	.025	.000	.000	2001.94	1117.32
.005208	445.	430.	407.	0	10	0	.00	66.04	1183.36

*SECNO 310.000

3301 HV CHANGED MORE THAN HVINS

[redacted]CNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 1035.9 1067.9 TYPE= 1 TARGET= 31.000
ELENCL= 2020.00 ELENCR= 2020.00

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2018.00 ELREA= 2020.00

310.000	7.87	2015.87	2015.87	.00	2019.84	3.97	1.34	.53	2018.00
3900.0	.0	3900.0	.0	.0	243.9	.0	56.9	11.4	2020.00
.14	.00	15.99	.00	.000	.015	.000	.000	2008.00	1036.87
.002878	360.	353.	352.	0	15	0	.00	31.00	1067.87

SPECIAL BRIDGE

5227 DOWNSTREAM ELEV IS 2014.87 , NOT 2015.87 HYDRAULIC JUMP OCCURS DOWNSTREAM (IF LOW FLOW CONTROLS)

SK[redacted]K	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
.90	1.56	2.60	53.00	31.00	1.00	210.00	.00	2008.40	2008.00

*SECNO 320.000
3280 CROSS SECTION 320.00 EXTENDED .30 FEET

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.89

PRESSURE AND WEIR FLOW, Weir Submergence Based on TRAPEZOIDAL Shape

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
2024.22	2020.63	.00	468.	3429.	210.	210.	2015.40	2020.20	58.

3470 ENCROACHMENT STATIONS= 1074.9 1105.9 TYPE= 1 TARGET= 31.000
ELENCL= 2021.00 ELENCR= 2021.00

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2020.00 ELREA= 2021.00

CNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	OLOB	OCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	X_OBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST
320.000	12.30	2020.70	.00	.00	2022.33	1.62	2.49	.00	2020.00
3900.0	.0	3900.0	.0	.0	381.4	.0	57.6	11.4	2021.00
.15	.00	10.23	.00	.000	.015	.000	.000	2008.40	1074.88
.000804	89.	87.	89.	3	0	2	.00	31.00	1105.88

*SECNO 330.000

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

330.000	9.55	2023.77	2023.77	.00	2026.20	2.43	.78	.24	2028.00
3900.0	.0	3900.0	.0	.0	311.7	.0	60.8	11.9	2026.16
.16	.00	12.51	.00	.000	.030	.000	.000	2014.22	1088.84
.008833	407.	409.	410.	0	19	0	.00	66.29	1155.13

*SECNO 340.000
7[illegible]MINIMUM SPECIFIC ENERGY
3[illegible]CRITICAL DEPTH ASSUMED

340.000	6.59	2028.51	2028.51	.00	2030.81	2.30	3.57	.01	2032.89
3900.0	.0	3900.0	.0	.0	320.4	.0	63.8	12.6	2032.00
.16	.00	12.17	.00	.000	.030	.000	.000	2021.92	1080.35
.008372	416.	415.	411.	0	19	0	.00	70.92	1151.27

*SECNO 350.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 1014.0 1077.2 TYPE= 1 TARGET= 63.200
ELENCL= 2036.00 ELENCR= 2036.00

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2034.00 ELREA= 2036.00

350.000	4.89	2030.79	2030.79	.00	2033.26	2.47	1.61	.05	2034.00
3900.0	.0	3900.0	.0	.0	309.3	.0	66.7	13.2	2036.00
.17	.00	12.61	.00	.000	.015	.000	.000	2025.90	1014.00
.002363	391.	400.	408.	0	15	0	.00	63.20	1077.20

CNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

SPECIAL BRIDGE

5227 DOWNSTREAM ELEV IS 2030.01 , NOT 2030.79 HYDRAULIC JUMP OCCURS DOWNSTREAM (IF LOW FLOW CONTROLS)

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	.90	1.56	2.60	70.00	63.20	3.20	480.00	.00	2025.90	2025.90

*SECNO 360.000

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.46

CLASS B LOW FLOW

3420 BRIDGE W.S.= 2030.98 BRIDGE VELOCITY= 12.79 CALCULATED CHANNEL AREA= 305.

S	EGLWC	H3	QWEIR	QLOW	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
.00	2033.65	.00	0.	3900.	480.	480.	2033.90	2036.06	0.

3470 ENCROACHMENT STATIONS= 1023.9 1087.1 TYPE= 1 TARGET= 63.200
ELENCL= 2037.00 ELENCR= 2037.00

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2036.00 ELREA= 2037.00

360.000	6.23	2032.13	.00	.00	2033.65	1.52	.39	.00	2036.00
3900.0	.0	3900.0	.0	.0	393.7	.0	67.3	13.3	2037.00
.18	.00	9.91	.00	.000	.015	.000	.000	2025.90	1023.92
.001109	69.	69.	68.	0	0	0	.00	63.20	1087.12

*SECNO 370.000

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

370.000	5.82	2033.82	2033.82	.00	2036.39	2.57	.10	.31	2037.44
3900.0	.0	3900.0	.0	.0	303.2	.0	67.8	13.4	2035.81
.18	.00	12.86	.00	.000	.015	.000	.000	2028.00	1048.85
.002156	67.	67.	67.	0	11	0	.00	59.68	1108.53

[redacted]CNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	OLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 380.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

380.000	5.71	2035.71	2035.71	.00	2038.15	2.44	.00	.01	2037.63
3900.0	.0	3900.0	.0	.0	311.4	.0	67.8	13.4	2036.85
.18	.00	12.52	.00	.000	.015	.000	.000	2030.00	1044.82
.002114	1.	1.	1.	0	8	0	.00	64.68	1109.50

*SECNO 390.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

390.000	7.17	2039.34	2039.34	.00	2041.78	2.44	1.54	.00	2044.00
3900.0	.0	3900.0	.0	.0	311.3	.0	70.7	14.0	2042.99
.19	.00	12.53	.00	.000	.030	.000	.000	2032.17	1055.45
.008386	385.	410.	428.	0	11	0	.00	65.09	1120.54

*SECNO 400.000

3[redacted]HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 2.91

400.000	8.08	2041.44	2040.16	.00	2042.77	1.33	.88	.11	2044.76
3900.0	.0	3900.0	.0	.0	421.7	.0	74.1	14.6	2044.00
.20	.00	9.25	.00	.000	.015	.000	.000	2033.36	1036.98
.000992	428.	400.	380.	3	11	0	.00	80.20	1117.18

*SECNO 410.000

410.000	8.34	2041.75	2039.71	.00	2042.80	1.05	.00	.03	2044.89
3900.0	.0	3900.0	.0	.0	474.1	.0	74.1	14.6	2043.99
.20	.00	8.23	.00	.000	.015	.000	.000	2033.41	1036.15
.000691	1.	1.	1.	2	15	0	.00	81.34	1117.49

*SECNO 420.000

3301 HV CHANGED MORE THAN HVINS

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.82

420.000	8.79	2042.44	2038.08	.00	2042.88	.44	.02	.06	2045.15
3900.0	.0	3900.0	.0	.0	732.6	.0	74.9	14.8	2045.00
.20	.00	5.32	.00	.000	.015	.000	.000	2033.65	1045.21
.000210	57.	58.	59.	2	11	0	.00	90.15	1135.36

*SECNO 430.000

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 1060.1 1090.7 TYPE= 1 TARGET= 30.580
ELENCL= 2048.00 ELENCR= 2048.00

3[illegible] OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2046.60 ELREA= 2048.00

430.000	7.96	2042.06	2042.06	.00	2046.07	4.01	.11	1.07	2046.60
3900.0	.0	3900.0	.0	.0	242.6	.0	77.3	15.0	2048.00
.20	.00	16.08	.00	.000	.015	.000	.000	2034.10	1060.08
.002906	208.	208.	212.	0	11	0	.00	30.58	1090.66

SPECIAL BRIDGE

5227 DOWNSTREAM ELEV IS 2041.29 , NOT 2042.06 HYDRAULIC JUMP OCCURS DOWNSTREAM (IF LOW FLOW CONTROLS)

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	1.25	1.56	2.60	31.50	30.58	.58	300.00	.00	2048.53	2034.15

*SECNO 440.000
6790 POSSIBLE INVALID SOLUTION 20 TRIALS OF EG NOT ENOUGH
FINAL QWEIR + QPR = 8287. DOES NOT EQUAL ACTUAL Q = 3900.

3301 HV CHANGED MORE THAN HVINS

CNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

PRESSURE AND WEIR FLOW, Weir Submergence Based on TRAPEZOIDAL Shape

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
2046.15	2060.72	.01	0.	8287.	300.	300.	2058.53	2060.53	32.

3470 ENCROACHMENT STATIONS= 1046.1 1076.7 TYPE= 1 TARGET= 30.580
ELENCL= 2060.00 ELENCR= 2060.00

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2058.81 ELREA= 2060.00

440.000	8.59	2057.12	.00	.00	2060.54	3.42	14.47	.00	2058.81
3900.0	.0	3900.0	.0	.0	262.6	.0	85.7	16.1	2060.00
.23	.00	14.85	.00	.000	.015	.000	.000	2048.53	1046.07
.002315	1470.	1464.	1457.	5	0	20	.00	30.58	1076.65

*SECNO 450.000

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

450.000	9.49	2061.71	2061.71	.00	2065.76	4.05	.99	.19	2062.00
3900.0	.0	3900.0	.0	.0	241.6	.0	88.0	16.4	2062.40
.24	.00	16.15	.00	.000	.015	.000	.000	2052.22	1069.41
.002654	389.	398.	405.	0	8	0	.00	30.62	1100.02

*SECNO 460.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

460.000	9.36	2066.76	2066.76	.00	2070.93	4.17	1.09	.04	2068.00
3900.0	.0	3900.0	.0	.0	237.9	.0	90.3	16.6	2068.00
.25	.00	16.39	.00	.000	.015	.000	.000	2057.40	1071.68
.002759	394.	402.	408.	0	8	0	.00	30.60	1102.28

*SECNO 470.000
7185 MINIMUM SPECIFIC ENERGY

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

3720 CRITICAL DEPTH ASSUMED

470.000	8.95	2071.62	2071.62	.00	2075.50	3.88	1.06	.03	2073.13
3900.0	.0	3900.0	.0	.0	246.9	.0	92.5	16.9	2074.36
.25	.00	15.80	.00	.000	.015	.000	.000	2062.67	1077.49
.002545	403.	399.	394.	0	8	0	.00	31.85	1109.34

*SECNO 480.000
3280 CROSS SECTION 480.00 EXTENDED 2.00 FEET

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 5.24

3470 ENCROACHMENT STATIONS= 1026.7 1163.8 TYPE= 1 TARGET= 137.130
ELENCL= 2076.00 ELENCR= 2076.00

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2074.97 ELREA= 2076.00

480.000	11.53	2075.71	2069.57	.00	2075.91	.21	.05	.37	2074.97
3900.0	.0	3900.0	.0	.0	1066.1	.0	95.4	17.3	2076.00
.27	.00	3.66	.00	.000	.015	.000	.000	2064.18	1026.66
.000093	214.	193.	186.	3	14	0	.00	137.13	1163.79

1490 NH CARD USED
*SECNO 490.000

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 1380.0 1473.5 TYPE= 1 TARGET= 93.500
ELENCL= 2077.00 ELENCR= 2077.00

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2075.25 ELREA= 2077.00

490.000	3.00	2075.56	2075.56	.00	2076.76	1.20	.02	.30	2075.25
1950.0	.0	1950.0	.0	.0	221.4	.0	97.4	17.7	2077.00
.27	.00	8.81	.00	.000	.016	.000	.000	2072.56	1380.00
.002891	138.	134.	135.	0	14	0	.00	93.50	1473.50

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

1490 NH CARD USED
*SECNO 500.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 1383.4 1469.1 TYPE= 1 TARGET= 85.750
ELENCL= 2079.00 ELENCR= 2079.00

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2076.00 ELREA= 2079.00

500.000	2.94	2077.58	2077.58	.00	2078.85	1.27	.57	.02	2076.00
1950.0	.0	1950.0	.0	.0	215.8	.0	98.4	18.1	2079.00
.28	.00	9.03	.00	.000	.016	.000	.000	2074.64	1383.37
.002814	202.	202.	206.	0	8	0	.00	85.75	1469.12

1490 NH CARD USED
*SECNO 510.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 1383.7 1470.6 TYPE= 1 TARGET= 86.930
ELENCL= 2081.00 ELENCR= 2081.00

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2078.40 ELREA= 2081.00

510.000	2.90	2079.48	2079.48	.00	2080.75	1.27	.56	.00	2078.40
1950.0	.0	1950.0	.0	.0	216.0	.0	99.4	18.5	2081.00
.28	.00	9.03	.00	.000	.016	.000	.000	2076.58	1383.68
.002823	200.	199.	199.	0	5	0	.00	86.86	1470.54

1490 NH CARD USED
*SECNO 520.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 1366.8 1457.4 TYPE= 1 TARGET= 90.620
ELENCL= 2082.00 ELENCR= 2082.00

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2080.50 ELREA= 2082.00

520.000	3.00	2081.00	2081.00	.00	2082.23	1.23	.57	.00	2080.50
1950.0	.0	1950.0	.0	.0	219.3	.0	100.3	18.9	2082.00
.29	.00	8.89	.00	.000	.016	.000	.000	2078.00	1366.83
.002856	198.	199.	199.	0	8	0	.00	90.62	1457.45

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

1490 NH CARD USED
*SECNO 530.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 1346.7 1431.3 TYPE= 1 TARGET= 84.560
ELENCL= 2084.00 ELENCR= 2084.00

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2082.60 ELREA= 2084.00

530.000	3.15	2083.13	2083.13	.00	2084.42	1.29	.65	.02	2082.60
1950.0	.0	1950.0	.0	.0	214.0	.0	101.5	19.3	2084.00
.30	.00	9.11	.00	.000	.016	.000	.000	2079.98	1346.74
.002865	210.	227.	241.	0	8	0	.00	84.56	1431.30

1490 NH CARD USED
*SECNO 540.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 1155.7 1235.2 TYPE= 1 TARGET= 79.480
ELENCL= 2085.00 ELENCR= 2085.00

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2083.00 ELREA= 2085.00

540.000	3.28	2084.68	2084.68	.00	2086.05	1.37	.55	.03	2083.00
1950.0	.0	1950.0	.0	.0	207.3	.0	102.4	19.7	2085.00
.30	.00	9.40	.00	.000	.016	.000	.000	2081.40	1155.70
.002931	173.	189.	201.	0	8	0	.00	79.48	1235.18

*SECNO 550.000

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 1113.8 1286.4 TYPE= 1 TARGET= 172.570
ELENCL= 2087.00 ELENCR= 2087.00

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	QCH	QFOB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VFOB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2085.22 ELREA= 2087.00

550.000	2.10	2086.10	2086.10	.00	2086.92	.82	.75	.05	2085.22
1950.0	.0	1950.0	.0	.0	267.8	.0	103.7	20.4	2087.00
.31	.00	7.28	.00	.000	.016	.000	.000	2084.00	1113.83
.003237	238.	244.	248.	0	14	0	.00	165.35	1279.18

*SECNO 560.000

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 4.04

560.000	9.98	2085.98	2084.29	.00	2087.09	1.11	.08	.09	2084.00
3900.0	5.9	3879.9	14.2	2.5	457.5	6.7	104.3	20.6	2085.15
.31	2.34	8.48	2.11	.016	.015	.016	.000	2076.00	1009.62
.000793	64.	68.	65.	2	23	0	.00	89.25	1098.87

THIS RUN EXECUTED 060CT97 11:07:19

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HEC-2 WATER SURFACE PROFILES

Version 4.6.2; May 1991
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NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

FLOODPLAIN DETERMINATION

SUMMARY PRINTOUT TABLE 100

	SECNO	EGLWC	ELLC	EGPRS	ELTRD	QPR	QWEIR	CLASS	H3	DEPTH	CWSEL	VCH	EG
*	50.000	1947.40	1939.60	1953.48	1943.13	3489.83	2011.25	30.00	.00	8.98	1943.58	12.16	1945.88
*	230.000	1979.79	1981.76	.00	1987.60	4600.00	.00	2.00	.00	7.98	1977.74	11.47	1979.79
*	280.000	1996.56	1994.30	1996.35	1997.30	4600.00	.00	2.00	.00	9.50	1993.80	13.33	1996.56
*	320.000	2020.63	2015.40	2024.22	2020.20	3429.31	467.90	30.00	.00	12.30	2020.70	10.23	2022.33
*	360.000	2033.65	2033.90	.00	2036.06	3900.00	.00	2.00	.00	6.23	2032.13	9.91	2033.65
*	440.000	2060.72	2058.53	2046.15	2060.53	8286.56	.08	30.00	.01	8.59	2057.12	14.85	2060.54

FLOODPLAIN DETERMINATION

SUMMARY PRINTOUT TABLE 150

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH	AREA	.01K
*	10.000	.00	.00	.00	1921.70	5500.00	1930.20	1930.20	1931.98	53.07	11.03	572.50	754.96
*	20.000	297.76	.00	.00	1924.40	5500.00	1933.32	1933.32	1935.22	51.74	11.37	562.50	764.65
*	30.000	417.80	.00	.00	1928.83	5500.00	1935.76	1935.76	1938.47	20.49	13.20	416.67	1215.16
*	40.000	10.00	.00	.00	1933.60	5500.00	1940.75	1940.75	1944.37	23.65	15.26	360.42	1131.07
*	50.000	115.08	1943.13	1939.60	1934.60	5500.00	1943.58	.00	1945.88	11.74	12.16	452.47	1605.42
	60.000	387.41	.00	.00	1936.76	4600.00	1944.80	1943.89	1946.41	12.20	10.16	452.64	1316.93
*	70.000	417.23	.00	.00	1941.57	4600.00	1947.87	1947.87	1950.25	20.92	12.39	371.17	1005.73
*	80.000	1.00	.00	.00	1942.60	4600.00	1947.88	1947.88	1950.28	20.96	12.43	370.14	1004.80
*	90.000	51.93	.00	.00	1943.10	4600.00	1949.75	1949.75	1952.71	21.02	13.82	332.80	1003.42
*	100.000	342.73	.00	.00	1944.70	4600.00	1951.82	1951.82	1955.06	21.55	14.43	318.79	991.02
*	110.000	1.00	.00	.00	1947.20	4600.00	1954.06	1954.06	1957.15	20.92	14.11	326.12	1005.73
*	120.000	24.78	.00	.00	1947.50	4600.00	1954.37	1954.37	1957.50	21.18	14.19	324.11	999.59
*	130.000	125.31	.00	.00	1948.00	4600.00	1954.99	1954.99	1958.20	21.41	14.38	319.95	994.20
*	140.000	55.76	.00	.00	1948.50	4600.00	1955.51	1955.51	1958.66	21.25	14.26	322.52	997.77
*	150.000	1.00	.00	.00	1950.50	4600.00	1957.33	1957.33	1960.36	20.74	13.98	329.03	1010.05
*	160.000	114.85	.00	.00	1951.76	4600.00	1958.71	1958.71	1961.75	20.67	13.99	328.91	1011.69
*	170.000	97.13	.00	.00	1952.30	4600.00	1960.78	1958.47	1962.03	6.73	8.97	512.88	1772.79
*	180.000	363.91	.00	.00	1955.07	4600.00	1962.50	1962.50	1965.24	56.34	13.27	346.59	612.87
*	190.000	356.25	.00	.00	1957.64	4600.00	1966.23	1966.23	1969.18	56.31	13.79	333.58	612.98
*	200.000	357.38	.00	.00	1962.44	4600.00	1969.92	1969.92	1972.64	57.66	13.24	347.43	605.79
*	210.000	220.26	.00	.00	1965.48	4600.00	1971.87	1971.87	1974.69	20.55	13.49	341.08	1014.74
*	220.000	95.38	.00	.00	1968.66	4600.00	1975.02	1975.02	1978.24	24.18	14.39	319.69	935.55
*	230.000	106.05	1987.60	1981.76	1969.76	4600.00	1977.74	.00	1979.79	12.13	11.47	401.20	1321.03
*	240.000	98.95	.00	.00	1975.59	4600.00	1982.29	1982.29	1984.89	56.36	12.94	355.39	612.76

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH	AREA	.01K
*	250.000	478.12	.00	.00	1978.65	4600.00	1987.12	1987.12	1989.44	60.35	12.22	376.45	592.13
*	260.000	437.75	.00	.00	1982.12	4600.00	1991.75	1991.75	1994.32	58.82	12.86	357.67	599.80
	270.000	213.69	.00	.00	1983.40	4600.00	1992.40	1991.16	1995.31	30.68	13.70	335.86	830.51
*	280.000	110.04	1997.30	1994.30	1984.30	4600.00	1993.80	.00	1996.56	28.05	13.33	345.01	868.57
*	290.000	451.82	.00	.00	1993.63	3900.00	2001.61	2001.61	2003.57	63.64	11.24	346.92	488.88
*	300.000	430.29	.00	.00	2001.94	3900.00	2012.51	2012.51	2014.71	52.08	11.90	327.62	540.41
*	310.000	353.38	.00	.00	2008.00	3900.00	2015.87	2015.87	2019.84	28.78	15.99	243.89	726.97
*	320.000	86.84	2020.20	2015.40	2008.40	3900.00	2020.70	.00	2022.33	8.04	10.23	381.40	1375.70
*	330.000	409.02	.00	.00	2014.22	3900.00	2023.77	2023.77	2026.20	88.33	12.51	311.66	414.96
*	340.000	414.66	.00	.00	2021.92	3900.00	2028.51	2028.51	2030.81	83.72	12.17	320.43	426.23
*	350.000	400.22	.00	.00	2025.90	3900.00	2030.79	2030.79	2033.26	23.63	12.61	309.28	802.35
*	360.000	69.23	2036.06	2033.90	2025.90	3900.00	2032.13	.00	2033.65	11.09	9.91	393.70	1171.27
*	370.000	66.95	.00	.00	2028.00	3900.00	2033.82	2033.82	2036.39	21.56	12.86	303.25	839.87
*	380.000	1.00	.00	.00	2030.00	3900.00	2035.71	2035.71	2038.15	21.14	12.52	311.43	848.26
*	390.000	409.92	.00	.00	2032.17	3900.00	2039.34	2039.34	2041.78	83.86	12.53	311.30	425.87
*	400.000	400.26	.00	.00	2033.36	3900.00	2041.44	2040.16	2042.77	9.92	9.25	421.69	1238.16
	410.000	1.00	.00	.00	2033.41	3900.00	2041.75	2039.71	2042.80	6.91	8.23	474.09	1483.61
*	420.000	57.86	.00	.00	2033.65	3900.00	2042.44	2038.08	2042.88	2.10	5.32	732.59	2694.15
*	430.000	208.45	.00	.00	2034.10	3900.00	2042.06	2042.06	2046.07	29.06	16.08	242.59	723.52
*	440.000	1463.68	2060.53	2058.53	2048.53	3900.00	2057.12	.00	2060.54	23.15	14.85	262.62	810.62
*	450.000	397.95	.00	.00	2052.22	3900.00	2061.71	2061.71	2065.76	26.54	16.15	241.55	757.01
*	460.000	401.61	.00	.00	2057.40	3900.00	2066.76	2066.76	2070.93	27.59	16.39	237.91	742.42
*	470.000	398.77	.00	.00	2062.67	3900.00	2071.62	2071.62	2075.50	25.45	15.80	246.87	773.14
*	480.000	192.99	.00	.00	2064.18	3900.00	2075.71	2069.57	2075.91	.93	3.66	1066.10	4048.35
*	490.000	133.56	.00	.00	2072.56	1950.00	2075.56	2075.56	2076.76	28.91	8.81	221.40	362.69
*	500.000	201.53	.00	.00	2074.64	1950.00	2077.58	2077.58	2078.85	28.14	9.03	215.83	367.62

SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH	AREA	.01K
510.000	199.21	.00	.00	2076.58	1950.00	2079.48	2079.48	2080.75	28.23	9.03	216.04	366.99
520.000	199.24	.00	.00	2078.00	1950.00	2081.00	2081.00	2082.23	28.56	8.89	219.25	364.87
530.000	227.48	.00	.00	2079.98	1950.00	2083.13	2083.13	2084.42	28.65	9.11	214.05	364.33
540.000	189.30	.00	.00	2081.40	1950.00	2084.68	2084.68	2086.05	29.31	9.40	207.34	360.18
550.000	244.36	.00	.00	2084.00	1950.00	2086.10	2086.10	2086.92	32.37	7.28	267.76	342.74
560.000	67.51	.00	.00	2076.00	3900.00	2085.98	2084.29	2087.09	7.93	8.48	466.68	1384.97

F[redacted]PLAIN DETERMINATION

SUMMARY PRINTOUT TABLE 150

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
*	10.000	5500.00	1930.20	.00	.00	.20	184.60	.00
*	20.000	5500.00	1933.32	.00	3.12	.00	208.12	297.76
*	30.000	5500.00	1935.76	.00	2.44	.00	78.28	417.80
*	40.000	5500.00	1940.75	.00	4.99	.00	50.38	10.00
*	50.000	5500.00	1943.58	.00	2.83	.00	50.38	115.08
	60.000	4600.00	1944.80	.00	1.22	.00	86.58	387.41
*	70.000	4600.00	1947.87	.00	3.06	.00	79.21	417.23
*	80.000	4600.00	1947.88	.00	.02	.00	77.98	1.00
*	90.000	4600.00	1949.75	.00	1.86	.00	56.81	51.93
*	100.000	4600.00	1951.82	.00	2.08	.00	49.85	342.73
*	110.000	4600.00	1954.06	.00	2.23	.00	52.89	1.00
*	120.000	4600.00	1954.37	.00	.31	.00	52.21	24.78
*	130.000	4600.00	1954.99	.00	.62	.00	50.41	125.31
*	140.000	4600.00	1955.51	.00	.52	.00	51.46	55.76
*	150.000	4600.00	1957.33	.00	1.82	.00	54.46	1.00
*	160.000	4600.00	1958.71	.00	1.38	.00	54.19	114.85
*	170.000	4600.00	1960.78	.00	2.07	.00	73.03	97.13
*	180.000	4600.00	1962.50	.00	1.72	.00	63.94	363.91
*	190.000	4600.00	1966.23	.00	3.72	.00	56.54	356.25
*	200.000	4600.00	1969.92	.00	3.70	.00	65.03	357.38
*	210.000	4600.00	1971.87	.00	1.95	.00	60.69	220.26
*	220.000	4600.00	1975.02	.00	3.15	.00	50.25	95.38
*	230.000	4600.00	1977.74	.00	2.72	.00	50.25	106.05
*	240.000	4600.00	1982.29	.00	4.54	.00	69.33	98.95

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
*	250.000	4600.00	1987.12	.00	4.83	.00	83.32	478.12
*	260.000	4600.00	1991.75	.00	4.63	.00	69.88	437.75
	270.000	4600.00	1992.40	.00	.64	.00	37.33	213.69
*	280.000	4600.00	1993.80	.00	1.40	.00	36.33	110.04
*	290.000	3900.00	2001.61	.00	7.81	.00	92.14	451.82
*	300.000	3900.00	2012.51	.00	10.91	.00	66.04	430.29
*	310.000	3900.00	2015.87	.00	3.36	.00	31.00	353.38
*	320.000	3900.00	2020.70	.00	4.84	.00	31.00	86.84
*	330.000	3900.00	2023.77	.00	3.07	.00	66.29	409.02
*	340.000	3900.00	2028.51	.00	4.74	.00	70.92	414.66
*	350.000	3900.00	2030.79	.00	2.29	.00	63.20	400.22
*	360.000	3900.00	2032.13	.00	1.34	.00	63.20	69.23
*	370.000	3900.00	2033.82	.00	1.69	.00	59.68	66.95
*	380.000	3900.00	2035.71	.00	1.89	.00	64.68	1.00
*	390.000	3900.00	2039.34	.00	3.63	.00	65.09	409.92
*	400.000	3900.00	2041.44	.00	2.10	.00	80.20	400.26
	410.000	3900.00	2041.75	.00	.31	.00	81.34	1.00
*	420.000	3900.00	2042.44	.00	.69	.00	90.15	57.86
*	430.000	3900.00	2042.06	.00	-.38	.00	30.58	208.45
*	440.000	3900.00	2057.12	.00	15.06	.00	30.58	1463.68
*	450.000	3900.00	2061.71	.00	4.59	.00	30.62	397.95
*	460.000	3900.00	2066.76	.00	5.05	.00	30.60	401.61
*	470.000	3900.00	2071.62	.00	4.86	.00	31.85	398.77
*	480.000	3900.00	2075.71	.00	4.08	.00	137.13	192.99
*	490.000	1950.00	2075.56	.00	-.15	.00	93.50	133.56
*	500.000	1950.00	2077.58	.00	2.02	.00	85.75	201.53

SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
510.000	1950.00	2079.48	.00	1.90	.00	86.86	199.21
520.000	1950.00	2081.00	.00	1.52	.00	90.62	199.24
530.000	1950.00	2083.13	.00	2.13	.00	84.56	227.48
540.000	1950.00	2084.68	.00	1.55	.00	79.48	189.30
550.000	1950.00	2086.10	.00	1.42	.00	165.35	244.36
560.000	3900.00	2085.98	.00	-.12	.00	89.25	67.51

SUMMARY OF ERRORS AND SPECIAL NOTES

CAUTION SECNO= 10.000 PROFILE= 1 CRITICAL DEPTH ASSUMED

CAUTION SECNO= 20.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 20.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 30.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 30.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 40.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 40.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 50.000 PROFILE= 1 HYDRAULIC JUMP D.S.
WARNING SECNO= 50.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO= 70.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 70.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 80.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 80.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 90.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 90.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 100.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 100.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 110.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 110.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 120.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 120.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 130.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 130.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 140.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 140.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 150.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 150.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 160.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 160.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

WARNING SECNO= 170.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO= 180.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 180.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 190.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 190.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

[redacted] SECNO= 200.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 200.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 210.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 210.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 220.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 220.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 230.000 PROFILE= 1 HYDRAULIC JUMP D.S.
WARNING SECNO= 230.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO= 240.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 240.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 250.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 250.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 260.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 260.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 280.000 PROFILE= 1 HYDRAULIC JUMP D.S.

CAUTION SECNO= 290.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
[redacted] SECNO= 290.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 300.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 300.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 310.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 310.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 320.000 PROFILE= 1 HYDRAULIC JUMP D.S.
WARNING SECNO= 320.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO= 330.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 330.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 340.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 340.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 350.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 350.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 360.000 PROFILE= 1 HYDRAULIC JUMP D.S.
WARNING SECNO= 360.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO= 370.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 370.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

[redacted] SECNO= 380.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
[redacted] SECNO= 380.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

[redacted]ON SECNO= 390.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 390.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

WARNING SECNO= 400.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 420.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO= 430.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 430.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 440.000 PROFILE= 1 HYDRAULIC JUMP D.S.
CAUTION SECNO= 440.000 PROFILE= 1 20 TRIALS OF EG NOT ENOUGH

CAUTION SECNO= 450.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 450.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 460.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 460.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 470.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 470.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

WARNING SECNO= 480.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

[redacted]ON SECNO= 490.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
[redacted]ON SECNO= 490.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 500.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 500.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 510.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 510.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 520.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 520.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 530.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 530.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 540.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 540.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 550.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 550.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

WARNING SECNO= 560.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

2.2.4 EASTERN AVE. TO LAS VEGAS WASH REACH

APPROXIMATE METHOD
HEC-2 MODEL ANALYSIS
EASTERN AVE. TO LAS VEGAS WASH REACH

This reach frcm Eastern Avenue to Las Vegas Wash was flown as part of this project. Therefore, topography was generated. The starting water surface elevation was computed using normal depth. The subcritial run was used to determine the floodplain delineation for this reach.

A supplemental HEC-2 model analysis was performed to estimate the limits of flooding between Desert Inn Road and Mojave Road using a supercritical run. This reach is completely concrete lined as demonstrated by the photographs. The starting water surface elevation was computed using critical depth.

BASE3-4.D1

```
*****************************************
*  HEC-2 WATER SURFACE PROFILES         *
*                                       *
*  Version  4.6.2;  May 1991            *
*                                       *
*  RUN DATE    06OCT97    TIME  11:11:00 *
*****************************************
```


```
*****************************************
*  U.S. ARMY CORPS OF ENGINEERS         *
*  HYDROLOGIC ENGINEERING CENTER        *
*  609 SECOND STREET, SUITE D           *
*  DAVIS, CALIFORNIA 95616-4687         *
*          (916) 756-1104               *
*****************************************
```


```
X     X  XXXXXXX   XXXXX             XXXXX
X     X  X        X     X           X     X
X     X  X        X                       X
XXXXXXX  XXXX     X         XXXXX   XXXXX
X     X  X        X                 X
X     X  X        X     X           X
X     X  XXXXXXX  XXXXX             XXXXXXX
```

THIS RUN EXECUTED 060CT97 11:11:01

```
**************************************
 HEC-2 WATER SURFACE PROFILES

 Version  4.6.2;  May 1991
**************************************


T1      550.032
T2      FLAMINGO WASH FIS RESTUDY
T3      FLOODPLAIN DELINEATION
T4      FILES: BASE3-4.DWG, BASE3-4.D1
T4      STARTING WSE = NORMAL DEPTH
T4      SUBCRITICAL RUN

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

                2                             0.004                         6400      1705

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

     -1                  -1                                      -2        -6

VARIABLE CODES FOR SUMMARY PRINTOUT

    100                 150

NC     0.03      0.03      0.03       0.1       0.3
X1       10        18      1000   1126.64
GR     1710      1000   1710.07   1002.71      1710   1003.06      1708   1012.39      1706   1021.7
GR     1704   1031.01      1702   1040.32   1701.54   1042.48   1700.33    1049.9   1700.55   1089.4
GR     1702   1095.84      1704   1104.89      1706   1114.24      1708   1123.66    1708.6   1126.64
GR     1710   1152.79   1710.41   1160.64      1712   1288.04

NC     0.03      0.03      0.03
X1       20        17   1182.02   1322.04    483.22    497.54    488.53
GR     1712      1000   1711.97   1182.02      1710   1190.86      1708   1199.75      1706   1208.56
GR     1704   1217.31   1703.12   1221.12   1703.59   1267.53      1704   1269.51      1706   1279.06
GR     1708    1288.6      1710   1298.12   1711.95   1307.42      1712    1307.8   1713.45   1322.04
GR   1712.7   1343.21    1713.7   1500.75

NC     0.03      0.03      0.03
X1       30        16   1053.23   1154.72    494.86    503.84    498.03
GR   1714.3      1000      1714   1012.26   1712.41   1053.23      1712   1055.19      1710   1064.74
GR     1708   1074.25      1706   1083.68   1705.86   1084.33   1705.85   1124.71      1706   1125.31
GR     1708   1133.14      1710   1140.87      1712   1148.55   1713.61   1154.72      1714   1175.89
GR   1715.8   1316.21

NC     0.03      0.03      0.03
       40        20    1146.2   1238.76    500.14    481.13    491.57
GR     1718      1000   1717.12   1101.53      1716    1146.2   1715.85   1152.03      1714   1159.77
GR     1712   1168.18      1710   1176.59      1708   1185.01   1707.75   1186.07   1707.38   1196.73
GR   1707.2   1216.01      1708   1218.57      1710   1225.27      1712   1231.97      1714   1238.76
```

GR	1714.1	1239.39	1716	1283.03	1716.17	1284.32	1716.77	1316.26	1718	1327.96

N[redacted]	0.03	0.03	0.03							
X1	50	21	1066.67	1235.55	334.29	277.63	305.6			
GR	1723	1000	1722	1020.92	1721.42	1037.11	1720.56	1066.67	1720	1068.75
GR	1718	1076.4	1716	1084.26	1714	1092.32	1712	1100.45	1710	1108.62
GR	1708.9	1112.98	1709	1152.91	1710	1158.04	1712	1168.25	1714	1178.41
GR	1714.6	1181.82	1716	1195.46	1717.14	1207.5	1718	1214.02	1720	1235.55
GR	1720	1249.78								
NC	0.03	0.03	0.03							
X1	60	31	1120.14	1223.41	499.62	502.1	499.27			
GR	1720	1000	1718.36	1013.98	1718	1035.26	1717.58	1105.92	1718	1119.77
GR	1718	1120.01	1718.01	1120.14	1716	1128.57	1714	1136.9	1712	1145.29
GR	1710.1	1153.14	1710	1183.08	1709.94	1194.72	1710	1194.99	1712	1203.55
GR	1714	1212.13	1716	1220.71	1716.63	1223.41	1717.35	1277.47	1718.05	1286.74
GR	1718	1287.48	1718	1296.95	1717.48	1310.09	1718	1314.87	1718.69	1321.04
GR	1718	1336.07	1717.62	1343.02	1718	1362.12	1718.73	1381.28	1718.4	1394.59
GR	1720	1400.91								
NC	0.03	0.03	0.03							
X1	70	17	1084.1	1197.56	493.27	498.08	497.95			
GR	1723.3	1000	1723.69	1084.1	1722	1090.63	1720	1098.35	1718	1106.05
GR	1716	1113.75	1714	1121.45	1712	1129.17	1712	1129.24	1712	1129.36
GR	1712.6	1169.17	1714	1174.59	1716	1182.8	1718	1191.03	1719.59	1197.56
GR	1720	1230.27	1720.07	1233.61						
N[redacted]	0.03	0.03	0.03							
X[redacted]	80	18	1147.29	1269.91	455.76	481.96	470.68			
GR	1726	1000	1725.4	1007.66	1724.07	1115.85	1724	1116.84	1723.19	1147.29
GR	1722	1152.02	1720	1159.92	1718	1167.78	1716	1175.62	1714.38	1181.94
GR	1714.9	1227.68	1716	1232.07	1718	1240.31	1720	1248.54	1722	1256.76
GR	1724	1264.99	1725.21	1269.91	1724.85	1287.78				
NC	0.03	0.03	0.03							
X1	90	20	1056.45	1168.18	495.14	465.14	482.19			
GR	1726	1000	1725.75	1009.38	1724.96	1031.29	1724.64	1056.45	1724	1058.67
GR	1722	1065.64	1720	1072.62	1718	1079.6	1716	1086.6	1715.19	1089.42
GR	1716	1103.03	1717.15	1124.51	1718	1128.2	1720	1136.83	1722	1145.32
GR	1724	1153.73	1726	1162.18	1727.42	1168.18	1728	1186.62	1728.02	1187.5
NC	0.03	0.03	0.03							
X1	100	25	1022.27	1132.68	289.86	299.75	295.13			
GR	1732	1000	1732	1001	1732.08	1001.22	1730	1011.88	1728	1022.27
GR	1727.6	1024.44	1726	1027.45	1724	1031.2	1722	1034.85	1720	1038.4
GR	1718.7	1040.93	1719.04	1047.62	1718.99	1102.02	1719.04	1118.34	1720	1119.65
GR	1722	1123	1724	1126.5	1726	1130.15	1727.26	1132.68	1727.45	1139.16
GR	1728	1142.93	1728.68	1147.57	1730	1157.98	1730.09	1158.86	1730	1162.48
NC	0.03	0.03	0.015							
X1	110	21	1022.67	1137.41	25.99	26.18	25.69			
GR	1732.5	1000	1732	1002.64	1730	1012.69	1728	1022.67	1727.56	1024.87
GP	1726	1027.45	1724	1030.85	1722	1034.42	1720.5	1036.37	1720.5	1099.9
G[redacted]	1720.5	1122.88	1720.5	1123.19	1720.5	1123.29	1722	1126.96	1724	1130.74
GR	1726	1134.53	1727.52	1137.41	1728	1142.14	1729.05	1148.68	1730	1154.29

GP	1731.7	1164.66								
[redacted]										
	0.03	0.03	0.015							
X1	120	7	1029.49	1136.49	88.77	93.13	90.11			
X3	10			1029.49	1730	1136.49	1730			
GR	1730.3	1000	1730	1006.09	1728	1029.49	1721.9	1029.49	1721.9	1136.49
GR	1728	1136.49	1728	1146.34						
NC	0.02	0.02	0.015							
SB	0.9	1.56	2.6	145	107	7	500	0	1722.53	1721.9
X1	130	8	1035.81	1142.81	120.77	117.86	119.69			
X2			1	1727.53	1731.43			1.33		
X3	10			1035.81	1731	1142.81	1731			
GR	1728.6	1000	1728.71	1018.83	1728	1035.81	1722.53	1035.81	1722.53	1142.81
GR	1728	1142.81	1728.87	1157.29	1728.69	1174.35				
NC	0.02	0.02	0.015							
X1	140	13	1149.72	1265.63	64.74	64.09	64.14			
X3	10			1149.72	1730	1265.63	1730			
GR	1729.5	1000	1728.41	1149.72	1728	1150.76	1726	1155.81	1724	1161.07
GR	1722.8	1165.81	1722.6	1250.59	1724	1254.37	1726	1259.66	1728	1264.74
GR	1728.3	1265.63	1728.8	1316.23	1728.18	1343.83				
NC	0.02	0.02	0.02							
QT	1	6300								
X1	150	18	1018.39	1152.46	491.39	488.88	489.94			
C[redacted]	1732	1000	1731.69	1018.39	1730	1024.12	1728	1030.88	1726.48	1035.9
C[redacted]	1726.1	1066.83	1726	1067.43	1724.2	1074.87	1724	1083.96	1723.53	1107.26
GR	1724	1108.86	1725.23	1113.02	1726	1135.88	1725.99	1136.31	1728	1142.71
GR	1730	1149.03	1731.09	1152.46	1731.43	1169.72				
NC	0.02	0.02	0.02							
X1	160	22	1042.38	1195.86	501.43	502.7	501.51			
GR	1734	1000	1734.52	1002.52	1734	1015.73	1733.26	1042.38	1732	1045.87
GR	1730	1051.46	1728	1057.16	1727.61	1058.29	1727.59	1089.49	1726.47	1097.9
GR	1726	1115.47	1725.61	1127.39	1726	1131.14	1727.46	1145.07	1728	1162.54
GR	1728.2	1169.98	1730	1173.77	1732	1178.13	1733.38	1181.15	1734	1195.86
GR	1734.2	1200.57	1735.81	1203.67						
NC	0.02	0.02	0.02							
X1	170	20	1042.95	1183.42	486.67	487.82	487.26			
GR	1734.6	1000	1735.53	1003.78	1734.5	1042.95	1734	1044.42	1732	1050.31
GR	1730	1056.26	1728.7	1060.18	1728.42	1095.07	1728	1097.52	1727.66	1099.65
GR	1727.3	1123.92	1728	1128.46	1729.82	1140.57	1730	1146.01	1730.66	1167.12
GR	1732	1172.19	1734	1179.55	1735.09	1183.42	1735.4	1201.5	1736	1203.33
NC	0.02	0.02	0.02							
X1	180	19	1037.9	1178.31	490.6	492.37	491.83			
GR	1738.4	1000	1738	1017.86	1736.58	1037.9	1736	1039.45	1734	1044.91
GR	1732	1050.47	1730.22	1055.47	1730.42	1062.62	1730	1097.25	1729.6	1099.77
GR	1730	1119.42	1730.04	1121.41	1731.15	1155.75	1732	1158.51	1734	1165.22
GR	1736	1172.22	1737.72	1178.31	1738	1187.42	1738.27	1197.86		

[redacted]

[redacted]	0.02	0.02	0.02							
X[redacted]	190	22	1000	1121.49	499.18	497.1	497.74			
GR	1743.5	950.33	1742.46	998.69	1742	1000	1740	1005.6	1738	1011
GR	1736	1016.29	1735.23	1018.97	1734.5	1040.24	1734	1042.17	1732.79	1046.61
GR	1732.9	1078.44	1734	1082	1734.71	1084.43	1736	1101.82	1736.3	1105.68
GR	1738	1110.9	1740	1116.85	1741.63	1121.49	1742	1135.5	1742.24	1142.58
GR	1742	1143.57	1741.64	1144.92						
NC	0.02	0.02	0.02							
X1	200	22	1000	1122.87	494.16	496.56	495.37			
GR	1748.8	956.38	1748	992.25	1747.84	995.39	1746	1000	1744	1004.98
GR	1742	1009.94	1740	1014.87	1738	1019.77	1737.9	1020.02	1737.52	1027.73
GR	1736.7	1037.66	1736.7	1061.55	1737.76	1074.9	1738	1083.37	1738.49	1103
GR	1740	1106.13	1742	1110.31	1744	1114.5	1746	1118.68	1748	1122.87
GR	1748.4	1123.7	1748.36	1144.3						
NC	0.02	0.02	0.02							
X1	210	25	1000	1113.22	499.74	500.05	500.38			
GR	1752	951.7	1752	1000	1750	1005.42	1748	1010.97	1746	1016.52
GR	1744	1022.03	1742	1027.65	1741.66	1028.59	1740.5	1037.62	1740	1039.36
GR	1738	1047.1	1737.52	1048.91	1737.8	1061.69	1738	1062.13	1740	1067.4
GR	1741.2	1071.1	1742	1079.44	1742.89	1088.66	1744	1091.26	1746	1095.98
GR	1748	1100.7	1750	1105.41	1752	1110.13	1753.31	1113.22	1753.21	1141.88
NC	0.02	0.02	0.02							
X[redacted]	220	26	1041.51	1160.79	464.69	489.34	476.72			
G[redacted]	1759.7	1000	1759.83	1041.51	1758	1045.1	1756	1049.03	1754	1052.95
GR	1752	1056.86	1750	1060.75	1748	1064.59	1747.25	1066.03	1746.15	1087.16
GR	1746	1087.54	1744.18	1092.6	1744	1106.98	1744	1109.94	1743.96	1110.03
GR	1745.8	1113.56	1746	1116.26	1748	1139.68	1747.99	1139.83	1750	1144.13
GR	1752	1148.41	1754	1152.7	1756	1156.99	1757.77	1160.79	1758	1173.7
GR	1758.3	1199.32								
NC	0.02	0.02	0.02							
X1	230	28	1034.85	1169.03	490.46	498.91	494.76			
GR	1763.6	1000	1763.36	1034.85	1762	1040.25	1761.13	1043.65	1760.31	1056.95
GR	1760	1057.18	1758	1062.98	1756	1068.2	1754	1073.41	1753.53	1074.65
GR	1752.6	1090.81	1752	1093.04	1750.12	1100.45	1750.12	1113.46	1751.49	1119.83
GR	1752	1124.28	1753.26	1136.24	1754	1137.93	1756	1142.51	1758	1147.1
GR	1760	1151.69	1761.94	1156.15	1762	1156.82	1763.75	1168.26	1764	1169.03
GR	1766	1176.57	1766.64	1178.93	1766.86	1205.52				
NC	0.02	0.02	0.02							
X1	240	29	1026.08	1194.47	496.31	488.69	492			
GR	1774.8	1000	1774.34	1026.08	1774	1026.81	1772	1030.67	1770	1034.53
GR	1768	1038.38	1766	1042.19	1764	1045.88	1762	1049.77	1760	1053.67
GR	1758	1057.57	1757.43	1059.06	1757.79	1143.57	1758	1145.62	1758.74	1152.68
GR	1759.2	1157.83	1760	1159.46	1762	1163.99	1764	1168.57	1766	1173.21
GR	1768	1177.84	1770	1181.98	1772	1185.85	1774	1189.72	1776	1193.59
GR	1776.4	1194.47	1776.87	1267.84	1776	1276.18	1775.49	1280.88		

[redacted]	0.02	0.02	0.015							
X[redacted]	250	24	1036.04	1171.85	57.45	58.44	58.6			
GR	1775.4	1000	1775.23	1020.11	1774	1022.51	1772	1025.97	1770	1029.5
GR	1768	1033.08	1766.5	1036.04	1766	1037.59	1764	1043.3	1762	1047.58
GR	1760	1050.92	1758	1053.04	1758.34	1154.39	1760	1154.67	1762	1155.12
GR	1764	1155.69	1766	1162.7	1766.67	1171.85	1768	1174.97	1770	1178.13
GR	1772	1180.86	1774	1183.9	1776	1187.8	1776.99	1190.22		
NC	0.02	0.02	0.015							
X1	260	20	1033.31	1171.52	1	1	1			
GR	1775.4	1000	1775.24	1020.49	1774	1022.9	1772	1026.35	1770	1029.81
GR	1768	1033.31	1767.3	1042.07	1766	1048.18	1764	1050.85	1762	1051.85
GR	1762	1154.61	1764	1155.13	1766	1155.64	1766.66	1171.52	1767.82	1173.98
GR	1768	1174.12	1770	1176.75	1772	1179.4	1774	1183.08	1776	1187.74
NC	0.02	0.02	0.015							
X1	270	20	1008.92	1116.05	33.84	8.99	21.92			
GR	1775.8	964	1775	1000	1774	1003.1	1772	1008.92	1772.04	1008.94
GR	1770	1009.59	1768	1010.24	1766	1010.83	1764	1011.18	1762	1011.54
GR	1762	1113.08	1762	1114.49	1762	1114.56	1764	1114.95	1766	1115.24
GR	1768	1115.55	1770	1115.92	1771.04	1116.05	1772	1122.67	1774	1132.66
NC	0.02	0.02	0.015							
X1	280	18	1044.87	1151.21	1	1	1			
GR	1775.8	1000	1775.02	1036.1	1774	1039.28	1772.37	1044.87	1772	1044.99
G[redacted]	1770	1045.65	1768	1046.31	1766	1047.17	1766	1103.57	1766.18	1146.5
GR	1766	1148.22	1766	1149.86	1768	1150.4	1770	1150.81	1772	1151.16
GR	1772.2	1151.21	1774.03	1160.57	1774	1160.65				
NC	0.02	0.02	0.015							
X1	290	7	1047.98	1151	14.68	12.7	14.95			
X3	10			1047.98	1775	1150.91	1775			
GR	1775.6	1000	1775.05	1036.02	1774	1047.98	1766.55	1047.98	1766.55	1151
GR	1774	1151	1774.77	1160.59						
NC	0.02	0.02	0.015							
SB	0.9	1.56	2.6	106	103.02	5.02	588	0	1766.92	1766.55
X1	300	8	1025.54	1128.56	102.54	98.55	102.75			
X2			1	1772.92	1776.92			1.33		
X3	10			1025.54	1775.19	1128.56	1775.56			
GR	1774.8	1000	1775.19	1017.87	1775.12	1025.54	1766.92	1025.54	1766.92	1128.56
GR	1775.1	1128.56	1775.56	1133.94	1775.35	1147.13				
NC	0.02	0.02	0.015							
X1	310	20	1022.98	1171.53	102.64	105.7	100.28			
GR	1776.8	1000	1776	1016.17	1775.68	1022.98	1774	1028.26	1772	1034.5
GR	1770	1040.77	1768.95	1044.12	1768	1047.77	1767.87	1048.18	1767.78	1072.14
GR	1767.8	1131.12	1768	1132.45	1768.79	1137.38	1768.62	1147.75	1770	1152.28
GR	1772	1158.91	1774	1165.6	1775.77	1171.53	1776	1177.59	1776.8	1198.8

[redacted]	0.02	0.02	0.02							
[redacted]	320	20	1022.11	1155.09	489.89	487.69	489.1			
GR	1779.4	1000	1778.04	1022.01	1778	1022.11	1776	1030.73	1774	1039.26
GR	1772	1047.79	1770.85	1052.67	1770.51	1061.45	1770	1063.83	1769.24	1067.59
GR	1770	1104.76	1770.04	1107.08	1771.21	1112.55	1771.76	1130.75	1772	1131.67
GR	1774	1139.29	1776	1146.67	1777.98	1153.84	1778	1155.09	1779.33	1191.2
NC	0.02	0.02	0.02							
X1	330	21	1027.28	1156.48	500.62	500.93	500.1			
GR	1781	1000	1780.94	1027.28	1780	1031.83	1778	1041.53	1776	1051.25
GR	1774	1060.96	1773.4	1063.9	1773.58	1078.46	1772	1084.27	1771.79	1085.02
GR	1771.8	1109.74	1772	1110.11	1774	1116.37	1774.53	1118.12	1774.72	1134.82
GR	1776	1138.9	1778	1145.34	1780	1151.87	1781.4	1156.48	1782	1173.24
GR	1782.3	1189.26								
NC	0.02	0.02	0.02							
X1	340	19	1000	1116.66	496.19	495.64	496.21			
GR	1783.7	907.67	1782.39	1000	1782	1002.25	1780	1013.68	1778	1025.11
GR	1777	1030.73	1776.57	1040.34	1776	1043.31	1774.53	1051.15	1774.37	1080.76
GR	1776	1084.3	1778	1088.43	1778.07	1088.55	1778.69	1101.43	1780	1107.4
GR	1782	1116.66	1784	1125.98	1785.09	1131.04	1785.6	1161.06		
NC	0.02	0.02	0.02							
X1	350	22	1042.74	1155.28	460.23	420.27	436.71			
GR	1786	1000	1786.37	1024.16	1787.1	1042.74	1786	1046.9	1784	1054.53
G[redacted]	1782	1062.22	1780	1069.93	1778	1077.61	1776.25	1084.32	1778.03	1100.93
G[redacted]	77.2	1111.98	1778	1120.32	1779.54	1134.41	1778.08	1145.13	1780	1148.5
GR	1782	1151.93	1784	1155.28	1784.22	1155.66	1785.25	1168.43	1786	1172.75
GR	1787.2	1179.81	1787.3	1201.99						
NC	0.02	0.02	0.02							
X1	360	26	1014.07	1129.57	341.79	294.05	314.29			
X3	10			1014.07	1792	1129.57	1792			
GR	1798	1000	1796	1005.44	1794	1009.82	1792	1014.07	1790	1018.52
GR	1788	1023.42	1787.25	1025.48	1786	1027.93	1784	1030.77	1782	1033.57
GR	1781.8	1036.36	1781.62	1056.13	1780.02	1067.23	1780	1073	1779.67	1111.44
GR	1780	1112.32	1782	1117.65	1784	1122.81	1786	1127.74	1786.74	1129.57
GR	1786.9	1190.42	1786.92	1217.35	1788	1239.83	1788.97	1260.98	1789.6	1274.74
GR	1790	1319.61								
NC	0.02	0.02	0.02							
SB		1.56	2.6	150	80		943	1.5	1781.68	1779.67
X1	370	26	1019.93	1180.43	188.4	272.56	232.15			
X2			1	1791.68	1803.16					
X3	10			1019.93	1800	1180.43	1800			
GR	1801.2	1000	1800	1006.14	1798	1012.48	1796	1019.93	1794	1026.84
GR	1792	1033.63	1790	1039.5	1788	1044.33	1787.04	1047.52	1786	1050.99
GR	1784	1063.28	1782.66	1069.39	1782	1116.66	1781.68	1141.49	1782	1142.19
GR	1784	1147.19	1786	1151.46	1787.43	1154.02	1788	1156.17	1790	1161.17
GR	1792	1166.33	1794	1173	1796	1180.43	1798	1186.39	1800	1192.83
GR	1800.7	1196.96								

[redacted]

[redacted]	0.03	0.03	0.02							
[redacted]	380	14	1091.25	1151.34	174.12	176.08	170.96			
X3	10			1091.25	1794	1151.34	1794			
GR	1792	1090.66	1792.75	1091.25	1792	1091.78	1790	1093.21	1788	1094.63
GR	1786	1096.06	1785.68	1096.29	1785.8	1149.56	1786	1149.61	1788	1150.11
GR	1790	1150.6	1792	1151.08	1793.07	1151.34	1794	1227.86		
NC	0.03	0.03	0.02							
X1	390	21	1045.15	1103.45	420.9	420.21	420.9			
X3	10			1045.15	1797	1103.45	1797			
GR	1792.6	1000	1793.3	1031.19	1793.78	1040.57	1794	1041.52	1794.81	1045.15
GR	1794	1045.61	1792	1046.74	1790	1047.86	1788	1049.03	1787.41	1049.38
GR	1787.2	1074.16	1787.54	1100.36	1788	1100.54	1790	1101.34	1792	1102.12
GR	1794	1102.9	1795.44	1103.45	1795.23	1128.39	1795.21	1144.16	1796	1147.04
GR	1797.3	1153.05								
NC	0.03	0.03	0.02							
X1	400	18	1042.29	1103.68	216.05	217.6	216.12			
X3	10			1042.29	1797	1103.68	1797			
GR	1795.3	1000	1795.77	1024.49	1795.76	1038.23	1796	1040.26	1796.25	1042.29
GR	1796	1042.47	1794	1043.62	1792	1044.73	1790	1045.83	1789.06	1046.34
GR	1788.6	1075.55	1788.96	1100.77	1790	1101.12	1792	1101.81	1794	1102.54
GR	1796	1103.31	1796.96	1103.68	1796.49	1128.41				
NC	0.03	0.03	0.02							
[redacted]	410	21	1041.49	1100.98	236.79	212.87	222.64			
[redacted]	1799	1000	1799.04	1002.09	1799.01	1019.84	1798	1026.7	1797.57	1029.5
GR	1797.2	1041.49	1796	1044.75	1794	1049.87	1792	1054.82	1790	1059.57
GR	1789.3	1061.07	1789.8	1078.69	1790	1092.24	1790.1	1099.54	1792	1099.88
GR	1794	1100.24	1796	1100.6	1798	1100.94	1798.24	1100.98	1798.57	1108.1
GR	1799.4	1170.81								
NC	0.03	0.03	0.02							
X1	420	24	1148.62	1204.8	228.48	213.43	218.15			
GR	1805.1	1000	1804.85	1087.59	1804.56	1107.49	1804	1110.27	1802	1120.11
GR	1800	1129.91	1799.62	1132.29	1798.49	1148.62	1798	1150.2	1796	1155.64
GR	1794	1161.15	1792	1166.99	1790.86	1170.59	1791.29	1186.61	1790.88	1202.56
GR	1792	1202.83	1794	1203.37	1796	1203.9	1798	1204.44	1799.34	1204.8
GR	1800	1213.14	1800	1213.21	1800.65	1276.28	1800.8	1276.28		
NC	0.03	0.03	0.015							
X1	430	6	1034.79	1072.54	228.08	218.61	221.27			
X3	10			1034.79	1805	1072.54	1805			
GR	1804.5	1000	1804.31	1034.79	1793.29	1034.79	1793.29	1072.54	1803.82	1072.54
GR	1803.7	1113.05								
NC	0.03	0.03	0.015							
SB	0.9	1.56	2.6	78	37.75	1.75	246	0	1794.3	1793.29
X1	440	9	1048.13	1085.88	183.21	206.01	197.38			
X2			1	1801.3	1802.38			1.33		
X3	10			1048.13	1805	1085.88	1805			
[redacted]	1804	1000	1803.68	1007.43	1803.75	1048.13	1794.3	1048.13	1794.3	1085.88
[redacted]	1803.7	1085.88	1803.91	1101.01	1804	1103.62	1805.3	1113.11		

N	0.025	0.025	0.04							
QI	1	5800								
X1	450	23	1056.87	1133.42	163.22	162.13	163.47			
X3	10			1056.87	1809	1133.42	1809			
GR	1804	1000	1804.07	1006.32	1804.32	1034.41	1804.73	1043.05	1804.96	1056.87
GR	1804	1058.72	1802	1062.07	1800	1065.72	1798	1069.89	1796	1074.12
GR	1795.5	1075.14	1796	1079.17	1797.92	1096.15	1798	1097.82	1799.19	1110.76
GR	1800	1121.55	1802	1125.68	1804	1129.41	1806	1133.42	1806.22	1133.91
GR	1806.3	1148.02	1806.93	1155.61	1806.39	1170.62				
NC	0.025	0.025	0.04							
X1	460	23	1048.18	1141.84	281.81	289.57	285.08			
X3	10			1048.18	1810	1141.84	1810			
GR	1808	1000	1808.02	1003.22	1808	1005.04	1807.55	1048.18	1806	1052.89
GR	1804	1059.32	1802.11	1065.59	1802	1067.54	1800.57	1088.15	1800	1090.66
GR	1798	1099.31	1797.57	1101.27	1797.83	1115.39	1798	1115.66	1800	1118.79
GR	1802	1121.96	1804	1125.23	1804.77	1126.62	1805.59	1139.81	1806	1140.19
GR	1808.4	1141.84	1808	1142.64	1808	1161.75				
NC	0.025	0.025	0.04							
X1	470	20	1035.45	1104.62	277.36	272.97	275.07			
X3	10			1035.45	1812	1104.62	1812			
GR	1810.7	1000	1810.44	1019.05	1811.3	1035.45	1810	1039.08	1808	1044.69
GR	1806	1050.13	1804	1055.32	1802	1061.49	1800.02	1066.39	1800	1067.21
GR	1799.3	1081.38	1800	1082.49	1802	1085.74	1804	1089.17	1806	1092.65
G	1806.1	1092.79	1808	1096.72	1810	1100.89	1810.59	1104.62	1810.87	1120.75
NC	0.025	0.025	0.04							
SB		1.56	2.6	100	20		288	2	1799.67	1799.29
X1	480	23	1049.96	1121.92	29.43	28.85	29.16			
X2			1	1808	1811.3					
X3	10			1049.96	1815	1121.92	1815			
GR	1810.8	1000	1810.29	1022.32	1810.42	1043.96	1811.06	1049.96	1810	1052.71
GR	1808	1057.64	1806	1063.42	1804	1071.44	1802	1076.07	1800.34	1079.25
GR	1800	1088.82	1799.67	1097.89	1800	1098.19	1802	1100.01	1804	1101.93
GR	1806	1109.03	1808	1115.05	1810	1119.54	1810.67	1121.92	1811.24	1130.7
GR	1810	1145.14	1809.57	1148.54	1809.64	1162.76				
NC	0.025	0.025	0.04							
X1	490	27	1050.08	1127.64	421.17	376.41	404.91			
X3	10			1050	1816	1127.64	1816			
GR	1816	1000	1816.02	1001.56	1814.9	1019.89	1814.74	1038.47	1815.04	1050.08
GR	1814	1052.5	1812	1057.09	1810	1061.66	1808	1066.16	1806	1070.64
GR	1804	1075.1	1803.66	1075.85	1804	1083.12	1804.15	1088.63	1806	1092.46
GR	1808	1096.8	1810	1101.52	1810.26	1101.82	1810	1113.29	1809.88	1118.54
GR	1810	1119.08	1812	1125.39	1812.71	1127.64	1812.65	1132.54	1812.36	1149.58
GR	1812.4	1162.71	1812.58	1182.47						

[redacted]	0.025	0.025	0.04							
X1	500	27	1035.57	1117.1	475.67	455.34	467.9			
X3	10			1035.57	1821	1117.1	1821			
GR	1820.6	1000	1820.49	1017.79	1820	1035.57	1820.01	1036.35	1818	1038.99
GR	1816	1041.72	1814	1044.53	1812	1047.45	1810	1050.47	1808	1053.53
GR	1807.5	1054.17	1808	1059.53	1808.27	1062.4	1810	1077.16	1811.11	1085.69
GR	1812	1088.38	1814	1094.42	1816	1100.48	1817.15	1103.98	1818	1112.84
GR	1818.4	1117.1	1818	1130.34	1817.52	1146.76	1817.56	1162.65	1817.78	1176.1
GR	1818	1181.93	1818.33	1189.71						
NC	0.02	0.02	0.03							
X1	510	21	1051.63	1118	410.79	403.61	413.47			
GR	1822.7	1000	1822	1014.17	1821.1	1051.63	1820	1053.73	1818	1057.54
GR	1816	1061.35	1814	1065.16	1812	1068.96	1811.08	1070.77	1810.29	1084.94
GR	1812	1091.3	1814	1098.08	1816	1104.27	1818	1110.29	1820	1116.14
GR	1820.6	1118	1821.24	1184.8	1821.07	1201.95	1821.84	1211.83	1822	1218.61
GR	1822.5	1218.61								
NC	0.02	0.02	0.03							
X1	520	29	1020.76	1156.45	494.67	471.93	477.37			
GR	1830.9	1000	1830	1005.42	1829.57	1007.86	1828.53	1020.76	1828	1022.81
GR	1826	1030.61	1824	1038.4	1822	1046.19	1820	1053.98	1818.67	1059.18
GR	1818.1	1072.9	1818	1073.42	1816	1079.92	1814.82	1084.01	1816	1106.79
GR	1816.3	1112.44	1817.17	1120.26	1818	1123.13	1820	1130.03	1822	1136.92
GR	1824	1143.81	1825.52	1149.11	1826	1150.07	1828	1153.82	1829.41	1156.45
[redacted]	1828	1169.03	1830	1185.2	1832	1235.46	1832.56	1257.15		
NC	0.02	0.02	0.03							
X1	530	25	1016.88	1152.68	371.54	424.3	399.2			
GR	1832	1000	1831.88	1004.01	1831.69	1016.88	1830	1021.18	1828	1026.26
GR	1826	1031.34	1824	1036.37	1822.35	1040.5	1822.35	1059.95	1822	1060.65
GR	1820	1064.77	1818	1068.85	1817.83	1069.21	1817.62	1090.03	1818	1090.71
GR	1820	1093.58	1822	1096.4	1823.81	1099.05	1824	1102.34	1826	1121.49
GR	1828	1130.45	1828.88	1133.79	1830	1143.91	1830.93	1152.68	1831.19	1159.85
NC	0.02	0.02	0.03							
X1	540	26	1018.16	1117.46	460.35	522.62	489.72			
GR	1834.9	1000	1834.9	1018.16	1834	1020.8	1832	1026.45	1830	1031.95
GR	1828	1037.42	1827.86	1037.75	1828	1041.19	1828.5	1054.97	1828	1055.74
GR	1826	1058.87	1824	1062.02	1823.45	1062.88	1823.47	1092.33	1824	1093.02
GR	1826	1095.58	1828	1098.1	1828.7	1098.97	1828.48	1106.52	1830	1108.88
GR	1832	1111.99	1834	1115.1	1835.51	1117.46	1836	1133.36	1836.3	1144.44
GR	1836.7	1152.23								
NC	0.02	0.02	0.03							
X1	550	28	1021.09	1124.94	438.1	474.94	456.26			
GR	1840.1	1000	1840	1001.92	1839.99	1006.32	1839.32	1021.09	1838	1024.57
GR	1836	1029.84	1833.93	1035.32	1834	1035.34	1833.46	1054.03	1832	1056.65
GR	1830	1060.26	1828	1063.9	1826.66	1066.34	1826.79	1083.14	1828	1085.42
GR	1830	1089.19	1832	1092.91	1834.1	1096.67	1834	1097.34	1834	1105.63
GR	1834	1111.84	1833.95	1114.36	1836	1119.24	1838	1124.12	1838.31	1124.94
[redacted]	1839.6	1150.68	1840	1160.26	1840.11	1162.86				

[redacted]	0.02	0.02	0.03							
X1	560	32	1011.15	1130.99	332.03	327.26	330.24			
GR	1847.8	1000	1846.27	1003.9	1846	1006.41	1845.43	1011.15	1844	1015.37
GR	1842	1021.39	1840	1027.57	1838	1033.9	1836.1	1039.95	1836	1045.57
GR	1835.9	1053.25	1834	1056.42	1832	1059.77	1830	1063.2	1829.01	1064.93
GR	1828	1072.16	1827.85	1073.13	1828	1074.51	1828.64	1080.27	1830	1082.3
GR	1832	1085.3	1834	1088.32	1836	1091.45	1836.23	1091.7	1836.22	1110.34
GR	1838	1115.46	1840	1121.18	1842	1126.85	1843.5	1130.99	1844	1135.55
GR	1845.8	1151.17	1845.91	1156.17						
NC	0.02	0.02	0.03							
X1	570	31	1064.51	1140.01	229.29	230.35	228.38			
GR	1847.9	1000	1846	1056.21	1845.65	1064.51	1844	1065.7	1842	1067.16
GR	1840	1068.62	1838	1070.08	1836	1071.54	1834	1072.98	1832	1073.78
GR	1832	1074.63	1832	1075.05	1832	1084.35	1832	1091.24	1831.69	1120.28
GR	1832	1120.51	1832	1120.78	1832	1121.95	1834	1124.47	1836	1126.81
GR	1838	1129.15	1840	1131.49	1842	1133.85	1844	1136.23	1846	1138.69
GR	1847	1140.01	1847.35	1156.32	1848	1159.82	1849.6	1168.44	1850	1170.12
GR	1850.7	1172.42								
NC	0.02	0.02	0.015							
X1	580	30	1055.05	1128.8	1	1	1			
GR	1847.7	1000	1847.49	1012.37	1846	1049.98	1845.83	1055.05	1844	1056.21
GR	1842	1057.48	1840	1058.71	1838	1059.87	1836	1060.93	1834	1061.78
GR	1834	1062.46	1834	1063.07	1834	1063.47	1834	1064.19	1834	1080.22
G[redacted]	1834	1109.26	1834	1109.31	1834	1114.45	1836	1116.75	1838	1119.03
GR	1840	1121.3	1842	1123.52	1844	1125.65	1846	1127.71	1847.09	1128.8
GR	1847.5	1145.88	1848	1148.67	1849.67	1157.77	1850	1158.89	1851.05	1161.45
NC	0.02	0.02	0.015							
X1	590	11	1031.2	1085.04	16.02	16.7	15.77			
X3	10			1031.2	1848	1085.04	1848			
GR	1847.3	1000	1847.01	1010.93	1846.27	1031.2	1834.21	1031.2	1834.21	1085.04
GR	1846.2	1085.04	1847.07	1099.88	1848	1120.18	1849.73	1131.49	1850	1132.09
GR	1851.3	1134.18								
NC	0.02	0.02	0.015							
SB	0.9	1.56	2.6	60	53.84	3.84	400	0	1835.13	1834.21
X1	600	15	1081.85	1135.69	93.41	94.92	93.51			
X2			1	1843.13	1846.5			1.33		
X3	10			1081.85	1848	1135.69	1848			
GR	1851	1000	1850	1003.75	1848	1011.09	1847.6	1012.57	1847.64	1032.47
GR	1848	1035.82	1849.27	1065.44	1848	1070.71	1847.2	1074.22	1846	1081.85
GR	1835.1	1081.85	1835.13	1135.69	1847.56	1135.69	1847.68	1152.6	1848	1170.43
NC	0.02	0.02	0.015							
X1	610	20	1083.2	1136.14	230.78	201.73	215.38			
X3	10			1061.48	1853	1207.54	1853			
GR	1851.7	1000	1851.08	1029.96	1852	1046.46	1852.83	1061.48	1852.52	1068.39
GR	1852	1080.06	1851.91	1083.2	1850	1085.83	1848	1088.59	1846	1091.36
GR	1844	1094.17	1842.71	1095.99	1842.62	1124.12	1844	1126.53	1846	1130
[redacted]	1848	1133.45	1849.56	1136.14	1850	1155.27	1852	1197.8	1852.45	1207.54

[redacted]	1872	1115.28	1874	1118.74	1876	1122.22	1878	1125.69	1878.44	1126.45
	1878.7	1156.41	1878	1161.77	1876.53	1173.07				
NC	0.025	0.025	0.025							
X1	690	10	1057.3	1141.3	408.17	434.4	422.9			
X3	10			1057.3	1894	1141.3	1894			
GR	1894	1000	1894	1014.18	1886	1057.29	1877	1057.3	1866	1079.3
GR	1866	1119.3	1877	1141.3	1886	1141.31	1894	1162.81	1894	1172.96
NC	0.025	0.025	0.025							
SB		1.56	2.6	90	40		1240	2	1866	1866
X1	700	8	1011.47	1095.49	132.78	172.81	153.08			
X2			1	1886	1894					
GR	1894	1000	1886	1011.47	1877	1011.48	1866	1033.48	1866	1073.48
GR	1877	1095.48	1886	1095.49	1894	1097.52				
NC	0.025	0.025	0.025							
X1	710	22	1055.32	1141.88	416	467.23	424.6			
GR	1887	1000	1887.65	1055.32	1886	1058.98	1884	1063.38	1882	1067.76
GR	1880	1072.17	1878	1076.59	1876.67	1079.53	1876.5	1091.93	1878	1098.6
GR	1878.2	1099.74	1880	1110.14	1880.28	1112.24	1882	1115.7	1884	1119.72
GR	1886	1123.75	1888	1127.78	1890	1131.82	1892	1135.86	1894	1139.91
GR	1894.9	1141.88	1896	1168.62						
NC	0.025	0.025	0.025							
X1	720	28	1031.02	1123.52	499.28	495.17	498.02			
[redacted]	1895.4	1000	1895.51	1008.85	1894	1013.03	1892	1018.46	1890.74	1021.86
[redacted]	1890.3	1031.02	1890	1031.86	1888	1036.41	1886	1041.01	1884	1045.63
GR	1882	1050.25	1882	1050.99	1881.59	1059.51	1882	1063.99	1882.46	1068.23
GR	1882.7	1085.75	1884	1093.67	1884.05	1094.02	1885.72	1102.19	1886	1102.68
GR	1888	1106.25	1890	1109.82	1892	1113.4	1894	1117.01	1896	1120.66
GR	1897.5	1123.52	1898	1138.24	1898	1204.99				
NC	0.025	0.025	0.025							
X1	730	27	1056.08	1126.41	484.5	472.89	480.56			
GR	1895.5	980.55	1890	997.92	1888.44	1014.84	1888.81	1032	1890	1034.91
GR	1892	1040.78	1892.61	1042.69	1892.66	1056.08	1892	1058.03	1890	1063.82
GR	1888	1069.32	1887.87	1069.57	1887.34	1076.5	1886	1080.07	1885.41	1081.64
GR	1885.1	1105.73	1886	1106.9	1888	1109.69	1890	1112.46	1892	1115.21
GR	1894	1117.97	1896	1120.72	1898	1123.48	1900	1126.26	1900.12	1126.41
GR	1900.5	1149.64	1900	1152.55						
NC	0.025	0.025	0.025							
X1	740	30	1042.02	1119.91	502.08	483.58	492.38			
GR	1901.2	1000	1902	1005.26	1904	1021.59	1904.51	1025.97	1904	1027.47
GR	1902	1034.42	1900	1042.02	1900.03	1042.1	1898	1046.77	1896	1051.39
GR	1894	1056.04	1893.01	1058.37	1892.51	1063.92	1892	1064.96	1890	1068.86
GR	1889.5	1069.72	1889.67	1082.45	1889.35	1096.82	1890	1098.41	1892	1103.02
GR	1892.5	1104.29	1894	1106.26	1896	1108.92	1898	1111.43	1900	1113.86
GR	1902	1116.25	1904	1118.59	1905.14	1119.91	1904.81	1126.67	1904	1127.41

[illegible]	1872	1115.28	1874	1118.74	1876	1122.22	1878	1125.69	1878.44	1126.45
	1878.7	1156.41	1878	1161.77	1876.53	1173.07				
NC	0.025	0.025	0.025							
X1	690	10	1057.3	1141.3	408.17	434.4	422.9			
X3	10			1057.3	1894	1141.3	1894			
GR	1894	1000	1894	1014.18	1886	1057.29	1877	1057.3	1866	1079.3
GR	1866	1119.3	1877	1141.3	1886	1141.31	1894	1162.81	1894	1172.96
NC	0.025	0.025	0.025							
SB		1.56	2.6	90	40		1240	2	1866	1866
X1	700	8	1011.47	1095.49	132.78	172.81	153.08			
X2			1	1886	1894					
GR	1894	1000	1886	1011.47	1877	1011.48	1866	1033.48	1866	1073.48
GR	1877	1095.48	1886	1095.49	1894	1097.52				
NC	0.025	0.025	0.025							
X1	710	22	1055.32	1141.88	416	467.23	424.6			
GR	1887	1000	1887.65	1055.32	1886	1058.98	1884	1063.38	1882	1067.76
GR	1880	1072.17	1878	1076.59	1876.67	1079.53	1876.5	1091.93	1878	1098.6
GR	1878.2	1099.74	1880	1110.14	1880.28	1112.24	1882	1115.7	1884	1119.72
GR	1886	1123.75	1888	1127.78	1890	1131.82	1892	1135.86	1894	1139.91
GR	1894.9	1141.88	1896	1168.62						
NC	0.025	0.025	0.025							
X1	720	28	1031.02	1123.52	499.28	495.17	498.02			
[illegible]	1895.4	1000	1895.51	1008.85	1894	1013.03	1892	1018.46	1890.74	1021.86
[illegible]	1890.3	1031.02	1890	1031.86	1888	1036.41	1886	1041.01	1884	1045.63
GR	1882	1050.25	1882	1050.99	1881.59	1059.51	1882	1063.99	1882.46	1068.23
GR	1882.7	1085.75	1884	1093.67	1884.05	1094.02	1885.72	1102.19	1886	1102.68
GR	1888	1106.25	1890	1109.82	1892	1113.4	1894	1117.01	1896	1120.66
GR	1897.5	1123.52	1898	1138.24	1898	1204.99				
NC	0.025	0.025	0.025							
X1	730	27	1056.08	1126.41	484.5	472.89	480.56			
GR	1895.5	980.55	1890	997.92	1888.44	1014.84	1888.81	1032	1890	1034.91
GR	1892	1040.78	1892.61	1042.69	1892.66	1056.08	1892	1058.03	1890	1063.82
GR	1888	1069.32	1887.87	1069.57	1887.34	1076.5	1886	1080.07	1885.41	1081.64
GR	1885.1	1105.73	1886	1106.9	1888	1109.69	1890	1112.46	1892	1115.21
GR	1894	1117.97	1896	1120.72	1898	1123.48	1900	1126.26	1900.12	1126.41
GR	1900.5	1149.64	1900	1152.55						
NC	0.025	0.025	0.025							
X1	740	30	1042.02	1119.91	502.08	483.58	492.38			
GR	1901.2	1000	1902	1005.26	1904	1021.59	1904.51	1025.97	1904	1027.47
GR	1902	1034.42	1900	1042.02	1900.03	1042.1	1898	1046.77	1896	1051.39
GR	1894	1056.04	1893.01	1058.37	1892.51	1063.92	1892	1064.96	1890	1068.86
GR	1889.5	1069.72	1889.67	1082.45	1889.35	1096.82	1890	1098.41	1892	1103.02
GR	1892.5	1104.29	1894	1106.26	1896	1108.92	1898	1111.43	1900	1113.86
GR	1902	1116.25	1904	1118.59	1905.14	1119.91	1904.81	1126.67	1904	1127.41

NC	0.025	0.025	0.025							
X1	750	40	1044.53	1148.05	361.65	431.03	391.69			
GR	1906.9	1000	1906	1004.65	1905.04	1009.47	1906	1015.43	1906.84	1019.12
GR	1906	1021.92	1904	1031.78	1903.79	1032.81	1903.79	1044.53	1902	1048.63
GR	1900	1053.26	1898	1057.91	1895.97	1062.64	1896	1063.05	1894.93	1077.63
GR	1894	1083.07	1893.44	1086.12	1893.85	1093.82	1894	1094.65	1895.88	1107.68
GR	1896	1108	1898	1113.7	1900	1119.39	1900.96	1122.14	1902	1123.57
GR	1904	1126.35	1906	1129.15	1908	1131.96	1910	1134.78	1912	1137.6
GR	1914	1140.41	1916	1143.23	1918	1146.05	1919.42	1148.05	1918	1155.65
GR	1916.8	1161.99	1916.93	1173.3	1916.59	1183.77	1916.83	1193	1918	1211.96
NC	0.025	0.025	0.025							
X1	760	24	1035.23	1131.59	409.52	457.63	428.24			
GR	1906.9	1000	1906.7	1035.23	1906	1036.91	1904	1042.08	1902	1047.23
GR	1901.2	1049.24	1900	1056.11	1898.24	1065.72	1898.23	1068.7	1899.02	1080.49
GR	1899.8	1088.61	1899.92	1101.11	1900	1101.27	1902	1105.14	1904	1109.01
GR	1906	1112.87	1908	1116.71	1910	1120.52	1912	1124.3	1914	1128.06
GR	1915.9	1131.59	1914.4	1139.1	1914	1153.98	1912.9	1195.72		
NC	0.025	0.025	0.025							
X1	770	24	1015.76	1126.99	456.52	419.22	434.78			
GR	1915	1000	1914	1015.76	1913.93	1016.79	1912	1022.95	1910	1029.33
GR	1908	1035.7	1906	1042.07	1905.12	1044.87	1904.51	1063.27	1904	1066.58
GR	1903.2	1072.95	1903.42	1081.93	1903.73	1095.61	1903.96	1105.84	1904	1105.97
GR	1906	1113.03	1906.63	1115.29	1908	1117.4	1910	1120.69	1912	1124.57
GR	1913.1	1126.99	1912.81	1130.93	1912.89	1143.7	1914	1148.24		
NC	0.025	0.025	0.015							
X1	780	8	1058.72	1114.05	52.99	49.44	49.44			
X3	10			1058.72	1916.5	1114.05	1916.5			
GR	1916.4	1000	1916	1003.3	1914.9	1058.72	1903.78	1058.72	1903.78	1114.05
GR	1914	1114.05	1914	1121.8	1915.01	1149.26				
NC	0.025	0.025	0.015							
SB	1.25	1.56	2.6	80	55.33	5.33	400	0	1905.12	1903.78
X1	790	10	1028.58	1083.91	108.42	108.26	108.02			
X2			1	1913.12	1917.12			2		
X3	10			1028.58	1916	1083.91	1916			
GR	1916	1000	1915.8	1001.42	1915.93	1017.77	1914.87	1028.58	1905.12	1028.58
GR	1905.1	1083.91	1914.59	1083.91	1916	1104.86	1916.37	1109.9	1916	1131.78
NC	0.035	0.035	0.03							
X1	800	14	1012.48	1094.47	100.8	88.06	95.8			
X3	10			1000	1915.5	1094.47	1915.5			
GR	1914.6	1000	1914.21	1012.48	1914	1012.99	1912	1017.82	1910	1022.59
GR	1908	1027.3	1904.86	1031.73	1904.86	1053.16	1904.86	1061.2	1908	1072.68
GR	1910	1078.88	1912	1084.82	1914	1090.67	1915.12	1094.47		

N	0.035	0.035	0.03	0.1	0.3					
X1	810	28	1144.23	1205.12	221.84	144.84	185.09			
GR	1918	980.65	1917.34	990.58	1916	1000	1914	1016.18	1913.61	1019.48
GR	1912	1086.58	1911.68	1097.61	1911.77	1130.03	1911.33	1144.23	1910.82	1158.38
GR	1910	1162.77	1908	1167.25	1906	1172.16	1905.36	1173.67	1905.8	1185.18
GR	1906	1185.5	1908	1188.52	1910	1192.61	1910.28	1194.53	1911.05	1205.12
GR	1911.2	1228.44	1911.5	1247.06	1912	1258.22	1914	1295.39	1914.12	1296.38
GR	1915.1	1324.03	1916	1338.5	1918	1370.57				

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*PROF 1

CRITICAL DEPTH TO BE CALCULATED AT ALL CROSS SECTIONS
ALLOWABLE ERROR FOR CRITICAL DEPTH DETERMINATION (ALLDC) = 2.000 PERCENT OF THE DEPTH

CCHV= .100 CEHV= .300

*SECNO 10.000

10.000	8.37	1708.70	1707.40	1705.00	1710.19	1.48	.00	.00	1710.00
6400.0	.0	6400.0	.0	.0	654.9	.1	.0	.0	1708.60
.00	.00	9.77	.03	.000	.030	.030	.000	1700.33	1009.11
.004017	0.	0.	0.	0	14	5	.00	119.45	1128.56

*SECNO 20.000

20.000	7.61	1710.73	1710.04	.00	1712.55	1.82	2.27	.10	1711.97
6400.0	.0	6400.0	.0	.0	591.5	.0	7.0	1.3	1713.45
.01	.00	10.82	.00	.000	.030	.000	.000	1703.12	1187.56
.005416	483.	489.	498.	2	12	0	.00	114.06	1301.62

*SECNO 30.000

30.000	7.51	1713.36	1712.99	.00	1715.48	2.12	2.84	.09	1712.41
6400.0	27.4	6372.6	.0	11.7	544.1	.0	13.5	2.7	1713.61
.02	2.34	11.71	.00	.030	.030	.000	.000	1705.85	1028.67
.006014	495.	498.	504.	2	12	0	.00	125.10	1153.77

*SECNO 40.000

40.000	9.07	1716.27	1715.79	.00	1718.18	1.91	2.67	.02	1716.00
6400.0	1.4	6177.9	220.7	1.5	548.8	55.2	20.1	4.3	1714.00
.04	.92	11.26	4.00	.030	.030	.030	.000	1707.20	1135.37
.004947	500.	492.	481.	2	8	0	.00	154.35	1289.72

*SECNO 50.000

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.40

50.000	9.46	1718.36	1716.06	.00	1719.32	.96	1.04	.10	1720.56
6400.0	.0	6400.0	.0	.0	815.2	.0	25.1	5.3	1720.00
.05	.00	7.85	.00	.000	.030	.000	.000	1708.90	1075.00
.002510	334.	306.	278.	2	15	0	.00	142.96	1217.96

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 60.000

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.45

60.000	9.73	1719.67	1717.29	.00	1720.20	.53	.84	.04	1718.01
6400.0	498.6	4971.7	929.7	199.2	769.7	335.3	37.2	8.4	1716.63
.07	2.50	6.46	2.77	.030	.030	.030	.000	1709.94	1002.76
.001193	500.	499.	502.	2	12	0	.00	396.87	1399.63

*SECNO 70.000

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

70.000	7.53	1719.53	1719.53	.00	1722.12	2.59	1.23	.62	1723.69
6400.0	.0	6400.0	.0	.0	495.4	.0	47.5	11.2	1719.59
.08	.00	12.92	.00	.000	.030	.000	.000	1712.00	1100.15
.007946	493.	498.	498.	0	12	0	.00	97.17	1197.32

*SECNO 80.000

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.54

80.000	8.83	1723.21	1721.50	.00	1724.56	1.35	2.31	.12	1723.19
6400.0	.0	6400.0	.0	.0	686.0	.0	53.9	12.3	1725.21
.10	.03	9.33	.00	.030	.030	.000	.000	1714.38	1146.51
.003339	456.	471.	482.	2	11	0	.00	115.23	1261.74

*SECNO 90.000

3301 HV CHANGED MORE THAN HVINS

90.000	9.58	1724.77	1723.80	.00	1726.63	1.85	1.91	.15	1724.64
6400.0	.4	6399.6	.0	.7	585.5	.0	60.9	13.6	1727.42
.11	.55	10.93	.00	.030	.030	.000	.000	1715.19	1046.26
.004785	495.	482.	465.	3	8	0	.00	110.73	1156.98

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 100.000

100.000	7.72	1726.42	1724.67	.00	1727.81	1.40	1.14	.05	1728.00
6400.0	.0	6400.0	.0	.0	674.4	.0	65.2	14.3	1727.26
.12	.00	9.49	.00	.000	.030	.000	.000	1718.70	1026.65
.003204	290.	295.	300.	2	14	0	.00	104.36	1131.01

*SECNO 110.000

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

110.000	5.29	1725.79	1725.79	.00	1728.22	2.43	.06	.31	1728.00
6400.0	.0	6400.0	.0	.0	512.0	.0	65.5	14.4	1727.52
.12	.00	12.50	.00	.000	.015	.000	.000	1720.50	1027.80
.002026	26.	26.	26.	0	14	0	.00	106.34	1134.14

*SECNO 120.000
7 MINIMUM SPECIFIC ENERGY
3 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 1029.5 1136.5 TYPE= 1 TARGET= 107.000
ELENCL= 1730.00 ELENCR= 1730.00

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1728.00 ELREA= 1730.00

120.000	4.79	1726.69	1726.69	.00	1729.11	2.42	.19	.00	1728.00
6400.0	.0	6400.0	.0	.0	512.5	.0	66.6	14.6	1730.00
.12	.00	12.49	.00	.000	.015	.000	.000	1721.90	1029.49
.002207	89.	90.	93.	0	11	0	.00	107.00	1136.49

SPECIAL BRIDGE

5227 DOWNSTREAM ELEV IS 1725.83 , NOT 1726.69 HYDRAULIC JUMP OCCURS DOWNSTREAM (IF LOW FLOW CONTROLS)

SB XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
.90	1.56	2.60	145.00	107.00	7.00	500.00	.00	1722.53	1721.90

*SECNO 130.000
3280 CROSS SECTION 130.00 EXTENDED .83 FEET

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.85

PRESSURE FLOW

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
1730.66	1730.30	.00	0.	6400.	500.	500.	1727.53	1731.43	0.

3470 ENCROACHMENT STATIONS= 1035.8 1142.8 TYPE= 1 TARGET= 107.000
ELENCL= 1731.00 ELENCR= 1731.00

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1728.00 ELREA= 1731.00

0.000	6.99	1729.52	.00	.00	1730.66	1.14	1.55	.00	1728.00
400.0	.0	6400.0	.0	.0	748.4	.0	68.3	14.9	1731.00
.12	.00	8.55	.00	.000	.015	.000	.000	1722.53	1035.81
.000645	121.	120.	118.	3	0	0	.00	107.00	1142.81

*SECNO 140.000
3280 CROSS SECTION 140.00 EXTENDED 1.27 FEET

3470 ENCROACHMENT STATIONS= 1149.7 1265.6 TYPE= 1 TARGET= 115.910
ELENCL= 1730.00 ELENCR= 1730.00

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1728.41 ELREA= 1730.00

140.000	6.85	1729.45	1727.93	.00	1730.75	1.30	.05	.05	1728.41
6400.0	.0	6400.0	.0	.0	698.7	.0	69.4	15.1	1730.00
.13	.00	9.16	.00	.000	.015	.000	.000	1722.60	1149.72
.000808	65.	64.	64.	2	15	0	.00	115.91	1265.63

*SECNO 150.000

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

150.000	6.46	1729.99	1729.99	.00	1732.17	2.18	.73	.26	1731.69
6300.0	.0	6300.0	.0	.0	532.2	.0	76.3	16.4	1731.09
.14	.00	11.84	.00	.000	.020	.000	.000	1723.53	1024.14
.003737	491.	490.	489.	0	11	0	.00	124.87	1149.01

*SECNO 160.000

3301 HV CHANGED MORE THAN HVINS

160.000	6.50	1732.11	1731.56	.00	1733.75	1.64	1.53	.05	1733.26
6300.0	.0	6300.0	.0	.0	613.0	.0	82.9	17.9	1734.00
.15	.00	10.28	.00	.000	.020	.000	.000	1725.61	1045.54
.002537	501.	502.	503.	2	11	0	.00	132.85	1178.39

*SECNO 170.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

170.000	6.04	1733.34	1733.34	.00	1735.45	2.11	1.49	.14	1734.50
6300.0	.0	6300.0	.0	.0	540.6	.0	89.4	19.4	1735.09
.16	.00	11.65	.00	.000	.020	.000	.000	1727.30	1046.37
.003759	487.	487.	488.	0	11	0	.00	130.75	1177.12

*SECNO 180.000

180.000	5.61	1735.21	1735.03	.00	1737.18	1.97	1.72	.01	1736.58
6300.0	.0	6300.0	.0	.0	559.5	.0	95.6	20.8	1737.72
.18	.00	11.26	.00	.000	.020	.000	.000	1729.60	1041.60
.003261	491.	492.	492.	2	11	0	.00	127.87	1169.47

*SECNO 190.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

190.000	6.70	1739.49	1739.49	.00	1741.88	2.39	1.71	.13	1742.00
6300.0	.0	6300.0	.0	.0	508.1	.0	101.7	22.2	1741.63
.19	.00	12.40	.00	.000	.020	.000	.000	1732.79	1006.97
.003627	499.	498.	497.	0	11	0	.00	108.37	1115.34

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 200.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

200.000	6.16	1742.86	1742.86	.00	1745.31	2.45	1.79	.02	1746.00
6300.0	.0	6300.0	.0	.0	502.0	.0	107.4	23.4	1748.00
.20	.00	12.55	.00	.000	.020	.000	.000	1736.70	1007.81
.003603	494.	495.	497.	0	11	0	.00	104.30	1112.11

*SECNO 210.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

210.000	9.31	1746.83	1746.83	.00	1749.68	2.85	1.78	.12	1752.00
6300.0	.0	6300.0	.0	.0	465.2	.0	113.0	24.5	1753.31
.21	.00	13.54	.00	.000	.020	.000	.000	1737.52	1014.22
.003528	500.	500.	500.	0	14	0	.00	83.71	1097.93

*SECNO 220.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

220.000	7.97	1751.93	1751.93	.00	1754.61	2.68	1.69	.02	1759.83
6300.0	.0	6300.0	.0	.0	479.2	.0	118.1	25.4	1757.77
.22	.00	13.15	.00	.000	.020	.000	.000	1743.96	1056.99
.003578	465.	477.	489.	0	15	0	.00	91.27	1148.26

*SECNO 230.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

230.000	8.28	1758.40	1758.40	.00	1761.19	2.78	1.75	.03	1763.36
6300.0	.0	6300.0	.0	.0	470.5	.0	123.5	26.4	1764.00
.23	.00	13.39	.00	.000	.020	.000	.000	1750.12	1061.81
.003514	490.	495.	499.	0	8	0	.00	86.22	1148.03

*SECNO 240.000

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

240.000	5.18	1762.61	1762.61	.00	1764.88	2.26	1.77	.05	1774.34
6300.0	.0	6300.0	.0	.0	522.0	.0	129.1	27.6	1776.40
.24	.00	12.07	.00	.000	.020	.000	.000	1757.43	1048.58
.003668	496.	492.	489.	0	14	0	.00	116.82	1165.40

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 250.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

250.000	5.05	1763.05	1763.05	.00	1765.39	2.34	.16	.02	1766.50
6300.0	.0	6300.0	.0	.0	513.2	.0	129.8	27.7	1766.67
.24	.00	12.28	.00	.000	.015	.000	.000	1758.00	1045.34
.002101	57.	59.	58.	0	8	0	.00	110.08	1155.42

*SECNO 260.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

260.000	4.97	1766.97	1766.97	.00	1769.12	2.15	.00	.02	1768.00
6300.0	.0	6299.9	.1	.0	536.0	.1	129.8	27.7	1766.66
.24	.00	11.75	.95	.000	.015	.020	.000	1762.00	1043.60
.002196	1.	1.	1.	0	5	0	.00	128.59	1172.19

*SECNO 270.000
7185 MINIMUM SPECIFIC ENERGY
CRITICAL DEPTH ASSUMED

0.000	4.86	1766.86	1766.86	.00	1769.28	2.42	.05	.08	1772.00
6300.0	.0	6300.0	.0	.0	504.7	.0	130.1	27.8	1771.04
.24	.00	12.48	.00	.000	.015	.000	.000	1762.00	1010.58
.002156	34.	22.	9.	0	8	0	.00	104.80	1115.37

*SECNO 280.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

280.000	4.89	1770.89	1770.89	.00	1773.30	2.41	.00	.00	1772.37
6300.0	.0	6300.0	.0	.0	505.9	.0	130.1	27.8	1772.20
.24	.00	12.45	.00	.000	.015	.000	.000	1766.00	1045.36
.002139	1.	1.	1.	0	5	0	.00	105.61	1150.97

*SECNO 290.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 1048.0 1150.9 TYPE= 1 TARGET= 102.930
ELENCL= 1775.00 ELENCR= 1775.00

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IOC	ICONT	CORAR	TOPWID	ENDST

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1774.00 ELREA= 1775.00

290.000	4.86	1771.41	1771.41	.00	1773.87	2.46	.03	.02	1774.00
6300.0	.0	6300.0	.0	.0	500.6	.0	130.3	27.8	1775.00
.24	.00	12.58	.00	.000	.015	.000	.000	1766.55	1047.98
.002208	15.	15.	13.	0	5	0	.00	102.93	1150.91

SPECIAL BRIDGE

5227 DOWNSTREAM ELEV IS 1770.65 , NOT 1771.41 HYDRAULIC JUMP OCCURS DOWNSTREAM (IF LOW FLOW CONTROLS)

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	.90	1.56	2.60	106.00	103.02	5.02	588.00	.00	1766.92	1766.55

*SECNO 300.000

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.46

CLASS B LOW FLOW

3420 BRIDGE W.S.= 1771.78 BRIDGE VELOCITY= 12.74 CALCULATED CHANNEL AREA= 476.

EGPRS	EGLWC	H3	QWEIR	QLOW	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
1774.19	1774.61	.00	0.	6300.	588.	588.	1772.92	1776.92	0.

3470 ENCROACHMENT STATIONS= 1025.5 1128.6 TYPE= 1 TARGET= 103.020
ELENCL= 1775.19 ELENCR= 1775.56

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1775.12 ELREA= 1775.56

300.000	6.16	1773.08	.00	.00	1774.61	1.53	.74	.00	1775.12
6300.0	.0	6300.0	.0	.0	634.9	.0	131.6	28.1	1775.56
.24	.00	9.92	.00	.000	.015	.000	.000	1766.92	1025.54
.001032	103.	103.	99.	0	0	0	.00	103.02	1128.56

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 310.000

310.000	5.24	1773.02	1772.67	.00	1774.82	1.80	.13	.08	1775.68
6300.0	.0	6300.0	.0	.0	584.9	.0	133.0	28.4	1775.77
.25	.00	10.77	.00	.000	.015	.000	.000	1767.78	1031.30
.001633	103.	100.	106.	2	15	0	.00	131.04	1162.34

*SECNO 320.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

320.000	6.59	1775.83	1775.83	.00	1778.13	2.30	1.15	.15	1778.00
6300.0	.0	6300.0	.0	.0	517.7	.0	139.2	29.7	1778.00
.26	.00	12.17	.00	.000	.020	.000	.000	1769.24	1031.46
.003649	490.	489.	488.	0	11	0	.00	114.58	1146.04

*SECNO 330.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

330.000	7.07	1778.86	1778.86	.00	1781.22	2.35	1.82	.02	1780.94
6300.0	.0	6300.0	.0	.0	511.8	.0	145.1	31.0	1781.40
.27	.00	12.31	.00	.000	.020	.000	.000	1771.79	1037.34
.003649	501.	500.	501.	0	8	0	.00	110.82	1148.16

*SECNO 340.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

340.000	7.48	1781.85	1781.85	.00	1784.18	2.33	1.82	.00	1782.39
6300.0	.0	6300.0	.0	.0	514.5	.0	151.0	32.3	1782.00
.28	.00	12.24	.00	.000	.020	.000	.000	1774.37	1003.10
.003670	496.	496.	496.	0	8	0	.00	112.87	1115.97

*SECNO 350.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

350.000	7.59	1783.84	1783.84	.00	1786.34	2.50	1.58	.05	1787.10
6300.0	.0	6300.0	.0	.0	496.9	.0	156.1	33.4	1784.00
.29	.00	12.68	.00	.000	.020	.000	.000	1776.25	1055.14
.003560	460.	437.	420.	0	5	0	.00	99.87	1155.01

	SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
		QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
	TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
	SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 360.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 1014.1 1129.6 TYPE= 1 TARGET= 115.500
ELENCL= 1792.00 ELENCR= 1792.00

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1792.00 ELREA= 1792.00

360.000	6.39	1786.06	1786.06	.00	1788.58	2.51	1.13	.01	1792.00
6300.0	.0	6300.0	.0	.0	495.1	.0	159.6	34.1	1792.00
.30	.00	12.72	.00	.000	.020	.000	.000	1779.67	1027.81
.003601	342.	314.	294.	0	15	0	.00	100.08	1127.89

SPECIAL BRIDGE

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	.00	1.56	2.60	150.00	80.00	.00	943.00	1.50	1781.68	1779.67

*SECNO 370.000

6070,LOW FLOW BY NORMAL BRIDGE

EGPRS= .000 EGLWC= 1790.131 ELLC= 1791.680 PCWSE= 1786.061 ELTRD= 1803.160

3370 NORMAL BRIDGE, NRD= 0 MIN ELTRD= 1803.16 MAX ELLC= 1791.68

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 1019.9 1180.4 TYPE= 1 TARGET= 160.500
ELENCL= 1800.00 ELENCR= 1800.00

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1796.00 ELREA= 1800.00

370.000	6.08	1787.76	1787.76	.00	1790.11	2.35	.84	.02	1796.00
6300.0	.0	6300.0	.0	.0	512.6	.0	162.3	34.6	1800.00
.30	.00	12.29	.00	.000	.020	.000	.000	1781.68	1045.12
.003601	188.	232.	273.	0	15	0	.00	110.15	1155.27

*SECNO 380.000

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 1091.3 1151.3 TYPE= 1 TARGET= 60.090
ELENCL= 1794.00 ELENCR= 1794.00

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1792.75 ELREA= 1794.00

380.000	7.42	1793.10	1793.10	.00	1796.62	3.52	.63	.35	1792.75
6300.0	.0	6300.0	.0	.0	418.2	.0	164.1	35.0	1794.00
.31	.00	15.06	.00	.000	.020	.000	.000	1785.68	1091.25
.003753	174.	171.	176.	0	11	0	.00	60.09	1151.34

*SECNO 390.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 1045.2 1103.4 TYPE= 1 TARGET= 58.300
ELENCL= 1797.00 ELENCR= 1797.00

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1794.81 ELREA= 1797.00

390.000	7.72	1794.92	1794.92	.00	1798.52	3.60	1.58	.02	1794.81
6300.0	.0	6300.0	.0	.0	413.7	.0	168.2	35.6	1797.00
.31	.00	15.23	.00	.000	.020	.000	.000	1787.20	1045.15
.003749	421.	421.	420.	0	8	0	.00	58.10	1103.25

*SECNO 400.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 1042.3 1103.7 TYPE= 1 TARGET= 61.390
ELENCL= 1797.00 ELENCR= 1797.00

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1796.25 ELREA= 1797.00

400.000	7.54	1796.14	1796.14	.00	1799.60	3.46	.80	.01	1796.25
6300.0	.0	6300.0	.0	.0	421.9	.0	170.2	35.8	1797.00
.32	.00	14.93	.00	.000	.020	.000	.000	1788.60	1042.37
.003696	216.	216.	218.	0	8	0	.00	60.99	1103.36

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 410.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

410.000	8.94	1798.24	1798.24	.00	1801.57	3.33	.78	.01	1797.20
6300.0	28.9	6271.1	.0	11.7	427.1	.0	172.4	36.2	1798.24
.32	2.46	14.68	.00	.030	.020	.000	.000	1789.30	1025.06
.003361	237.	223.	213.	0	12	0	.00	75.96	1101.01

*SECNO 420.000

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

420.000	9.85	1800.71	1800.71	.00	1803.49	2.78	.62	.06	1798.49
6300.0	98.3	6149.1	52.6	30.3	454.1	32.8	174.8	36.8	1799.34
.33	3.24	13.54	1.60	.030	.020	.030	.000	1790.86	1126.45
.002436	228.	218.	213.	0	8	0	.00	149.83	1276.28

*SECNO 430.000

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 1034.8 1072.5 TYPE= 1 TARGET= 37.750
ELENCL= 1805.00 ELENCR= 1805.00

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1804.31 ELREA= 1805.00

430.000	9.52	1802.81	1802.81	.00	1807.58	4.77	.56	.60	1804.31
6300.0	.0	6300.0	.0	.0	359.3	.0	177.1	37.2	1805.00
.33	.00	17.53	.00	.000	.015	.000	.000	1793.29	1034.79
.002676	228.	221.	219.	0	8	0	.00	37.75	1072.54

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

SPECIAL BRIDGE

5227 DOWNSTREAM ELEV IS 1801.33 , NOT 1802.81 HYDRAULIC JUMP OCCURS DOWNSTREAM (IF LOW FLOW CONTROLS)

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	.90	1.56	2.60	78.00	37.75	1.75	246.00	.00	1794.30	1793.29

*SECNO 440.000
PRESSURE AND WEIR FLOW, Weir Submergence Based on TRAPEZOIDAL Shape

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
1818.70	1811.23	.00	2706.	3603.	246.	252.	1801.30	1802.38	78.

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3710 WSEL ASSUMED BASED ON MIN DIFF
3693 PROBABLE MINIMUM SPECIFIC ENERGY

3470 ENCROACHMENT STATIONS= 1048.1 1085.9 TYPE= 1 TARGET= 37.750
ELENCL= 1805.00 ELENCR= 1805.00

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1803.75 ELREA= 1805.00

440.000	9.55	1803.85	1803.80	.00	1808.59	4.74	.53	-.10	1803.75
6300.0	.0	6300.0	.0	.0	360.4	.0	178.7	37.4	1805.00
.33	.00	17.48	.00	.000	.015	.000	.000	1794.30	1048.13
.002647	183.	197.	206.	20	5	3	.00	37.75	1085.88

*SECNO 450.000
3280 CROSS SECTION 450.00 EXTENDED 1.94 FEET

3301 HV CHANGED MORE THAN HVINS

3470 ENCROACHMENT STATIONS= 1056.9 1133.4 TYPE= 1 TARGET= 76.550
ELENCL= 1809.00 ELENCR= 1809.00

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1804.96 ELREA= 1809.00

450.000	12.84	1808.34	1804.77	.00	1809.41	1.08	.46	.37	1804.96
5800.0	.0	5800.0	.0	.0	696.1	.0	180.7	37.6	1809.00
.34	.00	8.33	.00	.000	.040	.000	.000	1795.50	1056.87
.002944	163.	163.	162.	4	8	0	.00	76.55	1133.42

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 460.000
3280 CROSS SECTION 460.00 EXTENDED 1.28 FEET

3470 ENCROACHMENT STATIONS= 1048.2 1141.8 TYPE= 1 TARGET= 93.660
ELENCL= 1810.00 ELENCR= 1810.00

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1807.55 ELREA= 1810.00

460.000	11.72	1809.29	1806.55	.00	1810.35	1.06	.93	.00	1807.55
5800.0	.0	5800.0	.0	.0	702.3	.0	185.2	38.2	1810.00
.35	.00	8.26	.00	.000	.040	.000	.000	1797.57	1048.18
.003634	282.	285.	290.	2	19	0	.00	93.66	1141.84

*SECNO 470.000

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
[illegible]RITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 1035.4 1104.6 TYPE= 1 TARGET= 69.170
ELENCL= 1812.00 ELENCR= 1812.00

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1811.30 ELREA= 1812.00

470.000	10.99	1810.29	1810.29	.00	1813.45	3.16	1.75	.63	1811.30
5800.0	.0	5800.0	.0	.0	406.6	.0	188.7	38.7	1812.00
.35	.00	14.27	.00	.000	.040	.000	.000	1799.30	1038.28
.013868	277.	275.	273.	0	11	0	.00	64.43	1102.71

SPECIAL BRIDGE

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	.00	1.56	2.60	100.00	20.00	.00	288.00	2.00	1799.67	1799.29

*SECNO 480.000
3280 CROSS SECTION 480.00 EXTENDED 4.18 FEET

3301 HV CHANGED MORE THAN HVINS

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 2.10

PRESSURE AND WEIR FLOW, Weir Submergence Based on TRAPEZOIDAL Shape

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
1820.11	1813.45	.00	1830.	4005.	288.	305.	1808.00	1811.30	100.

3470 ENCROACHMENT STATIONS= 1050.0 1121.9 TYPE= 1 TARGET= 71.960
ELENCL= 1815.00 ELENCR= 1815.00

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1811.06 ELREA= 1815.00

480.000	14.15	1813.82	.00	.00	1814.97	1.15	1.53	.00	1811.06
5800.0	.0	5800.0	.0	.0	672.6	.0	189.1	38.7	1815.00
.35	.00	8.62	.00	.000	.040	.000	.000	1799.67	1049.96
3157	29.	29.	29.	3	0	2	.00	71.96	1121.92

*SECNO 490.000
3280 CROSS SECTION 490.00 EXTENDED 2.62 FEET

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .63

3470 ENCROACHMENT STATIONS= 1050.0 1127.6 TYPE= 1 TARGET= 77.640
ELENCL= 1816.00 ELENCR= 1816.00

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1815.04 ELREA= 1816.00

490.000	11.54	1815.20	1813.93	.00	1817.13	1.93	1.93	.23	1815.04
5800.0	.0	5800.0	.0	.0	519.9	.0	194.7	39.4	1816.00
.36	.05	11.16	.00	.025	.040	.000	.000	1803.66	1050.00
.007968	421.	405.	376.	3	19	0	.00	77.64	1127.64

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	OLOB	OCH	OROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 500.000
3280 CROSS SECTION 500.00 EXTENDED .67 FEET

3470 ENCROACHMENT STATIONS= 1035.6 1117.1 TYPE= 1 TARGET= 81.530
ELENCL= 1821.00 ELENCR= 1821.00

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1820.00 ELREA= 1821.00

500.000	11.50	1819.00	1817.86	.00	1821.00	2.00	3.85	.02	1820.00
5800.0	.0	5800.0	.0	.0	511.4	.0	200.2	40.3	1821.00
.38	.00	11.34	.00	.000	.040	.000	.000	1807.50	1037.67
.008504	476.	468.	455.	3	11	0	.00	79.43	1117.10

*SECNO 510.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

510.000	11.75	1822.04	1822.04	.00	1823.68	1.64	2.10	.04	1821.10
5800.0	48.7	5326.1	425.2	18.2	500.3	96.3	205.5	41.6	1820.60
.39	2.67	10.65	4.42	.020	.030	.020	.000	1810.29	1013.43
03383	411.	413.	404.	0	8	0	.00	205.18	1218.61

*SECNO 520.000

520.000	9.13	1823.95	1822.70	.00	1825.46	1.51	1.77	.01	1828.53
5800.0	.0	5800.0	.0	.0	588.5	.0	212.1	43.3	1829.41
.40	.00	9.86	.00	.000	.030	.000	.000	1814.82	1038.59
.004091	495.	477.	472.	3	14	0	.00	105.06	1143.65

*SECNO 530.000

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

530.000	9.16	1826.78	1826.78	.00	1829.24	2.45	2.26	.28	1831.69
5800.0	.0	5800.0	.0	.0	461.5	.0	216.9	44.2	1830.93
.41	.00	12.57	.00	.000	.030	.000	.000	1817.62	1029.35
.008341	372.	399.	424.	0	5	0	.00	95.65	1125.00

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 540.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

540.000	8.31	1831.76	1831.76	.00	1834.43	2.67	4.08	.07	1834.90
5800.0	.0	5800.0	.0	.0	442.1	.0	222.0	45.2	1835.51
.42	.00	13.12	.00	.000	.030	.000	.000	1823.45	1027.12
.008330	460.	490.	523.	0	11	0	.00	84.49	1111.61

*SECNO 550.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

550.000	10.00	1836.66	1836.66	.00	1839.20	2.54	3.86	.01	1839.32
5800.0	.0	5800.0	.0	.0	453.2	.0	226.7	46.2	1838.31
.43	.00	12.80	.00	.000	.030	.000	.000	1826.66	1028.11
.008600	438.	456.	475.	0	11	0	.00	92.74	1120.84

*SECNO 560.000

560.000	11.65	1839.50	1839.24	.00	1841.81	2.31	2.59	.02	1845.43
5800.0	.0	5800.0	.0	.0	475.4	.0	230.2	46.9	1843.50
.44	.00	12.20	.00	.000	.030	.000	.000	1827.85	1029.17
.007179	332.	330.	327.	0	8	0	.00	90.56	1119.73

*SECNO 570.000

570.000	9.35	1841.04	1839.22	.00	1843.02	1.98	1.17	.03	1845.65
5800.0	.0	5800.0	.0	.0	514.1	.0	232.8	47.3	1847.00
.44	.00	11.28	.00	.000	.030	.000	.000	1831.69	1067.86
.003860	229.	228.	230.	2	14	0	.00	64.87	1132.73

*SECNO 580.000

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

580.000	6.94	1840.94	1840.94	.00	1844.13	3.18	.00	.36	1845.83
5800.0	.0	5800.0	.0	.0	405.1	.0	232.8	47.3	1847.09
.44	.00	14.32	.00	.000	.015	.000	.000	1834.00	1058.13
.002051	1.	1.	1.	0	15	0	.00	64.22	1122.35

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 590.000
*185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 1031.2 1085.0 TYPE= 1 TARGET= 53.840
ELENCL= 1848.00 ELENCR= 1848.00

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1846.27 ELREA= 1848.00

590.000	7.09	1841.30	1841.30	.00	1844.88	3.58	.03	.12	1846.27
5800.0	.0	5800.0	.0	.0	381.8	.0	233.0	47.3	1848.00
.44	.00	15.19	.00	.000	.015	.000	.000	1834.21	1031.20
.002356	16.	16.	17.	0	8	0	.00	53.84	1085.04

SPECIAL BRIDGE

3227 DOWNSTREAM ELEV IS 1839.99 , NOT 1841.30 HYDRAULIC JUMP OCCURS DOWNSTREAM (IF LOW FLOW CONTROLS)

S	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
.90	1.56	2.60	60.00	53.84	3.84	400.00	.00	1835.13	1834.21

*SECNO 600.000
6840, FLOW IS BY WEIR AND LOW FLOW

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.51

3420 BRIDGE W.S.= 1844.25 BRIDGE VELOCITY= 12.07 CALCULATED CHANNEL AREA= 456.

EGPRS	EGLWC	H3	QWEIR	QLOW	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
1846.40	1846.51	2.94	0.	5781.	400.	400.	1843.13	1846.50	60.

3470 ENCROACHMENT STATIONS= 1081.8 1135.7 TYPE= 1 TARGET= 53.840
ELENCL= 1848.00 ELENCR= 1848.00

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1846.00 ELREA= 1848.00

600.000	9.34	1844.44	.00	.00	1846.51	2.07	1.63	.00	1846.00
5800.0	.0	5800.0	.0	.0	501.8	.0	233.9	47.4	1848.00
.44	.00	11.56	.00	.000	.015	.000	.000	1835.10	1081.85
.001031	93.	94.	95.	4	0	0	.00	53.84	1135.69

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 610.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 1061.5 1207.5 TYPE= 1 TARGET= 146.060
ELENCL= 1853.00 ELENCR= 1853.00

610.000	9.68	1852.30	1852.30	.00	1854.80	2.50	.25	.13	1851.91
5800.0	2.2	5382.6	415.1	2.1	410.1	104.7	236.4	47.9	1849.56
.45	1.05	13.13	3.97	.020	.015	.020	.000	1842.62	1073.26
.001287	231.	215.	202.	0	8	0	.00	131.09	1204.36

*SECNO 620.000

3265 DIVIDED FLOW

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

620.000	9.83	1855.31	1855.31	.00	1857.66	2.35	.26	.02	1855.40
5800.0	.0	5322.5	477.4	.2	416.2	125.6	239.0	48.5	1852.46
.45	.24	12.79	3.80	.020	.015	.020	.000	1845.48	1021.74
.001208	224.	212.	202.	0	5	0	.00	141.80	1170.30

*SECNO 630.000
3280 CROSS SECTION 630.00 EXTENDED .66 FEET

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

630.000	9.56	1857.66	1857.66	.00	1859.80	2.14	.25	.02	1855.06
5800.0	121.6	5170.6	507.8	32.3	417.9	138.7	241.8	49.2	1855.00
.46	3.77	12.37	3.66	.020	.015	.020	.000	1848.10	1012.01
.001093	229.	221.	214.	0	8	0	.00	153.98	1165.99

CCHV= .100 CEHV= .300
*SECNO 640.000

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

640.000	9.28	1860.65	1860.65	.00	1863.91	3.25	.35	.33	1858.09
5800.0	146.1	5653.9	.0	29.0	386.3	.0	244.8	49.9	1861.23
.46	5.04	14.64	.00	.020	.015	.000	.000	1851.37	1012.10
.001695	252.	258.	262.	0	8	0	.00	66.64	1078.73

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 650.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 1035.3 1088.0 TYPE= 1 TARGET= 52.670
ELENCL= 1867.00 ELENCR= 1867.00

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1866.17 ELREA= 1867.00

650.000	7.20	1861.00	1861.00	.00	1864.63	3.64	.42	.12	1866.17
5800.0	.0	5800.0	.0	.0	379.0	.0	246.7	50.2	1867.00
.47	.00	15.30	.00	.000	.015	.000	.000	1853.80	1035.35
.002370	197.	211.	226.	0	15	0	.00	52.67	1088.02

SPECIAL BRIDGE

5227 DOWNSTREAM ELEV IS 1859.85 , NOT 1861.00 HYDRAULIC JUMP OCCURS DOWNSTREAM (IF LOW FLOW CONTROLS)

K	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
.90	1.56	2.60	150.00	52.67	2.67	400.00	.00	1856.17	1853.80

*SECNO 660.000

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.45

CLASS B LOW FLOW

3420 BRIDGE W.S.= 1862.46 BRIDGE VELOCITY= 15.52 CALCULATED CHANNEL AREA= 314.

EGPRS	EGLWC	H3	QWEIR	QLOW	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
1866.09	1867.56	.00	0.	5800.	400.	400.	1864.17	1869.17	0.

3470 ENCROACHMENT STATIONS= 1077.3 1129.9 TYPE= 1 TARGET= 52.670
ELENCL= 1870.00 ELENCR= 1870.00

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1869.67 ELREA= 1870.00

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST
660.000	9.24	1865.34	.00	.00	1867.56	2.22	2.93	.00	1869.67
5800.0	.0	5800.0	.0	.0	484.6	.0	248.6	50.4	1870.00
.47	.00	11.97	.00	.000	.015	.000	.000	1856.10	1077.26
.001128	191.	192.	191.	0	0	0	.00	52.67	1129.93

*SECNO 670.000

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

670.000	7.49	1866.49	1866.49	.00	1869.36	2.87	.95	.19	1874.27
5500.0	.0	5500.0	.0	.0	404.4	.0	253.2	51.1	1874.29
.48	.00	13.60	.00	.000	.025	.000	.000	1859.00	1084.90
.005530	476.	453.	439.	0	15	0	.00	71.51	1156.41

*SECNO 680.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

680.000	9.22	1871.82	1871.82	.00	1874.94	3.13	2.54	.08	1880.87
5500.0	.0	5500.0	.0	.0	387.6	.0	257.4	51.8	1878.44
.49	.00	14.19	.00	.000	.025	.000	.000	1862.60	1051.81
.005493	479.	462.	448.	0	11	0	.00	63.15	1114.96

*SECNO 690.000

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.42

3470 ENCROACHMENT STATIONS= 1057.3 1141.3 TYPE= 1 TARGET= 84.000
ELENCL= 1894.00 ELENCR= 1894.00

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1877.00 ELREA= 1894.00

690.000	8.87	1874.87	1873.33	.00	1876.66	1.79	1.59	.13	1877.00
5500.0	.0	5500.0	.0	.0	512.4	.0	261.8	52.5	1894.00
.50	.00	10.73	.00	.000	.025	.000	.000	1866.00	1061.55
.002727	408.	423.	434.	3	15	0	.00	75.49	1137.05

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

SPECIAL BRIDGE

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	.00	1.56	2.60	90.00	40.00	.00	1240.00	2.00	1866.00	1866.00

*SECNO 700.000

6070,LOW FLOW BY NORMAL BRIDGE

EGPRS= .000 EGLWC= 1876.664 ELLC= 1886.000 PCWSE= 1874.875 ELTRD= 1894.000

3370 NORMAL BRIDGE, NRD= 0 MIN ELTRD= 1894.00 MAX ELLC= 1886.00

700.000	9.60	1875.60	1873.33	.00	1877.06	1.45	.36	.03	1886.00
5500.0	.0	5500.0	.0	.0	568.2	.0	263.7	52.7	1886.00
.51	.00	9.68	.00	.000	.025	.000	.000	1866.00	1014.28
.002037	133.	153.	173.	3	19	0	.00	78.39	1092.68

*SECNO 710.000

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

710.000	9.42	1885.92	1885.92	.00	1888.98	3.06	1.33	.48	1887.65
5500.0	.0	5500.0	.0	.0	391.6	.0	268.4	53.4	1894.90
.52	.00	14.04	.00	.000	.025	.000	.000	1876.50	1059.17
.005417	416.	425.	467.	0	8	0	.00	64.41	1123.58

*SECNO 720.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

720.000	7.74	1889.33	1889.33	.00	1892.11	2.78	2.73	.03	1890.30
5500.0	.0	5500.0	.0	.0	411.0	.0	273.0	54.2	1897.50
.53	.00	13.38	.00	.000	.025	.000	.000	1881.59	1033.38
.005533	499.	498.	495.	0	15	0	.00	75.25	1108.63

*SECNO 730.000

3301 HV CHANGED MORE THAN HVINS

ECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	OCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

730.000	7.69	1892.79	1892.79	.00	1894.82	2.02	2.47	.08	1892.66
5500.0	1557.3	3942.7	.0	167.8	324.5	.0	278.0	55.3	1900.12
.54	9.28	12.15	.00	.025	.025	.000	.000	1885.10	989.10
.004791	485.	481.	473.	0	5	0	.00	127.21	1116.31

*SECNO 740.000

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

740.000	8.50	1897.85	1897.85	.00	1900.93	3.08	2.53	.32	1900.00
5500.0	.0	5500.0	.0	.0	390.7	.0	283.0	56.4	1905.14
.55	.00	14.08	.00	.000	.025	.000	.000	1889.35	1047.11
.005489	502.	492.	484.	0	8	0	.00	64.13	1111.24

*SECNO 750.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

750.000	8.37	1901.81	1901.81	.00	1904.64	2.83	2.17	.02	1903.79
5500.0	.0	5500.0	.0	.0	407.5	.0	286.6	57.0	1919.42
.56	.00	13.50	.00	.000	.025	.000	.000	1893.44	1049.07
.005581	362.	392.	431.	0	5	0	.00	74.23	1123.31

*SECNO 760.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

760.000	7.79	1906.02	1906.02	.00	1908.81	2.79	2.40	.00	1906.70
5500.0	.0	5500.0	.0	.0	410.3	.0	290.6	57.8	1915.90
.56	.00	13.40	.00	.000	.025	.000	.000	1898.23	1036.86
.005630	410.	428.	458.	0	9	0	.00	76.05	1112.91

*SECNO 770.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

770.000	6.57	1909.77	1909.77	.00	1912.24	2.46	2.45	.03	1914.00
5500.0	.0	5500.0	.0	.0	436.8	.0	294.8	58.6	1913.10
.57	.00	12.59	.00	.000	.025	.000	.000	1903.20	1030.05
.005652	457.	435.	419.	0	15	0	.00	90.26	1120.32

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 780.000

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 1058.7 1114.1 TYPE= 1 TARGET= 55.330
ELENCL= 1916.50 ELENCR= 1916.50

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1914.90 ELREA= 1916.50

780.000	6.72	1910.50	1910.50	.00	1913.90	3.40	.17	.28	1914.90
5500.0	.0	5500.0	.0	.0	371.9	.0	295.3	58.7	1916.50
.57	.00	14.79	.00	.000	.015	.000	.000	1903.78	1058.72
.002347	53.	49.	49.	0	8	0	.00	55.33	1114.05

SPECIAL BRIDGE

5227 DOWNSTREAM ELEV IS 1909.08 , NOT 1910.50 HYDRAULIC JUMP OCCURS DOWNSTREAM (IF LOW FLOW CONTROLS)

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	1.25	1.56	2.60	80.00	55.33	5.33	400.00	.00	1905.12	1903.78

*SECNO 790.000

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.72

CLASS B LOW FLOW

3420 BRIDGE W.S.= 1911.67 BRIDGE VELOCITY= 15.25 CALCULATED CHANNEL AREA= 327.

EGPRS	EGLWC	H3	QWEIR	QLOW	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
1915.08	1916.39	.00	0.	5500.	400.	400.	1913.12	1917.12	0.

3470 ENCROACHMENT STATIONS= 1028.6 1083.9 TYPE= 1 TARGET= 55.330
ELENCL= 1916.00 ELENCR= 1916.00

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1914.87 ELREA= 1916.00

790.000	9.63	1914.73	.00	.00	1916.39	1.66	2.49	.00	1914.87
5500.0	.0	5500.0	.0	.0	532.3	.0	296.4	58.8	1916.00
.58	.00	10.33	.00	.000	.015	.000	.000	1905.10	1028.58
.000791	108.	108.	108.	0	0	0	.00	55.33	1083.91

*SECNO 800.000

3280 CROSS SECTION 800.00 EXTENDED .05 FEET

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .53

3470 ENCROACHMENT STATIONS= 1000.0 1094.5 TYPE= 1 TARGET= 94.470
ELENCL= 1915.50 ELENCR= 1915.50

3[illegible] OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1914.21 ELREA= 1915.50

00.000	10.31	1915.17	1912.90	.00	1916.55	1.38	.13	.03	1914.21
5500.0	17.7	5482.3	.0	9.6	581.3	.0	297.6	59.0	1915.50
.58	1.84	9.43	.00	.035	.030	.000	.000	1904.86	1000.00
.002830	101.	96.	88.	2	15	0	.00	94.47	1094.47

CCHV= .100 CEHV= .300
*SECNO 810.000

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 2.02

810.000	11.29	1916.65	1914.06	.00	1916.89	.24	.23	.11	1911.33
5500.0	1697.2	2353.7	1449.1	580.4	471.5	495.9	302.2	60.0	1911.05
.59	2.92	4.99	2.92	.035	.030	.035	.000	1905.36	995.44
.000695	222.	185.	145.	3	9	0	.00	353.45	1348.89

THIS RUN EXECUTED 06OCT97 11:16:13

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HEC-2 WATER SURFACE PROFILES

Version 4.6.2; May 1991
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NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

FLOODPLAIN DELINEATION

SUMMARY PRINTOUT TABLE 100

	SECNO	EGLWC	ELLC	EGPRS	ELTRD	QPR	QWEIR	CLASS	H3	DEPTH	CWSEL	VCH	EG
*	130.000	1730.30	1727.53	1730.66	1731.43	6400.00	.00	10.00	.00	6.99	1729.52	8.55	1730.66
*	300.000	1774.61	1772.92	1774.19	1776.92	6300.00	.00	2.00	.00	6.16	1773.08	9.92	1774.61
*	370.000	1790.13	1791.68	.00	1803.16	6300.00	.00	59.00	.00	6.08	1787.76	12.29	1790.11
*	440.000	1811.23	1801.30	1818.70	1802.38	3603.15	2705.88	30.00	.00	9.55	1803.85	17.48	1808.59
*	480.000	1813.45	1808.00	1820.11	1811.30	4005.47	1830.21	30.00	.00	14.15	1813.82	8.62	1814.97
*	600.000	1846.51	1843.13	1846.40	1846.50	5780.91	.16	15.00	2.94	9.34	1844.44	11.56	1846.51
*	660.000	1867.56	1864.17	1866.09	1869.17	5800.00	.00	2.00	.00	9.24	1865.34	11.97	1867.56
	700.000	1876.66	1886.00	.00	1894.00	5500.00	.00	59.00	.00	9.60	1875.60	9.68	1877.06
*	790.000	1916.39	1913.12	1915.08	1917.12	5500.00	.00	2.00	.00	9.63	1914.73	10.33	1916.39

OPLAIN DELINEATION

SUMMARY PRINTOUT TABLE 150

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH	AREA	.01K
	10.000	.00	.00	.00	1700.33	6400.00	1708.70	1707.40	1710.19	40.17	9.77	654.99	1009.81
	20.000	488.53	.00	.00	1703.12	6400.00	1710.73	1710.04	1712.55	54.16	10.82	591.46	869.66
	30.000	498.03	.00	.00	1705.85	6400.00	1713.36	1712.99	1715.48	60.14	11.71	555.76	825.31
	40.000	491.57	.00	.00	1707.20	6400.00	1716.27	1715.79	1718.18	49.47	11.26	605.53	909.92
*	50.000	305.60	.00	.00	1708.90	6400.00	1718.36	1716.06	1719.32	25.10	7.85	815.17	1277.56
*	60.000	499.27	.00	.00	1709.94	6400.00	1719.67	1717.29	1720.20	11.93	6.46	1304.23	1852.60
*	70.000	497.95	.00	.00	1712.00	6400.00	1719.53	1719.53	1722.12	79.46	12.92	495.38	717.97
*	80.000	470.68	.00	.00	1714.38	6400.00	1723.21	1721.50	1724.56	33.39	9.33	685.96	1107.62
	90.000	482.19	.00	.00	1715.19	6400.00	1724.77	1723.80	1726.63	47.85	10.93	586.21	925.18
	100.000	295.13	.00	.00	1718.70	6400.00	1726.42	1724.67	1727.81	32.04	9.49	674.45	1130.66
*	110.000	25.69	.00	.00	1720.50	6400.00	1725.79	1725.79	1728.22	20.26	12.50	512.01	1421.91
*	120.000	90.11	.00	.00	1721.90	6400.00	1726.69	1726.69	1729.11	22.07	12.49	512.45	1362.37
*	130.000	119.69	1731.43	1727.53	1722.53	6400.00	1729.52	.00	1730.66	6.45	8.55	748.45	2519.99
	140.000	64.14	.00	.00	1722.60	6400.00	1729.45	1727.93	1730.75	8.08	9.16	698.74	2252.04
*	150.000	489.94	.00	.00	1723.53	6300.00	1729.99	1729.99	1732.17	37.37	11.84	532.17	1030.53
	160.000	501.51	.00	.00	1725.61	6300.00	1732.11	1731.56	1733.75	25.37	10.28	612.98	1250.86
*	170.000	487.26	.00	.00	1727.30	6300.00	1733.34	1733.34	1735.45	37.59	11.65	540.60	1027.52
	180.000	491.83	.00	.00	1729.60	6300.00	1735.21	1735.03	1737.18	32.61	11.26	559.45	1103.29
*	190.000	497.74	.00	.00	1732.79	6300.00	1739.49	1739.49	1741.88	36.27	12.40	508.15	1046.09
*	200.000	495.37	.00	.00	1736.70	6300.00	1742.86	1742.86	1745.31	36.03	12.55	501.99	1049.50
*	210.000	500.38	.00	.00	1737.52	6300.00	1746.83	1746.83	1749.68	35.28	13.54	465.25	1060.72
*	220.000	476.72	.00	.00	1743.96	6300.00	1751.93	1751.93	1754.61	35.78	13.15	479.23	1053.22
*	230.000	494.76	.00	.00	1750.12	6300.00	1758.40	1758.40	1761.19	35.14	13.39	470.48	1062.73
*	240.000	492.00	.00	.00	1757.43	6300.00	1762.61	1762.61	1764.88	36.68	12.07	521.97	1040.16

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH	AREA	.01K
*	250.000	58.60	.00	.00	1758.00	6300.00	1763.05	1763.05	1765.39	21.01	12.28	513.16	1374.32
*	260.000	1.00	.00	.00	1762.00	6300.00	1766.97	1766.97	1769.12	21.96	11.75	536.10	1344.52
*	270.000	21.92	.00	.00	1762.00	6300.00	1766.86	1766.86	1769.28	21.56	12.48	504.71	1356.90
*	280.000	1.00	.00	.00	1766.00	6300.00	1770.89	1770.89	1773.30	21.39	12.45	505.92	1362.04
*	290.000	14.95	.00	.00	1766.55	6300.00	1771.41	1771.41	1773.87	22.08	12.58	500.64	1340.65
*	300.000	102.75	1776.92	1772.92	1766.92	6300.00	1773.08	.00	1774.61	10.32	9.92	634.90	1960.95
	310.000	100.28	.00	.00	1767.78	6300.00	1773.02	1772.67	1774.82	16.33	10.77	584.86	1558.77
*	320.000	489.10	.00	.00	1769.24	6300.00	1775.83	1775.83	1778.13	36.49	12.17	517.70	1042.95
*	330.000	500.10	.00	.00	1771.79	6300.00	1778.86	1778.86	1781.22	36.49	12.31	511.82	1042.99
*	340.000	496.21	.00	.00	1774.37	6300.00	1781.85	1781.85	1784.18	36.70	12.24	514.52	1039.97
*	350.000	436.71	.00	.00	1776.25	6300.00	1783.84	1783.84	1786.34	35.60	12.68	496.89	1055.87
*	360.000	314.29	.00	.00	1779.67	6300.00	1786.06	1786.06	1788.58	36.01	12.72	495.11	1049.91
*	370.000	232.15	1803.16	1791.68	1781.68	6300.00	1787.76	1787.76	1790.11	36.01	12.29	512.65	1049.85
*	380.000	170.96	.00	.00	1785.68	6300.00	1793.10	1793.10	1796.62	37.53	15.06	418.21	1028.38
*	390.000	420.90	.00	.00	1787.20	6300.00	1794.92	1794.92	1798.52	37.49	15.23	413.68	1028.90
*	400.000	216.12	.00	.00	1788.60	6300.00	1796.14	1796.14	1799.60	36.96	14.93	421.85	1036.24
*	410.000	222.64	.00	.00	1789.30	6300.00	1798.24	1798.24	1801.57	33.61	14.68	438.82	1086.66
*	420.000	218.15	.00	.00	1790.86	6300.00	1800.71	1800.71	1803.49	24.36	13.54	517.22	1276.55
*	430.000	221.27	.00	.00	1793.29	6300.00	1802.81	1802.81	1807.58	26.76	17.53	359.32	1217.88
*	440.000	197.38	1802.38	1801.30	1794.30	6300.00	1803.85	1803.80	1808.59	26.47	17.48	360.40	1224.55
	450.000	163.47	.00	.00	1795.50	5800.00	1808.34	1804.77	1809.41	29.44	8.33	696.14	1068.91
	460.000	285.08	.00	.00	1797.57	5800.00	1809.29	1806.55	1810.35	36.34	8.26	702.34	962.09
*	470.000	275.07	.00	.00	1799.30	5800.00	1810.29	1810.29	1813.45	138.68	14.27	406.58	492.51
*	480.000	29.16	1811.30	1808.00	1799.67	5800.00	1813.82	.00	1814.97	31.57	8.62	672.62	1032.30
*	490.000	404.91	.00	.00	1803.66	5800.00	1815.20	1813.93	1817.13	79.68	11.16	519.90	649.77
*	500.000	467.90	.00	.00	1807.50	5800.00	1819.00	1817.86	1821.00	85.04	11.34	511.37	628.96

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH	AREA	.01K
*	510.000	413.47	.00	.00	1810.29	5800.00	1822.04	1822.04	1823.68	33.83	10.65	614.81	997.24
	520.000	477.37	.00	.00	1814.82	5800.00	1823.95	1822.70	1825.46	40.91	9.86	588.48	906.77
*	530.000	399.20	.00	.00	1817.62	5800.00	1826.78	1826.78	1829.24	83.41	12.57	461.47	635.06
*	540.000	489.72	.00	.00	1823.45	5800.00	1831.76	1831.76	1834.43	83.30	13.12	442.12	635.50
*	550.000	456.26	.00	.00	1826.66	5800.00	1836.66	1836.66	1839.20	86.00	12.80	453.18	625.44
	560.000	330.24	.00	.00	1827.85	5800.00	1839.50	1839.24	1841.81	71.79	12.20	475.41	684.51
	570.000	228.38	.00	.00	1831.69	5800.00	1841.04	1839.22	1843.02	38.60	11.28	514.15	933.54
*	580.000	1.00	.00	.00	1834.00	5800.00	1840.94	1840.94	1844.13	20.51	14.32	405.06	1280.79
*	590.000	15.77	.00	.00	1834.21	5800.00	1841.30	1841.30	1844.88	23.56	15.19	381.84	1194.84
*	600.000	93.51	1846.50	1843.13	1835.10	5800.00	1844.44	.00	1846.51	10.31	11.56	501.84	1806.12
*	610.000	215.38	.00	.00	1842.62	5800.00	1852.30	1852.30	1854.80	12.87	13.13	516.84	1616.89
*	620.000	212.31	.00	.00	1845.48	5800.00	1855.31	1855.31	1857.66	12.08	12.79	541.92	1668.78
*	630.000	221.03	.00	.00	1848.10	5800.00	1857.66	1857.66	1859.80	10.93	12.37	588.88	1754.17
*	640.000	258.21	.00	.00	1851.37	5800.00	1860.65	1860.65	1863.91	16.95	14.64	415.21	1408.60
*	650.000	211.31	.00	.00	1853.80	5800.00	1861.00	1861.00	1864.63	23.70	15.30	378.99	1191.31
*	660.000	191.78	1869.17	1864.17	1856.10	5800.00	1865.34	.00	1867.56	11.28	11.97	484.63	1726.55
*	670.000	452.82	.00	.00	1859.00	5500.00	1866.49	1866.49	1869.36	55.30	13.60	404.44	739.57
*	680.000	461.54	.00	.00	1862.60	5500.00	1871.82	1871.82	1874.94	54.93	14.19	387.58	742.12
*	690.000	422.90	.00	.00	1866.00	5500.00	1874.87	1873.33	1876.66	27.27	10.73	512.41	1053.31
	700.000	153.08	1894.00	1886.00	1866.00	5500.00	1875.60	1873.33	1877.06	20.37	9.68	568.21	1218.51
*	710.000	424.60	.00	.00	1876.50	5500.00	1885.92	1885.92	1888.98	54.17	14.04	391.63	747.29
*	720.000	498.02	.00	.00	1881.59	5500.00	1889.33	1889.33	1892.11	55.33	13.38	410.97	739.40
*	730.000	480.56	.00	.00	1885.10	5500.00	1892.79	1892.79	1894.82	47.91	12.15	492.26	794.59
*	740.000	492.38	.00	.00	1889.35	5500.00	1897.85	1897.85	1900.93	54.89	14.08	390.66	742.38
*	750.000	391.69	.00	.00	1893.44	5500.00	1901.81	1901.81	1904.64	55.81	13.50	407.50	736.20
*	760.000	428.24	.00	.00	1898.23	5500.00	1906.02	1906.02	1908.81	56.30	13.40	410.34	733.03

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH	AREA	.01K
	770.000	434.78	.00	.00	1903.20	5500.00	1909.77	1909.77	1912.24	56.52	12.59	436.79	731.56
*	780.000	49.44	.00	.00	1903.78	5500.00	1910.50	1910.50	1913.90	23.47	14.79	371.91	1135.21
*	790.000	108.02	1917.12	1913.12	1905.10	5500.00	1914.73	.00	1916.39	7.91	10.33	532.29	1955.06
*	800.000	95.80	.00	.00	1904.86	5500.00	1915.17	1912.90	1916.55	28.30	9.43	590.89	1033.90
*	810.000	185.09	.00	.00	1905.36	5500.00	1916.65	1914.06	1916.89	6.95	4.99	1547.86	2086.34

FLOODPLAIN DELINEATION

SUMMARY PRINTOUT TABLE 150

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
	10.000	6400.00	1708.70	.00	.00	3.70	119.45	.00
	20.000	6400.00	1710.73	.00	2.03	.00	114.06	488.53
	30.000	6400.00	1713.36	.00	2.63	.00	125.10	498.03
	40.000	6400.00	1716.27	.00	2.91	.00	154.35	491.57
*	50.000	6400.00	1718.36	.00	2.09	.00	142.96	305.60
*	60.000	6400.00	1719.67	.00	1.31	.00	396.87	499.27
*	70.000	6400.00	1719.53	.00	-.14	.00	97.17	497.95
*	80.000	6400.00	1723.21	.00	3.68	.00	115.23	470.68
	90.000	6400.00	1724.77	.00	1.56	.00	110.73	482.19
	100.000	6400.00	1726.42	.00	1.65	.00	104.36	295.13
	110.000	6400.00	1725.79	.00	-.62	.00	106.34	25.69
*	120.000	6400.00	1726.69	.00	.90	.00	107.00	90.11
*	130.000	6400.00	1729.52	.00	2.83	.00	107.00	119.69
	140.000	6400.00	1729.45	.00	-.07	.00	115.91	64.14
*	150.000	6300.00	1729.99	.00	.54	.00	124.87	489.94
	160.000	6300.00	1732.11	.00	2.12	.00	132.85	501.51
*	170.000	6300.00	1733.34	.00	1.23	.00	130.75	487.26
	180.000	6300.00	1735.21	.00	1.87	.00	127.87	491.83
*	190.000	6300.00	1739.49	.00	4.28	.00	108.37	497.74
*	200.000	6300.00	1742.86	.00	3.37	.00	104.30	495.37
*	210.000	6300.00	1746.83	.00	3.97	.00	83.71	500.38
*	220.000	6300.00	1751.93	.00	5.10	.00	91.27	476.72
*	230.000	6300.00	1758.40	.00	6.47	.00	86.22	494.76
	240.000	6300.00	1762.61	.00	4.21	.00	116.82	492.00

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
*	250.000	6300.00	1763.05	.00	.43	.00	110.08	58.60
*	260.000	6300.00	1766.97	.00	3.93	.00	128.59	1.00
*	270.000	6300.00	1766.86	.00	-.12	.00	104.80	21.92
*	280.000	6300.00	1770.89	.00	4.03	.00	105.61	1.00
*	290.000	6300.00	1771.41	.00	.52	.00	102.93	14.95
*	300.000	6300.00	1773.08	.00	1.67	.00	103.02	102.75
	310.000	6300.00	1773.02	.00	-.06	.00	131.04	100.28
*	320.000	6300.00	1775.83	.00	2.81	.00	114.58	489.10
*	330.000	6300.00	1778.86	.00	3.04	.00	110.82	500.10
*	340.000	6300.00	1781.85	.00	2.99	.00	112.87	496.21
*	350.000	6300.00	1783.84	.00	1.99	.00	99.87	436.71
*	360.000	6300.00	1786.06	.00	2.22	.00	100.08	314.29
*	370.000	6300.00	1787.76	.00	1.70	.00	110.15	232.15
*	380.000	6300.00	1793.10	.00	5.34	.00	60.09	170.96
*	390.000	6300.00	1794.92	.00	1.82	.00	58.10	420.90
*	400.000	6300.00	1796.14	.00	1.21	.00	60.99	216.12
*	410.000	6300.00	1798.24	.00	2.10	.00	75.96	222.64
*	420.000	6300.00	1800.71	.00	2.47	.00	149.83	218.15
*	430.000	6300.00	1802.81	.00	2.10	.00	37.75	221.27
*	440.000	6300.00	1803.85	.00	1.04	.00	37.75	197.38
	450.000	5800.00	1808.34	.00	4.49	.00	76.55	163.47
	460.000	5800.00	1809.29	.00	.95	.00	93.66	285.08
*	470.000	5800.00	1810.29	.00	1.00	.00	64.43	275.07
*	480.000	5800.00	1813.82	.00	3.53	.00	71.96	29.16
*	490.000	5800.00	1815.20	.00	1.38	.00	77.64	404.91
*	500.000	5800.00	1819.00	.00	3.81	.00	79.43	467.90

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
*	510.000	5800.00	1822.04	.00	3.03	.00	205.18	413.47
	520.000	5800.00	1823.95	.00	1.92	.00	105.06	477.37
*	530.000	5800.00	1826.78	.00	2.83	.00	95.65	399.20
*	540.000	5800.00	1831.76	.00	4.97	.00	84.49	489.72
*	550.000	5800.00	1836.66	.00	4.90	.00	92.74	456.26
	560.000	5800.00	1839.50	.00	2.85	.00	90.56	330.24
	570.000	5800.00	1841.04	.00	1.54	.00	64.87	228.38
*	580.000	5800.00	1840.94	.00	-.10	.00	64.22	1.00
*	590.000	5800.00	1841.30	.00	.36	.00	53.84	15.77
*	600.000	5800.00	1844.44	.00	3.13	.00	53.84	93.51
*	610.000	5800.00	1852.30	.00	7.87	.00	131.09	215.38
*	620.000	5800.00	1855.31	.00	3.01	.00	141.80	212.31
*	630.000	5800.00	1857.66	.00	2.34	.00	153.98	221.03
*	640.000	5800.00	1860.65	.00	3.00	.00	66.64	258.21
*	650.000	5800.00	1861.00	.00	.34	.00	52.67	211.31
*	660.000	5800.00	1865.34	.00	4.34	.00	52.67	191.78
*	670.000	5500.00	1866.49	.00	1.15	.00	71.51	452.82
*	680.000	5500.00	1871.82	.00	5.33	.00	63.15	461.54
*	690.000	5500.00	1874.87	.00	3.06	.00	75.49	422.90
	700.000	5500.00	1875.60	.00	.73	.00	78.39	153.08
*	710.000	5500.00	1885.92	.00	10.31	.00	64.41	424.60
*	720.000	5500.00	1889.33	.00	3.42	.00	75.25	498.02
*	730.000	5500.00	1892.79	.00	3.46	.00	127.21	480.56
*	740.000	5500.00	1897.85	.00	5.06	.00	64.13	492.38
*	750.000	5500.00	1901.81	.00	3.96	.00	74.23	391.69
*	760.000	5500.00	1906.02	.00	4.21	.00	76.05	428.24

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
*	770.000	5500.00	1909.77	.00	3.75	.00	90.26	434.78
*	780.000	5500.00	1910.50	.00	.73	.00	55.33	49.44
*	790.000	5500.00	1914.73	.00	4.23	.00	55.33	108.02
*	800.000	5500.00	1915.17	.00	.44	.00	94.47	95.80
*	810.000	5500.00	1916.65	.00	1.48	.00	353.45	185.09

SUMMARY OF ERRORS AND SPECIAL NOTES

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WARNING SECNO=     50.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=     60.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO=     70.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=     70.000  PROFILE=  1  MINIMUM SPECIFIC ENERGY

WARNING SECNO=     80.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO=    110.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=    110.000  PROFILE=  1  MINIMUM SPECIFIC ENERGY

CAUTION SECNO=    120.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=    120.000  PROFILE=  1  MINIMUM SPECIFIC ENERGY

CAUTION SECNO=    130.000  PROFILE=  1  HYDRAULIC JUMP D.S.
WARNING SECNO=    130.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO=    150.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=    150.000  PROFILE=  1  MINIMUM SPECIFIC ENERGY

CAUTION SECNO=    170.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=    170.000  PROFILE=  1  MINIMUM SPECIFIC ENERGY

CAUTION SECNO=    190.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=    190.000  PROFILE=  1  MINIMUM SPECIFIC ENERGY

CAUTION SECNO=    200.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=    200.000  PROFILE=  1  MINIMUM SPECIFIC ENERGY

CAUTION SECNO=    210.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=    210.000  PROFILE=  1  MINIMUM SPECIFIC ENERGY

CAUTION SECNO=    220.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=    220.000  PROFILE=  1  MINIMUM SPECIFIC ENERGY

CAUTION SECNO=    230.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=    230.000  PROFILE=  1  MINIMUM SPECIFIC ENERGY

CAUTION SECNO=    240.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=    240.000  PROFILE=  1  MINIMUM SPECIFIC ENERGY

CAUTION SECNO=    250.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=    250.000  PROFILE=  1  MINIMUM SPECIFIC ENERGY

CAUTION SECNO=    260.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=    260.000  PROFILE=  1  MINIMUM SPECIFIC ENERGY

CAUTION SECNO=    270.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=    270.000  PROFILE=  1  MINIMUM SPECIFIC ENERGY
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[redacted]ON SECNO= 280.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 280.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 290.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 290.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 300.000 PROFILE= 1 HYDRAULIC JUMP D.S.
WARNING SECNO= 300.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO= 320.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 320.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 330.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 330.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 340.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 340.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 350.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 350.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 360.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 360.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CA[redacted]TION SECNO= 370.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
[redacted]ON SECNO= 370.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 380.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 380.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 390.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 390.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 400.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 400.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 410.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 410.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 420.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 420.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 430.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 430.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 440.000 PROFILE= 1 PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 440.000 PROFILE= 1 WSEL ASSUMED BASED ON MIN DIFF
CAUTION SECNO= 440.000 PROFILE= 1 20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO= 440.000 PROFILE= 1 HYDRAULIC JUMP D.S.

CA[redacted]TION SECNO= 470.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
[redacted]ON SECNO= 470.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

WARNING SECNO= 480.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

[redacted]NG SECNO= 490.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO= 510.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 510.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 530.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 530.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 540.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
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CAUTION SECNO= 590.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 590.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 600.000 PROFILE= 1 HYDRAULIC JUMP D.S.
WARNING SECNO= 600.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO= 610.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 610.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

[redacted]ION SECNO= 620.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 620.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 630.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 630.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 640.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 640.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 650.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 650.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 660.000 PROFILE= 1 HYDRAULIC JUMP D.S.
WARNING SECNO= 660.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO= 670.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 670.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 680.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 680.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

WARNING SECNO= 690.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO= 710.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 710.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

[redacted]TION SECNO= 720.000 PROFILE= 1 CRITICAL DEPTH ASSUMED

CAUTION SECNO= 720.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 730.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 730.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 740.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 740.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 750.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 750.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 760.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 760.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 770.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 770.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 780.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 780.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

CAUTION SECNO= 790.000 PROFILE= 1 HYDRAULIC JUMP D.S.
WARNING SECNO= 790.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 800.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 810.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

BASE3-4.D2

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**********************************************
*  HEC-2 WATER SURFACE PROFILES              *
*                                            *
*  Version   4.6.2;  May 1991                *
*                                            *
*  RUN DATE    06OCT97    TIME   11:18:07    *
**********************************************
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**************************************
*  U.S. ARMY CORPS OF ENGINEERS      *
*  HYDROLOGIC ENGINEERING CENTER     *
*  609 SECOND STREET, SUITE D        *
*  DAVIS, CALIFORNIA 95616-4687      *
*          (916) 756-1104            *
**************************************
```

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X     X  XXXXXXX   XXXXX              XXXXX
X     X  X        X     X           X     X
X     X  X        X                       X
XXXXXXX  XXXX     X          XXXXX    XXXXX
X     X  X        X                  X
X     X  X        X     X            X
X     X  XXXXXXX  XXXXX              XXXXXXX
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THIS RUN EXECUTED 06OCT97 11:18:09

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**************************************
 HEC-2 WATER SURFACE PROFILES

 Version  4.6.2;  May 1991
**************************************


T1      550.032
T2      FLAMINGO WASH FIS RESTUDY
T3      FLOODPLAIN DELINEATION
T4      FILES: BASE3-4.DWG, BASE3-4.D2
T4      STARTING WSE = CRITICAL DEPTH
T4      SUPERCRITICAL RUN
T4      CONCRETE CHANNEL LINING BETWEEN D.I. ROAD & MOJAVE ROAD

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

                2                   1        -1                            5800   1860.44

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

     -1                  -1                                      -2        -6

J3  VARIABLE CODES FOR SUMMARY PRINTOUT

    150                 100

NC    0.02      0.02      0.015     0.1       0.3
X1     640        19    1026.88   1079.43    251.59    262.14    258.21
GR  1864.5      1000    1864.16   1004.77      1864   1005.12      1862    1009.4      1860   1013.41
GR  1858.6   1016.12    1858.09   1026.88      1858   1027.05      1856   1030.75      1854   1034.43
GR    1852   1038.12    1851.39   1039.25   1851.37   1067.22      1852   1068.01      1854   1070.51
GR    1856      1073       1858   1075.48      1860   1077.94   1861.23   1079.43

NC    0.02      0.02      0.015
X1     630        18       1031   1084.55    229.09    213.86    221.03
GR  1861.2      1000       1860   1004.03   1858.27   1009.63      1858   1010.62      1856   1018.67
GR  1855.9   1018.82    1855.06      1031      1854   1032.96      1852   1036.68      1850   1040.45
GR  1848.1   1044.02    1848.28    1071.6      1850   1074.89      1852   1078.71      1854   1082.53
GR    1855   1084.55       1856   1129.14      1857   1165.99

NC    0.02      0.02      0.015
X1     620        20    1033.45   1086.27    223.64    202.43    212.31
GR  1859.3      1000       1858    1007.7   1857.16   1012.48      1856   1018.28   1855.25   1022.06
GR  1855.4   1033.45       1854   1035.35      1852    1037.9      1850   1040.44      1848   1042.97
GR    1846   1045.49    1845.48   1046.14   1845.66   1075.97      1846   1076.49      1848   1079.51
GR    1850   1082.53       1852   1085.57   1852.46   1086.27      1854   1135.67   1855.53   1176.03
```

N	0.02	0.02	0.015							
X1	610	20	1083.2	1136.14	230.78	201.73	215.38			
X3	10			1061.48	1853	1207.54	1853			
GR	1851.7	1000	1851.08	1029.96	1852	1046.46	1852.83	1061.48	1852.52	1068.39
GR	1852	1080.06	1851.91	1083.2	1850	1085.83	1848	1088.59	1846	1091.36
GR	1844	1094.17	1842.71	1095.99	1842.62	1124.12	1844	1126.53	1846	1130
GR	1848	1133.45	1849.56	1136.14	1850	1155.27	1852	1197.8	1852.45	1207.54
NC	0.02	0.02	0.015							
X1	600	15	1081.85	1135.69						
X3	10			1081.85	1848	1135.69	1848			
GR	1851	1000	1850	1003.75	1848	1011.09	1847.6	1012.57	1847.64	1032.47
GR	1848	1035.82	1849.27	1065.44	1848	1070.71	1847.2	1074.22	1846	1081.85
GR	1835.1	1081.85	1835.1	1135.69	1847.56	1135.69	1847.68	1152.6	1848	1170.43

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	OLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*PROF 1

CRITICAL DEPTH TO BE CALCULATED AT ALL CROSS SECTIONS
ALLOWABLE ERROR FOR CRITICAL DEPTH DETERMINATION (ALLDC) = 2.000 PERCENT OF THE DEPTH

CCHV= .100 CEHV= .300
*SECNO 640.000
3720 CRITICAL DEPTH ASSUMED

640.000	9.27	1860.64	1860.64	1860.44	1863.91	3.27	.00	.00	1858.09
5800.0	144.5	5655.5	.0	28.7	385.3	.0	.0	.0	1861.23
.00	5.04	14.68	.00	.020	.015	.000	.000	1851.37	1012.14
.001710	0.	0.	0.	0	7	0	.00	66.57	1078.71

*SECNO 630.000

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 2.00

630.000	6.51	1854.61	1857.62	.00	1862.65	8.04	.78	.48	1855.06
5800.0	.0	5800.0	.0	.0	254.9	.0	2.0	.4	1855.00
.00	.00	22.75	.00	.000	.015	.000	.000	1848.10	1031.84
.006841	252.	258.	262.	9	8	0	.00	51.91	1083.75

*SECNO 620.000

3301 HV CHANGED MORE THAN HVINS

620.000	6.31	1851.79	1855.32	.00	1860.94	9.15	1.60	.11	1855.40
5800.0	.0	5800.0	.0	.0	238.9	.0	3.2	.6	1852.46
.01	.00	24.27	.00	.000	.015	.000	.000	1845.48	1038.17
.007680	229.	221.	214.	10	17	0	.00	47.08	1085.25

*SECNO 610.000

3301 HV CHANGED MORE THAN HVINS

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

3470 ENCROACHMENT STATIONS= 1061.5 1207.5 TYPE= 1 TARGET= 146.060
ELENCL= 1853.00 ELENCR= 1853.00

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1851.91 ELREA= 1849.56

610.000	6.01	1848.63	1852.30	.00	1859.02	10.39	1.79	.12	1851.91
5800.0	.0	5800.0	.0	.0	224.2	.0	4.4	.8	1849.56
.01	.00	25.86	.00	.000	.015	.000	.000	1842.62	1087.71
.009304	224.	212.	202.	9	14	0	.00	46.85	1134.55

*SECNO 600.000

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.69

3470 ENCROACHMENT STATIONS= 1081.8 1135.7 TYPE= 1 TARGET= 53.840
ELENCL= 1848.00 ELENCR= 1848.00

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 1846.00 ELREA= 1848.00

600.000	3.26	1838.36	1842.19	.00	1855.21	16.85	3.16	.65	1846.00
5800.0	.0	5800.0	.0	.0	176.1	.0	5.4	1.1	1848.00
.01	.00	32.94	.00	.000	.015	.000	.000	1835.10	1081.85
.026536	231.	215.	202.	6	11	0	.00	53.84	1135.69

THIS RUN EXECUTED 060CT97 11:18:39

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HEC-2 WATER SURFACE PROFILES

Version 4.6.2; May 1991
****

NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

FLOODPLAIN DELINEATION

SUMMARY PRINTOUT TABLE 100

SECNO	EGLWC	ELLC	EGPRS	ELTRD	QPR	QWEIR	CLASS	H3	DEPTH	CWSEL	VCH	EG

F[redacted]LAIN DELINEATION

SUMMARY PRINTOUT TABLE 150

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH	AREA	.01K
*	640.000	.00	.00	.00	1851.37	5800.00	1860.64	1860.64	1863.91	17.10	14.68	413.92	1402.59
*	630.000	258.21	.00	.00	1848.10	5800.00	1854.61	1857.62	1862.65	68.41	22.75	254.90	701.25
	620.000	221.03	.00	.00	1845.48	5800.00	1851.79	1855.32	1860.94	76.80	24.27	238.94	661.84
	610.000	212.31	.00	.00	1842.62	5800.00	1848.63	1852.30	1859.02	93.04	25.86	224.25	601.29
*	600.000	215.38	.00	.00	1835.10	5800.00	1838.36	1842.19	1855.21	265.36	32.94	176.07	356.05

PLAIN DELINEATION

SUMMARY PRINTOUT TABLE 150

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
*	640.000	5800.00	1860.64	.00	.00	.20	66.57	.00
*	630.000	5800.00	1854.61	.00	-6.03	.00	51.91	258.21
	620.000	5800.00	1851.79	.00	-2.82	.00	47.08	221.03
	610.000	5800.00	1848.63	.00	-3.15	.00	46.85	212.31
*	600.000	5800.00	1838.36	.00	-10.27	.00	53.84	215.38

SUMMARY OF ERRORS AND SPECIAL NOTES

CAUTION SECNO= 640.000 PROFILE= 1 CRITICAL DEPTH ASSUMED

WARNING SECNO= 630.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 600.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

ELEVATION REFERENCE MARKS

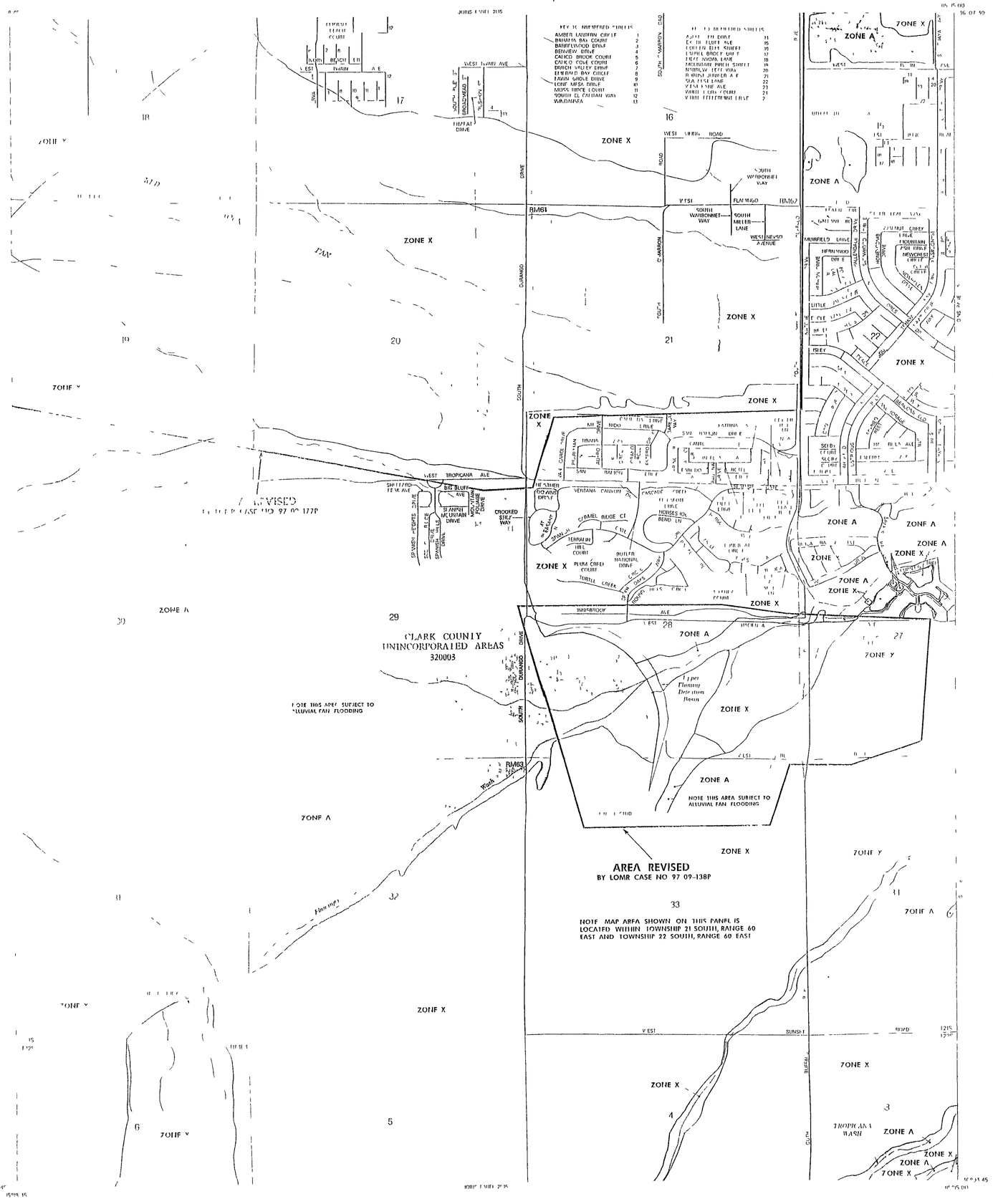
REFERENCE MARK	ELEVATION (FEET NGVD)	DESCRIPTION OF LOCATION
RM61	2551.32	BM C105W16 railroad spike on power pole #15/11. Pole is 50 feet south and 94 feet from the intersection of Flamingo Road and Pecos Drive.
RM62	2446.50	BM C105W15 Concrete nail in AC pavement at the intersection of Flamingo Road and Rainbow Drive. Section Corner
RM63	2484.15	Township 21 South, Range 61 East, BM C105W32/RM63 brass cap, large rock mound, 8 feet in 1 foot road running north and east of Section Corner
RM64	2588.01	Township 21 South Range 60 East BM C105W12 BLM brass cap, 1.20 feet north of flagpole in 1 foot large rock mound, Section Corner

KEY TO NUMBERED SHEETS

AMBER LAUREN CIRCLE	1
BAHAMA BAY COURT	2
BARRELWOOD DRIVE	3
BENVIEW DRIVE	4
CALICO BROOK COURT	5
CALICO COVE COURT	6
DRIFTWAY DRIVE	7
EDGEWOOD BAY CIRCLE	8
FAWN GROVE DRIVE	9
LONE MESA DRIVE	10
MOSS RIDGE COURT	11
SOUTH EL CAPITAN WAY	12
WINDAWREA	13

DETACHED PANELS

ASPEN FEN DRIVE	11
EDEN ELOISE AVE	15
EDITH ELLA STREET	95
FLORAL BROOK DRIVE	17
FREE WOMAN LANE	18
MOUNTAIN PARK STREET	19
NARROW LEAF WAY	20
RUNNING DEER AVE	21
SEA MIST LANE	22
VERA MAE AVE	23
WHITE FEATHER COURT	24
WHITE FEATHERMINT COURT	7



LEGEND

SPECIAL FLOOD HAZARD AREAS INUNDATED BY 100 YEAR FLOOD

- ZONE A — No base flood elevations determined
- ZONE AE — Base flood elevations determined
- ZONE AH — Flood depths of 1 to 3 feet (usually areas of ponding); base flood elevations determined
- ZONE AO — Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined for areas of alluvial fan flooding; velocities also determined
- ZONE A99 — To be protected from 100-year flood by federal flood protection system under construction; no base flood elevations determined
- ZONE V — Coastal flood with velocity hazard (wave action); no base flood elevations determined
- ZONE VE — Coastal flood with velocity hazard (wave action); base flood elevations determined

FLOODWAY AREAS IN ZONE AE

OTHER FLOOD AREAS

- ZONE X — Areas determined to be outside 500-year floodplain
- ZONE D — Areas in which flood hazards are undetermined

UNDEVELOPED COASTAL BARRIERS

OTHER AREAS

- ZONE X — Areas determined to be outside 500-year floodplain
- ZONE D — Areas in which flood hazards are undetermined

UNDEVELOPED COASTAL BARRIERS

OTHERWISE PROTECTED AREAS (OPAs)

Coastal barrier areas and other areas located within or adjacent to Special Flood Hazard Areas

- Flood Boundary
- Floodway Boundary
- Zone D Boundary
- Boundary Dividing Special Flood Hazard Zones and Boundary Dividing Areas of Different Coastal Base Flood Elevations within Special Flood Hazard Zones
- 513 — Base Flood Elevation Line; Elevation in Feet [Referenced to Mean Sea Level Datum]
- (D) — (D) — Cross Section Line
- 987 — Base Flood Elevations in Feet [Referenced to Mean Sea Level Datum]
- A17 — Elevation Reference Mark
- M2 — River Mile
- 97°07'30", 32°22'30" — Horizontal Coordinates Based on North American Datum of 1927 (NAD 27) in Decimal Degrees

NOTES

This panel contains no single National Flood Insurance Program flood risk zone that accurately represents all flood risk conditions for the entire area shown on this panel. Please refer to the separately printed Map Index for an overview map of the county showing the layout of adjacent panels, and the Community Map History table located in the Publication Info...

Coastal Base Flood Elevations shown on this map apply only landward of 0.0 North American Vertical Datum (NAVD). Users should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the floodways were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by flood control structures. Refer to the section titled "Protected Areas" in the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The projection used in the preparation of this map was Universal Transverse Mercator (UTM) zone 11. The horizontal datum was NAD 27, GRS 1866 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of adjacent FIRMs may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the National Geodetic Vertical Datum of 1929 (NGVD). These flood elevations must be compared to structure and ground elevations referenced to the same vertical datum. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and North American Vertical Datum of 1988, visit the National Geodetic Survey website at www.ngs.noaa.gov or contact the National Geodetic Survey at the following address:

NGS INFORMATION SERVICES
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, MD 20910-3282
(301) 713-3242

To obtain current elevation, description, and/or location information for bench marks shown on this map, please contact the Information Services Branch of the National Geodetic Survey at (301) 713-3242, or visit its website at www.ngs.noaa.gov.

Base map information shown on this FIRM was derived from digital orthophotography at a scale of 1:12,000 from aerial photography dated 1995.

This map reflects more detailed and up-to-date stream channel configurations and floodplain delineations than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables in the Flood Insurance Study report for this jurisdiction may reflect stream channel distances that differ from what is shown on this map.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed Map Index for an overview map of the county showing the layout of adjacent panels, and the Community Map History table located in the Publication Info... section of this FIRM panel for the current map number for each community shown.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
August 16, 1995
EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

For communities with multiple ongoing Special Flood Hazard Areas, this Panel Map Number is the sequential number assigned to the initial countywide mapping and should be used for insurance purposes. Subsequent Panels, if any, for each community may be identified by consulting the Community Map History table located in the Publication Info... section of this FIRM panel.

SCALE 1" = 1,000'

NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP

CLARK COUNTY, NEVADA AND INCORPORATED AREAS

PANEL 2535 OF 4090
(SEE MAP INDEX FOR PANELS NOT PRINTED)

COMMUNITY	NUMBER	PANEL	SUFFIX
CLARK COUNTY UNINCORPORATED AREAS	320003	2535	D

REVISED TO REFLECT LOMR DATED
NOV 14 1997

MAP NUMBER
32003C2535 D

EFFECTIVE DATE:
AUGUST 16,1995