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Letter of Map Revision

Hard Rock Casino Hotel

Prepared for:
Morgan's Hotel Group

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092564004

Kimley-Horn
and Associates, Inc.

LETTER OF MAP REVISION

FOR

Hard Rock Casino Hotel

Prepared for:

Morgan's Hotel Group
475 10th Avenue
New York, New York 10019

Prepared by:

Kimley-Horn and Associates, Inc.
2080 East Flamingo Road
Suite 210
Las Vegas, NV 89119
(702) 734-5666

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092564004

April 2, 2007

Mr. Jeff Jensen
Clark County Department of Development Services
Civil Engineering Division
P.O Box 551799
Las Vegas, NV 89155-1799

RE: Hard Rock Casino Hotel – Application for a Letter of Map Revision
KHA Project No. 092564004

Dear Mr. Jensen,

Please find the attached technical data package being submitted on behalf of Morgan's Hotel Group for the above referenced project in Clark County, Nevada. The technical data package has been prepared for submittal to the Federal Emergency Management Agency (FEMA) in order to obtain a Letter of Map Revision (LOMR). The application package is being submitted to your office to gain community concurrence for the LOMR submittal.

This particular LOMR is being prepared to establish accurate base flood elevations along the portion of the Tropicana Wash-Central Branch that falls within the existing Hard Rock Casino Hotel site. Subsequent to the original construction of the Hard Rock Casino Hotel, no LOMR was prepared and submitted to FEMA. The LOMR is based only upon existing conditions. Enclosed with this letter is a technical data package that includes hydraulic modeling, completed application forms, exhibits depicting the existing conditions and copies of the data files used in the hydraulic modeling. A narrative is also included to explain modeling procedures used for this particular submittal.

If any data has been omitted or if any additional data is needed, please feel free to contact me. Any requests for additional data shall be forwarded in a timely fashion.

Sincerely,
KIMLEY-HORN & ASSOCIATES, INC.

Thomas Kelley, P.E., CPESC
Project Manager

Enclosures: LOMR Application Package

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REFERENCES
FIS for Clark County and Incorported Areas
Technical Drainage Study for the Premier Golf Course

This document, together with the concepts and designs presented herein, as an instrument of service, is intended only for the specific purpose and client for which it was prepared. Reuse of and improper reliance on this document without written authorization and adaptation by Kimley-Horn and Associates, Inc. shall be without liability to Kimley-Horn and Associates, Inc.

1 Introduction

1.1 Scope

Kimley-Horn and Associates, Inc. has been contracted by Morgan's Hotel Group, to prepare a Letter of Map Revision (LOMR) for a portion of the Tropicana Wash-Central Branch (hereafter referred to as Central Branch) located within the Hard Rock Casino Hotel Property in Clark County, Nevada. The purpose of the LOMR is to update the effective Flood Insurance Rate Map (FIRM) to include the results of the existing box culvert system that lies underneath the existing Hard Rock Casino Hotel structure. This LOMR also incorporates hydrologic design elements associated in an upstream Technical Drainage Study that was approved locally by both Clark County Development Services and Clark County Regional Flood Control District (CCRFCD).

The MT-2 LOMR application forms with community concurrence signature page can be found in **Appendix A.**

1.2 Project Site

The affected portion of the Central Branch can be found on FEMA Flood Insurance Rate Map (FIRM) Panel 32003C2557E, dated September 27, 2002. More specifically the site is located at the northwest corner of Paradise Road and Harmon Avenue in Clark County, Nevada. Copies of both the effective FIRM and annotated versions of the FIRM can be found in **Appendix B.**

2 Technical Analysis

2.1 Hydrology

All hydrologic information used in the hydraulic modeling for the Hard Rock Casino Hotel LOMR was referenced from the effective FIS for Clark County and Unincorporated Areas, the 2002; the Clark County Regional Flood Control District (CCRFCD) *Master Plan Update* (MPU), September 2002; and the Technical Drainage Study (TDS) for Premier Park Golf Course (HTE# 03-7719) dated March 12, 2003.

The effective 100 year flowrate within the Central Branch at this site as mentioned in the above referenced FIS is 5,300 cfs. This flowrate includes the 3,320 cfs upstream of the confluence with the Airport Wash and approximately 1,980 cfs from the Airport Wash.

The Premier Golf Course TDS represents the most up-to-date hydrologic analysis for this particular area. As mentioned in the Premier Golf Course TDS, the 100 year flow from the Airport Wash has been reduced to 1,153 cfs. This flowrate represents the current capacity of the Airport Wash. This change in flowrate combined with the effective flowrate of the Central Branch reflects the 4,473 cfs that was used in the enclosed existing conditions hydraulic modeling.

Pertinent portions of the FIS and a complete copy of the Technical Drainage Study for the Premier Park Golf Course are located in **Appendix D**.

2.2 Effective Hydraulics

The effective hydraulic model for used for this submittal was acquired from CCRFCD. All elevation data used in the effective model was at a different datum then the current FIS information. All effective modeling reflect elevation data in NGVD. The FIS current lists all information in NAVD. A conversion calculation has been provided for in **Appendix C.**

2.3 Existing Hydraulics

Within the confines of the Hard Rock Casino site, a reinforced concrete box culvert system was constructed. This box culvert has existed for over a decade. The Hard Rock culvert adjoins the adjacent culvert system that begins along Paradise Road and continues off site to the east. Due to the length of time since the project was constructed, no detailed construction plans can be located. The enclosed workmaps include surveyed invert information as well as dimension information.

The original concrete box culvert under Paradise Road was analyzed using HY-8. In an effort to more accurate analysis the multiple internal transitions of the overall culvert system, WSPG was used for analysis. The starting water surface elevation of the WSPG model was based upon the effective water surface elevation indicated in the effective HEC-2 model. The results of the WSPG model were then used to set the elevations of the culvert within the existing conditions HEC-2 model. This was performed using X5 cards.

All cross sections with the exception of cross section 60.491 reflect topographic information provided for in the effective model. The existing conditions model enclosed focuses only upon the area of revision. All starting water surface elevations in the HEC-2 model were taken directly from the effective modeling. The results of the existing HEC-2 analysis reflect tie-ins upstream and downstream of the site within the required 0.5 feet. The models tie-in downstream along FIS section H and upstream along FIS section P. The floodplain in the area between FIS section K and H is now located within the channel section as indicated by comparing the results of the existing conditions model and the cross section geometry in the model. An exhibit reflecting the FIS section J has been provided in **Appendix C.**

A summary of the results from all the associative hydraulic models is provided in **Appendix C.** The results indicate the comparison between the effective and existing base flood elevations and the associated datum conversion information.

2.4 CHECK-2 Analysis

The HEC-2 analysis referenced above was analyzed using FEMA's CHECK-RAS software. Results of the analysis can be found in **Appendix C.** The results reflect that proper modeling methods were used to establish the hydraulic models.

2.5 Manning's Coefficients

Manning's Coefficients used in the HEC-2 analysis remain identical to those used in the effective modeling.

3 Mapping

3.1 Survey Information

The topographic information used for the development of the hydraulic modeling for the Hard Rock Casino Hotel was taken from a survey performed by Horizon Surveying, dated March 19, 2007.

3.2 FEMA FIRM Panel

A copy of the FIRM Panel 32003C2557E, dated September 27, 2002 and revised to reflect a LOMR dated October 24, 2006, can be found in **Appendix B.**

3.3 Annotated FEMA FIRM Panel

An annotated version of FIRM Panel 32003C2557E, dated September 27, 20022002 and revised to reflect a LOMR dated October 24, 2006, can be found in **Appendix B.**

3.4 Additional Information

Digital copies of all the hydraulic modeling have been provided on a CD-ROM located in **Appendix C**. The models included with this LOMR include the following:

- Effective HEC-2 modeling as taken from Clark County Regional Flood Control
- WSPG modeling of the existing box culvert system
- Revised HEC-2 modeling that reflect the addition of the existing culvert data from the WSPG modeling

Kimley-Horn and Associates, Inc.

Appendix A
FEMA LOMR FORMS

Overview and Concurrence Form
Riverine Hydrology and Hydraulics Form
Riverine Structures Form

FEDERAL EMERGENCY MANAGEMENT AGENCY

OVERVIEW & CONCURRENCE FORM

O.M.B No. 3067-0148
Expires September 30, 2005

PAPERWORK BURDEN DISCLOSURE NOTICE

Public reporting burden for this form is estimated to average 1 hour per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing, reviewing, and submitting the form. You are not required to respond to this collection of information unless a valid OMB control number appears in the upper right corner of this 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, SW, Washington DC 20472, Paperwork Reduction Project (3067-0148). Submission of the form is required to obtain or retain benefits under the National Flood Insurance Program. **Please do not send your completed survey to the above address.**

A. REQUESTED RESPONSE FROM FEMA

This request is for a (check one):

☐ CLOMR: A letter from FEMA commenting on whether a proposed project, if built as proposed, would justify a map revision, or proposed hydrology changes (See 44 CFR Ch. 1, Parts 60, 65 & 72).

☒ LOMR: A letter from FEMA officially revising the current NFIP map to show the changes to floodplains, regulatory floodway or flood elevations. (See Parts 60 & 65 of the NFIP Regulations.)

B. OVERVIEW

1. The NFIP map panel(s) affected for all impacted communities is (are):

Community No.	Community Name	State	Map No.	Panel No.	Effective Date
Ex: 480301	City of Katy	TX	480301	0005D	02/08/83
480287	Harris County	TX	48201C	0220G	09/28/90
0003	Clark County, Unincorporated Areas	NV	32003C	2557E	09/27/02

2. Flooding Source: Tropicana Wash - Central Branch

3. Project Name/Identifier: Hard Rock Hotel Casino

4. FEMA zone designations affected: AE (choices: A, AH, AO, A1-A30, A99, AE, AR, V, V1-V30, VE, B, C, D, X)

5. Basis for Request and Type of Revision:

   a. The basis for this revision request is (check all that apply)

   ☒ Physical Change ☒ Improved Methodology/Data

   ☒ Regulatory Floodway Revision ☐ Other (Attach Description)

   Note: A photograph and narrative description of the area of concern is not required, but is very helpful during review.

   b. The area of revision encompasses the following types of flooding and structures (check all that apply)

Types of Flooding:	☒ Riverine	☐ Coastal	☐ Shallow Flooding (e.g., Zones AO and AH)
	☐ Alluvial fan	☐ Lakes	☐ Other (Attach Description)
Structures:	☐ Channelization	☐ Levee/Floodwall	☒ Bridge/Culvert
	☐ Dam	☐ Fill	☐ Other, Attach Description

C. REVIEW FEE

Has the review fee for the appropriate request category been included? ☒ Yes Fee amount: $4,400.00

☐ No, Attach Explanation

Please see the FEMA Web site at http://www.fema.gov/plan/prevent/fhm/frm_fees.shtm for Fee Amounts and Exemptions.

D. SIGNATURE

All documents submitted in support of this request are 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: RICHARD SZYMANSKI	Company: HRHH HOTEL/CASINO LLC	
Mailing Address: MORGANS HOTEL GROUP 475 TENTH AVENUE NEW YORK, NEW YORK 10018	Daytime Telephone No.: 212-277-4188	Fax No.: 212-277-4280
	E-Mail Address: RICHARD.SZYMANSKI@MORGANSHOTELGROUP.COM	
Signature of Requester (required):		Date: APRIL 12, 2007

As the community official responsible for floodplain management, I hereby acknowledge that we have received and reviewed this Letter of Map Revision (LOMR) or conditional LOMR request. Based upon the community's review, we find the completed or proposed project meets or is designed to meet all of the community floodplain management requirements, including the requirement that no fill be placed in the regulatory floodway, and that all necessary Federal, State, and local permits have been, or in the case of a conditional LOMR, will be obtained. In addition, we have determined that the land and any existing or proposed structures to be removed from the SFHA are or will be reasonably safe from flooding as defined in 44CFR 65.2(c), and that we have available upon request by FEMA, all analyses and documentation used to make this determination.

Community Official's Name and Title:		Telephone No.:
nmunity Name:	Community Official's Signature (required):	Date:

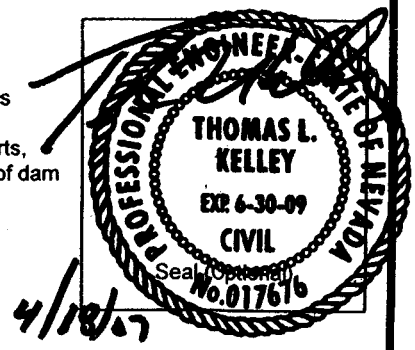
CERTIFICATION BY REGISTERED PROFESSIONAL ENGINEER AND/OR LAND SURVEYOR

This certification is to be signed and sealed by a licensed land surveyor, registered professional engineer, or architect authorized by law to certify elevation information. All documents submitted in support of this request are 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.

Certifier's Name: Thomas Kelley	License No.: 017676	Expiration Date: 06/30/09
Company Name: Kimley-Horn and Associates	Telephone No.: (702) 862-3632	Fax No.: (702) 735-4949
Signature:		Date: 4/18/07

Ensure the forms that are appropriate to your revision request are included in your submittal.

Form Name and (Number)	Required if ...
☒ Riverine Hydrology and Hydraulics Form (Form 2)	New or revised discharges or water-surface elevations
☒ Riverine Structures Form (Form 3)	Channel is modified, addition/revision of bridge/culverts, addition/revision of levee/floodwall, addition/revision of dam
☐ Coastal Analysis Form (Form 4)	New or revised coastal elevations
☐ Coastal Structures Form (Form 5)	Addition/revision of coastal structure
☐ Alluvial Fan Flooding Form (Form 6)	Flood control measures on alluvial fans



FEDERAL EMERGENCY MANAGEMENT AGENCY

RIVERINE STRUCTURES FORM

O.M.B. No. 3067-0148
Expires September 30, 2005

PAPERWORK REDUCTION ACT

Public reporting burden for this form is estimated to average 7 hours per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing, reviewing, and submitting the form. You are not required to respond to this collection of information unless a valid OMB control number appears in the upper right corner of this 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, SW, Washington DC 20472, Paperwork Reduction Project (3067-0148). Submission of the form is required to obtain or retain benefits under the National Flood Insurance Program. **Please do not send your completed survey to the above address.**

Flooding Source: Tropicana Wash - Central Branch
Note: Fill out one form for each flooding source studied

A. GENERAL

Complete the appropriate section(s) for each Structure listed below:

Channelization.....complete Section B
Bridge/Culvert.....complete Section C
Dam .....complete Section D
Levee/Floodwall .....complete Section E
Sediment Transport.....complete Section F (if required)

Description Of Structure

1. **Name of Structure: Box Culvert Underneath Hard Rock Hotel Casino**

   Type (check one): ☐ Channelization ☒ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam

   Location of Structure: Tropicana Wash - Central Branch - From FIS Section P to FIS Section K

   Downstream Limit/Cross Section: FIS Section K - 60.491

   Upstream Limit/Cross Section: FIS Section P - 60.866

2. **Name of Structure:**

   Type (check one): ☐ Channelization ☐ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam

   Location of Structure:

   Downstream Limit/Cross Section:

   Upstream Limit/Cross Section:

3. **Name of Structure:**

   Type (check one) ☐ Channelization ☐ Bridge/Culvert ☐ Levee/Floodwall ☐ Dam

   Location of Structure:

   Downstream Limit/Cross Section:

   Upstream Limit/Cross Section:

NOTE: For more structures, attach additional pages as needed.

B. CHANNELIZATION

Flooding Source:

Name of Structure:

1. Accessory Structures

The channelization includes (check one):

- ☐ Levees [Attach Section E (Levee/Floodwall)]
- ☐ Superelevated sections
- ☐ Debris basin/detention basin
- ☒ Other (Describe):
- ☐ Drop structures
- ☐ Transitions in cross sectional geometry
- ☐ Energy dissipator

2. Drawing Checklist

Attach the plans of the channelization certified by a registered professional engineer, as described in the instructions.

3. Hydraulic Considerations

The channel was designed to carry (cfs) and/or the -year flood.

The design elevation in the channel is based on (check one):

☐ Subcritical flow ☐ Critical flow ☒ Supercritical flow ☐ Energy grade line

If there is the potential for a hydraulic jump at the following locations, check all that apply and attach an explanation of how the hydraulic jump is controlled without affecting the stability of the channel.

☐ Inlet to channel ☐ Outlet of channel ☐ At Drop Structures ☐ At Transitions
☒ Other locations (specify):

4. Sediment Transport Considerations

Was sediment transport considered? ☐ Yes ☐ No If Yes, then fill out Section F (Sediment Transport).
If No, then attach your explanation for why sediment transport was not considered.

C. BRIDGE/CULVERT

Flooding Source: Tropicana Wash - Central Branch

Name of Structure: Box Culvert Under Hard Rock Hotel Casino

1. This revision reflects (check one):

- ☒ New bridge/culvert not modeled in the FIS
- ☐ Modified bridge/culvert previously modeled in the FIS
- ☐ New analysis of bridge/culvert previously modeled in the FIS

2. Hydraulic model used to analyze the structure (e.g., HEC-2 with special bridge routine, WSPRO, HY8): HEC-2 and WSPG
If different than hydraulic analysis for the flooding source, justify why the hydraulic analysis used for the flooding source could not analyze the structures. Attach justification.

3. Attach plans of the structures certified by a registered professional engineer. The plan detail and information should include the following (check the information that has been provided):

- ☒ Dimensions (height, width, span, radius, length)
- ☒ Shape (culverts only)
- ☒ Material
- ☐ Beveling or Rounding
- ☒ Wing Wall Angle
- ☒ Skew Angle
- ☒ Distances Between Cross Sections
- ☐ Erosion Protection
- ☒ Low Chord Elevations – Upstream and Downstream
- ☐ Top of Road Elevations – Upstream and Downstream
- ☒ Structure Invert Elevations – Upstream and Downstream
- ☒ Stream Invert Elevations – Upstream and Downstream
- ☒ Cross-Section Locations

4. Sediment Transport Considerations

Was sediment transport considered? ☐ Yes ☒ No If yes, then fill out Section F (Sediment Transport).
If No, then attach your explanation for why sediment transport was not considered.

D. DAM

Flooding Source:

Name of Structure:

1. This request is for (check one): ☐ Existing dam ☐ New dam ☐ Modification of existing dam
2. The dam was designed by (check one): ☐ Federal agency ☐ State agency ☐ Local government agency

   ☐ Private organization Name of the agency or organization:
3. Does the project involve revised hydrology? ☐ Yes ☐ No

   If Yes, complete the Riverine Hydrology & Hydraulics Form (Form 2).
4. Does the submittal include debris/sediment yield analysis? ☐ Yes ☐ No

   If yes, then fill out Section F (Sediment Transport).
   If No, then attach your explanation for why debris/sediment analysis was not considered.
5. Does the Base Flood Elevation behind the dam or downstream of the dam change?

   ☐ Yes ☐ No If Yes, complete the Riverine Hydrology & Hydraulics Form (Form 2) and complete the table below.

Stillwater Elevation Behind the Dam

FREQUENCY (% annual chance)	FIS	REVISED
10-year (10%)		
50-year (2%)		
100-year (1%)		
500-year (0.2%)		
Normal Pool Elevation		

6. Please attach a copy of the formal Operation and Maintenance Plan

E. LEVEE/FLOODWALL

1. System Elements

a. This Levee/Floodwall analysis is based on (check one):

☐ upgrading of an existing levee/floodwall system
☐ a newly constructed levee/floodwall system
☐ reanalysis of an existing levee/floodwall system

b. Levee elements and locations are (check one):

☐ earthen embankment, dike, berm, etc.	Station	to
☐ structural floodwall	Station	to
☐ Other (describe):	Station	to

c. Structural Type (check one):

☐ monolithic cast-in place reinforced concrete
☐ reinforced concrete masonry block
☐ sheet piling
☐ Other (describe):

d. Has this levee/floodwall system been certified by a Federal agency to provide protection from the base flood?

☐ Yes ☐ No

If Yes, by which agency?

e. Attach certified drawings containing the following information (indicate drawing sheet numbers):

1. Plan of the levee embankment and floodwall structures. Sheet Numbers:
2. A profile of the levee/floodwall system showing the Base Flood Elevation (BFE), levee and/or wall crest and foundation, and closure locations for the total levee system. Sheet Numbers:
3. A profile of the BFE, closure opening outlet and inlet invert elevations, type and size of opening, and kind of closure. Sheet Numbers:
4. A layout detail for the embankment protection measures. Sheet Numbers:
5. Location, layout, and size and shape of the levee embankment features, foundation treatment, floodwall structure, closure structures, and pump stations. Sheet Numbers:

2. Freeboard

a. The minimum freeboard provided above the BFE is:

Riverine

3.0 feet or more at the downstream end and throughout	☐ Yes	☐ No
3.5 feet or more at the upstream end	☐ Yes	☐ No
4.0 feet within 100 feet upstream of all structures and/or constrictions	☐ Yes	☐ No

Coastal

1.0 foot above the height of the one percent wave associated with the 1%-annual-chance stillwater surge elevation or maximum wave runup (whichever is greater).	☐ Yes	☐ No
2.0 feet above the 1%-annual-chance stillwater surge elevation	☐ Yes	☐ No

E. LEVEE/FLOODWALL (CONTINUED)

2. Freeboard (continued)

Please note, occasionally exceptions are made to the minimum freeboard requirement. If an exception is requested, attach documentation addressing Paragraph 65.10(b)(1)(ii) of the NFIP Regulations.

If No is answered to any of the above, please attach an explanation.

b. Is there an indication from historical records that ice-jamming can affect the BFE? ☐ Yes ☐ No

If Yes, provide ice-jam analysis profile and evidence that the minimum freeboard discussed above still exists.

3. Closures

a. Openings through the levee system (check one): ☐ exists ☐ does not exist

If opening exists, list all closures:

Channel Station	Left or Right Bank	Opening Type	Highest Elevation for Opening Invert	Type of Closure Device

(Extend table on an added sheet as needed and reference)

Note: Geotechnical and geologic data

In addition to the required detailed analysis reports, data obtained during field and laboratory investigations and used in the design analysis for the following system features should be submitted in a tabulated summary form. (Reference U.S. Army Corps of Engineers [USACE] EM-1110-2-1906 Form 2086.)

4. Embankment Protection

a. The maximum levee slope landside is:

b. The maximum levee slope floodside is:

c. The range of velocities along the levee during the base flood is: (min.) to (max.)

d. Embankment material is protected by (describe what kind):

e. Riprap Design Parameters (check one): ☐ Velocity ☐ Tractive stress
Attach references

Reach	Sideslope	Flow Depth	Velocity	Curve or Straight	Stone Riprap			Depth of Toedown
					D_{100}	D_{50}	Thickness	
Sta to								
Sta to								
Sta to								
Sta to								
Sta to								
Sta to								

(Extend table on an added sheet as needed and reference each entry)

E. LEVEE/FLOODWALL (CONTINUED)

4. Embankment Protection (continued)

f. Is a bedding/filter analysis and design attached? ☐ Yes ☐ No

g. Describe the analysis used for other kinds of protection used (include copies of the design analysis):

Attach engineering analysis to support construction plans.

5. Embankment And Foundation Stability

a. Identify locations and describe the basis for selection of critical location for analysis:

☐ Overall height: Sta. ; height ft.

☐ Limiting foundation soil strength:

Sta. , depth to

strength ϕ = degrees, c = psf

slope: SS = (h) to (v)

(Repeat as needed on an added sheet for additional locations)

b. Specify the embankment stability analysis methodology used (e.g., circular arc, sliding block, infinite slope, etc.):

c. Summary of stability analysis results:

Case	Loading Conditions	Critical Safety Factor	Criteria (Min.)
I	End of construction		1.3
II	Sudden drawdown		1.0
III	Critical flood stage		1.4
IV	Steady seepage at flood stage		1.4
VI	Earthquake (Case I)		1.0

(Reference: USACE EM-1110-2-1913 Table 6-1)

d. Was a seepage analysis for the embankment performed? ☐ Yes ☐ No

If Yes, describe methodology used:

e. Was a seepage analysis for the foundation performed? ☐ Yes ☐ No

f. Were uplift pressures at the embankment landside toe checked? ☐ Yes ☐ No

g. Were seepage exit gradients checked for piping potential? ☐ Yes ☐ No

h. The duration of the base flood hydrograph against the embankment is hours.

Attach engineering analysis to support construction plans.

E. LEVEE/FLOODWALL (CONTINUED)

6. Floodwall And Foundation Stability

a. Describe analysis submittal based on Code (check one):

☐ UBC (1988) or ☐ Other (specify):

b. Stability analysis submitted provides for:

☐ Overturning ☐ Sliding If not, explain:

c. Loading included in the analyses were:

☐ Lateral earth @ P_A = psf; P_p = psf

☐ Surcharge-Slope @ , ☐ surface psf

☐ Wind @ P_w = psf

☐ Seepage (Uplift); ☐ Earthquake @ P_{eq} = %g

☐ 1%-annual-chance significant wave height: ft.

☐ 1%-annual-chance significant wave period: sec.

d. Summary of Stability Analysis Results: Factors of Safety.

Itemize for each range in site layout dimension and loading condition limitation for each respective reach.

Loading Condition	Criteria (Min)		Sta	To	Sta	To
	Overturn	Sliding	Overturn	Sliding	Overturn	Sliding
Dead & Wind	1.5	1.5				
Dead & Soil	1.5	1.5				
Dead, Soil, Flood, & Impact	1.5	1.5				
Dead, Soil, & Seismic	1.3	1.3				

(Ref: FEMA 114 Sept 1986; USACE EM 1110-2-2502)

(Note: Extend table on an added sheet as needed and reference)

e. Foundation bearing strength for each soil type:

Bearing Pressure	Sustained Load (psf)	Short Term Load (psf)
Computed design maximum		
Maximum allowable		

f. Foundation scour protection ☐ is, ☐ is not provided. If provided, attach explanation and supporting documentation:

Attach engineering analysis to support construction plans.

E. LEVEE/FLOODWALL (CONTINUED)

7. Settlement

a. Has anticipated potential settlement been determined and incorporated into the specified construction elevations to maintain the established freeboard margin? ☐ Yes ☐ No

b. The computed range of settlement is ft. to ft.

c. Settlement of the levee crest is determined to be primarily from :

☐ Foundation consolidation
☐ Embankment compression
☐ Other (Describe):

d. Differential settlement of floodwalls ☐ has ☐ has not been accommodated in the structural design and construction.

Attach engineering analysis to support construction plans.

8. Interior Drainage

a. Specify size of each interior watershed:

Draining to pressure conduit: acres
Draining to ponding area: acres

b. Relationships Established

Ponding elevation vs. storage	☐ Yes	☐ No
Ponding elevation vs. gravity flow	☐ Yes	☐ No
Differential head vs. gravity flow	☐ Yes	☐ No

c. The river flow duration curve is enclosed: ☐ Yes ☐ No

d. Specify the discharge capacity of the head pressure conduit: cfs

e. Which flooding conditions were analyzed?

• Gravity flow (Interior Watershed)	☐ Yes	☐ No
• Common storm (River Watershed)	☐ Yes	☐ No
• Historical ponding probability	☐ Yes	☐ No
• Coastal wave overtopping	☐ Yes	☐ No

If No for any of the above, attach explanation.

f. Interior drainage has been analyzed based on joint probability of interior and exterior flooding and the capacities of pumping and outlet facilities to provide the established level of flood protection. ☐ Yes ☐ No

If No, attach explanation.

g. The rate of seepage through the levee system for the base flood is cfs

h. The length of levee system used to drive this seepage rate in item g: ft.

E. LEVEE/FLOODWALL (CONTINUED)

8. Interior Drainage (continued)

i. Will pumping plants be used for interior drainage? ☐ Yes ☐ No

If Yes, include the number of pumping plants:
For each pumping plant, list:

	Plant #1	Plant #2
The number of pumps		
The ponding storage capacity		
The maximum pumping rate		
The maximum pumping head		
The pumping starting elevation		
The pumping stopping elevation		
Is the discharge facility protected?		
Is there a flood warning plan?		
How much time is available between warning and flooding?		

Will the operation be automatic? ☐ Yes ☐ No

If the pumps are electric, are there backup power sources? ☐ Yes ☐ No

(Reference: USACE EM-1110-2-3101, 3102, 3103, 3104, and 3105)

Include a copy of supporting documentation of data and analysis. Provide a map showing the flooded area and maximum ponding elevations for all interior watersheds that result in flooding.

9. Other Design Criteria

a. The following items have been addressed as stated:

Liquefaction ☐ is ☐ is not a problem
Hydrocompaction ☐ is ☐ is not a problem
Heave differential movement due to soils of high shrink/swell ☐ is ☐ is not a problem

b. For each of these problems, state the basic facts and corrective action taken:

Attach supporting documentation

c. If the levee/floodwall is new or enlarged, will the structure adversely impact flood levels and/or flow velocities floodside of the structure?
☐ Yes ☐ No

Attach supporting documentation

d. Sediment Transport Considerations:

Was sediment transport considered? ☐ Yes ☐ No If Yes, then fill out Section F (Sediment Transport).
If No, then attach your explanation for why sediment transport was not considered.

E. LEVEE/FLOODWALL (CONTINUED)

10. Operational Plan And Criteria

a. Are the planned/installed works in full compliance with Part 65.10 of the NFIP Regulations? ☐ Yes ☐ No

b. Does the operation plan incorporate all the provisions for closure devices as required in Paragraph 65.10(c)(1) of the NFIP regulations?
☐ Yes ☐ No

c. Does the operation plan incorporate all the provisions for interior drainage as required in Paragraph 65.10(c)(2) of the NFIP regulations?
☐ Yes ☐ No

If the answer is No to any of the above, please attach supporting documentation.

11. Maintenance Plan

a. Are the planned/installed works in full compliance with Part 65.10 of the NFIP Regulations? ☐ Yes ☐ No
If No, please attach supporting documentation.

12. Operations and Maintenance Plan

Please attach a copy of the formal Operations and Maintenance Plan for the levee/floodwall.

F. SEDIMENT TRANSPORT

Flooding Source:

Name of Structure:

If there is any indication from historical records that sediment transport (including scour and deposition) can affect the Base Flood Elevation (BFE); and/or based on the stream morphology, vegetative cover, development of the watershed and bank conditions, there is a potential for debris and sediment transport (including scour and deposition) to affect the BFEs, then provide the following information along with the supporting documentation:

Sediment load associated with the base flood discharge: Volume acre-feet

Debris load associated with the base flood discharge: Volume acre-feet

Sediment transport rate (percent concentration by volume)

Method used to estimate sediment transport:

Most sediment transport formulas are intended for a range of hydraulic conditions and sediment sizes; attach a detailed explanation for using the selected method.

Method used to estimate scour and/or deposition:

Method used to revise hydraulic or hydrologic analysis (model) to account for sediment transport:
Please note that bulked flows are used to evaluate the performance of a structure during the base flood; however, FEMA does not map BFEs based on bulked flows.

If a sediment analysis has not been performed, an explanation as to why sediment transport (including scour and deposition) will not affect the BFEs or structures must be provided.

FEDERAL EMERGENCY MANAGEMENT AGENCY

RIVERINE HYDROLOGY & HYDRAULICS FORM

O.M.B No. 3067-0148
Expires September 30, 2005

PAPERWORK REDUCTION ACT

Public reporting burden for this form is estimated to average 3 hours per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing, reviewing, and submitting the form. You are not required to respond to this collection of information unless a valid OMB control number appears in the upper right corner of this 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, SW, Washington DC 20472, Paperwork Reduction Project (3067-0148). Submission of the form is required to obtain or retain benefits under the National Flood Insurance Program. **Please do not send your completed survey to the above address.**

Flooding Source:
Note: Fill out one form for each flooding source studied

A. HYDROLOGY

1. Reason for New Hydrologic Analysis (check all that apply)

☐ Not revised (skip to section 2) ☐ No existing analysis ☒ Improved data
☐ Alternative methodology ☐ Proposed Conditions (CLOMR) ☐ Changed physical condition of watershed

2. Comparison of Representative 1%-Annual-Chance Discharges

Location	Drainage Area (Sq. Mi.)	FIS (cfs)	Revised (cfs)
FIS Section P		5,300	4,473

3. Methodology for New Hydrologic Analysis (check all that apply)

☐ Statistical Analysis of Gage Records ☒ Precipitation/Runoff Model HEC-1 [TR-20, HEC-1, HEC-HMS etc.]
☐ Regional Regression Equations ☒ Other (please attach description)

Please enclose all relevant models in digital format, maps, computations (including computation of parameters) and documentation to support the new analysis. The document, "Numerical Models Accepted by FEMA for NFIP Usage" lists the models accepted by FEMA. This document can be found at: http://www.fema.gov/plan/prevent/fhm/en_modl.shtm.

4. Review/Approval of Analysis

If your community requires a regional, state, or federal agency to review the hydrologic analysis, please attach evidence of approval/review.

5. Impacts of Sediment Transport on Hydrology

Was sediment transport considered? ☐ Yes ☒ No If yes, then fill out Section F (Sediment Transport) of Form 3. If No, then attach your explanation for why sediment transport was not considered.

B. HYDRAULICS

1. Reach to be Revised

	Description	Cross Section	Water-Surface Elevations (ft.)	
			Effective	Proposed/Revised
Downstream Limit	FIS Section H - 60.345	60.345	2033.60	2033.34
Upstream Limit	FIS Section P - 60.866	60.866	2057.90	2057.65

2. Hydraulic Method Used

Hydraulic Analysis HEC-2 and WSPG [HEC-2 , HEC-RAS, Other (Attach description)]

B. HYDRAULICS (CONTINUED)

3. Pre-Submittal Review of Hydraulic Models

FEMA has developed two review programs, CHECK-2 and CHECK-RAS, to aid in the review of HEC-2 and HEC-RAS hydraulic models, respectively. These review programs verify that the hydraulic estimates and assumptions in the model data are in accordance with NFIP requirements, and that the data are comparable with the assumptions and limitations of HEC-2/HEC-RAS. CHECK-2 and CHECK-RAS identify areas of potential error or concern. These tools do not replace engineering judgment. CHECK-2 and CHECK-RAS can be downloaded from http://www.fema.gov/plan/prevent/fhm/frm_soft.shtm. We recommend that you review your HEC-2 and HEC-RAS models with CHECK-2 and CHECK-RAS. If you disagree with a message, please attach an explanation of why the message is not valid in this case. Review of your submittal and resolution of valid modeling discrepancies will result in reduced review time.

HEC-2/HEC-RAS models reviewed with CHECK-2/CHECK-RAS? ☒ Yes ☐ No

4. Models Submitted

Duplicate Effective Model*	Natural File Name:	FLAM-ENC.dat	Floodway File Name:	FLAM-ENC.dat
Corrected Effective Model*	Natural File Name:		Floodway File Name:	
Existing or Pre-Project Conditions Model	Natural File Name:	TROPLOMR.IH2	Floodway File Name:	TROPLOMR.IH2
Revised or Post-Project Conditions Model	Natural File Name:		Floodway File Name:	
Other - (attach description)	Natural File Name:	TROPLOMR.WSW	Floodway File Name:	

*Not required for revisions to approximate 1%-annual-chance floodplains (Zone A) – for details, refer to the corresponding section of the instructions.

The document "Numerical Models Accepted by FEMA for NFIP Usage" lists the models accepted by FEMA. This document can be found at: http://www.fema.gov/plan/prevent/fhm/en_modl.shtm.

C. MAPPING REQUIREMENTS

A **certified topographic map** must be submitted showing the following information (where applicable): the boundaries of the effective, existing, and proposed conditions 1%-annual-chance floodplain (for approximate Zone A revisions) or the boundaries of the 1%- and 0.2%-annual-chance floodplains and regulatory floodway (for detailed Zone AE, AO, and AH revisions); location and alignment of all cross sections with stationing control indicated; stream, road, and other alignments (e.g., dams, levees, etc.); current community easements and boundaries; boundaries of the requester's property; certification of a registered professional engineer registered in the subject State; location and description of reference marks; and the referenced vertical datum (NGVD, NAVD, etc.).

Note that the boundaries of the existing or proposed conditions floodplains and regulatory floodway to be shown on the revised FIRM and/or FBFM must tie-in with the effective floodplain and regulatory floodway boundaries. Please attach **a copy of the effective FIRM and/or FBFM,** annotated to show the boundaries of the revised 1%- and 0.2%-annual-chance floodplains and regulatory floodway that tie-in with the boundaries of the effective 1%- and 0.2%-annual-chance floodplain and regulatory floodway at the upstream and downstream limits of the area of revision.

D. COMMON REGULATORY REQUIREMENTS

1. For CLOMR requests, do Base Flood Elevations (BFEs) increase? ☐ Yes ☐ No

For CLOMR requests, if either of the following is true, please submit evidence of compliance with Section 65.12 of the NFIP regulations:
- The proposed project encroaches upon a regulatory floodway and would result in increases above 0.00 foot.
- The proposed project encroaches upon a SFHA with BFEs established and would result in increases above 1.00 foot.

2. Does the request involve the placement or proposed placement of fill? ☐ Yes ☐ No

If Yes, the community must be able to certify that the area to be removed from the special flood hazard area, to include any structures or proposed structures, meets all of the standards of the local floodplain ordinances, and is reasonably safe from flooding in accordance with the NFIP regulations set forth at 44 CFR 60.3(a)(3), 65.5(a)(4), and 65.6(a)(14). Please see the MT-2 instructions for more information.

3. For LOMR requests, is the regulatory floodway being revised? ☒ Yes ☐ No

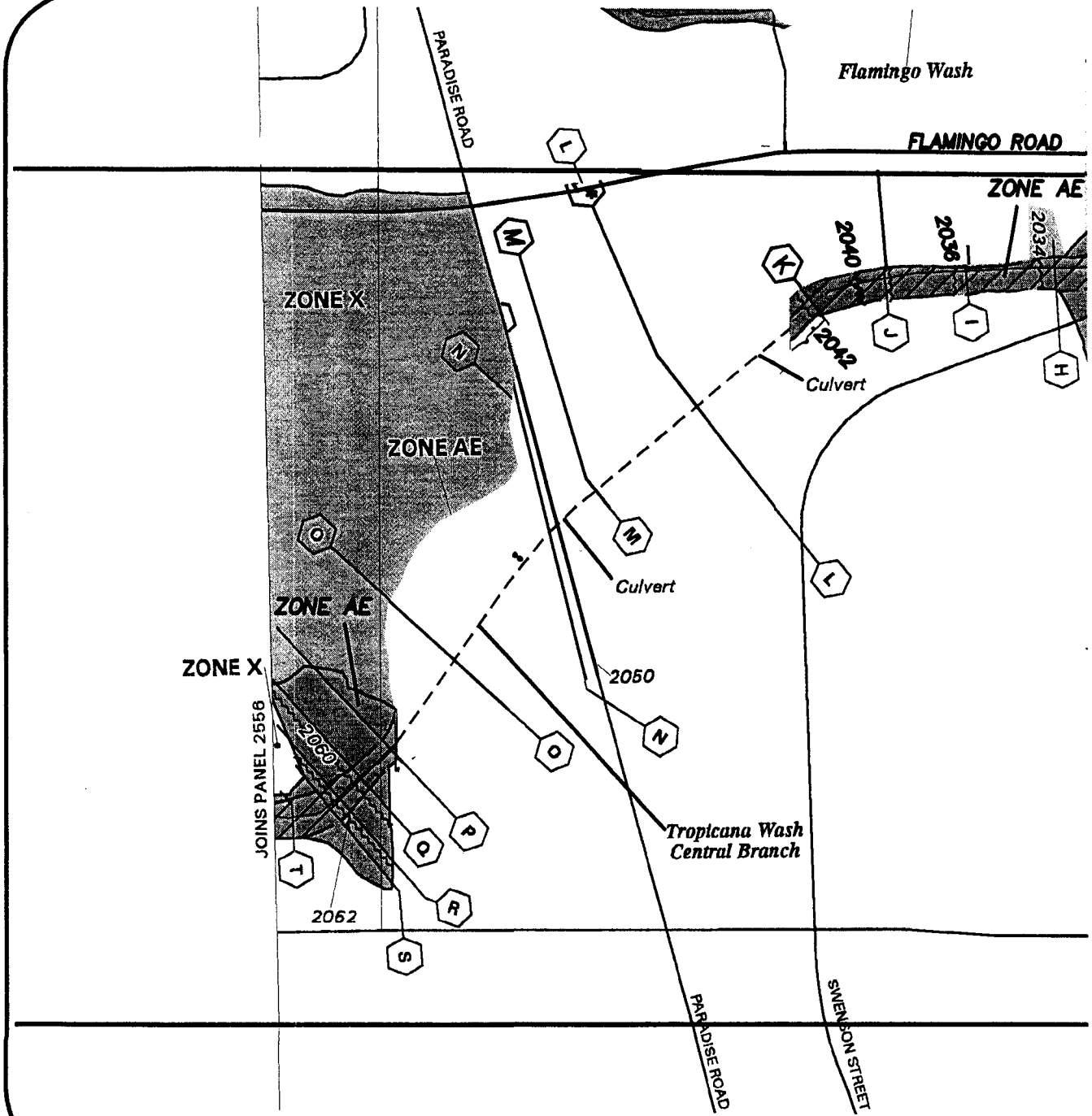
If Yes, attach evidence of regulatory floodway revision notification. As per Paragraph 65.7(b)(1) of the NFIP Regulations, notification is required for requests involving revisions to the regulatory floodway. (Not required for revisions to approximate 1%-annual-chance floodplains [studied Zone A designation] unless a regulatory floodway is being added. Elements and examples of regulatory floodway revision notification can be found in the MT-2 Form 2 Instructions.)

4. For LOMR requests, does this request require property owner notification and acceptance of BFE increases? ☐ Yes ☒ No

If Yes, please attach proof of property owner notification and acceptance (if available). Elements of and examples of property owner notification can be found in the MT-2 Form 2 Instructions.

Appendix B
EXHIBITS

Figure One: Effective FIRM Panel 32003C2557E
Figure Two: Annotated FIRM Panel 32003C2557E
Figure Three: Effective FIS Profile 79P
Figure Four: Annotated FIS Profile 79P
Figure Five: Effective FIS Floodway Data Table
Figure Six: Annotated FIS Floodway Data Table



MAP SCALE 1" = 500'

250 0 500 1000 FEET

PANEL 2557 E

FIRM

FLOOD INSURANCE RATE MAP

CLARK COUNTY,
NEVADA AND
INCORPORATED AREAS

PANEL 2557 OF 4090

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
CLARK COUNTY, UNINCORPORATED AREAS	320003	2557	E

REVISED TO REFLECT
LOMR DATE OCT. 24, 2006

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

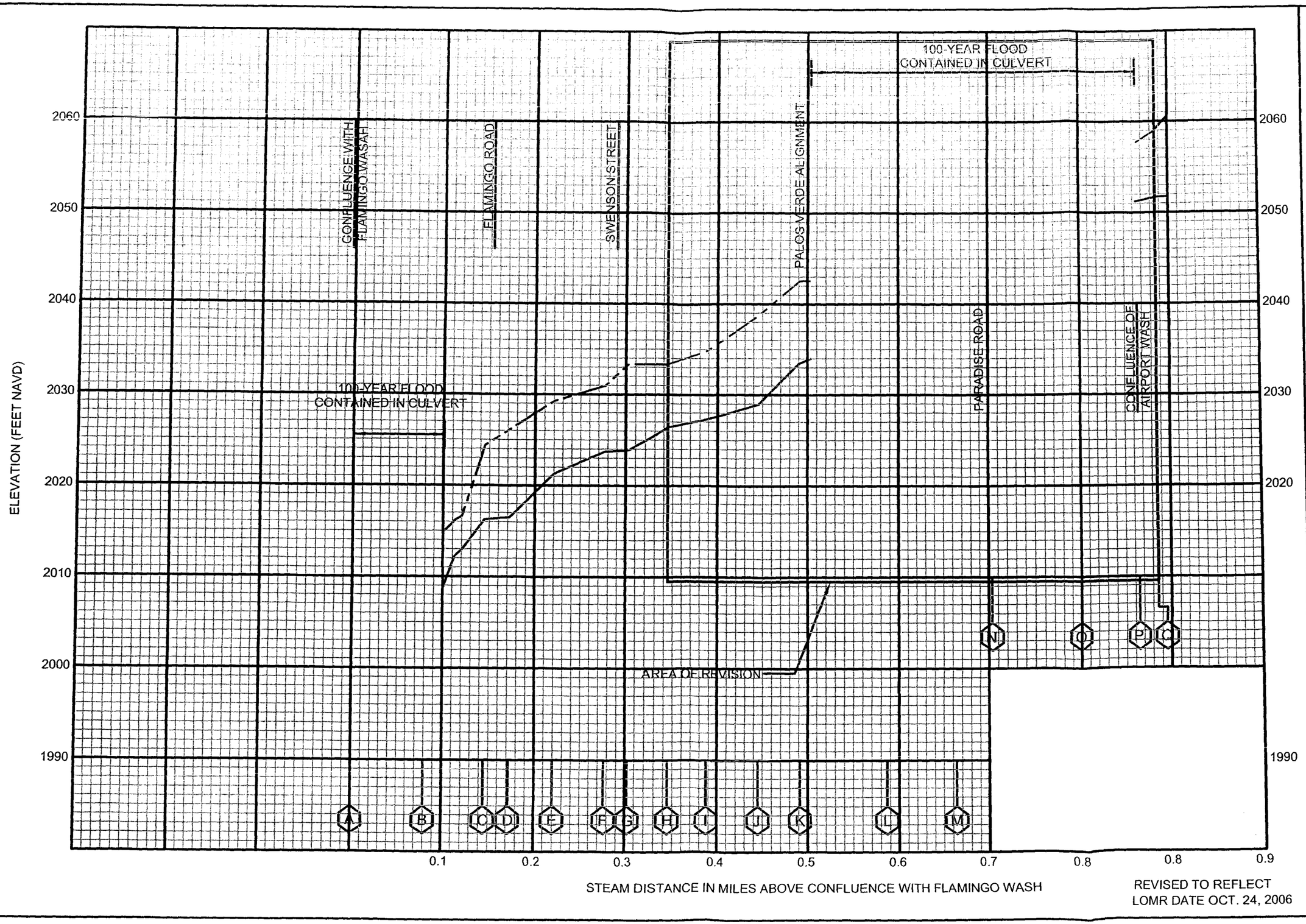
MAP NUMBER
32003C2557 E

MAP REVISED:
SEPTEMBER 27, 2002

Federal Emergency Management Agency

Date: Apre 18, 2007 - 12:02pm / User: tom.kelley
Path: K:\Civil\092564 Morgans\004 Hard Rock CLOMR\LOMR\Drawings\Hard Rock LOMR.dwg

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REVISED TO REFLECT
LOMR DATE OCT. 24, 2006

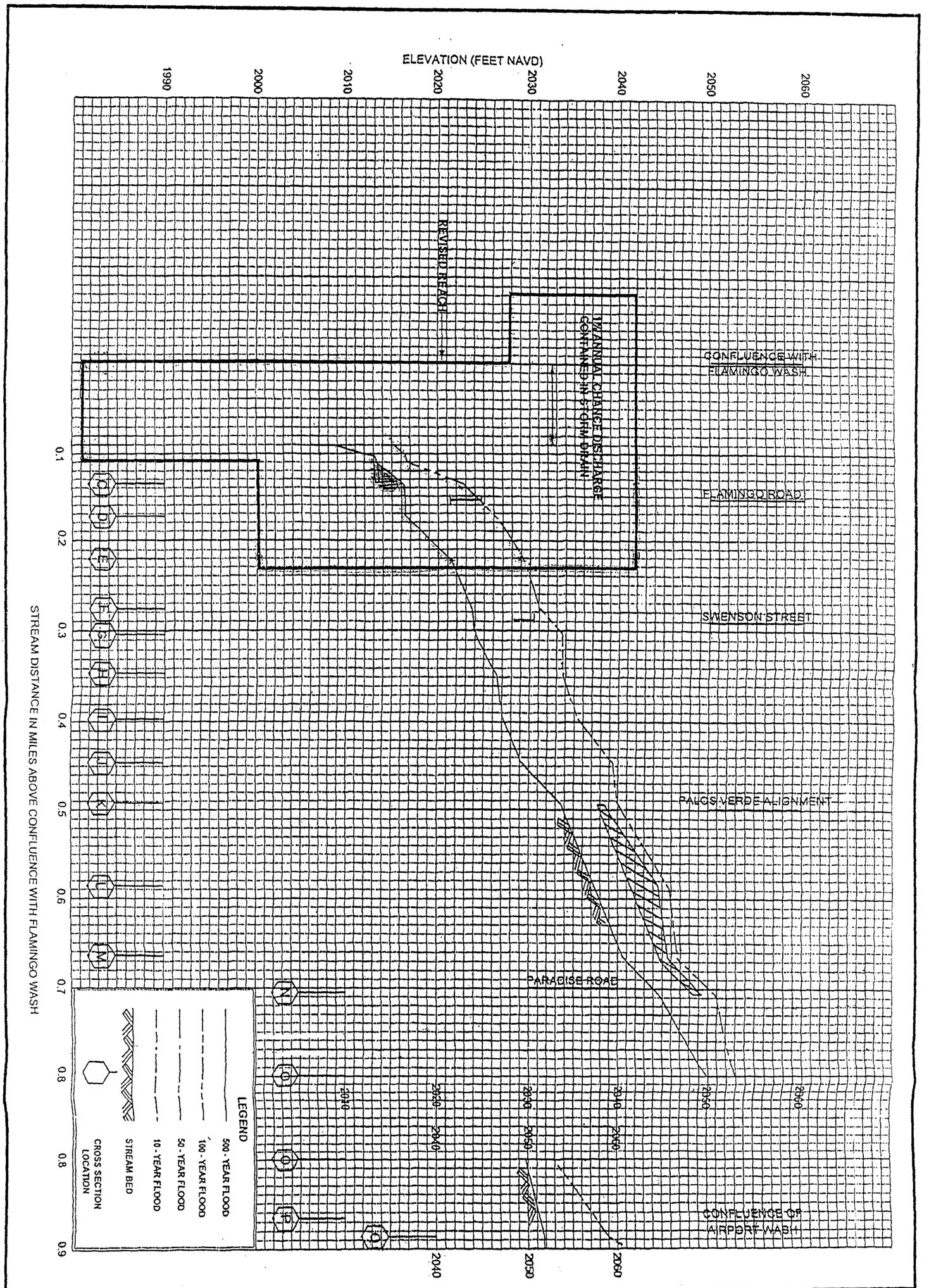
FLOOD PROFILES

TROPICANA WASH-CENTRAL BRANCH

FEDERAL EMERGENCY MANAGEMENT AGENCY

CLARK COUNTY, NV
AND INCORPORATED AREAS

79P



79P	FEDERAL EMERGENCY MANAGEMENT AGENCY CLARK COUNTY, NV AND INCORPORATED AREAS	FLOOD PROFILES TROPICANA WASH - CENTRAL BRANCH

REVISED TO REFLECT LOMR EFFECTIVE OCT 24 2006

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
						FEET (NAVD 88)		
Tropicana Wash Central Branch								
~~A~~	~~0.000~~	~~112~~	~~786~~	~~6.1~~	~~2,003.2~~	~~2,003.2~~	~~2,004.2~~	~~1.0~~
~~B~~	~~0.080~~	~~87~~	~~392~~	~~12.2~~	~~2,012.7~~	~~2,012.7~~	~~2,013.7~~	~~0.0~~
C	0.135	74	377	17.7	2,022.7	2,022.7	2,022.7	0.0
D	0.170	79	610	8.7	2,025.9	2,025.9	2,026.8	0.9
E	0.219	120	497	10.7	2,029.2	2,029.2	2,029.4	0.2
F	0.276	142	877	6.0	2,031.1	2,031.1	2,032.0	0.9
G	0.301	172	1,321	4.0	2,033.6	2,033.6	2,033.8	0.2
H	0.345	99	579	9.2	2,033.6	2,033.6	2,033.6	0.0
I	0.397	77	406	13.0	2,035.3	2,035.3	2,035.3	0.0
J	0.446	109	828	6.4	2,039.2	2,039.2	2,039.3	0.1
K	0.491	106	450	11.8	2,040.0	2,040.0	2,040.0	0.0
L	0.587	191	353	5.3	2,045.9	2,045.9	2,046.6	0.7
M	0.667	356	605	3.1	2,046.9	2,046.9	2,047.9	1.0
N	0.705	290	683	7.8	2,051.0	2,051.0	2,051.0	0.0
O	0.800	197	619	8.6	2,052.9	2,052.9	2,053.9	1.0
P	0.866	106	449	11.8	2,057.9	2,057.9	2,057.9	0.0
Q	0.887	92	431	12.3	2,059.1	2,059.1	2,059.1	0.0
R	0.903	104	771	4.3	2,061.0	2,061.0	2,061.9	0.0
S	0.912	120	802	4.1	2,062.3	2,062.3	2,062.3	0.0
T	0.936	123	744	4.5	2,062.3	2,062.3	2,062.3	0.0
U	0.992	107	553	6.0	2,062.3	2,062.3	2,062.3	0.0
V	1.036	95	444	7.5	2,062.5	2,062.5	2,062.5	0.0
W	1.073	85	364	9.1	2,062.8	2,062.8	2,062.8	0.0
X	1.080	58	356	9.3	2,063.2	2,063.2	2,063.2	0.0
Y	1.095	67	283	11.8	2,065.9	2,065.9	2,065.9	0.0
Z-AE[2]								

REVISED DATA

[1] Miles above confluence with Flamingo Wash

[2] Flood contained in culvert, floodway not computed

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

CLARK COUNTY, NV

AND INCORPORATED AREAS

REVISED TO REFLECT LOMR EFFECTIVE OCT 24 2008

FLOODWAY DATA

Tropicana Wash - Central Branch

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
						FEET (NAVD 88)		
Tropicana Wash Central Branch								
~~A~~	~~0.000~~	~~112~~	~~786~~	~~6.1~~	~~2,003.2~~	~~2,003.2~~	~~2,004.2~~	~~1.0~~
~~B~~	~~0.080~~	~~87~~	~~392~~	~~12.2~~	~~2,012.7~~	~~2,012.7~~	~~2,013.7~~	~~0.0~~
C	0.135	74	377	17.7	2,022.7	2,022.7	2,022.7	0.0
D	0.170	79	610	8.7	2,025.9	2,025.9	2,026.8	0.9
E	0.219	120	497	10.7	2,029.2	2,029.2	2,029.4	0.2
F	0.276	142	877	6.0	2,031.1	2,031.1	2,032.0	0.9
G	0.301	172	1,321	4.0	2,033.6	2,033.6	2,033.8	0.2
H	**0.345**	**99**	**579**	**7.7**	**2,033.3**	**2,033.3**	**2,033.6**	**0.3**
I	**0.397**	**73**	**354**	**12.6**	**2,034.8**	**2,034.8**	**2,034.8**	**0.0**
J	**0.446**	**107**	**743**	**6.0**	**2,038.7**	**2,038.7**	**2,038.7**	**0.0**
K	**0.491**	**101**	**397**	**11.3**	**2042.6**	**2042.6**	**2042.6**	**0.0**
L	**0.587**							
M	**0.667**							
N	**0.705**							
O	**0.800**							
P	**0.866**	**106**	**513**	**8.7**	**2057.7**	**2057.7**	**2058.7**	**1.0**
Q	0.887	92	431	12.3	2,059.1	2,059.1	2,059.1	0.0
R	0.903	104	771	4.3	2,061.0	2,061.0	2,061.9	0.0
S	0.912	120	802	4.1	2,062.3	2,062.3	2,062.3	0.0
T	0.936	123	744	4.5	2,062.3	2,062.3	2,062.3	0.0
U	0.992	107	553	6.0	2,062.3	2,062.3	2,062.3	0.0
V	1.036	95	444	7.5	2,062.5	2,062.5	2,062.5	0.0
W	1.073	85	364	9.1	2,062.8	2,062.8	2,062.8	0.0
X	1.080	58	356	9.3	2,063.2	2,063.2	2,063.2	0.0
Y	1.095	67	283	11.8	2,065.9	2,065.9	2,065.9	0.0
Z-AE[2]								

REVISED DATA

CULVERT

[1] Miles above confluence with Flamingo Wash

[2] Flood contained in culvert, floodway not computed

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

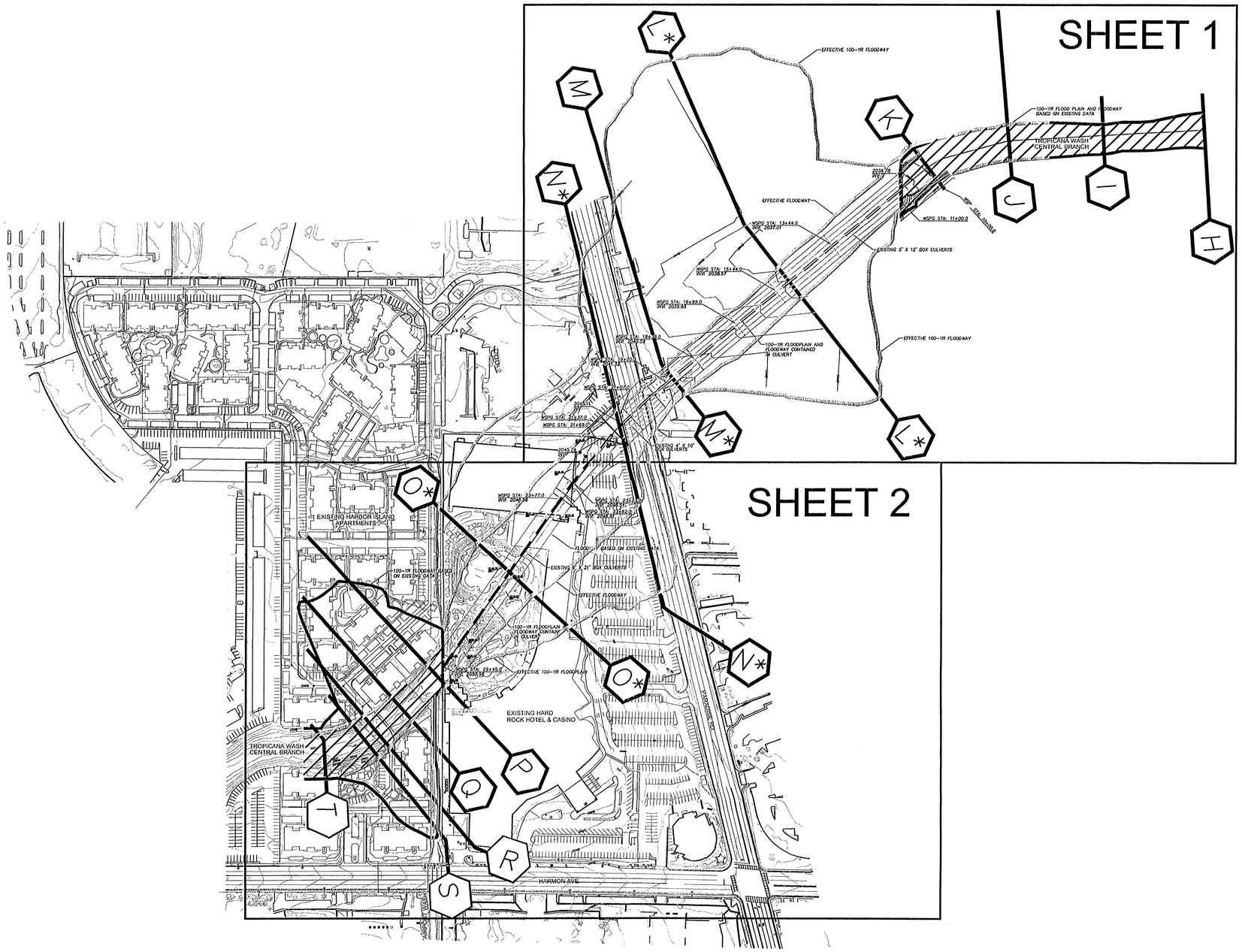
CLARK COUNTY, NV

AND INCORPORATED AREAS

REVISED TO REFLECT LOMR EFFECTIVE OCT 24 2003

FLOODWAY DATA

Tropicana Wash - Central Branch



NOTE:
ATTENTION IS DRAWN TO THE FACT THAT THE SCALE OF THESE DRAWINGS MAY HAVE BEEN DISTORTED DURING REPRODUCTION PROCESSES

120 60 0
150 90 30 75 150
SCALE: 1" = 150'

PROFESSIONAL ENGINEER STATE OF NEVADA
THOMAS L. KELLEY
EXP 6-30-09
CIVIL
No.017676
4/3/07

HARD ROCK CASINO HOTEL
LOMR WORK MAP EXHIBIT
OVERALL MAP KEY

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Date: April 03, 2007 - 3:14pm / User: tom.kelley
Path: K:\Civil\092954 Morgans\004 Hard Rock CLOMR\LOMR\Drawings\Hard Rock LOMR.dwg

EFFECTIVE 100-YR FLOODWAY

100-YR FLOOD PLAIN AND FLOODWAY
BASED ON EXISTING DATA

TROPICANA WASH
CENTRAL BRANCH

NOTE:
ATTENTION IS DRAWN TO THE FACT THAT THE SCALE OF THESE DRAWINGS MAY HAVE BEEN DISTORTED DURING REPRODUCTION PROCESSES

60 40 20 0 60
50 30 10 30
SCALE: 1" = 60'

2034.78
INV

EFFECTIVE FLOODWAY

WSPG STA: 10+00.0

WSPG STA: 11+00.0

WSPG STA: 13+44.0
INV: 2037.01

EXISTING 5' X 12' BOX CULVERTS

WSPG STA: 15+44.0
INV: 2038.57

WSPG STA: 16+89.0
INV: 2039.83

WSPG STA: 18+38.0
INV: 2040.59

WSPG STA: 19+20.0
INV: 2041.32

WSPG STA: 21+07.0

2045.11
INV

WSPG STA: 21+37.0

WSPG STA: 21+69.0

2045.98
INV

2045.43
INV

2045.74
INV

EXISTING 4' X 10'
BOX CULVERTS

100-YR FLOODPLAIN AND
FLOODWAY CONTAINED
IN CULVERT

EFFECTIVE 100-YR FLOODWAY

* CROSS SECTIONS NOT USED FOR EXISTING CONDITION ANALYSIS

PROFESSIONAL ENGINEER - STATE OF NEVADA
THOMAS L. KELLEY
EXP. 6-30-09
CIVIL
No. 017676
4/3/07

HARD ROCK CASINO HOTEL
LOMR WORK MAP EXHIBIT
SHEET ONE

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Date: April 03, 2007 - 3:15pm / User: tom.kelley
Path: K:\DAL\052564 Managers\004 Hard Rock CLOMR\LOMR\Drawings\Hard Rock LOMR.dwg

EXISTING HARBOR ISLAND APARTMENTS

TROPICANA WASH CENTRAL BRANCH

EXISTING HARD ROCK HOTEL & CASINO

PARADISE RD.

HARMON AVE.

T WASH

WSPG STA: 23+77.0
INV: 2046.86

WSPG STA: 23+23.0
INV: 2046.51

WSPG STA: 23+62.0
INV: 2046.81

WSPG STA: 29+45.0
INV: 2050.96

100-YR FLOODWAY BASED ON EXISTING DATA

FLOOD[illegible]Y BASED ON EXISTING [illegible]ATA

EXISTING 6' X 21' BOX CULVERTS

EFFECTIVE FLOODWAY

100-YR FLOODPLAIN AT FLOODWAY CONTAINED IN CULVERT

EFFECTIVE 100-YR FLOODPLAIN

EXISTING 3' PVC PIPES. EXACT LOCATIONS OF PIPES NOT DEFINED (TYPICAL)

2046.49 INV

2047.17 INV

2047.16 INV

2048.75 INV

2048.81 INV

2049.07 INV

2050.23 INV

2051.24 INV

2050.33 INV

2051.06 INV

(2060)

(2055)

(2054)

(2057) (2058) (2060)

(2059)

(2061) (2062)

(2058)

(2057)

(2056)

(2055)

NOTE:
ATTENTION IS DRAWN TO THE FACT THAT THE SCALE OF THESE DRAWINGS MAY HAVE BEEN DISTORTED DURING REPRODUCTION PROCESSES

60 40 20 0 60
50 30 10 30

SCALE: 1" = 60'

* CROSS SECTIONS NOT USED FOR EXISTING CONDITION ANALYSIS

PROFESSIONAL ENGINEER STATE OF NEVADA
THOMAS L. KELLEY
EXP. 6-30-09
CIVIL
No. 017675

4/18/07

HARD ROCK CASINO HOTEL
LOMR WORK MAP EXHIBIT
SHEET TWO

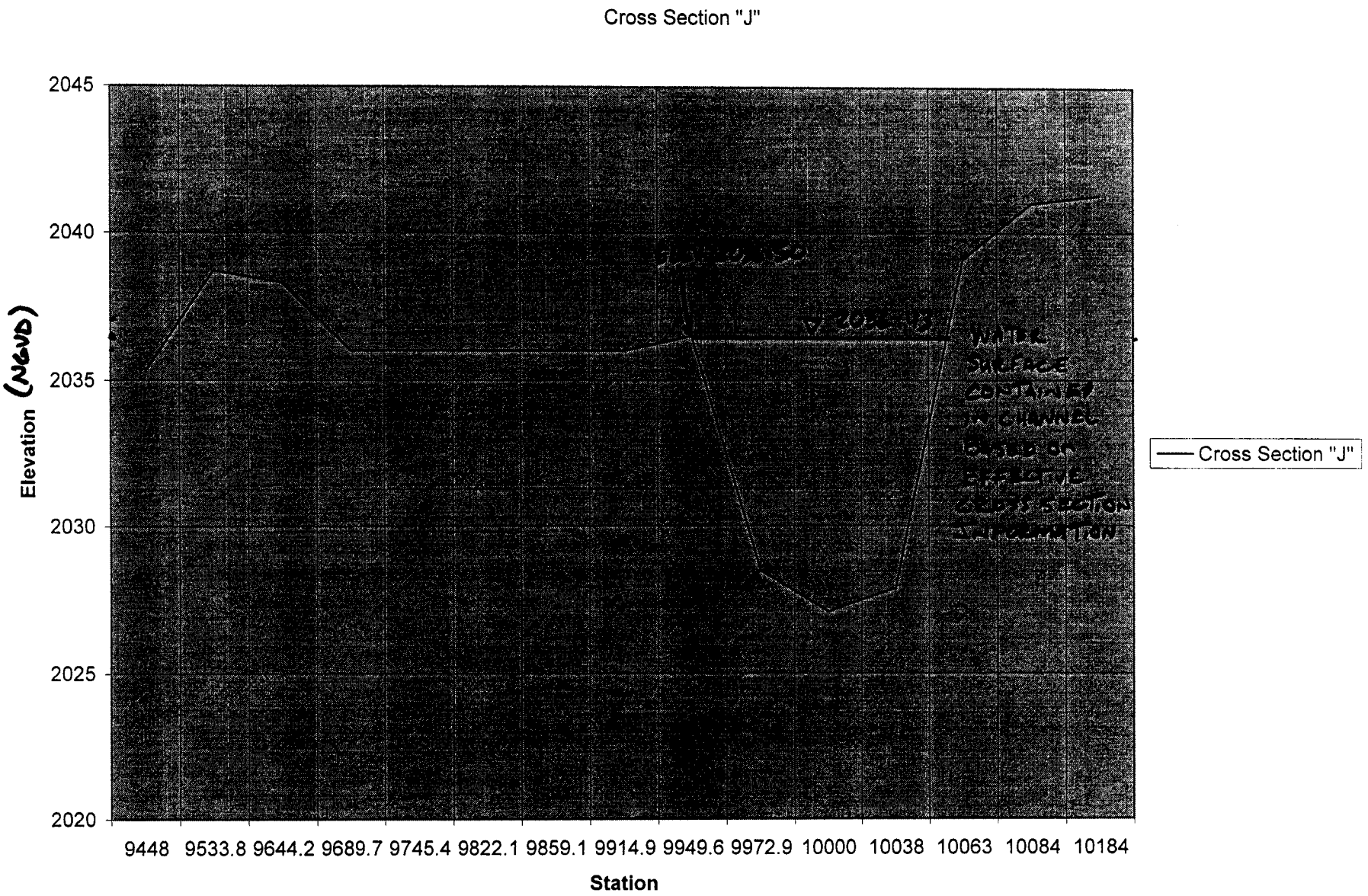
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Date: April 03, 2007 - 3:15pm / User: tom.kelley
Path: K:\Civil\092564 Hard Rock CLOMR\LOMR\Drawings\Hard Rock LOMR.dwg

Kimley-Horn and Associates, Inc.

Appendix C
HYRAULIC MODELING

Datum Conversion Information
Effective HEC-2 Modeling
Existing Conditions WSPGW Modeling
Existing Conditions HEC-2 Modeling
Exhibit of FIS Section J
Summary of Results


Cross Section "J"
2045
2040
2035
2030
2025
2020
Elevation (NAVD)
9448
9533.8
9644.2
9689.7
9745.4
9822.1
9859.1
9914.9
9949.6
9972.9
10000
10038
10063
10084
10184
Station
Cross Section "J"

EFFECTIVE HEC-2 MODELING

```
1*****************************************
**************************************
 *  HEC-2 WATER SURFACE PROFILES          *                    *  U.S. ARMY CORPS OF ENGINEERS
*                                         *                    *
 *                                        *                    *  HYDROLOGIC ENGINEERING CENTER
*                                         *                    *
 *  Version   4.6.2;  May 1991            *                    *  609 SECOND STREET, SUITE D
*                                         *                    *
 *                                        *                    *  DAVIS, CALIFORNIA 95616-4687
*                                         *                    *
 *  RUN DATE    06MAR07    TIME   15:57:18 *                    *          (916) 756-1104
*
 *****************************************
**************************************
```

EFFECTIVE MODELING AS PER CLARK COUNTY REGIONAL FLOOD CONTROL

```
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
1
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                                                          THIS RUN EXECUTED 06MAR07    15:57:18
 **************************************
  HEC-2 WATER SURFACE PROFILES

  Version   4.6.2;  May 1991
 **************************************


   TROPICANA WASH FLOOD INSURANCE STUDY

   by CH2M Hill, 1992          RDD33832
   *** Revised 6/15/1993 per MBJ review comments ***
   Notes:
   -discharges were based on those in the "Las Vegas Valley Flood Insurance
    Study Hydrology Report" by James M. Montgomery, Inc., September, 1991  (see
    CH2M Hill memo dated July 13, 1992)

   -Manning's "n" values were estimated by field observations of channels and
    floodplains in conjunction with methods recommended in "Open Channel
    Hydraulics" by Chow, 1959
   -"n" values of 0.10 were used to reflect the existence of buildings

   -stations and elevations obtained from 400 scale topo created by CH2M Hill
    from aerial photographs

     At I15, (the upstream end of this run), 5100 cfs approaches the box culvert
   under this road.  The F.H.W.A. culvert analysis program, HY-8 was used to
   calculate the amount of water that flows through the culvert, which
   was 3324 cfs. This is the discharge until section 60.887 where water from
   Airport Wash increases the flow to 5300 cfs.
     At Paradise Road, section 60.707, there is a large box culvert.  HY-8 was
   used to calculate the flow into the culvert and the amount that overtopped
   the road.  Of the 5300 cfs, 3430 went into the culvert while 1870 went over
   the road.  The portion that overtops travels down both a driveway and a
   parking lot and recombines with the 3430 cfs at the outlet of the culvert at
   section 60.492.


 T1   CCRFCD  TROPICANA WASH F.I.S.;   RDD33832
 T2   Main Tropicana Wash, Detailed Methods
 T3      Flam-Enc.HC2            From Flamingo Wash to B.C. w/encroachments


 J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

                 2                             0         0                     2001.08

 J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

       1         0        -1         0         0                   0         0         0


 J3  VARIABLE CODES FOR SUMMARY PRINTOUT

      38        39        40        41        42        43         1        34         4        27

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      21        22        28         0        38        43         1        50        51        27
      28         4         5         7       200                  38         1        53        27
      21        22        28        54
```

Q=4839.9 cfs estimated from previous run where a split-flow analysis was performed at Flamingo Rd. to estimate the amount of flow downstream of the road after some flow was lost when the road was overtopped.

```
QT        4     4839.9     4839.9     4839.9     4839.9
```

Begin run at confluence of Flamingo Wash and Tropicana Wash

```
NC     .048       .048       .080        0.1        0.3

ET                              6.1                              9912       10024

X1   60.000         13     9878.2    10040.0          0          0          0
GR   2012.4     9727.7     2011.0     9797.6     2011.3     9878.2     2001.1     9915.5     2000.3     9927.1
GR   1992.7     9944.2     1992.7     9965.4     1993.7     9980.6     1990.3    10000.0     2009.6    10040.0
GR   2010.6    10083.8     2014.4    10209.2     2015.1    10342.3


NC     .048       .048       .095

ET                              6.1                             9919.2     10053.2
X1   60.080         13     9919.2    10053.2        470        400        420
X3       10
GR   2023.9     9717.8     2021.9     9882.0     2020.1     9919.2     2008.7     9951.9     2007.4     9973.3
GR   2004.6     9982.4     2003.7    10000.0     2017.6    10053.2     2015.6    10146.3     2014.7    10256.7
GR   2017.2    10400.6     2018.9    10407.5     2019.7    10468.3


NC      .02        .02        .062        0.3        0.5

ET                              6.1                              9959       10042
X1   60.135         10     9959.3    10041.9        305        295        295
X3       10
GR   2029.6     9680.1     2028.2     9762.3     2024.9     9842.6     2022.8     9959.3     2014.7     9976.9
GR   2013.9    10000.0     2013.9    10020.0     2021.5    10040.8     2021.8    10041.9     2021.2    10227.6
```

Box culvert for Tropicana Wash under Flamingo Rd.

1
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```
SB    1.05        1.6        2.7          0       37.4        1.4        180          0     2014.3     2013.9

NC     .025       .025       .032
```

Following Q is the flow upstream of Flamingo Road where the split-flow occurs

```
QT        4       5300       5300       5300       5300
ET                4.11       6.11     9625.0    10215.7     9908.8    10097.6
X1   60.171         20     9968.8    10047.6        160        229        185
X2                               1     2019.3     2022.8
X3       10
BT       -4       9750     2025.0                10083     2022.7                10132.9     2022.9
BT            10327.3     2021.7
GR   2026.6     9387.9     2030.0     9488.2     2030.3     9624.5     2029.4     9667.2     2024.5     9794.4
GR   2023.6     9873.0     2022.7     9941.5     2022.1     9967.8     2022.4     9968.8     2015.4     9981.0
GR   2014.3    10000.0     2014.5    10017.0     2020.8    10037.8     2022.5    10047.6     2022.9    10132.9
GR   2021.7    10327.3     2024.1    10379.7     2021.3    10604.4     2018.2    10652.0     2019.7    10762.4
```

encroachments reflect 4:1 flow expansion

```
ET                4.11       6.11       9900      10070       9935      10055
X1   60.219         15     9975.8    10034.9        190        320        255
X3       10
GR   2030.1     9473.0     2029.3     9616.4     2025.9     9668.6     2025.6     9788.0     2024.4     9875.1
GR   2025.1     9975.8     2020.6     9983.6     2019.2    10000.0     2020.0    10021.4     2026.3    10034.9
GR   2025.8    10049.7     2023.7    10117.3     2025.2    10212.7     2026.3    10232.3     2026.1    10292.9


ET                              6.1                              9923       10066
X1   60.276         18     9923.0    10065.2        280        320        300
X3       10
GR   2029.6     9167.5     2029.6     9638.1     2028.1     9718.2     2027.6     9853.0     2027.6     9853.0
GR   2029.2     9923.0     2023.9     9954.1     2021.6    10000.0     2022.5    10050.1     2030.2    10065.2
GR   2028.7    10201.3     2028.9    10225.0     2033.1    10279.2     2031.6    10368.2     2031.0    10568.4
GR   2037.5    10626.2     2043.8    10690.2     2043.8    10715.4
```

Box culvert for Tropicana Wash under Swenson St
-along edge of bridge deck is 3 ft. high barrier which blocks flow over road

```
SB      .9        1.6        2.6          0       74.5        2.5      295.2          0     2021.8     2021.6

NC     .027       .027       .030

T                 4.1        6.1     9677.6    10970.0     9905.1    10076.9
.1   60.301         23     9905.1    10076.9        130        160        135
X2                               1     2025.9     2028.4
X3       10
BT       -3       9700     2032.0                10000     2028.4                10140     2032.0
GR   2026.2     9168.2     2025.1     9284.7     2025.5     9406.4     2028.1     9413.9     2029.2     9456.1
GR   2029.2     9543.6     2030.5     9596.3     2030.5     9655.1     2031.2     9677.6     2030.4     9792.2
GR   2029.4     9882.9     2029.3     9905.1     2028.5     9932.2     2022.6     9942.4     2021.8    10000.0
```

```
GR   2022.6    10053.7    2029.8    10076.9    2030.4    10111.4    2029.9    10196.1    2030.9    10260.5
1
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GR   2031.2    10349.4    2032.2    10649.1    2033.1    10973.1

T                 4.1        6.1      9606.8    10234.5      9922.9    10053.0
 1   60.345         20     9922.9     10053.0        260         200        230
X3       10
GR   2029.3     9364.8    2028.8     9417.7    2030.4     9426.0    2030.1     9471.2    2033.1     9492.1
GR   2033.6     9551.5    2032.3     9561.2    2033.4     9606.8    2032.9     9667.0    2032.8     9922.9
GR   2031.9     9948.0    2030.0     9960.8    2024.9     9966.8    2024.1    10000.0    2024.2    10038.0
GR   2032.8    10053.0    2031.2    10161.2    2032.2    10234.5    2031.2    10292.2    2031.5    10456.8

NC     .027       .027       .05         .1          .3

ET                4.1        6.1      9553.1    10568.0      9958.9    10051.6
X1   60.397         20     9958.9     10051.6        270         280        275
X3       10
GR   2031.4     9369.8    2031.1     9421.2    2032.8     9428.6    2033.4     9470.5    2035.3     9503.1
GR   2035.7     9553.1    2034.4     9559.0    2034.2     9667.6    2033.4     9942.4    2035.9     9958.9
GR   2025.0    10000.0    2025.5    10024.0    2035.1    10051.6    2034.5    10068.4    2036.0    10091.1
GR   2035.3    10230.7    2033.2    10239.5    2033.5    10313.2    2032.8    10400.1    2033.7    10570.4

  High conveyance changes due to channel changes.  Channel at 60.397 is
  improved with smooth sides and little vegetation.  Channel at 60.446 is
  natural and irregular with dense, tall grass in the bottom.

ET                4.1        6.1      9600.0    10180.0      9949.6    10062.9
X1   60.446         15     9949.6     10062.9        270         255        260
X3       10
GR   2035.3     9448.0    2038.7     9533.8    2038.3     9644.2       2036    9689.7       2036     9745.4
GR     2036     9822.1      2036     9859.1      2036     9914.9    2036.5     9949.6    2028.5     9972.9
GR   2027.1    10000.0    2027.9    10037.5    2039.1    10062.9    2041.0    10083.5    2041.3    10183.8

  Section 60.492 is the outlet of a large box culvert

ET                4.1        6.1      9335.0    10205.3      9937.6    10056.7
X1   60.492         25     9937.6     10056.7        260         220        240
X3       10
GR   2044.2     9332.7    2042.8     9377.0    2043.0     9441.4    2041.7     9505.5    2041.9     9546.4
GR   2043.7     9568.5    2042.1     9674.5    2042.0     9799.8    2039.2     9937.6    2035.6     9952.8
GR   2033.6     9965.7    2031.7    10000.0    2033.2    10024.2    2033.7    10038.0    2040.5    10056.7
GR   2042.8    10205.3    2039.7    10338.4    2038.5    10343.9    2037.5    10412.8    2037.9    10456.8
 R   2039.2    10470.6    2038.2    10573.1    2036.9    10637.8    2037.6    10740.3    2036.1    10801.4

NH       7       .027       9390       .999       9728       .020     9862.1       .020    10053.6       .020
NH   10100       .999      10410       .027    10487.2

  The following 1870 cfs is that portion of the 5300 cfs that overflowed the
  road at section 60.705
QT       4       1870       1870       1870       1870

  The next two sections are over the box culvert
1
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ET                4.1        6.1      9260.0    10187.3      9862.1    10053.6
X1   60.587         16     9862.1     10053.6        515         500        505
X3       10
GR   2044.2     9256.8    2043.5     9319.1    2043.8        9390    2044.2     9494.1    2043.0     9728.0
GR   2040.8       9820    2040.7     9825.5    2043.8     9862.1    2042.2     9968.4    2042.2    10000.0
GR   2042.2    10029.3    2043.1    10053.6    2043.3      10100    2043.7    10187.3    2043.7      10410
GR   2043.7    10487.2

NH       7       .027       9850       .999      10000       .02    10062.7       .020     10100       .999
NH   10194         .1    10358.7       .999    10724.2

ET                4.1        6.1      9220.0    10700.0       9700    10062.7
X1   60.667         15    10000.0     10062.7        385         425        420
GR   2046.5     9217.1    2045.8     9434.7    2043.4     9635.8    2043.5     9808.0    2043.8       9850
GR   2044.6     9952.6    2045.3    10000.0    2044.5    10022.3    2046.1    10062.7    2046.2      10100
GR   2046.3      10194    2045.7    10358.7    2044.6    10530.9    2045.4      10700    2045.5    10724.2

  Section 60.705 is the inlet of a large box culvert

QT       4       5300       5300       5300       5300

NH       3       .027     9876.2       .047    10238.3       .027      10485

ET                          6.1                                9910      10200
 1   60.705         13     9970.2     10043.6        165         300        200
X3       10
  The following elevation was calculated from the FHWA culvert analysis
  program HY-8
X5       2     2048.9     2049.9
GR   2050.3     9718.6    2048.2     9754.6    2048.0     9876.2    2043.7     9920.4    2043.2     9952.9
GR   2044.2     9970.2    2042.7    10000.0    2044.9    10043.6    2045.1    10097.1    2045.9    10238.3
GR   2047.8    10323.0       2048      10385       2050      10485
```

NH	4	0.1	9593.3	.027	9965.6	.047	10035.9	.027	10354.5	
ET			6.1			9839	10036			
X1	60.800	27	9965.6	10035.9	535	355	505			
X3	10									
GR	2057.4	9073.1	2057.0	9230.3	2055.9	9461.6	2054.1	9522.7	2054.1	9554.5
GR	2054.7	9593.3	2053.4	9696.4	2049.1	9728.1	2048.7	9774.1	2047.5	9812.0
R	2047.8	9866.3	2048.0	9916.9	2050.9	9949.8	2050.8	9965.6	2049.6	9975.1
GR	2047.8	10000.0	2048.0	10025.2	2050.7	10035.9	2049.6	10041.3	2048.6	10065.3
GR	2049.3	10098.9	2048.1	10132.6	2050.0	10148.6	2049.6	10161.5	2050.1	10174.0
GR	2052.6	10208.9	2051.8	10354.5						
NC	.10	.022	.022	.3	.5					

Sections 60.867 through 60.912:
Right bank was modified to reflect recent grading
Airport Wash is perpendicular to Tropicana Wash flow direction and was assumed ineffective

ET		4.1	6.1	9210.0	10060.8	9951.0	10060.8			
X1	60.867	16	9951.0	10060.8	346	360	350			
X3	10									
GR	2055.9	9206.7	2054.9	9416.1	2056.3	9436.9	2054.1	9523.7	2055.7	9725.4
GR	2056.6	9822.4	2057.3	9856.7	2057.8	9885.2	2056.7	9951.0	2050.3	9979.8
GR	2049.6	10000.0	2051.2	10028.7	2053.7	10060.8	2052.3	10272.8	2052.6	10423.7
GR	2051.4	10661.1								
NC		.10								
ET		4.1	6.1	9300.0	10150.0	9945.5	10065.0			
X1	60.887	20	9945.5	10065.0	110	108	110			
X3	10									
GR	2057.4	9054.8	2056.6	9256.3	2055.3	9457.6	2056.5	9704.3	2057.3	9845.4
GR	2059.1	9876.5	2058.7	9945.5	2051.3	9977.5	2049.8	10000.0	2050.9	10024.1
GR	2054.6	10034.1	2057.3	10046.1	2058.7	10065.0	2059.1	10144.3	2054.8	10164.2
GR	2054.8	10180.1	2054.8	10199.9	2055.2	10332.0	2053.7	10534.7	2054.6	10597.3

3324 cfs is the Q coming out of the box culvert at I-15

QT	4	3324	3324	3324	3324					
ET		4.1	6.1	9800.0	10250.0	9940.3	10044.8			
X1	60.903	21	9940.3	10044.8	80	90	85			
X3	10									
GR	2057.5	9075.4	2056.1	9190.0	2057.4	9201.6	2057.8	9244.4	2055.6	9450.6
GR	2056.6	9643.7	2058.6	9940.3	2051.4	9967.9	2050.8	9984.0	2049.7	10000.0
GR	2050.3	10016.4	2051.1	10027.8	2058.4	10044.8	2058.8	10068.8	2059.0	10192.8
GR	2055.0	10212.6	2055.0	10228.5	2055.0	10246.7	2055.2	10316.3	2054.7	10499.7
GR	2054.6	10564.7								

Bridge over Tropicana Wash just downstream from Harbor Island Development

SB	1.25	1.6	2.6	0	50	2	366.8	0	2050.0	2049.7
ET		4.1	6.1	9870.0	10310.0	9934.0	10054.4			
X1	60.912	24	9934.0	10054.4	45	45	45			
X2			1	2057.6	2056.5					
X3	10									
BT	-6	9890	2056.5		9920	2056.5		9950	2061.0	
BT		10000	2061.0		10030	2056.5		10060	2056.5	
GR	2057.7	9069.0	2057.1	9080.3	2056.4	9127.0	2058.9	9144.3	2059.2	9193.5
GR	2060.2	9394.7	2057.7	9440.0	2057.7	9600.6	2056.4	9628.3	2058.2	9826.6
GR	2060.1	9863.8	2059.2	9934.0	2051.2	9976.2	2050.0	10000.0	2050.6	10016.5
GR	2058.7	10054.4	2058.9	10122.8	2060.3	10163.6	2056.6	10263.5	2054.7	10285.4
GR	2054.7	10297.6	2054.7	10316.6	2054.9	10460.5	2055.3	10520.7		

NC			.025	.1	.3					
ET		4.1	6.1	9930.5	10219.4	9934.1	10057.5			
X1	60.936	18	9934.1	10057.5	70	230	125			
X3	10									
GR	2059.1	9242.3	2058.8	9304.1	2059.8	9446.6	2061.4	9537.5	2058.0	9583.4
GR	2058.2	9810.7	2061.1	9891.7	2060.1	9934.1	2051.9	9970.8	2050.9	10000.0
GR	2051.6	10020.9	2060.3	10057.5	2060.3	10136.2	2060.3	10204.3	2063.0	10219.4
GR	2062.8	10305.5	2059.4	10320.8	2059.4	10356.9				
ET		4.1	6.1	9780.0	10345.0	9946.7	10053.5			
X1	60.992	11	9946.7	10053.5	320	255	300			
GR	2061.7	9396.5	2061.8	9596.7	2061.4	9786.1	2059.4	9946.7	2054.7	9969.6
GR	2052.3	10000.0	2054.3	10027.7	2059.2	10053.5	2060.7	10108.7	2061.6	10293.1

```
GR   2060.9    10346.9

NC                                  .3          .5

ET                4.1         6.1       9780.0      10530.0      9948.6      10047.0
X1   61.034        15        9948.6      10047.0          215          235          228
GR   2064.4    9343.1      2065.0       9406.9       2063.3       9601.6       2062.2       9781.3       2059.9       9948.6
GR   2055.5    9970.0      2053.6      10000.0       2054.7      10026.1       2061.4      10047.0       2062.2      10058.7
GR   2065.9   10122.3      2065.0      10206.2       2067.0      10315.7       2061.4      10387.6       2060.6      10535.8


ET                4.1         6.1       9800.0      10560.0      9954.6      10078.3
X1   61.072        21        9954.6      10078.3          190          200          200
X3       10
GR   2064.9    9405.8      2065.2       9446.7       2066.5       9615.9       2065.1       9702.0       2062.4       9856.8
GR   2062.0    9943.7      2063.2       9954.6       2057.0       9973.5       2054.2      10000.0       2056.4      10033.0
GR   2062.5   10053.3      2066.5      10078.3       2066.2      10161.2       2066.9      10206.6       2068.4      10247.3
GR   2069.1   10507.9      2066.7      10542.9       2066.1      10638.9       2062.6      10653.2       2061.6      10679.2
GR   2060.8   10773.4

  Bridge over Tropicana Wash at entrance to Harbor Island Hotel

SB     1.25        1.6         2.6          85         50.1          2.1         398.4            0       2054.2       2054.2

NC        .                   .015

ET                4.1         6.1       9780.0      10545.0      9968.5      10070.2
X1   61.079        23        9968.5      10070.2          65           35           35
X2                                           1       2062.5       2064.3
X3       10
GR   2064.5    9351.7      2065.1       9407.5       2064.8       9545.1       2065.5       9619.0       2065.5       9668.8
GR   2064.2    9767.8      2062.4       9890.3       2062.8       9942.4       2065.0       9968.5       2054.8       9975.3
GR   2054.1   10000.0      2054.7      10025.7       2063.6      10030.0       2065.8      10070.2       2065.5      10126.4
GR   2065.4   10139.8      2067.3      10186.4       2066.9      10257.6       2067.7      10326.8       2067.1      10558.4
GR   2065.3   10737.1      2062.3      10750.9       2062.2      10777.9

  There is a drop structure between sections 61.079 and 61.093
1
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ET                4.1         6.1       9535.0      10535.0      9956.2      10048.1
X1   61.093        20        9956.2      10048.1          85           40           78
X3       10
GR   2068.2    9350.6      2068.7       9535.8       2066.7       9576.0       2066.9       9678.0       2063.4       9779.2
GR   2065.4    9943.1      2067.5       9956.2       2066.6       9967.8       2059.8       9973.3       2059.2      10000.
GR   2059.2   10033.2      2064.9      10037.5       2065.6      10048.1       2065.4      10063.7       2064.9      10141.
GR   2066.7   10220.3      2068.4      10313.7       2067.1      10446.8       2068.0      10563.4       2064.1      10825.


ET                4.1         6.1       9760.0      10070.0      9947.2      10056.1
X1   61.116        22        9947.2      10056.1          155          78           120
X3       10
GR   2068.0    9137.2      2066.5       9311.8       2068.7       9522.0       2068.5       9640.5       2070.1       9664.9
GR   2067.0    9724.0      2066.2       9829.3       2067.9       9901.1       2066.8       9929.7       2065.3       9947.2
GR   2061.0    9955.5      2057.9      10000.0       2059.9      10044.2       2064.1      10052.0       2065.3      10056.1
GR   2065.6   10143.3      2068.1      10180.5       2067.6      10278.2       2067.9      10410.4       2065.6      10504.0
GR   2066.4   10561.9      2065.5      10807.6

  Bridge over Tropicana Wash at Harmon

SB     1.05        1.6         2.6          80         62.5          2.5         246.0            0       2060.0       2057.9

NC                              .025

  Sections 61.141 to 61.235: encroachment limits put in on right overbank to
  reflect extent of effective flow due to expansion of flow area as channel
  widens.

ET                4.1         6.1       9860.0      10070.0      9904.7      10056.3
X1   61.141        20        9904.7      10056.3          150          165          130
X2                                           1       2064.1       2065.9
X3       10
GR   2069.9    9210.1      2068.0       9291.9       2069.3       9470.7       2068.8       9598.6       2070.8       9642.0
GR   2067.8    9766.8      2069.8       9793.3       2067.9       9877.6       2065.7       9904.7       2060.0       9965.0
GR   2060.0   10000.0      2060.0      10035.0       2065.4      10056.3       2068.1      10065.9       2066.8      10205.1
GR   2069.2   10264.1      2067.9      10421.4       2066.3      10466.3       2066.2      10557.7       2065.5      10614.8


NC                                  .1          .3

ET                4.1         6.1       9880.0      10140.0      9951.0      10034.0
X1   61.164        18        9981.0      10014.6           60          140          125
GR   2068.4    9232.9      2068.4       9232.9       2068.4       9276.4       2068.6       9382.6       2069.4       9568.0
GR   2069.9    9748.6      2068.7       9854.9       2066.5       9880.9       2066.0       9952.1       2065.7       9981.0
GR   2061.7   10000.0      2066.0      10014.6       2065.9      10036.2       2065.8      10111.2       2068.7      10129.5
GR   2068.5   10259.0      2070.3      10378.0       2067.7      10587.3

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NC      .03        .03       .038

ET                 4.1        6.1     9770.0    10334.9     9866.0    10062.9
X1    61.235          12     9866.0    10062.9        410        330        375
X3        10
GR    2080.1     9747.4     2080.5     9769.0     2079.6     9866.0     2072.3     9957.5     2069.1    10000.0
GR    2069.8    10026.1     2075.2    10046.4     2075.9    10062.9     2072.2    10087.3     2073.7    10141.0
GR    2070.7    10158.0     2072.7    10334.9


NC     .125       .030       .043

ET                 4.1        6.1     9960.0    10100.0     9982.8    10064.7
X1    61.339           8     9982.8    10064.7        510        610        545
GR    2085.1     9634.6     2085.8     9750.1     2080.6     9982.8     2074.4    10000.0     2077.1    10017.1
GR    2078.2    10044.2     2084.6    10064.7     2084.8    10101.4


ET                 4.1        6.1     9941.4    10335.0     9941.4    10035.0
X1    61.390          12     9941.4    10035.0        265        275        270
X3        10
GR    2086.4     9674.6     2083.2     9744.0     2083.3     9941.4     2078.0     9949.8     2075.7    10000.0
GR    2078.4    10012.0     2086.7    10035.0     2090.2    10078.4     2090.6    10107.1     2089.3    10126.8
GR    2089.0    10172.1     2092.5    10337.7

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    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


 *PROF 1
0

 CCHV=      .100 CEHV=      .300
 *SECNO 60.000
     60.000      10.78    2001.08        .00    2001.08    2001.87        .79        .00        .00    2011.30
     4839.9         .0     4839.9         .0         .0      676.7         .0         .0         .0    2009.60
        .00         .00       7.15        .00        .000       .080       .000       .000    1990.30    9915.79
    .013306          0.         0.         0.          0          0          0        .00     106.55   10022.34


 *SECNO 60.080

  301 HV CHANGED MORE THAN HVINS

 7185 MINIMUM SPECIFIC ENERGY
 3720 CRITICAL DEPTH ASSUMED

 3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA=      2020.10 ELREA=      2017.60

     60.080       7.96    2011.66    2011.66        .00    2013.99       2.33      11.44        .46    2020.10
     4839.9         .0     4839.9         .0         .0      395.2         .0        5.2         .9    2017.60
        .01         .00       12.25        .00        .000       .095       .000       .000    2003.70    9943.40
    .084113       470.       420.       400.         10         19          0        .00      87.09   10030.48


 CCHV=      .300 CEHV=      .500
 *SECNO 60.135
 3280 CROSS SECTION      60.13 EXTENDED        .92 FEET


 3301 HV CHANGED MORE THAN HVINS

 7185 MINIMUM SPECIFIC ENERGY
 3720 CRITICAL DEPTH ASSUMED

 3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA=      2022.80 ELREA=      2021.80

     60.135       8.22    2022.12    2022.12        .00    2023.14       1.02       7.24        .39    2022.80
     4839.9         .0     4178.1      661.8         .0      497.2      114.8        8.6        2.1    2021.80
        .02         .00       8.40       5.77        .000       .062       .020       .000    2013.90    9960.78
    .011509       305.       295.       295.          4          9          0        .00     266.82   10227.60


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    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

 5227 DOWNSTREAM ELEV IS    2020.81 , NOT    2022.12 HYDRAULIC JUMP OCCURS DOWNSTREAM (IF LOW FLOW CONTROLS)

 SB  XK         XKOR       COFQ       RDLEN      BWC        BWP        BAREA      SS         ELCHU      ELCHD
      1.05       1.60       2.70        .00      37.40       1.40     180.00        .00    2014.30    2013.90
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*SECNO 60.171
BTCARD, BRIDGE STENCL=    9625.00   STENCR=   10215.70
3280 CROSS SECTION      60.17 EXTENDED       5.36 FEET


3301 HV CHANGED MORE THAN HVINS


,302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  4.08

PRESSURE AND WEIR FLOW,  Weir Submergence Based on TRAPEZOIDAL Shape

 EGPRS       EGLWC       H3        QWEIR       QPR        BAREA    TRAPEZOID       ELLC      ELTRD      WEIRLN
                                                                       AREA
   2043.66   2025.33        .00      3258.      2061.       180.       180.      2019.30   2022.80       466.


3470 ENCROACHMENT STATIONS=     9625.0   10215.7  TYPE=       1  TARGET=      590.700
    60.171      10.76   2025.06        .00        .00   2025.37        .32       2.24        .00   2022.40
    5300.0      725.4    3358.2    1216.4      287.4      638.1      401.7       12.9        3.7   2022.50
       .03       2.52       5.26      3.03       .025       .032       .025       .000   2014.30   9779.81
   .000830       160.       185.      229.          2          0          5        .00    435.89  10215.70


*SECNO 60.219
3280 CROSS SECTION      60.22 EXTENDED        .95 FEET


3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=     9900.0   10070.0  TYPE=       1  TARGET=      170.000
1
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    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


    60.219        7.85    2027.05    2027.05         .00    2028.55        1.50         .42         .59    2025.10
    5300.0      1179.5     3887.1      233.4       167.9      362.2        46.6        18.4         5.5    2026.30
       .04         7.03      10.73       5.01        .025       .032       .025        .000   2019.20   9900.00
   .005053       190.       255.        320.          20         14          0         .00    170.00  10070.00


*SECNO 60.276

3301 HV CHANGED MORE THAN HVINS


3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  1.44


3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA=      2029.20 ELREA=      2030.20

    60.276        7.42    2029.02         .00         .00   2029.78         .76        1.01         .22   2029.20
    5300.0          .0     5300.0          .0          .0     756.1          .0        23.0         6.5   2030.20
       .05          .00       7.01        .00        .000       .032       .000        .000   2021.60   9924.04
   .002426       280.       300.        320.          2          0          0         .00    138.86  10062.89


SPECIAL BRIDGE

SB  XK          XKOR        COFQ        RDLEN       BWC         BWP         BAREA       SS          ELCHU       ELCHD
      .90         1.60        2.60         .00       74.50        2.50      295.20         .00    2021.80     2021.60

*SECNO 60.301

3301 HV CHANGED MORE THAN HVINS


3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  2.61

PRESSURE AND WEIR FLOW,  Weir Submergence Based on TRAPEZOIDAL Shape

 EGPRS       EGLWC       H3        QWEIR       QPR        BAREA    TRAPEZOID       ELLC      ELTRD      WEIRLN
                                                                       AREA
   2037.03   2029.78        .06      2234.      3071.       295.       295.      2025.90   2028.40       404.


3470 ENCROACHMENT STATIONS=     9677.6   10970.0  TYPE=       1  TARGET=     1292.400
1
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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
60.301	9.73	2031.53	.00	.00	2031.71	.17	1.93	.00	2029.30
5300.0	368.8	4599.7	331.5	280.9	1295.1	299.6	27.2	8.0	2029.80
.06	1.31	3.55	1.11	.027	.030	.027	.000	2021.80	9677.60
.000355	130.	135.	160.	2	0	4	.00	772.01	10449.61

*SECNO 60.345

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .30

3470 ENCROACHMENT STATIONS= 9606.8 10234.5 TYPE= 1 TARGET= 627.700

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2032.80 ELREA= 2032.80

60.345	6.99	2031.09	.00	.00	2032.53	1.44	.19	.63	2032.80
5300.0	.0	5300.0	.0	.0	550.0	.0	33.5	10.3	2032.80
.07	.00	9.64	.00	.000	.030	.000	.000	2024.10	9953.44
.003917	260.	230.	200.	3	0	0	.00	96.59	10050.02

CCHV= .100 CEHV= .300
*SECNO 60.397

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 9553.1 10568.0 TYPE= 1 TARGET= 1014.900

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2035.90 ELREA= 2035.10

60.397	8.22	2033.22	2033.22	.00	2035.89	2.67	2.14	.37	2035.90
5300.0	.0	5300.0	.0	.0	404.5	.0	36.6	10.8	2035.10
.08	.00	13.10	.00	.000	.050	.000	.000	2025.00	9969.00
.022238	270.	275.	280.	20	11	0	.00	77.20	10046.20

1

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
60.446	10.02	2037.12	.00	.00	2037.53	.41	1.41	.23	2036.50
5300.0	831.9	4468.1	.0	295.5	817.6	.0	41.1	12.3	2039.10
.09	2.82	5.46	.00	.027	.050	.000	.000	2027.10	9667.50
.002391	270.	260.	255.	3	0	0	.00	390.92	10058.42

*SECNO 60.446

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 3.05

3470 ENCROACHMENT STATIONS= 9600.0 10180.0 TYPE= 1 TARGET= 580.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2036.50 ELREA= 2039.10

60.446	10.02	2037.12	.00	.00	2037.53	.41	1.41	.23	2036.50
5300.0	831.9	4468.1	.0	295.5	817.6	.0	41.1	12.3	2039.10
.09	2.82	5.46	.00	.027	.050	.000	.000	2027.10	9667.50
.002391	270.	260.	255.	3	0	0	.00	390.92	10058.42

*SECNO 60.492
3280 CROSS SECTION 60.49 EXTENDED 1.78 FEET

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 9335.0 10205.3 TYPE= 1 TARGET= 870.300

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2039.20 ELREA= 2040.50

60.492	6.18	2037.88	2037.88	.00	2040.04	2.16	1.33	.52	2039.20
5300.0	.0	5300.0	.0	.0	449.8	.0	45.5	13.7	2040.50
.10	.00	11.78	.00	.000	.050	.000	.000	2031.70	9943.15
.023352	260.	240.	220.	20	14	0	.00	106.36	10049.51

1490 NH CARD USED
*SECNO 60.587

3265 DIVIDED FLOW

1
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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

3280 CROSS SECTION 60.59 EXTENDED .14 FEET

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.41

3470 ENCROACHMENT STATIONS= 9260.0 10187.3 TYPE= 1 TARGET= 927.300

60.587	1.63	2043.83	.00	.00	2043.99	.16	3.75	.20	2043.80
1870.0	1131.5	675.3	63.2	340.1	217.6	59.0	51.7	18.6	2043.10
.14	3.33	3.10	1.07	.022	.020	.033	.000	2042.20	9289.08
.001472	515.	505.	500.	6	0	0	.00	733.12	10187.30

1490 NH CARD USED
*SECNO 60.667

3265 DIVIDED FLOW

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .47

3470 ENCROACHMENT STATIONS= 9220.0 10700.0 TYPE= 1 TARGET= 1480.000

60.667	1.42	2044.82	.00	.00	2045.10	.29	1.07	.04	2045.30
1870.0	1865.0	4.8	.2	433.5	2.7	8.7	56.5	24.4	2046.10
.16	4.30	1.79	.03	.030	.020	.999	.000	2043.40	9517.06
.006750	385.	420.	425.	4	0	0	.00	546.99	10576.80

1490 NH CARD USED
*SECNO 60.705
WATER EL=X5 CARD= 2048.900

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 6.43

60.705	6.20	2048.90	.00	.00	2049.03	.13	.36	.02	2044.20
5300.0	1431.6	1328.2	2540.2	503.4	384.8	944.6	62.5	27.5	2044.90
.18	2.84	3.45	2.69	.045	.047	.041	.000	2042.70	9742.60
.001311	165.	200.	300.	0	0	0	.00	687.39	10430.00

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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

1490 NH CARD USED
*SECNO 60.800

3265 DIVIDED FLOW

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

60.800	3.01	2050.81	2050.81	.00	2051.36	.55	.98	.12	2050.80
5300.0	3662.8	472.2	1165.0	565.5	147.4	235.2	76.9	33.4	2050.70
.21	6.48	3.20	4.95	.027	.047	.027	.000	2047.80	9715.48
.003856	535.	505.	355.	20	17	0	.00	453.60	10183.94

CCHV= .300 CEHV= .500
*SECNO 60.867
3280 CROSS SECTION 60.87 EXTENDED 4.40 FEET

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

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3470 ENCROACHMENT STATIONS=     9210.0   10060.8  TYPE=      1  TARGET=      850.800

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA=      2056.70 ELREA=    100000.00

    60.867      6.20   2055.80   2055.80       .00   2057.97      2.16      1.47       .81   2056.70
    5300.0        .0    5300.0        .0        .0     449.1        .0      82.5      35.6 100000.00
       .21       .00     11.80       .00      .000      .022      .000      .000   2049.60   9955.03
   .004600       346.      350.      360.        20        17         0       .00    105.76  10060.80


*SECNO 60.887
3280 CROSS SECTION     60.89 EXTENDED      2.40 FEET

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=     9300.0   10150.0  TYPE=      1  TARGET=      850.000
1
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    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


3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA=      2058.70 ELREA=      2058.70

    60.887      7.20   2057.00   2057.00       .00   2059.35      2.35       .49       .09   2058.70
    5300.0        .0    5300.0        .0        .0     431.0        .0      83.7      35.9   2058.70
       .22       .00     12.30       .00      .000      .022      .000      .000   2049.80   9952.85
   .004325       110.      110.      108.        20         8         0       .00     91.92  10044.77


*SECNO 60.903
3280 CROSS SECTION     60.90 EXTENDED      5.23 FEET


3301 HV CHANGED MORE THAN HVINS


3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  2.65


3470 ENCROACHMENT STATIONS=     9800.0   10250.0  TYPE=      1  TARGET=      450.000
    60.903     10.14   2059.84       .00       .00   2060.06       .22       .07       .64   2058.60
    3324.0      78.0    3072.7     173.4     239.0     778.9     381.6      85.4      36.4   2058.40
       .22       .33      3.95       .45      .100      .022      .100      .000   2049.70   9800.00
   .000242        80.       85.       90.         3         0         0       .00    450.00  10250.00


SPECIAL BRIDGE

SB  XK         XKOR       COFQ       RDLEN      BWC        BWP        BAREA      SS         ELCHU      ELCHD
     1.25       1.60       2.60        .00      50.00       2.00     366.80        .00    2050.00    2049.70

*SECNO 60.912

3265 DIVIDED FLOW

3280 CROSS SECTION     60.91 EXTENDED      4.92 FEET

PRESSURE AND WEIR FLOW,  Weir Submergence Based on TRAPEZOIDAL Shape

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    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      ELLC       ELTRD      WEIRLN
                                                                     AREA
   2060.42    2060.13        .01      1559.      1782.       367.       365.     2057.60    2056.50       112.


3470 ENCROACHMENT STATIONS=     9870.0   10310.0  TYPE=      1  TARGET=      440.000
    60.912     10.22   2060.22       .00       .00   2060.42       .20       .36       .00   2059.20
    3324.0       6.5    3070.8     246.7      39.0     815.5     535.0      86.9      36.9   2058.70
       .23       .17      3.77       .46      .100      .022      .100      .000   2050.00   9870.00
   .000247        45.       45.       45.         2         0         3       .00    435.45  10310.00


CCHV=      .100 CEHV=      .300
*SECNO 60.936
3280 CROSS SECTION     60.94 EXTENDED       .79 FEET
```

3470 ENCROACHMENT STATIONS= 9930.5 10219.4 TYPE= 1 TARGET= 288.900

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2060.10 ELREA= 2060.30

60.936	9.29	2060.19	.00	.00	2060.50	.30	.04	.03	2060.10
3324.0	.0	3324.0	.0	.2	752.9	.0	90.6	37.9	2060.30
.24	.05	4.41	.00	.100	.025	.000	.000	2050.90	9930.50
.000503	70.	125.	230.	2	0	0	.00	126.55	10057.05

*SECNO 60.992

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .68

3470 ENCROACHMENT STATIONS= 9780.0 10345.0 TYPE= 1 TARGET= 565.000

60.992	7.94	2060.24	.00	.00	2060.78	.54	.21	.07	2059.40
3324.0	7.9	3309.7	6.4	28.5	560.5	20.0	95.3	39.1	2059.20
.25	.28	5.90	.32	.100	.025	.100	.000	2052.30	9879.03
.001097	320.	300.	255.	2	0	0	.00	212.85	10091.87

CCHV= .300 CEHV= .500

1

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 61.034

3470 ENCROACHMENT STATIONS= 9780.0 10530.0 TYPE= 1 TARGET= 750.000

61.034	6.82	2060.42	.00	.00	2061.27	.85	.33	.15	2059.90
3324.0	2.7	3321.3	.0	9.9	449.3	.0	98.1	40.0	2061.40
.26	.27	7.39	.00	.100	.025	.000	.000	2053.60	9910.56
.001997	215.	228.	235.	0	0	0	.00	133.39	10043.95

*SECNO 61.072

3470 ENCROACHMENT STATIONS= 9800.0 10560.0 TYPE= 1 TARGET= 760.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2063.20 ELREA= 2066.50

61.072	6.52	2060.72	.00	.00	2061.99	1.27	.51	.21	2063.20
3324.0	.0	3324.0	.0	.0	366.9	.0	100.0	40.5	2066.50
.26	.00	9.06	.00	.000	.025	.000	.000	2054.20	9962.15
.003394	190.	200.	200.	0	0	0	.00	85.23	10047.38

SPECIAL BRIDGE

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	1.25	1.60	2.60	85.00	50.10	2.10	398.40	.00	2054.20	2054.20

*SECNO 61.079

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.93

CLASS A LOW FLOW

3420 BRIDGE W.S.= 2060.35 BRIDGE VELOCITY= 11.26 CALCULATED CHANNEL AREA= 295.

EGPRS	EGLWC	H3	QWEIR	QLOW	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
.00	2062.41	.35	0.	3324.	398.	398.	2062.50	2064.30	0.

3470 ENCROACHMENT STATIONS= 9780.0 10545.0 TYPE= 1 TARGET= 765.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2065.00 ELREA= 2065.80

1

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

61.079	6.96	2061.06	.00	.00	2062.41	1.34	.42	.00	2065.00
3324.0	.0	3324.0	.0	.0	357.5	.0	100.2	40.6	2065.80
.27	.00	9.30	.00	.000	.015	.000	.000	2054.10	9971.12
.000907	65.	35.	35.	0	0	0	.00	57.65	10028.78

*SECNO 61.093

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 9535.0 10535.0 TYPE= 1 TARGET= 1000.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2067.50 ELREA= 2065.60

61.093	4.61	2063.81	2063.81	.00	2065.96	2.15	.11	.40	2067.50
3324.0	.0	3324.0	.0	.0	282.8	.0	100.8	40.7	2065.60
.27	.00	11.76	.00	.000	.015	.000	.000	2059.20	9970.05
.002224	85.	78.	40.	20	14	0	.00	66.62	10036.68

*SECNO 61.116
3280 CROSS SECTION 61.12 EXTENDED .69 FEET

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 3.24

3470 ENCROACHMENT STATIONS= 9760.0 10070.0 TYPE= 1 TARGET= 310.000

61.116	8.29	2066.19	.00	.00	2066.55	.36	.06	.53	2065.30
3324.0	.6	3321.2	2.3	4.6	685.9	12.0	102.2	40.9	2065.30
.27	.13	4.84	.19	.100	.015	.100	.000	2057.90	9936.85
.000211	155.	120.	78.	4	0	0	.00	133.15	10070.00

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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

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	1.05	1.60	2.60	80.00	62.50	2.50	246.00	.00	2060.00	2057.90

*SECNO 61.141
3280 CROSS SECTION 61.14 EXTENDED 2.92 FEET

PRESSURE AND WEIR FLOW, Weir Submergence Based on TRAPEZOIDAL Shape

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
2070.72	2066.58	.03	911.	2413.	246.	246.	2064.10	2065.90	80.

3470 ENCROACHMENT STATIONS= 9860.0 10070.0 TYPE= 1 TARGET= 210.000

61.141	8.42	2068.42	.00	.00	2068.58	.15	2.03	.00	2065.70
3324.0	13.8	3305.2	5.0	49.8	1047.8	17.5	104.9	41.5	2065.40
.29	.28	3.15	.28	.100	.025	.100	.000	2060.00	9860.00
.000216	150.	130.	165.	2	0	2	.00	210.00	10070.00

CCHV= .100 CEHV= .300
*SECNO 61.164
3280 CROSS SECTION 61.16 EXTENDED 1.25 FEET

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 9880.0 10140.0 TYPE= 1 TARGET= 260.000

61.164	7.25	2068.95	2068.95	.00	2070.34	1.39	.07	.37	2065.70
3324.0	571.1	2071.2	681.7	283.5	174.0	330.5	107.5	42.1	2066.00
.29	2.01	11.90	2.06	.100	.025	.100	.000	2061.70	9880.00
.004657	60.	125.	140.	20	10	0	.00	260.00	10140.00

*SECNO 61.235

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

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3280 CROSS SECTION     61.24 EXTENDED      1.50 FEET

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=     9770.0   10334.9  TYPE=      1  TARGET=      564.900

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA=      2079.60 ELREA=      2075.90

    61.235      5.10   2074.20   2074.20       .00   2075.76      1.56      2.87       .05   2079.60
    3324.0       .0    3324.0        .0        .0     332.2        .0     112.2      43.6   2075.90
       .30       .00     10.01       .00      .000      .038      .000      .000   2069.10    9933.64
   .014968      410.      375.      330.        20        19         0       .00    109.02   10042.66


*SECNO 61.339

3470 ENCROACHMENT STATIONS=     9960.0   10100.0  TYPE=      1  TARGET=      140.000
    61.339      7.46   2081.86   2081.56       .00   2083.54      1.68      7.74       .04   2080.60
    3324.0      31.1    3292.9        .0      22.9     315.0        .0     116.4      44.9   2084.60
       .31      1.36     10.45       .00      .125      .043      .000      .000   2074.40    9960.00
   .013503      510.      545.      610.         6        14         0       .00     95.92   10055.92


*SECNO 61.390

3301 HV CHANGED MORE THAN HVINS


3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  2.24


3470 ENCROACHMENT STATIONS=     9941.4   10335.0  TYPE=      1  TARGET=      393.600

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA=      2083.30 ELREA=      2086.70

    61.390      8.79   2084.49       .00       .00   2085.04       .55      1.39       .11   2083.30
    3324.0       .0    3324.0        .0        .0     556.3        .0     119.2      45.5   2086.70
       .33       .00      5.98       .00      .000      .043      .000      .000   2075.70    9941.40
   .002699      265.      270.      275.         3         0         0       .00     87.47   10028.87


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 T1      FLAMINGO WASH    ENCROACHMENT CONDITIONS
 T2      JOB NUMBER RDD33832.A2.60
 T3      Flam-Enc.HC2             100 YEAR FLOOD CONDITIONS  ENCROACHMENT

 J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

      -10        3          0         0         0         0         0         0   2002.08         0

 J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

       2         0        -1         0         0         0         0         0         0        15

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     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


 *PROF 2
0

 CCHV=      .100 CEHV=      .300
 *SECNO 60.000

 3470 ENCROACHMENT STATIONS=     9912.0   10024.0  TYPE=      1  TARGET=      112.000
     60.000     11.78   2002.08       .00   2001.08   2002.67       .59       .00       .00 100000.00
     4839.9       .0    4839.9        .0        .0     786.3        .0        .0        .0 100000.00
        .00       .00      6.16       .00      .000      .080      .000      .000   1990.30    9912.00
    .008653        0.        0.        0.         0         0         0       .00    112.00   10024.00


 FLOW DISTRIBUTION FOR SECNO=      60.00          CWSEL=   2002.08

 STA=     9912.    10040.
   PER Q=     100.0
    AREA=     786.3
     VEL=       6.2
   DEPTH=       7.0

 *SECNO 60.080

 3301 HV CHANGED MORE THAN HVINS
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3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 9919.2 10053.2 TYPE= 1 TARGET= 134.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2020.10 ELREA= 100000.00

60.080	7.96	2011.66	2011.66	2011.66	2013.99	2.33	8.34	.52	2020.10
4839.9	.0	4839.9	.0	.0	395.1	.0	5.7	1.0	100000.00
.01	.00	12.25	.00	.000	.095	.000	.000	2003.70	9943.40
.084178	470.	420.	400.	20	19	0	.00	87.08	10030.48

FLOW DISTRIBUTION FOR SECNO= 60.08 CWSEL= 2011.66

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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

STA= 9943. 10053.
PER Q= 100.0
AREA= 395.1
VEL= 12.3
DEPTH= 4.5

CCHV= .300 CEHV= .500
*SECNO 60.135
3280 CROSS SECTION 60.13 EXTENDED .81 FEET

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 2.27

3470 ENCROACHMENT STATIONS= 9959.0 10042.0 TYPE= 1 TARGET= 83.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2022.80 ELREA= 2021.80

60.135	8.10	2022.00	.00	2022.12	2023.53	1.53	9.29	.24	2022.80
4839.9	.0	4839.9	.0	.0	488.1	.0	8.7	1.5	2021.80
.02	.00	9.92	.10	.000	.062	.020	.000	2013.90	9961.02
.016350	305.	295.	295.	6	0	0	.00	80.97	10042.00

FLOW DISTRIBUTION FOR SECNO= 60.13 CWSEL= 2022.00

STA= 9961. 10042.
PER Q= 100.0
AREA= 488.1
VEL= 9.9
DEPTH= 6.0

SPECIAL BRIDGE

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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

5227 DOWNSTREAM ELEV IS 2020.81 , NOT 2022.00 HYDRAULIC JUMP OCCURS DOWNSTREAM (IF LOW FLOW CONTROLS)

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	1.05	1.60	2.70	.00	37.40	1.40	180.00	.00	2014.30	2013.90

*SECNO 60.171
BTCARD, BRIDGE STENCL= 9908.80 STENCR= 10097.60
3280 CROSS SECTION 60.17 EXTENDED 6.36 FEET

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 5.03

PRESSURE AND WEIR FLOW, Weir Submergence Based on TRAPEZOIDAL Shape

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
2043.54	2025.84	.00	2920.	2410.	180.	180.	2019.30	2022.80	189.

```
3470 ENCROACHMENT STATIONS=     9908.8   10097.6  TYPE=      1  TARGET=      188.800
    60.171     11.76   2026.06      .00   2025.06   2026.46      .40      2.93      .00   2022.40
    5300.0     738.2    3939.7    622.1     202.9     716.6     172.1      12.1      2.1   2022.50
       .03      3.64      5.50     3.62      .025      .032      .025      .000   2014.30   9908.80
   .000776      160.      185.      229.         2         0         4       .00    188.80  10097.60


.LOW DISTRIBUTION FOR SECNO=     60.17          CWSEL=   2026.06

STA=    9909.    9942.    9968.    9969.   10048.   10098.
  PER Q=      6.5      7.1       .3     74.3     11.7
   AREA=    102.8     96.2      3.8    716.6    172.1
    VEL=      3.4      3.9      3.9      5.5      3.6
  DEPTH=      3.1      3.7      3.8      9.1      3.4

*SECNO 60.219
3280 CROSS SECTION     60.22 EXTENDED      1.12 FEET

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    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

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=     9935.0   10055.0  TYPE=      1  TARGET=      120.000
    60.219      8.02   2027.22   2027.22   2027.05   2029.23      2.01       .42       .81   2025.10
    5300.0     708.9    4461.6     129.5      92.2     372.1      25.2      16.6       3.0   2026.30
       .03      7.69     11.99      5.13      .025      .032      .025      .000   2019.20   9935.00
   .006085      190.      255.      320.        20        19         0       .00    120.00  10055.00


FLOW DISTRIBUTION FOR SECNO=     60.22          CWSEL=   2027.22

STA=    9935.    9976.   10035.   10050.   10055.
  PER Q=     13.4     84.2      1.7       .8
   AREA=     92.2    372.1     17.3      8.0
    VEL=      7.7     12.0      5.1      5.1
  DEPTH=      2.3      6.3      1.2      1.5

*SECNO 60.276

3301 HV CHANGED MORE THAN HVINS


3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  2.01


3470 ENCROACHMENT STATIONS=     9923.0   10066.0  TYPE=      1  TARGET=      143.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA=      2029.20 ELREA=      2030.20

    60.276      8.31   2029.91      .00   2029.02   2030.47      .56       .80       .44   2029.20
    5300.0        .0    5300.0        .0         .0     881.4        .0      21.3       3.9   2030.20
       .05       .00      6.01       .00       .000      .032      .000      .000   2021.60   9923.00
   .001507      280.      300.      320.         2         0         0       .00    141.64  10064.64


FLOW DISTRIBUTION FOR SECNO=     60.28          CWSEL=   2029.91

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    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


STA=    9923.   10065.
  PER Q=    100.0
   AREA=    881.4
    VEL=      6.0
  DEPTH=      6.2


SPECIAL BRIDGE

SB  XK         XKOR       COFQ       RDLEN      BWC        BWP        BAREA      SS         ELCHU      ELCHD
      .90       1.60       2.60        .00      74.50       2.50     295.20        .00    2021.80    2021.60

*SECNO 60.301
```

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.82

PRESSURE AND WEIR FLOW, Weir Submergence Based on TRAPEZOIDAL Shape

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
2037.92	2030.47	.03	2652.	2671.	295.	295.	2025.90	2028.40	433.

3470 ENCROACHMENT STATIONS= 9905.1 10076.9 TYPE= 1 TARGET= 171.801

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2029.30 ELREA= 100000.00

60.301	9.89	2031.69	.00	2031.53	2031.94	.25	1.47	.00	2029.30
5300.0	.0	5300.0	.0	.0	1322.3	.0	24.7	4.4	100000.00
.06	.00	4.01	.00	.000	.030	.000	.000	2021.80	9905.10
.000454	130.	135.	160.	2	0	4	.00	171.80	10076.90

FLOW DISTRIBUTION FOR SECNO= 60.30 CWSEL= 2031.69

STA= 9905. 10077.
PER Q= 100.0
AREA= 1322.3
VEL= 4.0
DEPTH= 7.7

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 60.345

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .37

3470 ENCROACHMENT STATIONS= 9922.9 10053.0 TYPE= 1 TARGET= 130.100

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2032.80 ELREA= 100000.00

60.345	7.29	2031.39	.00	2031.09	2032.69	1.30	.22	.52	2032.80
5300.0	.0	5300.0	.0	.0	580.0	.0	29.8	5.1	100000.00
.06	.00	9.14	.00	.000	.030	.000	.000	2024.10	9951.38
.003401	260.	230.	200.	2	0	0	.00	99.18	10050.55

FLOW DISTRIBUTION FOR SECNO= 60.35 CWSEL= 2031.39

STA= 9951. 10053.
PER Q= 100.0
AREA= 580.0
VEL= 9.1
DEPTH= 5.8

CCHV= .100 CEHV= .300
*SECNO 60.397

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 9958.9 10051.6 TYPE= 1 TARGET= 92.699

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2035.90 ELREA= 100000.00

60.397	8.24	2033.24	2033.24	2033.22	2035.89	2.64	1.93	.40	2035.90
5300.0	.0	5300.0	.0	.0	406.2	.0	32.9	5.6	100000.00
.07	.00	13.05	.00	.000	.050	.000	.000	2025.00	9968.91
.021984	270.	275.	280.	20	8	0	.00	77.35	10046.26

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

FLOW DISTRIBUTION FOR SECNO= 60.40 CWSEL= 2033.24

STA= 9969. 10052.
PER Q= 100.0
AREA= 406.2
VEL= 13.0
DEPTH= 5.3

*SECNO 60.446

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 2.60

3470 ENCROACHMENT STATIONS= 9949.6 10062.9 TYPE= 1 TARGET= 113.301

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2036.50 ELREA= 100000.00

60.446	10.12	2037.22	.00	2037.12	2037.86	.64	1.77	.20	2036.50
5300.0	.0	5300.0	.0	.0	828.3	.0	36.6	6.2	100000.00
.08	.00	6.40	.00	.000	.050	.000	.000	2027.10	9949.60
.003258	270.	260.	255.	3	0	0	.00	109.04	10058.64

FLOW DISTRIBUTION FOR SECNO= 60.45 CWSEL= 2037.22

STA= 9950. 10063.
PER Q= 100.0
AREA= 828.3
VEL= 6.4
DEPTH= 7.6

*SECNO 60.492
3280 CROSS SECTION 60.49 EXTENDED 1.79 FEET

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY

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

3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 9937.6 10056.7 TYPE= 1 TARGET= 119.101

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2039.20 ELREA= 100000.00

60.492	6.19	2037.89	2037.89	2037.88	2040.04	2.16	1.66	.46	2039.20
5300.0	.0	5300.0	.0	.0	449.9	.0	40.1	6.8	100000.00
.09	.00	11.78	.00	.000	.050	.000	.000	2031.70	9943.15
.023339	260.	240.	220.	4	14	0	.00	106.36	10049.51

FLOW DISTRIBUTION FOR SECNO= 60.49 CWSEL= 2037.89

STA= 9943. 10057.
PER Q= 100.0
AREA= 449.9
VEL= 11.8
DEPTH= 4.2

1490 NH CARD USED
*SECNO 60.587
3280 CROSS SECTION 60.59 EXTENDED .84 FEET

3301 HV CHANGED MORE THAN HVINS

3470 ENCROACHMENT STATIONS= 9862.1 10053.6 TYPE= 1 TARGET= 191.500

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2043.80 ELREA= 100000.00

60.587	2.34	2044.54	.00	2043.83	2044.98	.44	4.77	.17	2043.80
1870.0	.0	1870.0	.0	.0	352.9	.0	44.7	8.5	100000.00
.11	.00	5.30	.00	.000	.020	.000	.000	2042.20	9862.10
.002286	515.	505.	500.	6	0	0	.00	191.50	10053.60

FLOW DISTRIBUTION FOR SECNO= 60.59 CWSEL= 2044.54

STA= 9862. 10054.
PER Q= 100.0
AREA= 352.9
VEL= 5.3
DEPTH= 1.8

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

.490 NH CARD USED
*SECNO 60.667
3280 CROSS SECTION 60.67 EXTENDED .35 FEET

3470 ENCROACHMENT STATIONS= 9700.0 10062.7 TYPE= 1 TARGET= 362.700

60.667	2.45	2045.85	.00	2044.82	2045.99	.15	.99	.03	2045.30
1870.0	1728.2	141.8	.0	560.6	44.0	.0	49.1	11.0	100000.00
.15	3.08	3.22	.00	.039	.020	.000	.000	2043.40	9700.00
.002612	385.	420.	425.	4	0	0	.00	356.31	10056.31

FLOW DISTRIBUTION FOR SECNO= 60.67 CWSEL= 2045.85

STA=	9700.	9808.	9850.	9953.	10000.	10063.
PER Q=	67.8	23.5	1.0	.2	7.6	
AREA=	256.9	92.3	169.0	42.5	44.0	
VEL=	4.9	4.8	.1	.1	3.2	
DEPTH=	2.4	2.2	1.6	.9	.8	

1490 NH CARD USED
*SECNO 60.705
WATER EL=X5 CARD= 2049.900

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 4.12

3470 ENCROACHMENT STATIONS= 9910.0 10200.0 TYPE= 1 TARGET= 290.000

60.705	7.20	2049.90	.00	2048.90	2050.08	.18	.29	.01	2044.20
5300.0	1367.9	1723.5	2208.7	376.1	458.2	726.1	54.6	12.6	2044.90
.17	3.64	3.76	3.04	.047	.047	.047	.000	2042.70	9910.00
.001234	165.	200.	300.	0	0	0	.00	290.00	10200.00

FLOW DISTRIBUTION FOR SECNO= 60.71 CWSEL= 2049.90

STA=	9910.	9920.	9953.	9970.	10044.	10097.	10200.
PER Q=	3.0	15.2	7.6	32.5	15.8	25.8	
AREA=	59.2	209.6	107.3	458.2	262.1	463.9	
VEL=	2.7	3.8	3.7	3.8	3.2	3.0	
DEPTH=	5.7	6.4	6.2	6.2	4.9	4.5	

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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

1490 NH CARD USED
*SECNO 60.800

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 9839.0 10036.0 TYPE= 1 TARGET= 197.000

60.800	3.88	2051.68	2051.68	2050.81	2053.16	1.48	1.24	.39	2050.80
5300.0	4107.2	1192.8	.0	385.4	208.2	.1	66.1	15.2	2050.70
.18	10.66	5.73	.05	.027	.047	.027	.000	2047.80	9839.00
.007785	535.	505.	355.	20	11	0	.00	197.00	10036.00

FLOW DISTRIBUTION FOR SECNO= 60.80 CWSEL= 2051.68

STA=	9839.	9866.	9917.	9950.	9966.	10036.
PER Q=	22.5	42.5	11.4	1.1	22.5	
AREA=	107.9	191.1	73.3	13.1	208.2	
VEL=	11.1	11.8	8.3	4.3	5.7	
DEPTH=	4.0	3.8	2.2	.8	3.0	

CCHV= .300 CEHV= .500
*SECNO 60.867
3280 CROSS SECTION 60.87 EXTENDED 4.40 FEET

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

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3470 ENCROACHMENT STATIONS=     9951.0   10060.8  TYPE=       1  TARGET=      109.800

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA=      2056.70 ELREA=    100000.00

    60.867      6.20   2055.80   2055.80   2055.80   2057.97      2.16      2.05       .34   2056.70
    5300.0        .0    5300.0        .0        .0     449.2        .0      70.2      16.4 100000.00
       .19       .00     11.80       .00      .000      .022      .000      .000   2049.60   9955.03
   .004598      346.      350.      360.        20        14         0       .00    105.77  10060.80


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    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


FLOW DISTRIBUTION FOR SECNO=      60.87          CWSEL=   2055.80

STA=     9955.   10061.
  PER Q=     100.0
   AREA=     449.2
    VEL=      11.8
  DEPTH=       4.2

*SECNO 60.887
3280 CROSS SECTION     60.89 EXTENDED      2.40 FEET

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=     9945.5   10065.0  TYPE=       1  TARGET=      119.500

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA=      2058.70 ELREA=    100000.00

    60.887      7.20   2057.00   2057.00   2057.00   2059.35      2.35       .49       .09   2058.70
    5300.0        .0    5300.0        .0        .0     431.0        .0      71.3      16.6 100000.00
       .19       .00     12.30       .00      .000      .022      .000      .000   2049.80   9952.85
   .004324      110.      110.      108.        20         8         0       .00     91.92  10044.77


FLOW DISTRIBUTION FOR SECNO=      60.89          CWSEL=   2057.00

STA=     9953.   10065.
  PER Q=     100.0
   AREA=     431.0
    VEL=      12.3
  DEPTH=       4.7

*SECNO 60.903
3280 CROSS SECTION     60.90 EXTENDED      5.16 FEET

3301 HV CHANGED MORE THAN HVINS

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    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 =  2.38

3470 ENCROACHMENT STATIONS=     9940.3   10044.8  TYPE=       1  TARGET=      104.500

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA=      2058.60 ELREA=    100000.00

    60.903     10.06   2059.76       .00   2059.84   2060.05       .29       .09       .62   2058.60
    3324.0        .0    3324.0        .0        .0     771.4        .0      72.5      16.8 100000.00
       .20       .00      4.31       .00      .000      .022      .000      .000   2049.70   9940.30
   .000301       80.       85.       90.         3         0         0       .00    104.50  10044.80


FLOW DISTRIBUTION FOR SECNO=      60.90          CWSEL=   2059.76

STA=     9940.   10045.
  PER Q=     100.0
   AREA=     771.4
    VEL=       4.3
  DEPTH=       7.4


SPECIAL BRIDGE

SB  XK         XKOR       COFQ       RDLEN      BWC        BWP        BAREA      SS         ELCHU      ELCHD
     1.25       1.60       2.60         .00      50.00       2.00      366.80        .00   2050.00    2049.70
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*SECNO 60.912
3280 CROSS SECTION      60.91 EXTENDED       4.80 FEET

PRESSURE AND WEIR FLOW,  Weir Submergence Based on TRAPEZOIDAL Shape

 EGPRS      EGLWC       H3       QWEIR      QPR       BAREA   TRAPEZOID      ELLC      ELTRD      WEIRLN
                                                              AREA
   2060.37   2060.07       .01     1529.     1812.       367.      365.     2057.60   2056.50       112.


3470 ENCROACHMENT STATIONS=      9934.0   10054.4  TYPE=       1  TARGET=       120.400

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA=       2059.20 ELREA=     100000.00

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    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

    60.912      10.10   2060.10        .00   2060.22   2060.37        .27        .32        .00   2059.20
    3324.0         .0    3324.0         .0         .0     801.6         .0       73.3       16.9 100000.00
       .20         .00      4.15        .00       .000       .022       .000       .000   2050.00   9934.00
   .000314       45.        45.        45.          2          0          3        .00    120.40  10054.40


FLOW DISTRIBUTION FOR SECNO=      60.91          CWSEL=    2060.10

STA=     9934.   10054.
  PER Q=     100.0
   AREA=     801.6
    VEL=       4.1
  DEPTH=       6.7

CCHV=      .100 CEHV=      .300
*SECNO 60.936
3280 CROSS SECTION      60.94 EXTENDED        .72 FEET


3470 ENCROACHMENT STATIONS=      9934.1   10057.5  TYPE=       1  TARGET=       123.400

 495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA=       2060.10 ELREA=     100000.00

    60.936       9.22   2060.12        .00   2060.19   2060.43        .31        .05        .01   2060.10
    3324.0         .0    3324.0         .0         .0     744.3         .0       75.5       17.3 100000.00
       .21         .00      4.47        .00       .000       .025       .000       .000   2050.90   9934.10
   .000521       70.        125.       230.          2          0          0        .00    122.66  10056.76


FLOW DISTRIBUTION FOR SECNO=      60.94          CWSEL=    2060.12

STA=     9934.   10058.
  PER Q=     100.0
   AREA=     744.3
    VEL=       4.5
  DEPTH=       6.1

*SECNO 60.992

3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =    .66

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    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=      9946.7   10053.5  TYPE=       1  TARGET=       106.800
    60.992       7.87   2060.17        .00   2060.24   2060.73        .56        .23        .08   2059.40
    3324.0         .0    3324.0         .0         .0     553.1         .0       80.0       18.1 100000.00
       .22         .00      6.01        .00       .000       .025       .000       .000   2052.30   9946.70
   .001182      320.       300.       255.          2          0          0        .00    106.80  10053.50


FLOW DISTRIBUTION FOR SECNO=      60.99          CWSEL=    2060.17

STA=     9947.   10054.
  PER Q=     100.0
   AREA=     553.1
    VEL=       6.0
  DEPTH=       5.2

CCHV=      .300 CEHV=      .500
*SECNO 61.034
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3470 ENCROACHMENT STATIONS=     9948.6   10047.0  TYPE=      1  TARGET=       98.400
    61.034      6.77   2060.37       .00   2060.42   2061.24       .87       .35       .16   2059.90
    3324.0        .0    3324.0        .0        .0     443.8        .0      82.6      18.6 100000.00
       .23       .00      7.49       .00      .000      .025      .000      .000   2053.60   9948.60
   .002092      215.      228.      235.         0         0         0       .00     95.17  10043.77


'LOW DISTRIBUTION FOR SECNO=     61.03          CWSEL=   2060.37

STA=    9949.   10047.
  PER Q=    100.0
   AREA=    443.8
    VEL=      7.5
  DEPTH=      4.7

*SECNO 61.072

3470 ENCROACHMENT STATIONS=     9954.6   10078.3  TYPE=      1  TARGET=      123.700

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA=      2063.20 ELREA=    100000.00

    61.072      6.49   2060.69       .00   2060.72   2061.98      1.29       .53       .21   2063.20
    3324.0        .0    3324.0        .0        .0     364.2        .0      84.5      19.0 100000.00
       .24       .00      9.13       .00      .000      .025      .000      .000   2054.20   9962.25
   .003466      190.      200.      200.         0         0         0       .00     85.03  10047.28


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   06MAR07      15:57:18                                                                                PAGE   38

    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


FLOW DISTRIBUTION FOR SECNO=     61.07          CWSEL=   2060.69

STA=    9962.   10078.
  PER Q=    100.0
   AREA=    364.2
    VEL=      9.1
  DEPTH=      4.3


SPECIAL BRIDGE

SB  XK        XKOR      COFQ      RDLEN     BWC       BWP       BAREA     SS        ELCHU     ELCHD
     1.25      1.60      2.60     85.00     50.10      2.10    398.40       .00   2054.20   2054.20

*SECNO 61.079

3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  1.95

CLASS A LOW FLOW

3420 BRIDGE W.S.=    2060.31 BRIDGE VELOCITY=      11.33     CALCULATED CHANNEL AREA=       293.

 EGPRS      EGLWC       H3        QWEIR     QLOW      BAREA    TRAPEZOID      ELLC      ELTRD     WEIRLN
                                                                  AREA
       .00   2062.40       .36         0.     3324.      398.      398.     2062.50   2064.30         0.


3470 ENCROACHMENT STATIONS=     9968.5   10070.2  TYPE=      1  TARGET=      101.700

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA=      2065.00 ELREA=    100000.00

    61.079      6.95   2061.05       .00   2061.06   2062.40      1.35       .42       .00   2065.00
    3324.0        .0    3324.0        .0        .0     356.5        .0      84.8      19.1 100000.00
       .24       .00      9.32       .00      .000      .015      .000      .000   2054.10   9971.14
   .000915       65.       35.       35.         0         0         0       .00     57.63  10028.77


FLOW DISTRIBUTION FOR SECNO=     61.08          CWSEL=   2061.05

STA=    9971.   10070.
  PER Q=    100.0
   AREA=    356.5
    VEL=      9.3
  DEPTH=      6.2

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   06MAR07      15:57:18                                                                                PAGE   39

    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 61.093
```

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS= 9956.2 10048.1 TYPE= 1 TARGET= 91.899

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2067.50 ELREA= 100000.00

61.093	4.62	2063.82	2063.82	2063.81	2065.96	2.14	.11	.40	2067.50
3324.0	.0	3324.0	.0	.0	283.0	.0	85.3	19.2	100000.00
.24	.00	11.75	.00	.000	.015	.000	.000	2059.20	9970.05
.002218	85.	78.	40.	20	14	0	.00	66.63	10036.68

FLOW DISTRIBUTION FOR SECNO= 61.09 CWSEL= 2063.82

STA= 9970. 10048.
PER Q= 100.0
AREA= 283.0
VEL= 11.7
DEPTH= 4.2

*SECNO 61.116
3280 CROSS SECTION 61.12 EXTENDED .69 FEET

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 3.20

3470 ENCROACHMENT STATIONS= 9947.2 10056.1 TYPE= 1 TARGET= 108.899

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2065.30 ELREA= 100000.00

61.116	8.29	2066.19	.00	2066.19	2066.55	.36	.06	.53	2065.30
3324.0	.0	3324.0	.0	.0	685.7	.0	86.7	19.4	100000.00
.25	.00	4.85	.00	.000	.015	.000	.000	2057.90	9947.20
.000217	155.	120.	78.	4	0	0	.00	108.90	10056.10

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

FLOW DISTRIBUTION FOR SECNO= 61.12 CWSEL= 2066.19

STA= 9947. 10056.
PER Q= 100.0
AREA= 685.7
VEL= 4.8
DEPTH= 6.3

SPECIAL BRIDGE

SB	XK	XKOR	COFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	1.05	1.60	2.60	80.00	62.50	2.50	246.00	.00	2060.00	2057.90

*SECNO 61.141
3280 CROSS SECTION 61.14 EXTENDED 2.92 FEET

PRESSURE AND WEIR FLOW, Weir Submergence Based on TRAPEZOIDAL Shape

EGPRS	EGLWC	H3	QWEIR	QPR	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
2070.72	2066.58	.03	911.	2413.	246.	246.	2064.10	2065.90	80.

3470 ENCROACHMENT STATIONS= 9904.7 10056.3 TYPE= 1 TARGET= 151.600

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2065.70 ELREA= 100000.00

61.141	8.42	2068.42	.00	2068.42	2068.58	.16	2.03	.00	2065.70
3324.0	.0	3324.0	.0	.0	1047.2	.0	89.3	19.8	100000.00
.26	.00	3.17	.00	.000	.025	.000	.000	2060.00	9904.70
.000230	150.	130.	165.	2	0	2	.00	151.60	10056.30

FLOW DISTRIBUTION FOR SECNO= 61.14 CWSEL= 2068.42

STA= 9905. 10056.
PER Q= 100.0
AREA= 1047.2
VEL= 3.2

```
  DEPTH=      6.9

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    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


 CCHV=     .100 CEHV=     .300
 *SECNO 61.164
 3280 CROSS SECTION     61.16 EXTENDED      2.14 FEET


 3301 HV CHANGED MORE THAN HVINS

 3685 20 TRIALS ATTEMPTED WSEL,CWSEL
 3693 PROBABLE MINIMUM SPECIFIC ENERGY
 3720 CRITICAL DEPTH ASSUMED

 3470 ENCROACHMENT STATIONS=     9951.0   10034.0  TYPE=      1  TARGET=       83.000
    61.164      8.14   2069.84   2069.84   2068.95   2072.41      2.57       .08       .72   2065.70
    3324.0     312.8    2835.8     175.3     119.5     204.1      75.4      91.3      20.1   2066.00
       .26      2.62     13.89      2.33      .100      .025      .100      .000   2061.70   9951.00
   .005134       60.      125.      140.        20         8         0       .00     83.00  10034.00


 FLOW DISTRIBUTION FOR SECNO=     61.16          CWSEL=   2069.84

 STA=    9951.    9952.    9981.   10015.   10034.
   PER Q=       .1      9.3     85.3      5.3
    AREA=      4.2    115.3    204.1     75.4
     VEL=      1.0      2.7     13.9      2.3
   DEPTH=      3.8      4.0      6.1      3.9

 *SECNO 61.235
 3280 CROSS SECTION     61.24 EXTENDED      1.50 FEET


 3301 HV CHANGED MORE THAN HVINS

 7185 MINIMUM SPECIFIC ENERGY
 3720 CRITICAL DEPTH ASSUMED

 3470 ENCROACHMENT STATIONS=     9866.0   10062.9  TYPE=      1  TARGET=      196.900

 3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA=      2079.60 ELREA=    100000.00

    61.235      5.10   2074.20   2074.20   2074.20   2075.76      1.56      3.07       .10   2079.60
    3324.0        .0    3324.0        .0        .0     332.1        .0      94.4      21.0 100000.00
       .27       .00     10.01       .00      .000      .038      .000      .000   2069.10   9933.64
   .014971       410.      375.      330.        10        14         0       .00    109.01  10042.65


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   06MAR07      15:57:18                                                                                    PAGE   42

    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


 FLOW DISTRIBUTION FOR SECNO=     61.24          CWSEL=   2074.20

 STA=    9934.   10063.
   PER Q=    100.0
    AREA=    332.1
     VEL=     10.0
   DEPTH=      3.0

 *SECNO 61.339

 3470 ENCROACHMENT STATIONS=     9982.8   10064.7  TYPE=      1  TARGET=       81.900
    61.339      7.50   2081.90       .00   2081.86   2083.59      1.70      7.79       .04   2080.60
    3324.0        .0    3324.0        .0        .0     318.0        .0      98.5      22.1 100000.00
       .28       .00     10.45       .00      .000      .043      .000      .000   2074.40   9982.80
   .013673       510.      545.      610.         3         0         0       .00     73.25  10056.05


 FLOW DISTRIBUTION FOR SECNO=     61.34          CWSEL=   2081.90

 STA=    9983.   10065.
   PER Q=    100.0
    AREA=    318.0
     VEL=     10.5
   DEPTH=      4.3

 *SECNO 61.390

 3301 HV CHANGED MORE THAN HVINS
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3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 2.28

3470 ENCROACHMENT STATIONS= 9941.4 10035.0 TYPE= 1 TARGET= 93.600

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 2083.30 ELREA= 100000.00

61.390	8.84	2084.54	.00	2084.49	2085.08	.55	1.37	.12	2083.30
3324.0	.0	3324.0	.0	.0	560.8	.0	101.2	22.6	100000.00
.30	.00	5.93	.00	.000	.043	.000	.000	2075.70	9941.40
.002635	265.	270.	275.	3	0	0	.00	87.61	10029.01

1

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

FLOW DISTRIBUTION FOR SECNO= 61.39 CWSEL= 2084.54

STA= 9941. 10035.
PER Q= 100.0
AREA= 560.8
VEL= 5.9
DEPTH= 6.4

1

THIS RUN EXECUTED 06MAR07 15:57:18

****
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

.lam-Enc.HC2

SUMMARY PRINTOUT

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	.01K	TOPWID	STENCL	STCHL	STCHR	STENCR
	60.000	.00	.00	.00	1990.30	4839.90	2001.08	419.57	106.55	.00	9878.20	10040.00	.00
	60.000	.00	.00	.00	1990.30	4839.90	2002.08	520.29	112.00	9912.00	9878.20	10040.00	10024.00
•	60.080	420.00	.00	.00	2003.70	4839.90	2011.66	166.88	87.09	.00	9919.20	10053.20	.00
*	60.080	420.00	.00	.00	2003.70	4839.90	2011.66	166.82	87.08	9919.20	9919.20	10053.20	10053.20
*	60.135	295.00	.00	.00	2013.90	4839.90	2022.12	451.15	266.82	.00	9959.30	10041.90	.00
•	60.135	295.00	.00	.00	2013.90	4839.90	2022.00	378.51	80.97	9959.00	9959.30	10041.90	10042.00
*	60.171	185.00	2022.80	2019.30	2014.30	5300.00	2025.06	1839.71	435.89	9625.00	9968.80	10047.60	10215.70
•	60.171	185.00	2022.80	2019.30	2014.30	5300.00	2026.06	1903.05	188.80	9908.80	9968.80	10047.60	10097.60
*	60.219	255.00	.00	.00	2019.20	5300.00	2027.05	745.61	170.00	9900.00	9975.80	10034.90	10070.00
•	60.219	255.00	.00	.00	2019.20	5300.00	2027.22	679.45	120.00	9935.00	9975.80	10034.90	10055.00
*	60.276	300.00	.00	.00	2021.60	5300.00	2029.02	1076.05	138.86	.00	9923.00	10065.20	.00
•	60.276	300.00	.00	.00	2021.60	5300.00	2029.91	1365.48	141.64	9923.00	9923.00	10065.20	10066.00
*	60.301	135.00	2028.40	2025.90	2021.80	5300.00	2031.53	2812.64	772.01	9677.60	9905.10	10076.90	10970.00
*	60.301	135.00	2028.40	2025.90	2021.80	5300.00	2031.69	2486.54	171.80	9905.10	9905.10	10076.90	10076.90
*	60.345	230.00	.00	.00	2024.10	5300.00	2031.09	846.84	96.59	9606.80	9922.90	10053.00	10234.50
*	60.345	230.00	.00	.00	2024.10	5300.00	2031.39	908.79	99.18	9922.90	9922.90	10053.00	10053.00
*	60.397	275.00	.00	.00	2025.00	5300.00	2033.22	355.41	77.20	9553.10	9958.90	10051.60	10568.00
*	60.397	275.00	.00	.00	2025.00	5300.00	2033.24	357.46	77.35	9958.90	9958.90	10051.60	10051.60
•	60.446	260.00	.00	.00	2027.10	5300.00	2037.12	1083.89	390.92	9600.00	9949.60	10062.90	10180.00
*	60.446	260.00	.00	.00	2027.10	5300.00	2037.22	928.47	109.04	9949.60	9949.60	10062.90	10062.90
*	60.492	240.00	.00	.00	2031.70	5300.00	2037.88	346.82	106.36	9335.00	9937.60	10056.70	10205.30
*	60.492	240.00	.00	.00	2031.70	5300.00	2037.89	346.93	106.36	9937.60	9937.60	10056.70	10056.70

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	.01K	TOPWID	STENCL	STCHL	STCHR	STENCR
*	60.587	505.00	.00	.00	2042.20	1870.00	2043.83	487.38	733.12	9260.00	9862.10	10053.60	10187.30

	60.587	505.00	.00	.00	2042.20	1870.00	2044.54	391.10	191.50	9862.10	9862.10	10053.60	10053.60
•	60.667	420.00	.00	.00	2043.40	1870.00	2044.82	227.61	546.99	9220.00	10000.00	10062.70	10700.00
	60.667	420.00	.00	.00	2043.40	1870.00	2045.85	365.86	356.31	9700.00	10000.00	10062.70	10062.70
•	60.705	200.00	.00	.00	2042.70	5300.00	2048.90	1463.63	687.39	.00	9970.20	10043.60	.00
*	60.705	200.00	.00	.00	2042.70	5300.00	2049.90	1509.01	290.00	9910.00	9970.20	10043.60	10200.00
	60.800	505.00	.00	.00	2047.80	5300.00	2050.81	853.48	453.60	.00	9965.60	10035.90	.00
	60.800	505.00	.00	.00	2047.80	5300.00	2051.68	600.67	197.00	9839.00	9965.60	10035.90	10036.00
*	60.867	350.00	.00	.00	2049.60	5300.00	2055.80	781.48	105.76	9210.00	9951.00	10060.80	10060.80
•	60.867	350.00	.00	.00	2049.60	5300.00	2055.80	781.61	105.77	9951.00	9951.00	10060.80	10060.80
•	60.887	110.00	.00	.00	2049.80	5300.00	2057.00	805.89	91.92	9300.00	9945.50	10065.00	10150.00
•	60.887	110.00	.00	.00	2049.80	5300.00	2057.00	806.01	91.92	9945.50	9945.50	10065.00	10065.00
*	60.903	85.00	.00	.00	2049.70	3324.00	2059.84	2137.50	450.00	9800.00	9940.30	10044.80	10250.00
*	60.903	85.00	.00	.00	2049.70	3324.00	2059.76	1914.64	104.50	9940.30	9940.30	10044.80	10044.80
	60.912	45.00	2056.50	2057.60	2050.00	3324.00	2060.22	2115.23	435.45	9870.00	9934.00	10054.40	10310.00
	60.912	45.00	2056.50	2057.60	2050.00	3324.00	2060.10	1875.40	120.40	9934.00	9934.00	10054.40	10054.40
	60.936	125.00	.00	.00	2050.90	3324.00	2060.19	1482.48	126.55	9930.50	9934.10	10057.50	10219.40
	60.936	125.00	.00	.00	2050.90	3324.00	2060.12	1456.52	122.66	9934.10	9934.10	10057.50	10057.50
•	60.992	300.00	.00	.00	2052.30	3324.00	2060.24	1003.66	212.85	9780.00	9946.70	10053.50	10345.00
•	60.992	300.00	.00	.00	2052.30	3324.00	2060.17	966.96	106.80	9946.70	9946.70	10053.50	10053.50
	61.034	228.00	.00	.00	2053.60	3324.00	2060.42	743.75	133.39	9780.00	9948.60	10047.00	10530.00
	61.034	228.00	.00	.00	2053.60	3324.00	2060.37	726.69	95.17	9948.60	9948.60	10047.00	10047.00
	61.072	200.00	.00	.00	2054.20	3324.00	2060.72	570.57	85.23	9800.00	9954.60	10078.30	10560.00
	61.072	200.00	.00	.00	2054.20	3324.00	2060.69	564.60	85.03	9954.60	9954.60	10078.30	10078.30
*	61.079	35.00	2064.30	2062.50	2054.10	3324.00	2061.06	1103.51	57.65	9780.00	9968.50	10070.20	10545.00
*	61.079	35.00	2064.30	2062.50	2054.10	3324.00	2061.05	1098.63	57.63	9968.50	9968.50	10070.20	10070.20
•	61.093	78.00	.00	.00	2059.20	3324.00	2063.81	704.91	66.62	9535.00	9956.20	10048.10	10535.00
*	61.093	78.00	.00	.00	2059.20	3324.00	2063.82	705.86	66.63	9956.20	9956.20	10048.10	10048.10
*	61.116	120.00	.00	.00	2057.90	3324.00	2066.19	2285.70	133.15	9760.00	9947.20	10056.10	10070.00
•	61.116	120.00	.00	.00	2057.90	3324.00	2066.19	2258.96	108.90	9947.20	9947.20	10056.10	10056.10
	61.141	130.00	2065.90	2064.10	2060.00	3324.00	2068.42	2263.33	210.00	9860.00	9904.70	10056.30	10070.00
	61.141	130.00	2065.90	2064.10	2060.00	3324.00	2068.42	2193.82	151.60	9904.70	9904.70	10056.30	10056.30
•	61.164	125.00	.00	.00	2061.70	3324.00	2068.95	487.11	260.00	9880.00	9981.00	10014.60	10140.00
	61.164	125.00	.00	.00	2061.70	3324.00	2069.84	463.91	83.00	9951.00	9981.00	10014.60	10034.00

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	.01K	TOPWID	STENCL	STCHL	STCHR	STENCR
*	61.235	375.00	.00	.00	2069.10	3324.00	2074.20	271.69	109.02	9770.00	9866.00	10062.90	10334.90
*	61.235	375.00	.00	.00	2069.10	3324.00	2074.20	271.66	109.01	9866.00	9866.00	10062.90	10062.90
	61.339	545.00	.00	.00	2074.40	3324.00	2081.86	286.05	95.92	9960.00	9982.80	10064.70	10100.00
	61.339	545.00	.00	.00	2074.40	3324.00	2081.90	284.27	73.25	9982.80	9982.80	10064.70	10064.70
*	61.390	270.00	.00	.00	2075.70	3324.00	2084.49	639.86	87.47	9941.40	9941.40	10035.00	10335.00
*	61.390	270.00	.00	.00	2075.70	3324.00	2084.54	647.57	87.61	9941.40	9941.40	10035.00	10035.00

Flam-Enc.HC2

SUMMARY PRINTOUT

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	STENCL	STENCR	TOPWID	10*KS	VOL
	60.000	4839.90	2001.08	.00	.00	.00	.00	106.55	133.06	.00
	60.000	4839.90	2002.08	1.00	.00	9912.00	10024.00	112.00	86.53	.00
*	60.080	4839.90	2011.66	.00	10.58	.00	.00	87.09	841.13	5.17
*	60.080	4839.90	2011.66	.00	9.58	9919.20	10053.20	87.08	841.78	5.70
*	60.135	4839.90	2022.12	.00	10.45	.00	.00	266.82	115.09	8.58
•	60.135	4839.90	2022.00	-.11	10.34	9959.00	10042.00	80.97	163.50	8.69
•	60.171	5300.00	2025.06	.00	2.94	9625.00	10215.70	435.89	8.30	12.87
*	60.171	5300.00	2026.06	1.00	4.05	9908.80	10097.60	188.80	7.76	12.07
	60.219	5300.00	2027.05	.00	1.99	9900.00	10070.00	170.00	50.53	18.44
	60.219	5300.00	2027.22	.17	1.16	9935.00	10055.00	120.00	60.85	16.62
•	60.276	5300.00	2029.02	.00	1.97	.00	.00	138.86	24.26	23.00
*	60.276	5300.00	2029.91	.89	2.69	9923.00	10066.00	141.64	15.07	21.33
*	60.301	5300.00	2031.53	.00	2.52	9677.60	10970.00	772.01	3.55	27.15
*	60.301	5300.00	2031.69	.16	1.78	9905.10	10076.90	171.80	4.54	24.74

*	60.345	5300.00	2031.09	.00	-.44	9606.80	10234.50	96.59	39.17	33.55
*	60.345	5300.00	2031.39	.30	-.30	9922.90	10053.00	99.18	34.01	29.77
*	60.397	5300.00	2033.22	.00	2.13	9553.10	10568.00	77.20	222.38	36.56
*	60.397	5300.00	2033.24	.02	1.85	9958.90	10051.60	77.35	219.84	32.88
*	60.446	5300.00	2037.12	.00	3.90	9600.00	10180.00	390.92	23.91	41.12
	60.446	5300.00	2037.22	.10	3.97	9949.60	10062.90	109.04	32.58	36.56
*	60.492	5300.00	2037.88	.00	.77	9335.00	10205.30	106.36	233.52	45.50
*	60.492	5300.00	2037.89	.00	.67	9937.60	10056.70	106.36	233.39	40.08
*	60.587	1870.00	2043.83	.00	5.95	9260.00	10187.30	733.12	14.72	51.71
	60.587	1870.00	2044.54	.71	6.66	9862.10	10053.60	191.50	22.86	44.74
*	60.667	1870.00	2044.82	.00	.98	9220.00	10700.00	546.99	67.50	56.53
	60.667	1870.00	2045.85	1.03	1.30	9700.00	10062.70	356.31	26.12	49.13
*	60.705	5300.00	2048.90	.00	4.08	.00	.00	687.39	13.11	62.47
*	60.705	5300.00	2049.90	1.00	4.05	9910.00	10200.00	290.00	12.34	54.56
*	60.800	5300.00	2050.81	.00	1.91	.00	.00	453.60	38.56	76.93
*	60.800	5300.00	2051.68	.86	1.78	9839.00	10036.00	197.00	77.85	66.05
*	60.867	5300.00	2055.80	.00	4.99	9210.00	10060.80	105.76	46.00	82.54
*	60.867	5300.00	2055.80	.00	4.13	9951.00	10060.80	105.77	45.98	70.23

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	STENCL	STENCR	TOPWID	10*KS	VOL
*	60.887	5300.00	2057.00	.00	1.20	9300.00	10150.00	91.92	43.25	83.65
*	60.887	5300.00	2057.00	.00	1.20	9945.50	10065.00	91.92	43.24	71.34
*	60.903	3324.00	2059.84	.00	2.84	9800.00	10250.00	450.00	2.42	85.45
*	60.903	3324.00	2059.76	-.07	2.76	9940.30	10044.80	104.50	3.01	72.51
	60.912	3324.00	2060.22	.00	.38	9870.00	10310.00	435.45	2.47	86.89
	60.912	3324.00	2060.10	-.12	.34	9934.00	10054.40	120.40	3.14	73.32
	60.936	3324.00	2060.19	.00	-.03	9930.50	10219.40	126.55	5.03	90.58
	60.936	3324.00	2060.12	-.07	.02	9934.10	10057.50	122.66	5.21	75.54
*	60.992	3324.00	2060.24	.00	.05	9780.00	10345.00	212.85	10.97	95.27
*	60.992	3324.00	2060.17	-.07	.05	9946.70	10053.50	106.80	11.82	80.01
	61.034	3324.00	2060.42	.00	.18	9780.00	10530.00	133.39	19.97	98.06
	61.034	3324.00	2060.37	-.05	.20	9948.60	10047.00	95.17	20.92	82.62
	61.072	3324.00	2060.72	.00	.30	9800.00	10560.00	85.23	33.94	99.96
	61.072	3324.00	2060.69	-.03	.32	9954.60	10078.30	85.03	34.66	84.47
*	61.079	3324.00	2061.06	.00	.35	9780.00	10545.00	57.65	9.07	100.25
*	61.079	3324.00	2061.05	-.02	.36	9968.50	10070.20	57.63	9.15	84.76
*	61.093	3324.00	2063.81	.00	2.75	9535.00	10535.00	66.62	22.24	100.82
*	61.093	3324.00	2063.82	.00	2.77	9956.20	10048.10	66.63	22.18	85.33
•	61.116	3324.00	2066.19	.00	2.38	9760.00	10070.00	133.15	2.11	102.17
*	61.116	3324.00	2066.19	.00	2.37	9947.20	10056.10	108.90	2.17	86.67
	61.141	3324.00	2068.42	.00	2.24	9860.00	10070.00	210.00	2.16	104.91
	61.141	3324.00	2068.42	.00	2.23	9904.70	10056.30	151.60	2.30	89.25
*	61.164	3324.00	2068.95	.00	.52	9880.00	10140.00	260.00	46.57	107.45
*	61.164	3324.00	2069.84	.89	1.42	9951.00	10034.00	83.00	51.34	91.25
*	61.235	3324.00	2074.20	.00	5.26	9770.00	10334.90	109.02	149.68	112.22
*	61.235	3324.00	2074.20	.00	4.36	9866.00	10062.90	109.01	149.71	94.41
	61.339	3324.00	2081.86	.00	7.65	9960.00	10100.00	95.92	135.03	116.40
	61.339	3324.00	2081.90	.04	7.69	9982.80	10064.70	73.25	136.73	98.48
*	61.390	3324.00	2084.49	.00	2.63	9941.40	10335.00	87.47	26.99	119.17
•	61.390	3324.00	2084.54	.05	2.64	9941.40	10035.00	87.61	26.35	101.20

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SUMMARY PRINTOUT

	SECNO	CWSEL	SSTA	STENCL	STCHL	STCHR	STENCR	ENDST
	60.000	2001.08	9915.79	.00	9878.20	10040.00	.00	10022.34
	60.000	2002.08	9912.00	9912.00	9878.20	10040.00	10024.00	10024.00
*	60.080	2011.66	9943.40	.00	9919.20	10053.20	.00	10030.48
*	60.080	2011.66	9943.40	9919.20	9919.20	10053.20	10053.20	10030.48

•	60.135	2022.12	9960.78	.00	9959.30	10041.90	.00	10227.60
*	60.135	2022.00	9961.02	9959.00	9959.30	10041.90	10042.00	10042.00
*	60.171	2025.06	9779.81	9625.00	9968.80	10047.60	10215.70	10215.70
*	60.171	2026.06	9908.80	9908.80	9968.80	10047.60	10097.60	10097.60
•	60.219	2027.05	9900.00	9900.00	9975.80	10034.90	10070.00	10070.00
*	60.219	2027.22	9935.00	9935.00	9975.80	10034.90	10055.00	10055.00
	60.276	2029.02	9924.04	.00	9923.00	10065.20	.00	10062.89
•	60.276	2029.91	9923.00	9923.00	9923.00	10065.20	10066.00	10064.64
*	60.301	2031.53	9677.60	9677.60	9905.10	10076.90	10970.00	10449.61
•	60.301	2031.69	9905.10	9905.10	9905.10	10076.90	10076.90	10076.90
*	60.345	2031.09	9953.44	9606.80	9922.90	10053.00	10234.50	10050.02
•	60.345	2031.39	9951.38	9922.90	9922.90	10053.00	10053.00	10050.55
•	60.397	2033.22	9969.00	9553.10	9958.90	10051.60	10568.00	10046.20
*	60.397	2033.24	9968.91	9958.90	9958.90	10051.60	10051.60	10046.26
*	60.446	2037.12	9667.50	9600.00	9949.60	10062.90	10180.00	10058.42
*	60.446	2037.22	9949.60	9949.60	9949.60	10062.90	10062.90	10058.64
•	60.492	2037.88	9943.15	9335.00	9937.60	10056.70	10205.30	10049.51
*	60.492	2037.89	9943.15	9937.60	9937.60	10056.70	10056.70	10049.51
*	60.587	2043.83	9289.08	9260.00	9862.10	10053.60	10187.30	10187.30
	60.587	2044.54	9862.10	9862.10	9862.10	10053.60	10053.60	10053.60
*	60.667	2044.82	9517.06	9220.00	10000.00	10062.70	10700.00	10576.80
	60.667	2045.85	9700.00	9700.00	10000.00	10062.70	10062.70	10056.31
•	60.705	2048.90	9742.60	.00	9970.20	10043.60	.00	10430.00
*	60.705	2049.90	9910.00	9910.00	9970.20	10043.60	10200.00	10200.00
*	60.800	2050.81	9715.48	.00	9965.60	10035.90	.00	10183.94
*	60.800	2051.68	9839.00	9839.00	9965.60	10035.90	10036.00	10036.00
*	60.867	2055.80	9955.03	9210.00	9951.00	10060.80	10060.80	10060.80
*	60.867	2055.80	9955.03	9951.00	9951.00	10060.80	10060.80	10060.80

SECNO	CWSEL	SSTA	STENCL	STCHL	STCHR	STENCR	ENDST
60.887	2057.00	9952.85	9300.00	9945.50	10065.00	10150.00	10044.77
60.887	2057.00	9952.85	9945.50	9945.50	10065.00	10065.00	10044.77
* 60.903	2059.84	9800.00	9800.00	9940.30	10044.80	10250.00	10250.00
* 60.903	2059.76	9940.30	9940.30	9940.30	10044.80	10044.80	10044.80
60.912	2060.22	9870.00	9870.00	9934.00	10054.40	10310.00	10310.00
60.912	2060.10	9934.00	9934.00	9934.00	10054.40	10054.40	10054.40
60.936	2060.19	9930.50	9930.50	9934.10	10057.50	10219.40	10057.05
60.936	2060.12	9934.10	9934.10	9934.10	10057.50	10057.50	10056.76
* 60.992	2060.24	9879.03	9780.00	9946.70	10053.50	10345.00	10091.87
* 60.992	2060.17	9946.70	9946.70	9946.70	10053.50	10053.50	10053.50
61.034	2060.42	9910.56	9780.00	9948.60	10047.00	10530.00	10043.95
61.034	2060.37	9948.60	9948.60	9948.60	10047.00	10047.00	10043.77
61.072	2060.72	9962.15	9800.00	9954.60	10078.30	10560.00	10047.38
61.072	2060.69	9962.25	9954.60	9954.60	10078.30	10078.30	10047.28
* 61.079	2061.06	9971.12	9780.00	9968.50	10070.20	10545.00	10028.78
* 61.079	2061.05	9971.14	9968.50	9968.50	10070.20	10070.20	10028.77
* 61.093	2063.81	9970.05	9535.00	9956.20	10048.10	10535.00	10036.68
• 61.093	2063.82	9970.05	9956.20	9956.20	10048.10	10048.10	10036.68
* 61.116	2066.19	9936.85	9760.00	9947.20	10056.10	10070.00	10070.00
* 61.116	2066.19	9947.20	9947.20	9947.20	10056.10	10056.10	10056.10
61.141	2068.42	9860.00	9860.00	9904.70	10056.30	10070.00	10070.00
61.141	2068.42	9904.70	9904.70	9904.70	10056.30	10056.30	10056.30
* 61.164	2068.95	9880.00	9880.00	9981.00	10014.60	10140.00	10140.00
* 61.164	2069.84	9951.00	9951.00	9981.00	10014.60	10034.00	10034.00
* 61.235	2074.20	9933.64	9770.00	9866.00	10062.90	10334.90	10042.66
* 61.235	2074.20	9933.64	9866.00	9866.00	10062.90	10062.90	10042.65
61.339	2081.86	9960.00	9960.00	9982.80	10064.70	10100.00	10055.92
61.339	2081.90	9982.80	9982.80	9982.80	10064.70	10064.70	10056.05
* 61.390	2084.49	9941.40	9941.40	9941.40	10035.00	10335.00	10028.87
* 61.390	2084.54	9941.40	9941.40	9941.40	10035.00	10035.00	10029.01

SUMMARY OF ERRORS AND SPECIAL NOTES

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CAUTION SECNO=     60.080  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=     60.080  PROFILE=  1  MINIMUM SPECIFIC ENERGY
CAUTION SECNO=     60.080  PROFILE=  2  CRITICAL DEPTH ASSUMED
CAUTION SECNO=     60.080  PROFILE=  2  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=     60.080  PROFILE=  2  20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO=     60.135  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=     60.135  PROFILE=  1  MINIMUM SPECIFIC ENERGY
WARNING SECNO=     60.135  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO=     60.171  PROFILE=  1  HYDRAULIC JUMP D.S.
WARNING SECNO=     60.171  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
CAUTION SECNO=     60.171  PROFILE=  2  HYDRAULIC JUMP D.S.
WARNING SECNO=     60.171  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO=     60.219  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=     60.219  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=     60.219  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=     60.219  PROFILE=  2  CRITICAL DEPTH ASSUMED
CAUTION SECNO=     60.219  PROFILE=  2  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=     60.219  PROFILE=  2  20 TRIALS ATTEMPTED TO BALANCE WSEL

WARNING SECNO=     60.276  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=     60.276  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=     60.301  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=     60.301  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=     60.345  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=     60.345  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO=     60.397  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=     60.397  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=     60.397  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=     60.397  PROFILE=  2  CRITICAL DEPTH ASSUMED
CAUTION SECNO=     60.397  PROFILE=  2  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=     60.397  PROFILE=  2  20 TRIALS ATTEMPTED TO BALANCE WSEL

WARNING SECNO=     60.446  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=     60.446  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO=     60.492  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=     60.492  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=     60.492  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=     60.492  PROFILE=  2  CRITICAL DEPTH ASSUMED
CAUTION SECNO=     60.492  PROFILE=  2  MINIMUM SPECIFIC ENERGY

WARNING SECNO=     60.587  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=     60.667  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
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NOTE    SECNO=     60.705  PROFILE=  1  WSEL BASED ON X5 CARD
WARNING SECNO=     60.705  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
NOTE    SECNO=     60.705  PROFILE=  2  WSEL BASED ON X5 CARD
WARNING SECNO=     60.705  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO=     60.800  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=     60.800  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=     60.800  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=     60.800  PROFILE=  2  CRITICAL DEPTH ASSUMED
CAUTION SECNO=     60.800  PROFILE=  2  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=     60.800  PROFILE=  2  20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO=     60.867  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=     60.867  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=     60.867  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=     60.867  PROFILE=  2  CRITICAL DEPTH ASSUMED
CAUTION SECNO=     60.867  PROFILE=  2  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=     60.867  PROFILE=  2  20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO=     60.887  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=     60.887  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=     60.887  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=     60.887  PROFILE=  2  CRITICAL DEPTH ASSUMED
CAUTION SECNO=     60.887  PROFILE=  2  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=     60.887  PROFILE=  2  20 TRIALS ATTEMPTED TO BALANCE WSEL

WARNING SECNO=     60.903  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=     60.903  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=     60.992  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=     60.992  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=     61.079  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=     61.079  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
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 CAUTION SECNO=     61.093  PROFILE=  1  CRITICAL DEPTH ASSUMED
 CAUTION SECNO=     61.093  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
 CAUTION SECNO=     61.093  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL
 CAUTION SECNO=     61.093  PROFILE=  2  CRITICAL DEPTH ASSUMED
 CAUTION SECNO=     61.093  PROFILE=  2  PROBABLE MINIMUM SPECIFIC ENERGY
 CAUTION SECNO=     61.093  PROFILE=  2  20 TRIALS ATTEMPTED TO BALANCE WSEL

 WARNING SECNO=     61.116  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
 WARNING SECNO=     61.116  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

 CAUTION SECNO=     61.164  PROFILE=  1  CRITICAL DEPTH ASSUMED
 CAUTION SECNO=     61.164  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
 CAUTION SECNO=     61.164  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL
 CAUTION SECNO=     61.164  PROFILE=  2  CRITICAL DEPTH ASSUMED
 CAUTION SECNO=     61.164  PROFILE=  2  PROBABLE MINIMUM SPECIFIC ENERGY
 CAUTION SECNO=     61.164  PROFILE=  2  20 TRIALS ATTEMPTED TO BALANCE WSEL

 CAUTION SECNO=     61.235  PROFILE=  1  CRITICAL DEPTH ASSUMED
 CAUTION SECNO=     61.235  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
1
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 CAUTION SECNO=     61.235  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL
 CAUTION SECNO=     61.235  PROFILE=  2  CRITICAL DEPTH ASSUMED
 CAUTION SECNO=     61.235  PROFILE=  2  MINIMUM SPECIFIC ENERGY

 WARNING SECNO=     61.390  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
 WARNING SECNO=     61.390  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

1
    06MAR07      15:57:18                                                    PAGE   54


 FLOODWAY DATA,   Flam-Enc.HC2
 PROFILE NO.  2
```

STATION	FLOODWAY WIDTH	FLOODWAY SECTION AREA	FLOODWAY MEAN VELOCITY	WATER SURFACE ELEVATION WITH FLOODWAY	WITHOUT FLOODWAY	DIFFERENCE
60.000	112.	786.	6.2	2002.1	2001.1	1.0
60.080	87.	395.	12.3	2011.7	2011.7	.0
60.135	81.	488.	9.9	2022.0	2022.1	-.1
60.171	189.	1092.	4.9	2026.1	2025.1	1.0
60.219	120.	490.	10.8	2027.3	2027.1	.2
60.276	142.	881.	6.0	2029.9	2029.0	.9
60.301	172.	1322.	4.0	2031.7	2031.5	.2
60.345	99.	580.	9.1	2031.4	2031.1	.3
60.397	77.	406.	13.0	2033.2	2033.2	.0
60.446	109.	828.	6.4	2037.2	2037.1	.1
60.492	106.	450.	11.8	2037.9	2037.9	.0
60.587	191.	353.	5.3	2044.5	2043.8	.7
60.667	356.	605.	3.1	2045.8	2044.8	1.0
60.705	290.	1560.	3.4	2049.9	2048.9	1.0
60.800	197.	594.	8.9	2051.7	2050.8	.9
60.867	106.	449.	11.8	2055.8	2055.8	.0
60.887	92.	431.	12.3	2057.0	2057.0	.0
60.903	104.	771.	4.3	2059.7	2059.8	-.1
60.912	120.	802.	4.1	2060.1	2060.2	-.1
60.936	123.	744.	4.5	2060.1	2060.2	-.1
60.992	107.	553.	6.0	2060.1	2060.2	-.1
61.034	95.	444.	7.5	2060.4	2060.4	.0
61.072	85.	364.	9.1	2060.7	2060.7	.0
61.079	58.	356.	9.3	2061.1	2061.1	.0
61.093	67.	283.	11.7	2063.8	2063.8	.0
61.116	109.	686.	4.8	2066.2	2066.2	.0
61.141	152.	1047.	3.2	2068.4	2068.4	.0
61.164	83.	399.	8.3	2069.8	2068.9	.9
61.235	109.	332.	10.0	2074.2	2074.2	.0
61.339	73.	318.	10.5	2081.9	2081.9	.0
61.390	88.	561.	5.9	2084.6	2084.5	.1

Kimley-Horn and Associates, Inc.

EXISTING CONDITIONS WSPG MODELING

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 1 CLARK COUNTY                                                                0
T2 HARD ROCK CASINO EXISTING CONDITION LOMR
T3 KHA PROJECT NO. 092564004
SO   1000.0002035.490  1      .027                2037.880
R    1000.0002035.491  1      .027                                  .000
R    1100.0002035.140  2      .027                                  .000
TS   1100.1002035.141 24      .013                                  .000
BX   1100.1002035.141  3
TS   1100.2002035.142  3      .013                                  .000
R    1344.0002037.050  4      .013                                  .000    .000 0
R    1544.0002038.570  4      .013                                  .000    .000 0
R    1689.0002039.840  4      .013                                  .000    .000 0
R    1838.0002040.590  4      .013                                  .000    .000 0
R    1940.0002041.320  4      .013                                  .000    .000 0
BE   1940.0002041.320  4     1.00
R    1940.1002041.321  5      .013                                  .000    .000 0
BX   1940.1002041.321  6
TS   1940.2002041.322  6      .013                                  .000
R    1988.0002043.330  7      .013                                  .000    .000 0
BE   1988.0002043.330  7     1.00
R    1988.1002043.331  8      .013                                  .000    .000 0
BX   1988.1002043.331  9
TS   1988.2002043.332  9      .013                                  .000    .000 0
R    2107.0002045.110 10      .013                                  .000    .000 0
BE   2107.0002045.110 10     1.00
TS   2107.1002045.111 11      .013                                  .000
TS   2137.0002045.350 12      .013                                  .000
     2169.1002045.451 13      .013                                  .000    .000 0
BX   2169.1002045.451 14
TS   2169.2002045.452 14      .013                                  .000
R    2323.0002046.520 15      .013                                  .000    .000 0
BE   2323.0002046.520 15     1.00
R    2323.1002046.521 16      .013                                  .000    .000 0
BX   2323.1002046.521 17
TS   2323.2002046.522 17      .013                                  .000    .000 0
R    2362.0002046.840 18      .013                                  .000    .000 0
BE   2362.0002046.840 18     1.00
R    2362.0002046.841 19      .013                                  .000
R    2377.0002047.030 20      .013                                  .000    .000 0
BX   2377.0002047.030 21
TS   2377.1002047.031 21      .013                                  .000    .000 0
R    2945.0002051.160 22      .013                                  .000    .000 0
BE   2945.0002051.160 22     1.00
TS   2945.1002051.161 23      .030                                  .000
SH   2945.1002051.161 23      .030                        .000
CD   1  5   0    .000    .000     .000  .000  .000   .00
CD   2  5   0    .000    .000     .000  .000  .000   .00
CD   3  3   5    .500   5.000   95.000  .000  .000   .00
CD   4  3   5    .500   5.000   75.000  .000  .000   .00
CD   5  3   0    .000   5.000   75.000  .000  .000   .00
CD   6  3   1   1.400   5.000   75.000  .000  .000   .00
CD   7  3   1   1.400   4.000  104.000  .000  .000   .00
CD   8  3   0    .000   4.000  104.000  .000  .000   .00
CD   9  3   9    .500   4.000  104.000  .000  .000   .00
 D  10  3   9    .500   4.000  120.000  .000  .000   .00
CD  11  3   0    .000   4.000  120.000  .000  .000   .00
CD  12  2   0    .000   5.000  105.000  .000  .000   .00
CD  13  3   0    .000   6.000  110.000  .000  .000   .00
CD  14  3   3    .830   6.000  110.000  .000  .000   .00
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 )  15  3   3     .830    6.000    71.000  .000  .000   .00
CD  16  3   0     .000    6.000    71.000  .000  .000   .00
CD  17  3   2     .830    6.000    71.000  .000  .000   .00
CD  18  3   2     .830    6.000    65.000  .000  .000   .00
CD  19  3   0     .000    6.000    65.000  .000  .000   .00
CD  20  3   0     .000    6.000    65.000  .000  .000   .00
CD  21  3   2     .830    6.000    65.000  .000  .000   .00
CD  22  3   2     .830    6.000   110.000  .000  .000   .00
CD  23  5   0     .000     .000      .000  .000  .000   .00
CD  24  3   0     .000    5.000    95.000  .000  .000   .00
PTS  1 7   .000 43.100     .000 40.850 21.000 40.000 34.000 35.490104.000 35.490
PTS     119.000 42.000 127.000 43.000
PTS  2 7   .000 43.300     .000 40.030 24.000 36.000 27.000 35.000 42.000 35.000
PTS      99.000 36.000 135.000 42.000
PTS 23 6   .000 57.440    .000 51.340 17.000 51.240 33.500 50.940110.000 51.170
PTS     110.000 60.340
Q          4473.000   .0
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FILE: TROPLOMR.WSW W S P G W - CIVILDESIGN Version 14.06 PAGE 1
Program Package Serial Number: 1887
WATER SURFACE PROFILE LISTING Date: 4- 1-2007 Time: 9: 7: 5

CLARK COUNTY
HARD ROCK CASINO EXISTING CONDITION LOMR
KHA PROJECT NO. 092564004

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
1000.000	2035.490	4.815	2040.305	4473.00	11.23	1.96	2042.26	.00	4.82	101.63		1		0 .0
1000.000	2035.490	4.815	2040.305	4473.00	11.23	1.96	2042.26	.00	4.82	101.63		1		0 .0
1000.000	2035.491	4.848	2040.339	4473.00	10.60	1.74	2042.08	.00	4.85	121.00		2		0 .0
2.101	-.0035					.0064	.01	4.85	1.00	.000	.027			IR-OPEN
1002.101	2035.484	5.090	2040.574	4473.00	9.90	1.52	2042.10	.00	4.85	123.54		2		0 .0
7.048	-.0035					.0053	.04	5.09	.91	.000	.027			IR-OPEN
1009.149	2035.459	5.345	2040.804	4473.00	9.25	1.33	2042.13	.00	4.85	125.07		2		0 .0
12.821	-.0035					.0043	.05	5.34	.83	.000	.027			IR-OPEN
1021.970	2035.414	5.612	2041.026	4473.00	8.65	1.16	2042.19	.00	4.85	126.67		2		0 .0
19.285	-.0035					.0035	.07	5.61	.75	.000	.027			IR-OPEN
1041.255	2035.346	5.893	2041.239	4473.00	8.09	1.02	2042.26	.00	4.85	128.36		2		0 .0
26.373	-.0035					.0029	.08	5.89	.69	.000	.027			IR-OPEN
1067.628	2035.254	6.187	2041.441	4473.00	7.57	.89	2042.33	.00	4.85	130.12		2		0 .0
32.372	-.0035					.0023	.08	6.19	.63	.000	.027			IR-OPEN
1100.000	2035.140	6.483	2041.623	4473.00	7.10	.78	2042.41	.00	4.85	131.90		2		0 .0
RANS STR	.0098					.0005	.00	6.48	.57		.013			IR-OPEN
1100.100	2035.141	6.186	2041.327	4473.00	9.42	1.38	2042.70	.00	4.10	95.00	5.000	95.000	.00	0 .0
BRIDGE EXIT														
1100.100	2035.141	6.186	2041.327	4473.00	9.67	1.45	2042.78	.00	4.17	95.00	5.000	95.000	.00	5 .5
TRANS STR	.0098					.0031	.00	6.19	.77		.013	.00	.00	BOX

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Program Package Serial Number: 1887
WATER SURFACE PROFILE LISTING Date: 4- 1-2007 Time: 9: 7: 5

CLARK COUNTY
HARD ROCK CASINO EXISTING CONDITION LOMR
KHA PROJECT NO. 092564004

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
1100.200	2035.142	6.185	2041.327	4473.00	12.34	2.36	2043.69	.00	4.91	75.00	5.000	75.000	.00	5 .5
98.521	.0078					.0054	.54	6.18	.99	3.56	.013	.00	.00	BOX
1198.721	2035.913	5.948	2041.861	4473.00	12.34	2.36	2044.23	.00	4.91	75.00	5.000	75.000	.00	5 .5
HYDRAULIC JUMP														
1198.721	2035.913	3.349	2039.262	4473.00	18.42	5.27	2044.53	.00	4.91	75.00	5.000	75.000	.00	5 .5
145.279	.0078					.0098	1.43	3.35	1.80	3.56	.013	.00	.00	BOX
1344.000	2037.050	3.235	2040.285	4473.00	19.07	5.65	2045.93	.00	4.91	75.00	5.000	75.000	.00	5 .5
103.023	.0076					.0109	1.13	3.24	1.90	3.60	.013	.00	.00	BOX
1447.023	2037.833	3.108	2040.941	4473.00	19.85	6.12	2047.06	.00	4.91	75.00	5.000	75.000	.00	5 .5
96.977	.0076					.0124	1.20	3.11	2.02	3.60	.013	.00	.00	BOX
1544.000	2038.570	2.963	2041.533	4473.00	20.82	6.73	2048.26	.00	4.91	75.00	5.000	75.000	.00	5 .5
58.541	.0088					.0138	.81	2.96	2.17	3.42	.013	.00	.00	BOX
1602.541	2039.083	2.884	2041.966	4473.00	21.39	7.11	2049.07	.00	4.91	75.00	5.000	75.000	.00	5 .5
86.459	.0088					.0154	1.33	2.88	2.26	3.42	.013	.00	.00	BOX
1689.000	2039.840	2.750	2042.589	4473.00	22.44	7.82	2050.41	.00	4.91	75.00	5.000	75.000	.00	5 .5
5.350	.0050					.0166	.09	2.75	2.43	4.17	.013	.00	.00	BOX

694.350	2039.867	2.736	2042.603	4473.00	22.55	7.89	2050.50	.00	4.91	75.00	5.000	75.000	.00	5	.5
51.142	.0050					.0180	.92	2.74	2.44	4.17	.013	.00	.00	BOX	

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WATER SURFACE PROFILE LISTING Date: 4- 1-2007 Time: 9: 7: 5

CLARK COUNTY
HARD ROCK CASINO EXISTING CONDITION LOMR
KHA PROJECT NO. 092564004

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip	
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch	
1745.493	2040.124	2.609	2042.733	4473.00	23.65	8.68	2051.42	.00	4.91	75.00	5.000	75.000	.00	5	.5
47.754	.0050					.0207	.99	2.61	2.62	4.17	.013	.00	.00	BOX	
1793.246	2040.365	2.488	2042.852	4473.00	24.80	9.55	2052.40	.00	4.91	75.00	5.000	75.000	.00	5	.5
44.754	.0050					.0238	1.06	2.49	2.82	4.17	.013	.00	.00	BOX	
1838.000	2040.590	2.372	2042.962	4473.00	26.01	10.51	2053.47	.00	4.91	75.00	5.000	75.000	.00	5	.5
14.507	.0072					.0260	.38	2.37	3.03	3.68	.013	.00	.00	BOX	
1852.507	2040.694	2.338	2043.032	4473.00	26.39	10.81	2053.85	.00	4.91	75.00	5.000	75.000	.00	5	.5
45.383	.0072					.0286	1.30	2.34	3.09	3.68	.013	.00	.00	BOX	
1897.889	2041.019	2.229	2043.248	4473.00	27.68	11.90	2055.14	.00	4.91	75.00	5.000	75.000	.00	5	.5
42.111	.0072					.0329	1.39	2.23	3.32	3.68	.013	.00	.00	BOX	
1940.000	2041.320	2.125	2043.445	4473.00	29.03	13.09	2056.53	.00	4.91	75.00	5.000	75.000	.00	5	.5
BRIDGE ENTRANCE															
1940.000	2041.320	1.976	2043.296	4473.00	30.18	14.15	2057.44	.00	4.80	75.00	5.000	75.000	.00	0	.0
.100	.0110					.0301	.00	1.98	3.78	2.69	.013	.00	.00	BOX	
1940.100	2041.321	1.975	2043.296	4473.00	30.20	14.16	2057.45	.00	4.80	75.00	5.000	75.000	.00	0	.0
BRIDGE EXIT															
1940.100	2041.321	2.015	2043.336	4473.00	30.16	14.13	2057.46	.00	4.86	75.00	5.000	75.000	.00	1	1.4
TRANS STR	.0098					.0314	.00	2.01	3.78		.013	.00	.00	BOX	

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Program Package Serial Number: 1887

WATER SURFACE PROFILE LISTING Date: 4- 1-2007 Time: 9: 7: 5

CLARK COUNTY
HARD ROCK CASINO EXISTING CONDITION LOMR
KHA PROJECT NO. 092564004

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip	
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch	
1940.200	2041.322	2.014	2043.336	4473.00	21.65	7.28	2050.61	.00	3.89	104.00	4.000	104.000	.00	1	1.4
15.353	.0420					.0148	.23	2.01	2.71	1.48	.013	.00	.00	BOX	
1955.552	2041.967	2.085	2044.052	4473.00	20.91	6.79	2050.84	.00	3.89	104.00	4.000	104.000	.00	1	1.4
17.742	.0420					.0130	.23	2.08	2.57	1.48	.013	.00	.00	BOX	
1973.295	2042.712	2.187	2044.899	4473.00	19.94	6.17	2051.07	.00	3.89	104.00	4.000	104.000	.00	1	1.4
14.705	.0420					.0111	.16	2.19	2.39	1.48	.013	.00	.00	BOX	
1988.000	2043.330	2.293	2045.623	4473.00	19.01	5.61	2051.23	.00	3.89	104.00	4.000	104.000	.00	1	1.4
BRIDGE ENTRANCE															
1988.000	2043.330	2.218	2045.548	4473.00	19.39	5.84	2051.39	.00	3.86	104.00	4.000	104.000	.00	0	.0
.100	.0110					.0105	.00	2.22	2.29	2.19	.013	.00	.00	BOX	
1988.100	2043.331	2.218	2045.549	4473.00	19.39	5.84	2051.39	.00	3.86	104.00	4.000	104.000	.00	0	.0
BRIDGE EXIT															
1988.100	2043.331	2.343	2045.674	4473.00	19.19	5.72	2051.39	.00	3.97	104.00	4.000	104.000	.00	9	.5
TRANS STR	.0098					.0152	.00	2.34	2.26		.013	.00	.00	BOX	
1988.200	2043.332	2.342	2045.675	4473.00	16.53	4.24	2049.92	.00	3.60	120.00	4.000	120.000	.00	9	.5
8.984	.0150					.0105	.09	2.34	1.94	2.08	.013	.00	.00	BOX	
1997.184	2043.467	2.358	2045.824	4473.00	16.43	4.19	2050.01	.00	3.60	120.00	4.000	120.000	.00	9	.5
50.554	.0150					.0097	.49	2.36	1.92	2.08	.013	.00	.00	BOX	

FILE: TROPLOMR.WSW W S P G W - CIVILDESIGN Version 14.06 PAGE 5
Program Package Serial Number: 1887
WATER SURFACE PROFILE LISTING Date: 4- 1-2007 Time: 9: 7: 5

CLARK COUNTY
HARD ROCK CASINO EXISTING CONDITION LOMR
KHA PROJECT NO. 092564004

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head / SF Ave	Energy Grd.El. / HF	Super Elev / SE Dpth	Critical Depth / Froude N	Flow Top Width / Norm Dp	Height/ Dia.-FT / "N"	Base Wt or I.D. / X-Fall	ZL / ZR	No Wth Prs/Pip / Type Ch
2047.737	2044.223	2.473	2046.696	4473.00	15.66	3.81	2050.50	.00	3.60	120.00	4.000	120.000	.00	9 .5
34.570	.0150					.0084	.29	2.47	1.79	2.08	.013	.00	.00	BOX
2082.308	2044.740	2.593	2047.334	4473.00	14.93	3.46	2050.80	.00	3.60	120.00	4.000	120.000	.00	9 .5
24.692	.0150					.0073	.18	2.59	1.67	2.08	.013	.00	.00	BOX
2107.000	2045.110	2.720	2047.830	4473.00	14.24	3.15	2050.98	.00	3.60	120.00	4.000	120.000	.00	9 .5
BRIDGE ENTRANCE														
2107.000	2045.110	2.407	2047.517	4473.00	15.48	3.72	2051.24	.00	3.51	120.00	4.000	120.000	.00	0 .0
TRANS STR	.0098					.0060	.00	2.41	1.76		.013	.00	.00	BOX
2107.100	2045.111	2.407	2047.518	4473.00	15.48	3.72	2051.24	.00	3.51	120.00	4.000	120.000	.00	0 .0
TRANS STR	.0080					.0050	.15	2.41	1.76		.013	.00	.00	BOX
2137.000	2045.350	2.964	2048.314	4473.00	13.72	2.92	2051.24	.00	3.72	110.00	6.000	110.000	.00	0 .0
32.100	.0031					.0037	.12	2.96	1.40	3.10	.013	.00	.00	BOX
2169.100	2045.451	2.947	2048.398	4473.00	13.80	2.96	2051.35	.00	3.72	110.00	6.000	110.000	.00	0 .0
BRIDGE EXIT														
2169.100	2045.451	3.089	2048.540	4473.00	13.47	2.82	2051.36	.00	3.77	110.00	6.000	110.000	.00	3 .8
TRANS STR	.0098					.0041	.00	3.09	1.37		.013	.00	.00	BOX
2169.200	2045.452	3.089	2048.542	4473.00	21.13	6.93	2055.48	.00	5.10	71.00	6.000	71.000	.00	3 .8
61.851	.0069					.0119	.74	3.09	2.16	3.66	.013	.00	.00	BOX

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Program Package Serial Number: 1887
WATER SURFACE PROFILE LISTING Date: 4- 1-2007 Time: 9: 7: 5

CLARK COUNTY
HARD ROCK CASINO EXISTING CONDITION LOMR
KHA PROJECT NO. 092564004

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head / SF Ave	Energy Grd.El. / HF	Super Elev / SE Dpth	Critical Depth / Froude N	Flow Top Width / Norm Dp	Height/ Dia.-FT / "N"	Base Wt or I.D. / X-Fall	ZL / ZR	No Wth Prs/Pip / Type Ch
2231.051	2045.881	3.005	2048.886	4473.00	21.73	7.33	2056.22	.00	5.10	71.00	6.000	71.000	.00	3 .8
91.949	.0069					.0134	1.23	3.01	2.25	3.66	.013	.00	.00	BOX
2323.000	2046.520	2.865	2049.385	4473.00	22.79	8.06	2057.45	.00	5.10	71.00	6.000	71.000	.00	3 .8
BRIDGE ENTRANCE														
2323.000	2046.520	2.631	2049.151	4473.00	23.94	8.90	2058.05	.00	4.98	71.00	6.000	71.000	.00	0 .0
.100	.0098					.0133	.00	2.63	2.60	2.89	.013	.00	.00	BOX
2323.100	2046.521	2.631	2049.152	4473.00	23.95	8.90	2058.06	.00	4.98	71.00	6.000	71.000	.00	0 .0
BRIDGE EXIT														
2323.100	2046.521	2.705	2049.226	4473.00	23.85	8.83	2058.06	.00	5.06	71.00	6.000	71.000	.00	2 .8
TRANS STR	.0098					.0153	.00	2.70	2.59		.013	.00	.00	BOX
2323.200	2046.522	2.704	2049.226	4473.00	26.12	10.59	2059.82	.00	5.37	65.00	6.000	65.000	.00	2 .8
38.800	.0082					.0195	.76	2.70	2.84	3.56	.013	.00	.00	BOX
2362.000	2046.840	2.642	2049.482	4473.00	26.73	11.10	2060.58	.00	5.37	65.00	6.000	65.000	.00	2 .8
BRIDGE ENTRANCE														
2362.000	2046.841	2.492	2049.333	4473.00	27.62	11.84	2061.17	.00	5.28	65.00	6.000	65.000	.00	0 .0
15.000	.0126					.0192	.29	2.49	3.08	2.83	.013	.00	.00	BOX
2377.000	2047.030	2.480	2049.510	4473.00	27.74	11.95	2061.46	.00	5.28	65.00	6.000	65.000	.00	0 .0
BRIDGE EXIT														

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Program Package Serial Number: 1887
WATER SURFACE PROFILE LISTING Date: 4- 1-2007 Time: 9: 7: 5

CLARK COUNTY
HARD ROCK CASINO EXISTING CONDITION LOMR
KHA PROJECT NO. 092564004

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head / SF Ave	Energy Grd.El. / HF	Super Elev / SE Dpth	Critical Depth / Froude N	Flow Top Width / Norm Dp	Height/Dia.-FT / "N"	Base Wt or I.D. / X-Fall	ZL / ZR	No Wth Prs/Pip / Type Ch
2377.000	2047.030	2.552	2049.582	4473.00	27.67	11.89	2061.47	.00	5.37	65.00	6.000	65.000	.00	2 .8
TRANS STR	.0098					.0224	.00	2.55	3.09		.013	.00	.00	BOX
2377.100	2047.031	2.551	2049.582	4473.00	16.19	4.07	2053.65	.00	3.75	110.00	6.000	110.000	.00	2 .8
62.014	.0073					.0068	.42	2.55	1.80	2.50	.013	.00	.00	BOX
2439.114	2047.482	2.564	2050.046	4473.00	16.10	4.03	2054.07	.00	3.75	110.00	6.000	110.000	.00	2 .8
242.647	.0073					.0063	1.52	2.56	1.79	2.50	.013	.00	.00	BOX
2681.762	2049.246	2.689	2051.935	4473.00	15.35	3.66	2055.60	.00	3.75	110.00	6.000	110.000	.00	2 .8
107.723	.0073					.0054	.58	2.69	1.66	2.50	.013	.00	.00	BOX
2789.485	2050.029	2.820	2052.850	4473.00	14.64	3.33	2056.18	.00	3.75	110.00	6.000	110.000	.00	2 .8
62.822	.0073					.0046	.29	2.82	1.55	2.50	.013	.00	.00	BOX
2852.306	2050.486	2.958	2053.444	4473.00	13.96	3.03	2056.47	.00	3.75	110.00	6.000	110.000	.00	2 .8
39.936	.0073					.0040	.16	2.96	1.44	2.50	.013	.00	.00	BOX
2892.242	2050.776	3.102	2053.879	4473.00	13.31	2.75	2056.63	.00	3.75	110.00	6.000	110.000	.00	2 .8
25.762	.0073					.0034	.09	3.10	1.34	2.50	.013	.00	.00	BOX
2918.005	2050.964	3.254	2054.218	4473.00	12.69	2.50	2056.72	.00	3.75	110.00	6.000	110.000	.00	2 .8
15.907	.0073					.0030	.05	3.25	1.25	2.50	.013	.00	.00	BOX
2933.912	2051.079	3.413	2054.492	4473.00	12.10	2.27	2056.76	.00	3.75	110.00	6.000	110.000	.00	2 .8
8.496	.0073					.0026	.02	3.41	1.16	2.50	.013	.00	.00	BOX

Program Package Serial Number: 1887
WATER SURFACE PROFILE LISTING Date: 4- 1-2007 Time: 9: 7: 5

CLARK COUNTY
HARD ROCK CASINO EXISTING CONDITION LOMR
KHA PROJECT NO. 092564004

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head / SF Ave	Energy Grd.El. / HF	Super Elev / SE Dpth	Critical Depth / Froude N	Flow Top Width / Norm Dp	Height/Dia.-FT / "N"	Base Wt or I.D. / X-Fall	ZL / ZR	No Wth Prs/Pip / Type Ch
2942.408	2051.141	3.579	2054.720	4473.00	11.54	2.07	2056.79	.00	3.75	110.00	6.000	110.000	.00	2 .8
2.592	.0073					.0022	.01	3.58	1.08	2.50	.013	.00	.00	BOX
2945.000	2051.160	3.755	2054.915	4473.00	11.00	1.88	2056.79	.00	3.75	110.00	6.000	110.000	.00	2 .8
BRIDGE ENTRANCE														
2945.000	2051.160	4.274	2055.434	4473.00	9.51	1.41	2056.84	.00	3.72	110.00	6.000	110.000	.00	0 .0
TRANS STR	.0098					.0065	.00	4.27	.81		.030	.00	.00	BOX
2945.100	2051.161	4.186	2055.347	4473.00	10.09	1.58	2056.93	.00	3.87	110.00		23		0 .0

Kimley-Horn
and Associates, Inc.

EXISTING CONDITIONS HEC-2 MODELING

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 ******************************************
*****************************************
 *  HEC-2 WATER SURFACE PROFILES           *                                  *  U.S. ARMY CORPS OF ENGINEERS
*                                          *                                  *
 *                                         *                                  *  HYDROLOGIC ENGINEERING CENTER
*                                          *                                  *
 *  Version   4.6.2;  May 1991             *                                  *  609 SECOND STREET, SUITE D
*                                          *                                  *
 *                                         *                                  *  DAVIS, CALIFORNIA 95616-4687
*                                          *                                  *
 *  RUN DATE    03APR07    TIME   13:52:03 *                                  *          (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
1
    03APR07      13:52:03                                                                    PAGE    1


                                                                  THIS RUN EXECUTED 03APR07    13:52:03
 ************************************
  HEC-2 WATER SURFACE PROFILES

  Version   4.6.2;  May 1991
 ************************************


T1   CCRFCD  TROPICANA WASH F.I.S.;   RDD33832
T2Tropicana Wash Central Branch - Existing Conditions LOMR
T3TROPLOMR.ih2 - KHA Project Number 092564004

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

                2                                     0         0                   2031.09

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

      1         0        -1         0         0                   0         0         0

J3  VARIABLE CODES FOR SUMMARY PRINTOUT

    110        200        115        150

J5  LPRNT    NUMSEC                    ********REQUESTED SECTION NUMBERS********

    -10       -10

  Begin run at a section upstream confluence of Flamingo Wash and Tropicana Wash
  Flow information beyond this point has not been restudied

QT        4     4473.0     4473.0     4473.0     4473.0
  Cross Section information taken from effective model

ET                          6.1      9606.8     10234.5      9922.9     10053.0
X1   60.345         20     9922.9     10053.0        260         200         230
X3       10
GR   2029.3      9364.8    2028.8      9417.7     2030.4      9426.0     2030.1      9471.2     2033.1      9492.1
GR   2033.6      9551.5    2032.3      9561.2     2033.4      9606.8     2032.9      9667.0     2032.8      9922.9
GR   2031.9      9948.0    2030.0      9960.8     2024.9      9966.8     2024.1     10000.0     2024.2     10038.0
GR   2032.8     10053.0    2031.2     10161.2     2032.2     10234.5     2031.2     10292.2     2031.5     10456.8


NC     .027       .027        .05         .1          .3

  Cross Section information taken from effective model

ET                          6.1      9553.1     10568.0      9958.9     10051.6
X1   60.397         20     9958.9     10051.6        270         280         275
```

```
 3       10
GR    2031.4     9369.8     2031.1     9421.2     2032.8     9428.6     2033.4     9470.5     2035.3     9503.1
GR    2035.7     9553.1     2034.4     9559.0     2034.2     9667.6     2033.4     9942.4     2035.9     9958.9
GR    2025.0    10000.0     2025.5    10024.0     2035.1    10051.6     2034.5    10068.4     2036.0    10091.1
1
    03APR07      13:52:03                                                                                PAGE    2

GR    2035.3    10230.7     2033.2    10239.5     2033.5    10313.2     2032.8    10400.1     2033.7    10570.4

  Cross Section information taken from effective model

  High conveyance changes due to channel changes.  Channel at 60.397 is
  improved with smooth sides and little vegetation.  Channel at 60.446 is
  natural and irregular with dense, tall grass in the bottom.

ET                              6.1      9600.0     10180.0      9949.6     10062.9
X1    60.446         15       9949.6    10062.9         270         255         260
X3       10
GR    2035.3     9448.0     2038.7     9533.8     2038.3     9644.2        2036     9689.7        2036     9745.4
GR      2036     9822.1        2036     9859.1        2036     9914.9      2036.5     9949.6      2028.5     9972.9
GR    2027.1    10000.0     2027.9    10037.5     2039.1    10062.9      2041.0    10083.5      2041.3    10183.8

ET                              6.1        0.1       127.0        0.1       127.0
X1    60.492          7        0.1      127.0          90          90          90
X3       10

  The following elevation was calculated from the WSPG HYDRAULIC ANALYSIS

GR    2043.1        0.0     2040.9        0.1     2040.0         21.0     2035.5         34.0     2035.5        104.0
GR    2042.0      119.0     2043.0      127.0

  Section 60.493 is the outlet of a large box culvert

ET                              6.1        0.1       135.0        0.1       135.0
X1    60.493          7        0.1      135.0        1730       1710         1780
3        10

  The following elevation was calculated from the WSPG HYDRAULIC ANALYSIS

X5        2     2040.3     2040.3
GR    2043.3        0.0     2040.0        0.1     2036.0         24.0     2035.0         27.0     2035.0         42.0
GR    2036.0       99.0     2042.0      135.0

QT        4       4473       4473       4473       4473

  FLOW CHANGED TO REFLECT UPSTREAM DEVELOPMENT ALONG AIRPORT WASH

NC      .10        .022       .022         .3         .5

  Sections 60.867 through 60.912:
  Right bank was modified to reflect recent grading
  Airport Wash is perpendicular to Tropicana Wash flow direction and was
  assumed ineffective

ET                              6.1      9210.0     10060.8      9951.0     10060.8
1
    03APR07      13:52:03                                                                                PAGE    3

X1    60.867         16       9951.0    10060.8         346         360         350
X3       10

  The following elevation was calculated from the WSPG HYDRAULIC ANALYSIS

X5        2     2055.4     2056.4
GR    2055.9     9206.7     2054.9     9416.1     2056.3     9436.9     2054.1     9523.7     2055.7     9725.4
GR    2056.6     9822.4     2057.3     9856.7     2057.8     9885.2     2056.7     9951.0     2050.3     9979.8
GR    2049.6    10000.0     2051.2    10028.7     2053.7    10060.8     2052.3    10272.8     2052.6    10423.7
GR    2051.4    10661.1

NC                .10

ET                4.1        6.1      9300.0     10150.0      9945.5     10065.0
X1    60.887         20       9945.5    10065.0         110         108         110
X3       10
GR    2057.4     9054.8     2056.6     9256.3     2055.3     9457.6     2056.5     9704.3     2057.3     9845.4
GR    2059.1     9876.5     2058.7     9945.5     2051.3     9977.5     2049.8    10000.0     2050.9    10024.1
GR    2054.6    10034.1     2057.3    10046.1     2058.7    10065.0     2059.1    10144.3     2054.8    10164.2
GR    2054.8    10180.1     2054.8    10199.9     2055.2    10332.0     2053.7    10534.7     2054.6    10597.3

1
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    03APR07       13:52:03                                                                PAGE     4

 1553 STARTING NC CARD OMITTED
1
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 T1FLAMINGO WASH     ENCROACHMENT CONDITIONS
 T2JOB NUMBER RDD33832.A2.60
 T3Flam-Enc.HC2              100 YEAR FLOOD CONDITIONS  ENCROACHMENT

 J1  ICHECK     INQ        NINV       IDIR       STRT       METRIC     HVINS      Q          WSEL       FQ

      -10         3          0          0          0          0          0          0    2031.39          0

 J2  NPROF      IPLOT      PRFVS      XSECV      XSECH      FN         ALLDC      IBW        CHNIM      ITRACE

       2          0         -1          0          0          0          0          0          0         15

 1553 STARTING NC CARD OMITTED
 FLOW DISTRIBUTION FOR SECNO=      60.35          CWSEL=    2031.39

 STA=     9951.    10053.
   PER Q=     100.0
    AREA=     579.1
     VEL=       7.7
   DEPTH=       5.8

 FLOW DISTRIBUTION FOR SECNO=      60.40          CWSEL=    2032.55

 STA=     9972.    10052.
   PER Q=     100.0
    AREA=     354.0
     VEL=      12.6
   DEPTH=       4.9

 FLOW DISTRIBUTION FOR SECNO=      60.45          CWSEL=    2036.43

 STA=     9950.    10063.
   PER Q=     100.0
    AREA=     742.7
     VEL=       6.0
   DEPTH=       6.9

 FLOW DISTRIBUTION FOR SECNO=      60.49          CWSEL=    2040.30

 STA=       14.      127.
   PER Q=     100.0
    AREA=     396.8
     VEL=      11.3
   DEPTH=       3.9

1
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     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


 FLOW DISTRIBUTION FOR SECNO=      60.49          CWSEL=    2040.30

 STA=        0.      135.
   PER Q=     100.0
    AREA=     477.9
     VEL=       9.4
   DEPTH=       3.8

 FLOW DISTRIBUTION FOR SECNO=      60.87          CWSEL=    2056.40

 STA=     9952.    10061.
   PER Q=     100.0
    AREA=     513.0
     VEL=       8.7
   DEPTH=       4.7

 FLOW DISTRIBUTION FOR SECNO=      60.89          CWSEL=    2056.40

 STA=     9955.    10065.
   PER Q=     100.0
    AREA=     377.2
     VEL=      11.9
```

DEPTH= 4.4

1
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THIS RUN EXECUTED 03APR07 13:52:03

****
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

MR.ih2 - KHA Project Num

SUMMARY PRINTOUT TABLE 110

	SECNO	CWSEL	DIFKWS	EG	TOPWID	QLOB	QCH	QROB	PERENC	STENCL	STCHL	STCHR	STENCR
	60.345	2031.09	.00	2032.12	96.56	.00	4473.00	.00	.00	.00	9922.90	10053.00	.00
	60.345	2031.39	.30	2032.32	99.10	.00	4473.00	.00	130.10	9922.90	9922.90	10053.00	10053.00
•	60.397	2032.56	.00	2035.03	72.77	.00	4473.00	.00	.00	.00	9958.90	10051.60	.00
*	60.397	2032.55	-.01	2035.03	72.72	.00	4473.00	.00	92.70	9958.90	9958.90	10051.60	10051.60
•	60.446	2036.43	.00	2036.99	107.02	.00	4473.00	.00	.00	.00	9949.60	10062.90	.00
•	60.446	2036.43	.00	2036.99	107.04	.00	4473.00	.00	113.30	9949.60	9949.60	10062.90	10062.90
*	60.492	2040.30	.00	2042.27	101.06	.00	4473.00	.00	.00	.00	.10	127.00	.00
•	60.492	2040.30	.00	2042.27	101.06	.00	4473.00	.00	126.90	.10	.10	127.00	127.00
	60.493	2040.30	.00	2041.66	124.71	.00	4473.00	.00	.00	.00	.10	135.00	.00
	60.493	2040.30	.00	2041.66	124.70	.00	4473.00	.00	134.90	.10	.10	135.00	135.00
*	60.867	2055.40	.00	2055.47	704.25	.00	969.87	3503.13	.00	.00	9951.00	10060.80	.00
•	60.867	2056.40	1.00	2057.58	108.45	.00	4473.00	.00	109.80	9951.00	9951.00	10060.80	10060.80
*	60.887	2056.39	.00	2058.58	86.61	.00	4473.00	.00	850.00	9300.00	9945.50	10065.00	10150.00
*	60.887	2056.40	.00	2058.58	86.63	.00	4473.00	.00	119.50	9945.50	9945.50	10065.00	10065.00

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MR.ih2 - KHA Project Num

SUMMARY PRINTOUT TABLE 150

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH	AREA	.01K
	60.345	.00	.00	.00	2024.10	4473.00	2031.09	.00	2032.12	.00	8.14	549.75	*********
	60.345	.00	.00	.00	2024.10	4473.00	2031.39	.00	2032.32	.00	7.72	579.10	*********
•	60.397	275.00	.00	.00	2025.00	4473.00	2032.56	2032.56	2035.03	227.04	12.62	354.49	296.86
•	60.397	275.00	.00	.00	2025.00	4473.00	2032.55	2032.55	2035.03	227.96	12.64	353.96	296.26
•	60.446	260.00	.00	.00	2027.10	4473.00	2036.43	.00	2036.99	32.30	6.03	742.35	787.08
*	60.446	260.00	.00	.00	2027.10	4473.00	2036.43	.00	2036.99	32.25	6.02	742.70	787.62
*	60.492	90.00	.00	.00	2035.50	4473.00	2040.30	2040.30	2042.27	237.55	11.27	396.85	290.22
•	60.492	90.00	.00	.00	2035.50	4473.00	2040.30	2040.30	2042.27	237.56	11.27	396.83	290.21
•	60.493	1780.00	.00	.00	2035.00	4473.00	2040.30	.00	2041.66	166.83	9.36	477.95	346.31
•	60.493	1780.00	.00	.00	2035.00	4473.00	2040.30	.00	2041.66	167.36	9.36	477.94	345.76
•	60.867	350.00	.00	.00	2049.60	4473.00	2055.40	.00	2055.47	2.04	2.38	2167.84	3132.81
•	60.867	350.00	.00	.00	2049.60	4473.00	2056.40	.00	2057.58	21.90	8.72	512.99	955.86
•	60.887	110.00	.00	.00	2049.80	4473.00	2056.39	2056.39	2058.58	44.47	11.87	376.89	670.78
	60.887	110.00	.00	.00	2049.80	4473.00	2056.40	2056.40	2058.58	44.37	11.86	377.19	671.50

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MR.ih2 - KHA Project Num

UMMARY PRINTOUT TABLE 150

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
	60.345	4473.00	2031.09	.00	.00	.00	96.56	.00
	60.345	4473.00	2031.39	.30	.00	.30	99.10	.00
•	60.397	4473.00	2032.56	.00	1.47	.00	72.77	275.00
•	60.397	4473.00	2032.55	-.01	1.16	-.01	72.72	275.00
•	60.446	4473.00	2036.43	.00	3.87	.00	107.02	260.00
*	60.446	4473.00	2036.43	.00	3.88	.00	107.04	260.00
•	60.492	4473.00	2040.30	.00	3.88	.00	101.06	90.00
•	60.492	4473.00	2040.30	.00	3.87	.00	101.06	90.00
•	60.493	4473.00	2040.30	.00	.00	.00	124.71	1780.00
•	60.493	4473.00	2040.30	.00	.00	.00	124.70	1780.00
•	60.867	4473.00	2055.40	.00	15.10	.00	704.25	350.00
*	60.867	4473.00	2056.40	1.00	16.10	1.00	108.45	350.00
•	60.887	4473.00	2056.39	.00	.99	.00	86.61	110.00
*	60.887	4473.00	2056.40	.00	.00	.00	86.63	110.00

1
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SUMMARY OF ERRORS AND SPECIAL NOTES

```
CAUTION SECNO=     60.397  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=     60.397  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=     60.397  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL
 AUTION SECNO=     60.397  PROFILE=  2  CRITICAL DEPTH ASSUMED
 AUTION SECNO=     60.397  PROFILE=  2  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=     60.397  PROFILE=  2  20 TRIALS ATTEMPTED TO BALANCE WSEL

WARNING SECNO=     60.446  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=     60.446  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO=     60.492  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=     60.492  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=     60.492  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=     60.492  PROFILE=  2  CRITICAL DEPTH ASSUMED
CAUTION SECNO=     60.492  PROFILE=  2  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=     60.492  PROFILE=  2  20 TRIALS ATTEMPTED TO BALANCE WSEL

NOTE    SECNO=     60.493  PROFILE=  1  WSEL BASED ON X5 CARD
NOTE    SECNO=     60.493  PROFILE=  2  WSEL BASED ON X5 CARD

NOTE    SECNO=     60.867  PROFILE=  1  WSEL BASED ON X5 CARD
WARNING SECNO=     60.867  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
NOTE    SECNO=     60.867  PROFILE=  2  WSEL BASED ON X5 CARD
WARNING SECNO=     60.867  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO=     60.887  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=     60.887  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=     60.887  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO=     60.887  PROFILE=  2  CRITICAL DEPTH ASSUMED
CAUTION SECNO=     60.887  PROFILE=  2  MINIMUM SPECIFIC ENERGY
```

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Floodway width summary: MR.ih2 - KHA Project Num
Profile No. 2

Section Number	Elevation Increase	Top Width	Left Encroach Station	Left Sta Distance From Center	Center Station	Right Sta Distance From Center	Right Encroach Station
60.345	.30	130.10	9922.90	65.05	9987.95	65.05	10053.00
60.397	-.01	92.70	9958.90	46.35	10005.25	46.35	10051.60
60.446	.00	113.30	9949.60	56.65	10006.25	56.65	10062.90
60.492	.00	126.90	.10	63.45	63.55	63.45	127.00
60.493	.00	134.90	.10	67.45	67.55	67.45	135.00
60.867	1.00	109.80	9951.00	54.90	10005.90	54.90	10060.80
60.887	.00	119.50	9945.50	59.75	10005.25	59.75	10065.00

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FLOODWAY DATA, MR.ih2 - KHA Project Num
PROFILE NO. 2

STATION	FLOODWAY WIDTH	FLOODWAY SECTION AREA	FLOODWAY MEAN VELOCITY	WATER SURFACE ELEVATION WITH FLOODWAY	WITHOUT FLOODWAY	DIFFERENCE
60.345	99.	579.	7.7	2031.4	2031.1	.3
60.397	73.	354.	12.6	2032.6	2032.6	.0
60.446	107.	743.	6.0	2036.4	2036.4	.0
60.492	101.	397.	11.3	2040.3	2040.3	.0
60.493	125.	478.	9.4	2040.3	2040.3	.0
60.867	108.	513.	8.7	2056.4	2055.4	1.0
60.887	87.	377.	11.9	2056.4	2056.4	.0

Kimley-Horn and Associates, Inc.

FIS SECTION	HEC-2 SECTION (NAVD) (Effective Model)	FIS ELEVATION (NAVD) (W/O Floodway)	HEC-2 ELEVATION (NGVD) (Effective Model)	HEC-2 ELEVATION (NAVD) (Effective Model)	EXISTING MODEL ELEVATION (NGVD) (LOMR)	EXISTING MODEL ELEVATION (NAVD) (LOMR)	WSPG SECTION
H	60.345	2033.60	2031.09	2033.34	2031.09	2033.34	
I	60.397	2035.30	2033.22	2035.47	2032.56	2034.81	
J	60.446	2039.20	2037.12	2039.37	2036.43	2038.68	
K	60.491	2040.00	2037.88	2040.13	2040.3	2042.55	1000
							1100
							1344
L	60.587	2045.90	2043.83	2046.08	Contained in Culvert	Contained in Culvert	
							1544
							1689
							1838
M	60.667	2046.90	2044.82	2047.07	Contained in Culvert	Contained in Culvert	1920
							1940
							1988
N	60.705	2051.00	2048.90	2051.15	Contained in Culvert	Contained in Culvert	2107
							2137
							2169
							2323
							2377
O	60.800	2052.90	2050.81	2053.06	Contained in Culvert	Contained in Culvert	
P	60.866	2057.90	2055.80	2058.05	2055.40	2057.65	2945

HYDRAULIC ANALYSIS SUMMARY TABLE

Kimley-Horn and Associates, Inc.

FIS for Clark County and Incorporated Areas

EFFECTIVE FIS INFORMATION

Table 3. Summary of Discharges (Cont'd)

Flooding Source and Location	Drainage Area (Square Miles)	Peak Discharges (Cubic Feet per Second) 10-Year	50-Year	100-Year	500-Year
Muddy River					
At Cooper Avenue	4,035	5,250	14,750	21,300	45,900
Downstream of Wells Siding	3,950	5,270	14,800	21,400	45,500
Upstream of Confluence with Meadow Valley Wash	1,360	3,620	10,900	16,000	34,400
North Branch Blue Diamond Wash					
At Union Pacific Railroad	71.6	30	1,280	2,900	12,700
At Interstate 15	72.6	30	1,280	2,900	12,700
Overton Wash					
At Upstream Limit of Detailed Study	21.7	2,170	4,510	5,680	8,200
Pulsifer Wash					
At Interstate 15	4.9	930	1,730	2,070	3,230
Southwest Unnamed Wash					
At Apex	3.9	260	1,070	1,770	4,890
Tropicana Wash - Central Branch					
At Flamingo Wash	20.1	--[1]	--[1]	5,300	--[1]
Upstream of Airport Wash	12.1	--[1]	--[1]	3,320	--[1]
Downstream of Koval Road	11.0	--[1]	--[1]	3,320	--[1]
Interstate 15 to 600 feet downstream of Union Pacific Railroad	8.9	--[1]	--[1]	800	--[1]
Just downstream of Union Pacific Railroad	8.1	--[1]	--[1]	710	--[1]

[1]Discharge Not Available

Kimley-Horn and Associates, Inc.

Premier Golf Course TDS

DRAINAGE STUDY

HTE#

03-7719

PROJECT NAME

PREMIERE PARK GOLF COURSE STREETS

SECTION TOWNSHIP RANGE

SEC 22 T21S R61E

CROSS STREETS

TROPICANA / PARADISE

NEW ASSESSORS PARCEL NUMBER

162-22-401-002

ACREAGE

± 21 AC

SUBMITTAL DATE

1-24-03

DRAWER# D -530

530

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



RECEIVED
MAR 17 2003
DEVELOPMENT SERVICES
CIVIL ENGINEERING

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

BOARD OF DIRECTORS

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City of Las Vegas

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Bruce L. Woodbury
Clark County

March 12, 2003

Mr. Robert Thompson, P.E.
Department of Development Services
500 S. Grand Central Parkway
Las Vegas, NV 89155

DISTRICT CONCURRENCE: PREMIERE PARK GOLF COURSE STREETS (4182)
(HTE #03-7719)

Dear Mr. Thompson:

Clark County Regional Flood Control District (District) reviewed Technical Drainage Study dated January 24, 2003, for the above-mentioned project as submitted by Martin & Martin Civil Engineers. In addition, District is in receipt of the Conditional Letter of Acceptance from Clark County Public Works dated February 7, 2003.

District concurs with acceptance of this Technical Drainage Study by Clark County Public Works.

District's review of this project was limited to issues of Regional Flood Control Significance as defined in *Uniform Regulations for the Control of Drainage.*

Please be aware that as additional information becomes available and/or restudies of Flood Insurance Studies are performed, information submitted by Martin & Martin Civil Engineers may be superseded. Compliance with regulatory elements and design standards specified in *Uniform Regulations for the Control of Drainage* does not imply a guarantee that properties will be free from flooding or flood damage. The District, its officials, or employees assume no liability for information, data, or conclusions presented by consulting engineers. We, therefore, make no warranties, either expressed or implied, in conducting this review.

GALE WM. FRASER, II, P.E.
General Manager/Chief Engineer

BY: ARTL
Andrew R. Trelease, P.E.
Senior Civil Engineer

ART:css

c: Todd L. Myers, P.E., Martin & Martin Civil Engineers

File: 21-61-22.MAR

600 S. Grand Central Parkway, Suite 300 • Las Vegas, Nevada 89106-4511
(702) 455-3139 • FAX: (702) 455-3870
Website: http://www.ccrfcd.org

Department of Development Services
Civil Engineering Division

500 S Grand Central Pky 1st Fl • PO Box 551842 • Las Vegas NV 89155-1842
(702) 455-4600 • Fax (702) 388-2550

Phil Rosenquist, Director • Carla J. Pearson, Assistant Director

February 7, 2003

Martin & Martin, Inc.
2101 S. Jones Blvd., Suite A
Las Vegas, NV 89146

Dear Sirs:

SUBJECT: WILLDAN / Clark County Development Services Dept. Plan Review Contract
Technical Drainage Study for Premiere Park Golf Course Streets **(4182)**
Study Dated: January 24, 2003
Location: Northwest corner of Tropicana Avenue and Paradise Road
(Sec. 22, T. 21 S., R. 61 E.)
HTE #03-7719

The referenced **Technical Drainage Study** has been reviewed and is accepted as complying with minimum improvement standards. As set forth in the subject drainage study, the following measures will be taken to mitigate flood hazards.

1. The site shall be graded with respect to drainage as shown on "Premiere Park Golf Course," sheets C4.01 through C4.09 and sheet C8.01 signed and sealed by Jon R. Wakenhut, P.E., on January 24, 2003;

2. The following drainage facilities shall be constructed:

   a. An 8-foot wide concrete valley gutter located on the north side of Tropicana Avenue crossing the eastern driveway

   b. Approximately 70-LF of five (5) 3-foot high by 8-foot wide RCB's crossing the interior street as shown on sheet C4.05

   c. A trapezoidal channel with 15-foot wide bottom and 4H:1V side slope located onsite outletting flows onto Paradise Road with a rip-rap pad at the outlet with the following dimensions:

      d_{50} = 6-inches
      Thickness = 12-inches

BOARD OF COUNTY COMMISSIONERS
MARY KINCAID-CHAUNCEY, Chair • CHIP MAXFIELD, Vice-Chairman
YVONNE ATKINSON GATES • MARK A. JAMES • RORY REID • MYRNA WILLIAMS • BRUCE L. WOODBURY
THOM REILLY, County Manager

d. A 2-foot wide sidewalk underdrain located on the west side of Paradise Road

e. Onsite 18-inch HDPE storm drain, concrete headwall and concrete valley gutter as shown on the plans

3. A bond estimate must be submitted to Clark County Civil Engineering Division for the above-mentioned stormwater management facilities;

4. Section 2 of the Clark County Building Office Operations Division Drainage Compliance Report must be completed by the engineer for the facilities listed in Item 2 above;

5. The minimum finished floor elevation for the proposed structure shall be constructed as shown on the above-mentioned grading plans;

6. The subject site is located within Zone X, as shown on FIRM Community Panel Number 32003C 2557E, revised September 27, 2002. Zone X is determined to be outside the 0.2% annual chance flood plain;

7. Mylars of the grading plan must be submitted to the Clark County Civil Engineering Division Plan Check for approval signatures prior to permit issuance;

8. The grading plan will be reviewed by the Building Office Operations Division to ensure compliance with the handicap access requirements. Revisions to the grading plan may be required if the site accessibility design does not comply with the requirements set forth in the Accessibility Chapter of the Clark County Building Code;

9. Clark County Regional Flood Control District (CCRFCD) concurrence is required since the subject project is adjacent to a Proposed Master Plan Facility. As a condition of final approval, the applicant must submit a copy of the drainage study and any addenda to the CCRFCD. Permits will not be issued until concurrence is obtained from the CCRFCD;

10. Nevada Department of Transportation (NDOT) concurrence is required for the proposed improvements **being performed in NDOT ROW**;

11. Right-of-way dedication must be verified;

12. It is noted that the flow rates indicated on Figure 6 for basin SB4 does not match the results from the Interim Condition HEC-1 analysis;

13. At the request of Clark County Development Services Department, drainage/grading plans for the proposed development have been reviewed for compliance to the requirements set forth in the "Minimum Drainage Study Criteria Checklist," "Drainage Plan Information," dated July 15, 1997. **As a condition of final approval, the drainage/grading plans submitted for this project require the following modifications to meet the minimum standards outlined in the above-referenced regulation:**

    a. Provide a vicinity map

    b. Provide an index map

    c. Identify property line on legend

    d. Label existing flow line elevation on sheet C4.07 at valley gutter crossing

    e. Provide a valley gutter crossing the eastern entrance from Tropicana Avenue

No liability is assumed by the County for information, data, and conclusions of the consulting engineer.

DEPARTMENT OF DEVELOPMENT SERVICES

BY: _____

Dave Betley, P.E.
Principal Engineer
Civil Engineering Division

DB/AW/bk

cc: ILX Resorts, INC.
Development File

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- Reference - *(McCarran International Airport West Side Drainage System Design Hydrologic & Hydraulic Report)* by Kennedy/Jenks, September 1993.

1.0 INTRODUCTION

1.1 SCOPE

ILX, Resorts, Inc. has retained Martin & Martin Civil Engineers to provide a Drainage Study and Improvement Plans for the Proposed *Premiere Park* project, located between Harmon Avenue and Paradise Road near McCarron Airport, north of Tropicana, in Las Vegas, Nevada. This report is to serve as a Technical Study for the Golf Course improvements and a conceptual study for the remainder of the site. Drainage Study Updates will be submitted as the design phases for the overall site progresses.

The following tasks are performed in the preparation of this report:

1. Identify FEMA Flood Plain designation for the project site.
2. Identify any existing or proposed drainage facilities that affect or are affected by the site.
3. Review Approved Drainage Studies for the subject site.
4. Estimate runoff generated within and around the project site for the 10-year and 100-year storm events.

1.2 SITE DESCRIPTION AND LOCATION

The 44±-acre Premiere Park site is located at the northwest corner of the intersection of Tropicana Avenue and Paradise Road (See Figure 1 in Appendix 'A' for Vicinity Map). Specifically, the site is within Section 22, Township 21 South and Range 61 East. The site is identified by Assessors Parcel Numbers 162-22-401-002, -304-001, -002. The project is located within the Flamingo/Tropicana Wash Drainage Basin, as indicated in the 2002 Flood Control Master Plan Update for Las Vegas Valley.

Under existing conditions, the site serves as a Golf Driving Range. The site slopes generally from west to east, towards Paradise Road. The existing ground cover consists of asphaltic paving, desert landscaping and hardscape, artificial turf (driving range areas), building and parking lot areas.

The proposed site improvements include a golf course to be located on the southern portion of the site, with future commercial/office developments to be located on the northern portion of the site (Please refer to Figures 6 and 7 in Appendix 'A' for the Interim and Future Drainage Plans). The golf course portion will be richly landscaped with berms and ponds. The commercial developments consist of additional building structures and paved parking areas.

The Tropicana Wash-McCarran Airport channel (TRMC 0030) is located along the west boundary of the site as per the 2002 Master Plan Update for the Las Vegas Valley (MPU). Per the MPU the channel conveys an ultimate flow of 2665

cfs. Further west, across the channel, is an abandoned trailer park, north of the site is existing residential housing, and east of the site across Paradise Road are commercial businesses and airport parking areas.

Existing site drainage conditions have been analyzed in a previously approved study, *Technical Drainage Study for the Las Vegas Sports Center.* Excerpts of the Reference Study are provided in Appendix D.

1.3 FLOOD HAZARD ZONE

As shown on F.E.M.A. community panel 32003C2557E, dated September 27, 2002 (Figure 2 – Appendix A) the project area is located within Zone X. Zone X areas are determined to be outside the 500-year flood plain.

1.4 DRAINAGE CHARACTERISTICS

OFFSITE

The offsite watershed impacting the subject site encompasses an area of approximately 4± square miles draining from southwest to northeast as indicated in the 2002 MPU. As shown in Figures 8 and 8A in Appendix 'A', the drainage basins impacting the subject site are identified as MC2 through MC11. Runoff from the offsite watershed is conveyed within the Tropicana Wash-McCarran Airport channel commencing from Las Vegas Boulevard to the subject site. Runoff from the offsite watershed impacts the site via a 5 cell 8' by 4' Reinforced concrete box culvert (RCBC) identified as TRMC 0060 on Figure 4 in Appendix 'A'. Flows conveyed through the RCBC are conveyed north within an existing trapezoidal channel (TRMC 0030) along the west boundary of the subject site.

The 2002 MPU quantified an ultimate 100-year flow of 2665 cfs impacting the TRMC 0030 via the 5 cell RCBC. However, the 2665 cfs is based on additional upstream CCRFCD conveyance facilities in place and full build-out conditions. The analysis presented in this report accepts the Hydrology presented within the 2002 MPU, however, the 100-year flows impacting the TRMC 0030 have been determined to be 1971 cfs based upon conveyance capacities of the existing CCRFCD facilities. (See Appendix C for capacity calculations).

Two main locations of breakout flow from the TRMC are identified within this study as follows (Refer to Figures 8 & 9 in Appendix 'A"):

- TRMC 0263 – 2:10' x 6' RCB located at Las Vegas Boulevard (LVBLVD), south of Tropicana Avenue. The structure has a conveyance capacity of approximately 1166 cfs. Per the 2002 MPU, the ultimate flow impacting TRMC 0263 is 1620 cfs, resulting in 454 cfs breaking out to LVBLVD. The west side of LVBLVD has a conveyance capacity of approximately 261 cfs. A conservative estimate, assuming all of the

remaining flows impact Tropicana Avenue, of 193 cfs (454 – 261 = 193 cfs) split east on Tropicana.

- TRMC 0233 – 2:8'x 6' RCB located at Dewey. TRMC 0233 has a capacity of approximately 1393 cfs. The 2002 MPU quantifies a flow of 1968 cfs impacting the structure, resulting in 121 cfs (1968 – 454 –1393 =121) breaking out of the TRMC at Dewey and being conveyed through the McCarran Airport site to impact Tropicana Avenue adjacent to the subject site.

A conservative estimate results in an ultimate 100-year street flow in Tropicana Avenue of 433 cfs adjacent to the subject site; calculated as follows:

▪ Per 2002 MPU Total flow	2665 cfs
▪ Flow conveyed to TRMC 0030	-1971 cfs
▪ Flow conveyed north on LVBLVD	- 261 cfs
	= 433 cfs

Per the calculations included with this study, the existing unimproved channel has a capacity of approximately 1153 cfs. The remainder of the flow breaks out of the channel and is conveyed northeasterly across the site to Paradise Road.

ONSITE

The existing overall site gradually slopes from southwest to the northeast at approximately 1-2%. The site is developed containing commercial space with paved areas for parking and artificial turf covered areas for a golf driving range. The proposed development replaces the golf driving range with a furnished golf course area along the south side of the lot adjacent to Tropicana Avenue whereby significantly reducing onsite runoff to Paradise Road. The north portion of the lot will be redeveloped to include a combination of additional commercial buildings and paved parking areas that conveys drainage to Paradise Road.

As indicated on the Interim Conditions Drainage Plan (Figure 6, Appendix 'A'), the proposed subject site is divided into 8 sub-basins. Golf course basins are identified as SB1 through SB5. Interim condition basins ISB 6, ISB 7 and ISB 8 will not be significantly disturbed for the proposed golf course improvements. A significant reduction in onsite runoff is expected as a result of the golf course improvements due to the increased infiltration expected from the proposed ground cover. All flow from the golf course basins and ISB 6 will be conveyed to Paradise Road at CP2 and CP3 as shown on Figure 6.

Breakout flow of 456 cfs from the TRMC 0030 impacting the golf course area will be conveyed to the proposed pond in SB1, then overflow to the proposed grass lined trapezoidal channel. Breakout calculations and golf course channel calculations are included in Appendix 'C' of this report.

In reference to the Future Drainage Plan (Figure 7, Appendix 'A'), the future, developed site has been sub-divided into eleven drainage basins, namely SB1 thru SB11, based on the expected build-out conditions. The individual drainage characteristics are summarized as follows:

- SB1 – Landscaped golf course area, self-contained with all flows draining into the man-made pond.
- SB2 thru SB5 – Landscaped golf course area, combined flows at on Paradise at CP2.
- FSB6, FSB8, & FSB9 – Future paved and commercial areas include roof drainage as sheet flows, FSB6 combined flows with FSB8 at CP4, which are routed with FSB9 and calculated at CP5.
- FSB10 – Future paved and commercial areas include roof drainage as sheet flows and drain toward Paradise road at CP6. Flows calculated at CP6 include flows from CP5.
- FSB7 & FSB11 – Future paved and commercial areas include roof drainage as sheet flows, combined flows calculated at CP7. CP7 located on Paradise Road includes flows from CP6.
- Refer to Standard Form 4 in Appendix B for tabulated areas for each Basin.

Means to convey additional 238 cfs breakout flow impacting the future site from TRMC 0030 will be addressed within future Drainage updates for the subject site.

1.5 EXISTING / PROPOSED REGIONAL FLOOD CONTROL FACILITIES

A review of the 2002 Clark County Regional Flood Control District *Flood Control Master Plan Update of the Las Vegas Valley* indicates the following regional flood control facility located within and adjacent to the subject site (Please refer to Figure 4 in Appendix A).

- TRMC 0012 – Existing earth channel; 930 cfs
- TRMC 0012 – Proposed master plan; concrete channel; 930 cfs
- TRMC 0030 – Existing earth channel; 2665 cfs
- TRMC 0033 - Proposed 166 ac-ft offline Tropicana Wash McCarran Airport Detention Basin. Located on the subject site.
- TRMC 0060 – 5 existing culverts: 10' x 4' RCBC; 2665 cfs; southwest corner of the site.

As stated above, TRMC 0033 is a proposed CCRFCD detention basin to be located on the subject site. As agreed upon with Kevin Eubanks of CCRFD, a new location for an offline detention basin should be investigated. The site is private property. Additionally, due to grade constrictions (site cannot gravity flow to TRMC 0030) the site is not a feasible location for a detention basin.

1.6 PREVIOUS DRAINAGE STUDIES

The following Studies were reviewed and incorporated (where applicable) into this Study:

- Reference No. 6 - Clark County Regional Flood Control District, "*Master Plan Update of the Las Vegas Valley*", September 2002.

- Reference No. 7 - *Technical Drainage Study for the Las Vegas Sports Center – Tropicana and Paradise Road,* prepared by CVL Consultants Inc., dated November 1995
- Reference No. 8 - *McCarran International Airport Westside Drainage Study Hydrologic and Hydraulic Report,* prepared by Kennedy / Jenks, dated September 1993.

2.0 HYDROLOGY

2.1 METHODOLOGY

The Soils Conservation Services (SCS) Unit Hydrograph Method, within the U.S. Army Corps of Engineers HEC-1 Flood Hydrograph Package Computer Method, was utilized to determine the peak discharges for Interim and Future on-site conditions. Existing onsite runoff was determined within the Reference No. 7 study. Offsite conditions were determined and incorporated from above referenced studies and the 2002 MPU. Peak discharges were computed for the 10-year and 100-year, 6-hour storm events. A complete discussion of the methodology used in the Hydrological Analysis can be found in the U.S. Army Corps. of Engineers HEC-1 Users Manual.

2.2 RAINFALL

The project site is located within the McCarran Airport Rainfall Area where the precipitation values have been pre-determined. The precipitation depths used to determine the 10-year and 100-year, 6-hour storm event discharge were obtained from the *Clark County Regional Flood Control District Design Manual*, Figure 505. No depth - area- reduction - factor was applied to the point precipitation value used in the onsite analysis, due to the small basin area. The 6-hour precipitation depths used for the HEC-1 analysis were 1.58 inches, and 2.77 inches for the 10-year and 100-year, 6-hour rainfall events, respectively. The basin areas analyzed in this Study are less than 10 square miles. Therefore, the SDN3, six-hour storm distribution was utilized, per the Clark County Regional Flood Control District *Hydrologic Criteria and Design Manual* (MANUAL).

2.3 TIME OF CONCENTRATION – LAG TIME

Time of Concentration calculations are performed per section 602 of the MANUAL for basins less than one square mile. The method recommended by the MANUAL was developed by the Federal Aviation Administration (FAA1970) and is outlined as follows:

$t_c = t_i + t_t$

$TLAG = 0.60t_c /60$ (hr) – Lag time used in HEC1 model

In which t_c = Time of Concentration (min)

t_i = Initial, Inlet, or Overland Flow Time (min)

t_t = Travel Time in the Ditch, Gutter, Storm Sewer, etc. (min)

The initial overland flow time is calculated as follows:

$t_i = 1.8(1.1-K)L_o^{1/2}/S^{1/3}$

Where K = flow resistance factor

L_o = length overland flow

L = length of channel (ect.)

S = average slope of basin (%)

For SCS & TR55 unit hydrographic Methods

$$K = 0.0132(CN) - 0.39$$

Where: CN = SCS runoff curve number
t_t = L/60V (min)
V = average channel velocity (ft/sec)

VELOCITY DETERMINATION FOR TIME OF CONCENTRATION

At the upstream end of a drainage area, the initial overland flows begin to collect and gradually increase from small, shallow flows to larger, deeper flows with greater velocities. To estimate the average velocity for flow condition, that constantly vary throughout the length of drainage area, two generalized relationships can be used. Velocity V_1 applies to the small shallow flows in the first 500 feet or less of travel distance and velocity V_2 applies to the remainder of the travel distance where the velocity is greater. Manning's equation was used to derive formulas for estimating the two travel time velocities. The equations are as follows:

$$V = CS^{1/2} \qquad C = 1.49/n\, R^{2/3} \qquad R = A/P$$

Where: V = Average Velocity (fps)
S = Average Slope (ft/ft)
N = Manning's Roughness Coefficient
R = Hydraulic Radius (ft)
P = Wetted Perimeter (ft)
A = Area of Flow (sq. ft.)

Two sets of coefficients were determines, one four developed conditions and the other for undeveloped conditions. For the first developed conditions velocity (V1), the appropriate coefficient (C=20.2) represents street flow with n = 0.016 and a depth in the gutter of 0.3 feet. For the second developed conditions velocity (V2), the appropriate coefficient (C=30.6) represents curb height street flow. As may be noted, V2 is approximately equal to 1.5 times V1. Typically, drainage areas are delineated such that the channelized flow considered in the calculations of travel times is within streets and other minor watercourses and does not include significant lengths of major improvement floodway and channels in the travel distance for the time of concentration. For the first undeveloped conditions velocity (V1), the appropriate coefficient (C = 14.8) represents wide channel flow with D = 0.25' and n = 0.04. For the second undeveloped conditions velocity (V 2), the appropriate coefficient C = 29.4) represents wide channel flow with D = 0.7' and n = 0.04.

For urbanized basins, the time of concentration should not exceed the time of concentration calculated by the following equation.

$$t_c = L/ 180 + 10$$

Where: L = Watershed Length (ft)
Additionally, the minimum $t_{c\ for}$ urbanized areas is 5 minutes.

These methods are consistent with the methods outlined in Technical Release 55, SCS (TR55) for calculating the time of concentration and should provide times of concentration and lag times that are consistent with one another and with the degree of accuracy of typical hydrologic modeling.

2.4 SOILS GROUP

Curve numbers for the on-site drainage basins have been estimated using procedures and data documented in the Soils Conservation Services (SCS) Technical Release 55 (Ref. 4) and the Clark County Regional Flood Control District Drainage Design Manual's Table 602 (Ref. 5). The computed curve numbers were based on soil types; present and future land uses and the assumed antecedent soils moisture condition (AMII) for this region. The SCS Curve Number Method is the abstraction method used in the HEC-1 model. The subject site is mapped to be within Hydrologic Soils Group 'B' as shown on Figure 4 in Appendix 'A'

2.5 RESULTS

Table 1 represents a summary of the results from the HEC1 analyses.

TABLE 1
HEC-1 RESULTS

BASIN / Location	Q10 (cfs)	Q100 (cfs)	REMARKS
OFFSITE (from 2002 MPU)			
CMC8	------	1620	Impacts TRMC 0263 – 454 cfs breaks out, 261 cfs conveyed north on LVBLVD away from site, 193-cfs conveyed east on Tropicana to site.
CMC11	-------	2665	261 cfs splits north on LVBLVD, 1971 cfs conveyed in TRMC 0030, remaining 433 cfs conveyed as surface flow on Tropicana
E1	------	433	Tropicana Street flow – 10 yr flow assumed to be conveyed in channel.
GOLF COURSE - EXISTING CONDITIONS – from Reference 7 study (from onsite basins only)			
CM1	6	19	Runoff to Paradise Rd.
CM3	14	44	Runoff to Paradise Rd.
CM4	18	57	Runoff to Paradise Rd.
CM6	24	73	Runoff to Paradise Rd.
GOLF COURSE - PROPOSED INTERIM CONDITIONS			
SB1	< 1	2	Golf course basin – conveyed to Paradise
SB2	< 1	1.0	Golf course basin – conveyed to Paradise
SB3	< 1	1.0	Golf course basin – conveyed to Paradise
SB4	4	8.0	Golf course basin – conveyed to Paradise
SB5	< 1	2	Golf course basin – conveyed to Paradise
RD1	<1	1	Tropicana Driveway
ISB6	5	13	Interim condition onsite basin
ISB7	6	14	Interim condition onsite basin
ISB8	7	19	Interim condition onsite basin
CP1	< 1	4	Onsite only - 456 Offsite Breakout flow
CP2	< 1	6	Onsite only - 456 Offsite Breakout flow
CP3	5	19	Onsite only - 456 Offsite Breakout flow
CP6	11	31	Onsite only - 456 Offsite Breakout flow
CP7	18	50	Onsite only – 964 Breakout flow
COMMERCIAL AREA - FUTURE CONDITIONS			
RD1	0	1.0	Paved driveway entrance draining to Tropicana Avenue
FSB6	5.0	4	Flows follows natural drainage toward NE direction, see CP4
FSB8	6.0	13.0	Flows toward Paradise Road, CP4
CP4	11.0	23.0	Calculated combined flows from SB6 & SB8
FSB9	5.0	10.0	Flows calculated at CP5
CP5	15.0	33.0	Combined flow from SB9 & CP4
FSB10	4.0	9.0	Flows toward Paradise Road, CP6
CP6	19.0	42.0	Calculated flows from SB10, CP3, CP5
FSB7	3.0	7.0	Surface flows from paved parking area to SB11
FSB11	4.0	9.0	Combined surface flows from SB7 to CP7
CP7	26.0	57.0	Total flows from SB11, CP6

As shown in Table 1, onsite surface flows discharging to Paradise Road from the south portion of the lot are significantly lowered by the landscaped golf course. The commercial development, northerly portion of the lot, will follow the existing drainage patterns and discharge to Paradise Road.

(Detailed analysis of the channel is provided in Appendix 'C').

3.0 HYDRAULICS

Manning's Equation was utilized to determine street flow conditions. The U.S. Army corps of Engineers HEC-RAS computer program was utilized to analyze the TRMC 0030 channel adjacent to the site. Lateral weir flow was modeled within the HEC-RAS run to determine breakout flows. Haestad Methods Culvert Master was utilized to determine offsite and onsite culvert capacities. Methods outlined within the MANUAL were utilized for freeboard and drop inlet calculations. Calculations are provided in Appendix 'C' of this study.

3.1 RESULTS

The results of the street flow calculations are summarized in TABLE 2. Street flow calculations are included in Appendix C.

TABLE 2
STREET FLOW

Location	Q cfs	Depth (ft)	Velocity (f/s)	D x V
E2 - CP3 Paradise / 100-yr	456	1.57	5.28	8.29 > 8
CP3 Paradise /10-yr	<1	<1	<1	<1
CP6 Paradise /10-yr	19.0	0.52	4.21	2.18 < 6
E3 - CP7 Paradise /100-yr	964	1.48	8.79	13.0 > 8
CP7 Paradise /10-yr	26.0	0.56	4.79	2.68<6
E1 – Tropicana / 100-yr	433	1.43	7.59	10.85 > 8

As indicated above, street flow criteria is not met for 100-year flow conditions for Paradise or Tropicana. However, both streets are fully developed, and this is an existing condition.

10-year street flow calculations were not performed for Tropicana Avenue. Tropicana is a fully developed street, and the proposed improvements have no impact on it.

Channel flow calculations indicate that a trapezoidal channel with a 15' bottom width, 4:1 side slopes and a 50' top width will provide adequate capacity (with 1.5' of freeboard) to convey the offsite flows through the golf course.

4.0 RECOMMENDATIONS

The following recommendations are provided to facilitate safety for both public and private.

1. Grade site as shown on the enclosed plans to convey onsite and offsite runoff to Paradise Rd.
2. Construct low point in east driveway to convey breakout flow to SB1 onsite pond.
3. Construct trapezoidal channel to convey offsite runoff through site to Paradise road, following existing flow patterns.
4. Provide riprap as shown on the enclosed grading plans.
5. Construct onsite 18" storm drain to convey 10-yr flow from ISB6 and SB4 to Paradise Rd.
6. Set Maintenance Building Finished floor elevation as shown on the enclosed grading plan.
7. All flood control facilities should be constructed as shown on the enclosed grading plans.

5.0 CONCLUSIONS

This study examined the 10- and 100-year, 6-hour storm event flows. The preparation of this study was conducted in accordance with the *Clark County Regional Flood Control District – Hydrologic Criteria and Drainage Design Manual.*

The calculations presented with this study indicate that the proposed development should not result in increases in the 100-year peak discharges to Paradise Road or existing downstream developments.

In conclusion, the results of this study indicate that if construction is in accordance with the recommendations of this study, the proposed improvements should not adversely impact surrounding or downstream properties.

5.0 REFERENCES

1. U.S. Army Corps of Engineers "*HEC-1 Flood Hydrograph Package*", September 1981, Revised March 1987.

2. James M. Montgomery, Consulting Engineer Inc., "Clark County Regional Flood Control District – Flood Control Master Plan", October 1986.

3. U.S. Department of Commerce, NOAA, Atlas 2, "*Precipitation-Frequency Atlas of the Western United States, Volume III, Nevada*", 1973 (out of print).

4. U.S. Department of Agriculture, Soil Conservation Service, Technical Release 55, "*Urban Hydrology for Small Watersheds*", Washington, D.C., Second Edition, June 1986.

5. Clark County Regional Flood Control District, "*Hydrologic Criteria & Drainage Design Manual*", October 1990.

6. Clark County Regional Flood Control District, "*Master Plan Update of the Las Vegas Valley*", September 2002.

7. *Technical Drainage Study for Las Vegas Sports Center – Tropicana Avenue/ Paradise Road,* prepared by CVL Consultants, Inc., dated November 1995.

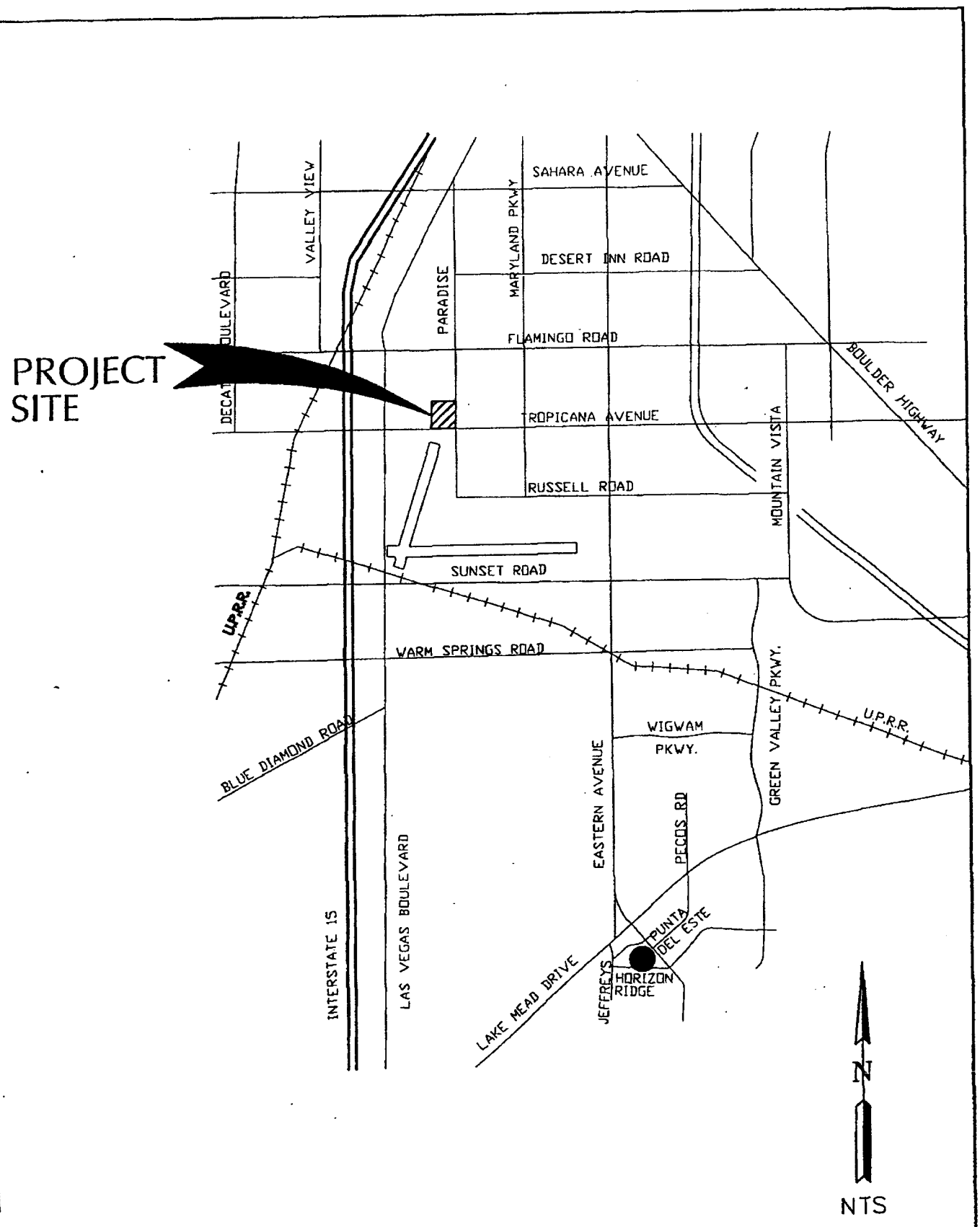
APPENDIX A

Figures:

1. Vicinity Map
2. F.I.R.M. Map
3. CCRFCD - Regional Facilities
4. CCRFCD - Hydrologic Sub Areas, Land Use & Soils
5. Existing On-Site Basin Map (from Ref. 1 Study)
6. Interim Condition Drainage Plan
7. Future Condition Drainage Plan
8. MPU 2002 - Off-Site Basins & TRMC Breakout Locations

8A. MPU 2002 - Off-Site Basins

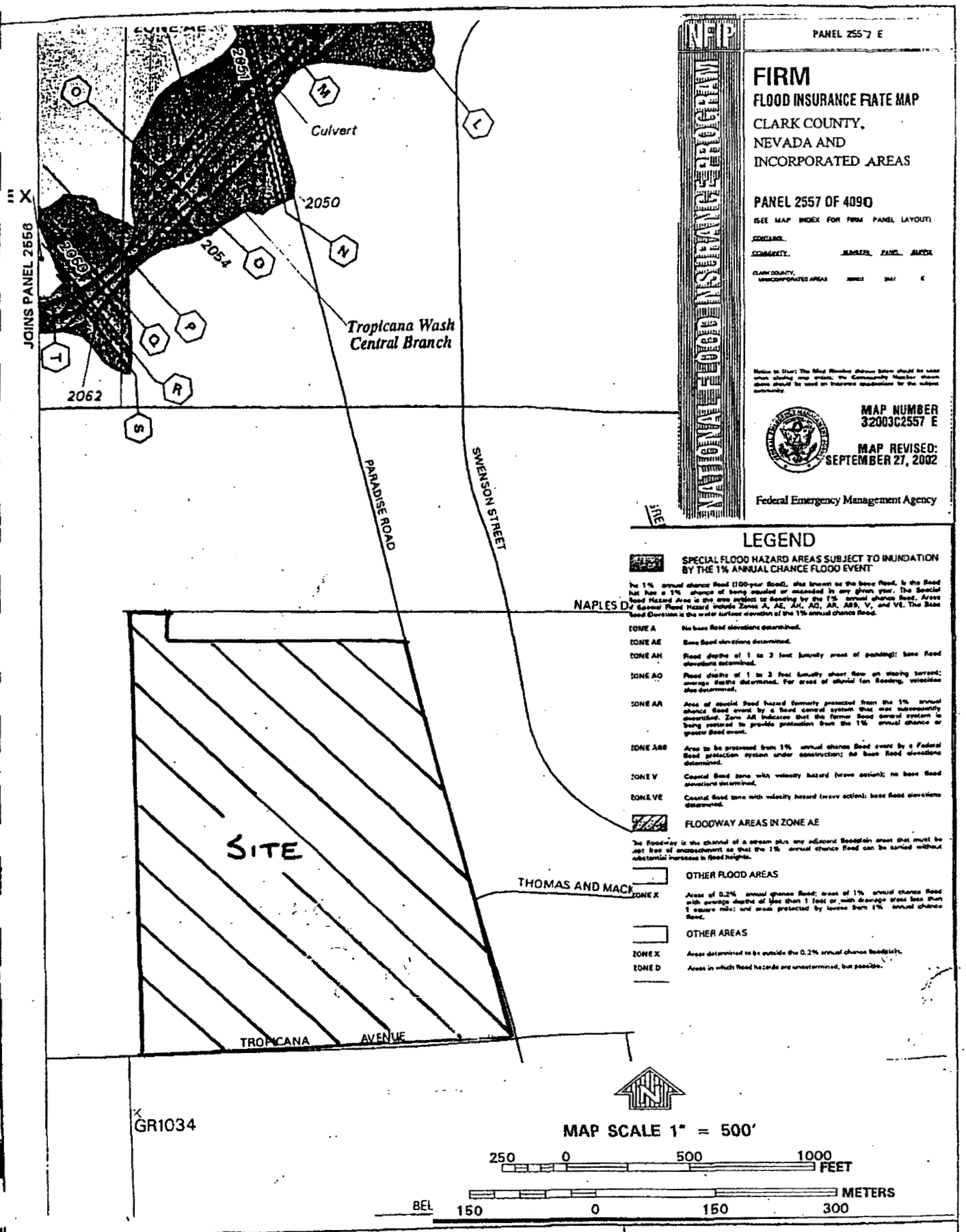
9. MPU 2002 - Off-Site Facilities & Breakout Locations
10. Split Flow @ Las Vegas Boulevard and Tropicana



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PREMIERE PARK	**VICINITY MAP** FIGURE 1	MARTIN & MARTIN CIVIL ENGINEERS 2101 S. JONES BLVD. SUITE 120 LAS VEGAS, NEVADA 89146 PHONE (702) 248-8000

FILE:



FEMA - FLOOD INSURANCE RATE MAP
FIGURE 2

MARTIN & MARTIN
CIVIL ENGINEERS
2171 E. JONES BLVD.
SUITE A
LAS VEGAS, NEVADA 89146
PHONE (702) 248-5000
FAX (702) 248-5070
E-MAIL MARTINMARTIN@COX.COM

ID / River Mile	Status	Facility Description	Length (ft.)	Flow (cfs)	HEC-1 Node	HEC-1 Model	Tributary Area (sq.mi.)	Channel Slope (%) *
SLOR		ORCHARD AREA CONVEYANCE / DETENTION						
0000	E	Conc Chnl 25'W 5.5'D 2:1 SS	1190	588	2C150R	RW3	1.82	0.88
TRMC		TROPICANA WASH - MCCARRAN AIRPORT						
0000	E	Conc Chnl 10'W 4.5'D 2:1 SS	450	930	CTW10S	FLAM3	4.52	0.30
0011	E	12' X 4' RCBC @ Harmon	80	930	CTW10S	FLAM3	4.52	0.50
0011	P0	2: 10' X 6' RCBC	80	930	CTW10S	FLAM3	4.52	0.50
0012	E	Earth Chnl 18'W 5'D 2:1 SS	925	930	CTW10S	FLAM3	4.52	0.45
0012	P1	Conc Chnl 18'W 5.5'D 0:1 SS	925	930	CTW10S	FLAM3	4.52	0.45
0030	E	Earth Chnl 18'W 5'D 2:1 SS	1575	2665	CMC11	FLAM3SC	4.03	0.45
0030	P1	Conc Chnl 40'W 6'D 0:1 SS	1575	2665	CMC11	FLAM3SC	4.03	0.45
0031	P1	18" RCP Outlet	70	28	TMD8	FLAM3SC	4.03	
0032	P1	26,650 cfs PMF Spillway		26650	CMC11	FLAM3SC	4.03	
0033	P1	186 ac-ft Offline Tropicana Wash - McCarran Airport Detention Basin		2665	CMC11	FLAM3SC	4.03	
0060	E	5: 10' X 4' RCBC	120	2665	CMC11	FLAM3SC	4.03	0.70
0062	P0	Add 1: 14' X 8' RCB	7100	1968	CMC9	FLAM3SC	2.84	0.30
0063	E	2: 8' X 6' RCB	7100	1968	CMC9	FLAM3SC	2.84	0.30

REGIONAL FLOOD CONTROL DISTRICT

2002 LAS VEGAS VALLEY FLOOD CONTROL MASTER PLAN UPDATE

LEGEND

- Ultimate Development Boundary
- Existing Facilities
- Category A Proposed Facilities
- Category B Proposed Facilities
- Local Existing Facilities
- Local Proposed Facilities
- Detention Basin
- Culvert
- Bridge
- Pipeline
- Lined Channel
- Untined Channel
- XXXX Dike
- Natural Wash
- ID-Mile Separator

N W E S

0 1,000 2,000 3,000 4,000 5,000 Feet

SCALE: 1 inch = 3000 feet

US95 I-15 I-215

FLOOD CONTROL FACILITIES

FIGURE 3

PBS&J

C.C. MINAGE, INC.

ID / River Mile	Status	Facility Description	Length (ft.)	Flow (cfs)	HEC-1 Node	HEC-1 Model	Tributary Area (sq.mi.)	Channel Slope (%)
SLOR		ORCHARD AREA CONVEYANCE / DETENTION						
0000	E	Conc Chnl 25'W 5.5'D 2:1 SS	1180	588	2C1SOR	RW3	1.82	0.86
TRMC		TROPICANA WASH - MCCARRAN AIRPORT						
0000	E	Conc Chnl 10'W 4.5'D 2:1 SS	450	930	CTW10S	FLAM3	4.52	0.30
0011	E	12' X 4' RCBC @ Harmon	80	930	CTW10S	FLAM3	4.52	0.50
0011	P0	2: 10' X 6' RCBC	80	930	CTW10S	FLAM3	4.52	0.50
0012	E	Earth Chnl 18'W 5'D 2:1 SS	925	930	CTW10S	FLAM3	4.52	0.45
0012	P1	Conc Chnl 18'W 5.5'D 0:1 SS	925	930	CTW10S	FLAM3	4.52	0.45
0030	E	Earth Chnl 18'W 5'D 2:1 SS	1575	2665	CMC11	FLAM3SC	4.03	0.45
0030	P1	Conc Chnl 40'W 6'D 0:1 SS	1575	2665	CMC11	FLAM3SC	4.03	0.45
0031	P1	18" RCP Outlet	70	28	TMD6	FLAM3SC	4.03	
0032	P1	26,650 cfs PMF Spillway		26650	CMC11	FLAM3SC	4.03	
0033	P1	186 ac-ft Offline Tropicana Wash - McCarran Airport Detention Basin		2665	CMC11	FLAM3SC	4.03	
0060	E	5: 10' X 4' RCBC	120	2665	CMC11	FLAM3SC	4.03	0.70
0062	P0	Add 1: 14' X 9' RCB	7100	1968	CMC9	FLAM3SC	2.94	0.30
0063	E	2: 8' X 6' RCB	7100	1968	CMC9	FLAM3SC	2.94	0.30

REGIONAL FLOOD CONTROL DISTRICT

2002 LAS VEGAS VALLEY FLOOD CONTROL MASTER PLAN UPDATE

LEGEND

- Ultimate Development Boundary
- Existing Facilities
- Category A Proposed Facilities
- Category B Proposed Facilities
- Local Existing Facilities
- Local Proposed Facilities
- Detention Basin
- Culvert
- Bridge
- Pipeline
- Lined Channel
- Unlined Channel
- Dike
- Natural Wash
- ID-Mile Separator

N W E S

0 1,000 2,000 3,000 4,000 5,000 Feet

SCALE: 1 inch = 3000 feet

US95 I-15 I-215

1	2		
3	4	5	6
7	8	9	10
11	12	13	14
15	16	17	18
19	20	21	22
23	24	25	26
27	28	29	

FLOOD CONTROL FACILITIES

FIGURE 3

PBS&J

C.C. MILLAGE, INC.

REGIONAL FLOOD CONTROL DISTRICT

2002 LAS VEGAS VALLEY FLOOD CONTROL MASTER PLAN UPDATE

LEGEND

- Ultimate Development Boundary
- Watershed Boundary
- 10 Subarea Boundary
- Flow Arrows

Flood Control Facilities

- Existing Facilities
- Proposed Facilities

Type Hydrologic Soil Groups

- A Low Runoff Potential
- B Moderately Low Runoff Potential
- C Moderately High Runoff Potential
- C High Runoff Potential

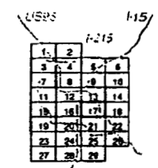
Typical Land Use

- 1 Undeveloped Land, Open Desert
- 2 Parks, Golf Courses
- 3 Rural
- 4 Low Density Residential
- 5 Medium Density Residential
- 6 High Density Residential
- 7 Public Facility, Multi Family
- 8 Commercial, Office, Retail, Casino
- 9 Light Industrial
- 10 Heavy Industrial
- 11 Schools
- 12 Lakes

N W E S

0 1,000 2,000 3,000 4,000 5,000
Feet

SCALE: 1 inch = 3000 feet



HYDROLOGIC SUBAREAS, LAND USE & SOILS

FIGURE 4

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C.C. MYERS, INC.

REGIONAL FLOOD CONTROL DISTRICT

2002 LAS VEGAS VALLEY FLOOD CONTROL MASTER PLAN UPDATE

LEGEND

- Ultimate Development Boundary
- Watershed Boundary
- Subarea Boundary
- Flow Arrows

Flood Control Facilities

- Existing Facilities
- Proposed Facilities

Hydrologic Soil Groups

- A Low Runoff Potential
- B Moderately Low Runoff Potential
- C Moderately High Runoff Potential
- D High Runoff Potential

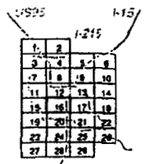
Typical Land Use

1. Undeveloped Land, Open Desert
2. Parks, Golf Courses
3. Rural
4. Low Density Residential
5. Medium Density Residential
6. High Density Residential
7. Public Facility, Multi Family
8. Commercial, Office, Retail, Casino
9. Light Industrial
10. Heavy Industrial
11. Schools
12. Lakes

N W E S

0 1,000 2,000 3,000 4,000 5,000 Feet

SCALE: 1 inch = 3000 feet



HYDROLOGIC SUBAREAS, LAND USE & SOILS

FIGURE H-16

PBS&J

G.C. WALLACE, INC.

FIGURE 8

REGIONAL FLOOD CONTROL DISTRICT

2002 LAS VEGAS VALLEY FLOOD CONTROL MASTER PLAN UPDATE

LEGEND

- Ultimate Development Boundary
- Watershed Boundary
- Subarea Boundary
- Flow Arrows

Flood Control Facilities

- Existing Facilities
- Proposed Facilities

Hydrologic Soil Groups

- A Low Runoff Potential
- B Moderately Low Runoff Potential
- C Moderately High Runoff Potential
- D High Runoff Potential

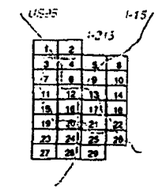
Typical Land Use

1. Undeveloped Land, Open Desert
2. Parks, Golf Courses
3. Rural
4. Low Density Residential
5. Medium Density Residential
6. High Density Residential
7. Public Facility, Muti Family
8. Commercial, Office, Retail, Casino
9. Light Industrial
10. Heavy Industrial
11. Schools
12. Lakes

N W E S

0 1,000 2,000 3,000 4,000 5,000 Feet

SCALE: 1 inch = 3000 feet



HYDROLOGIC SUBAREAS, LAND USE & SOILS

FIGURE H-20

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C.C. WALLACE, INC.

FIGURE 8A

REGIONAL FLOOD CONTROL DISTRICT

2002 LAS VEGAS VALLEY FLOOD CONTROL MASTER PLAN UPDATE

LEGEND

- Ultimate Development Boundary
- Existing Facilities
- Category A Proposed Facilities
- Category B Proposed Facilities
- Local Existing Facilities
- Local Proposed Facilities
- Detention Basin
- Culvert
- Bridge
- Pipeline
- Lined Channel
- Unlined Channel
- XXXX Dike
- Natural Wash
- ID-Mile Separator

N W E S

0 1,000 2,000 3,000 4,000 5,000
Feet

SCALE: 1 inch = 3000 feet



FLOOD CONTROL FACILITIES
FIGURE F-16

PBS&J

C.C. WILLIAMS, P.E.

FIGURE 9

TRMC		TROPICANA WASH - MCCARRAN AIRPORT						
0062	P0	Add 1: 14' X 9' RCB	7100	1968	CMC9	FLAM3SC	2.94	0.30
0063	E	2: 8' X 6' RCB	7100	1968	CMC9	FLAM3SC	2.94	0.30
0195	E	Conc Chnl 12'W STD 1.5:1 SS	1350	1968	CMC9	FLAM3SC	2.94	0.60
0135	P0	Conc Chnl 12'W 7.5'D 1.5:1 SS	1350	1968	CMC9	FLAM3SC	2.94	0.60
0215	E	Single Span Bridge 40'W 7'D @ Four Seasons	40	1968	CMC9	FLAM3SC	2.94	0.30
0216	E	Conc Chnl 12'W STD 1.5:1 SS	630	1968	CMC9	FLAM3SC	2.94	1.42
0233	E	2: 8' X 6' RCB @ Decatur	40	1968	CMC9	FLAM3SC	2.94	1.69
0234	P0	Add 2: 9' X 6' RCBS @ Valley	40	1968	CMC9	FLAM3SC	2.94	1.69
0235	E	Conc Chnl 12'W STD 1.5:1 SS	1120	1968	CMC9	FLAM3SC	2.94	0.85
0240	E	10' X 6' RCB	1500	1968	CMC9	FLAM3SC	2.42	1.26
0250	E	Rip Rap Chnl 30'W 20:1 SS	2400	1968	RIP	FLAM3SC	0.51	0.79

* TRMC 0263, CAPACITY = 1166 CFS, BREAKOUT = 454 CFS
* TRMC 0233, CAPACITY = 1393 CFS, BREAKOUT = 121 CFS

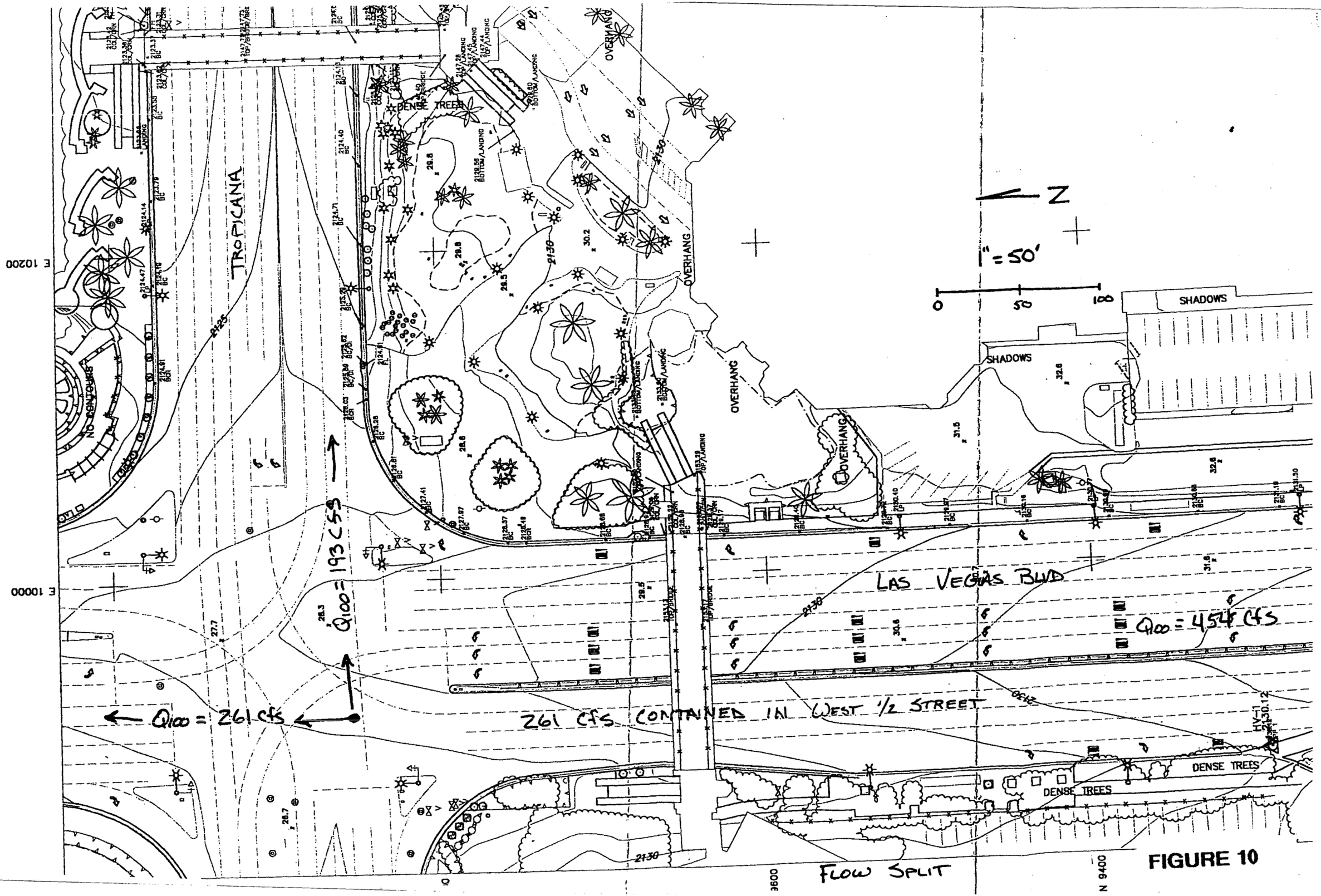

TROPICANA
DENSE TREES
OVERHANG
OVERHANG
OVERHANG
SHADOWS
SHADOWS
N
1" = 50'
0
50
100
LAS VEGAS BLVD
Q100 = 193 cfs
Q100 = 261 cfs
261 cfs CONTAINED IN WEST 1/2 STREET
Q100 = 454 cfs
DENSE TREES
DENSE TREES
FLOW SPLIT
E 10200
E 10000
N 9600
N 9400

FIGURE 10

APPENDIX B

(HYDROLOGY)

Figures:

- Six-Hour Depth Area Reduction Factors
- Six-Hour Storm Distribution
- Depth - Duration - Frequency Values
- McCarran Airport Rainfall Area
- Runoff Curve Numbers - Urban Areas
- Travel Time Velocity
- Standard Form 4
- HEC -1 Input / Output File - CCRFCD (Off-Site)
- HEC - 1 Input / Output File - Interim Conditions (On-Site)
- HEC - 1 Input / Output File / Future Conditions (On-Site)

SIX HOUR DEPTH-AREA REDUCTION FACTORS

Drainage Area (Square Miles)	Six-Hour Depth-Area Reduction Factor
0.0	1.00
0.5	0.98
1.0	0.97
2.0	0.93
4.0	0.91
6.0	0.90
8.0	0.88
10.0	0.86
20.0	0.79
30.0	0.74
50.0	0.68
100.0	0.60
150.0	0.55
200.0	0.51
300.0	0.46
400.0	0.42
500.0	0.39

NOTES: 1. A graphical representation of these factors is presented in Figure 514.

2. Consult with the local entity and/or the CCRFCD for guidance in using the Depth-Area Reduction Factors for drainage areas greater than 200 square miles.

Revision	Date

SIX-HOUR STORM DISTRIBUTIONS

Storm Time (In Minutes)	Percent of Total Storm Depth SDN3	SDN4	SDN5	Storm Time (In Minutes)	Percent of Total Storm Depth SDN3	SDN4	SDN5
0	0.0	0.0	0.0	185	32.2	37.6	43.0
5	2.0	2.0	2.0	190	35.2	41.5	47.7
10	5.7	5.8	5.9	195	40.9	46.2	51.4
15	7.0	7.5	8.0	200	49.9	53.0	56.1
20	8.7	9.9	11.0	205	59.0	61.0	63.0
25	10.8	12.6	14.4	210	71.0	71.0	71.0
30	12.4	13.7	15.0	215	74.4	73.2	72.0
35	13.0	14.5	16.0	220	78.1	75.6	73.1
40	13.0	14.9	16.8	225	81.2	78.2	75.2
45	13.0	15.1	17.1	230	81.9	79.9	77.9
50	13.0	15.5	18.0	235	83.5	81.3	79.0
55	13.0	15.6	18.2	240	85.1	82.3	79.5
60	13.0	15.9	18.7	245	85.6	83.0	80.4
65	13.3	16.2	19.0	250	86.0	83.5	81.0
70	14.0	16.9	19.7	255	86.8	84.4	82.0
75	14.2	17.2	20.2	260	87.6	85.1	82.6
80	14.8	17.9	21.0	265	88.8	86.4	84.0
85	15.8	18.9	22.0	270	91.0	88.5	85.9
90	17.2	20.1	23.0	275	92.6	90.8	88.9
95	18.1	21.1	24.1	280	93.7	92.4	91.0
100	19.0	22.0	25.0	285	95.0	94.4	93.8
105	19.7	22.8	25.9	290	97.0	96.8	96.6
110	19.9	23.2	26.5	295	97.6	97.3	97.0
115	20.0	24.0	28.0	300	98.2	97.8	97.4
120	20.1	24.6	29.0	305	98.5	98.2	97.9
125	20.4	25.2	30.0	310	98.7	98.4	98.1
130	21.4	26.0	30.5	315	98.9	98.6	98.3
135	22.9	26.9	30.9	320	99.0	98.8	98.5
140	24.1	27.6	31.0	325	99.3	99.1	98.9
145	24.9	28.3	31.7	330	99.3	99.2	99.0
150	25.1	28.6	32.1	335	99.4	99.3	99.2
155	25.6	29.2	32.7	340	99.5	99.4	99.3
160	27.0	30.2	33.3	345	99.8	99.7	99.6
165	27.8	31.2	34.6	350	99.8	99.8	99.7
170	28.1	32.1	36.1	355	99.9	99.9	99.9
175	28.3	33.2	38.1	360	100.0	100.0	100.0
180	29.5	35.2	40.8				

Notes:
1. For drainage areas less than 8 square miles in size, use SDN 3.
2. For drainage areas greater than or equal to 8 square miles and less than 12 square miles in size, use SDN 4.
3. For drainage areas greater than or equal to 12 square miles, use SDN 5.
4. A graphical representation of these values is presented on **Figure 515.**

Revision	Date

REFERENCE:

TABLE 503

DEPTH-DURATION-FREQUENCY VALUES FOR McCARRAN AIRPORT RAINFALL AREA

(IN INCHES)

	RECURRENCE INTERVAL					
TIME	2-YR	5-YR	10-YR	25-YR	50-YR	100-YR
5 min.	0.15	0.27	0.35	0.46	0.54	0.63
10 min.	0.25	0.44	0.57	0.74	0.89	1.02
15 min.	0.33	0.57	0.74	0.97	1.15	1.32
30 min.	0.44	0.78	1.01	1.31	1.55	1.79
1 hour	0.52	0.89	1.15	1.50	1.78	2.06
2 hour	0.59	1.01	1.30	1.70	2.01	2.30
3 hour	0.64	1.08	1.39	1.82	2.15	2.48
6 hour	0.72	1.22	1.58	2.05	2.41	2.77
24 hour (TR-55)	1.20	1.60	1.80	2.40	2.70	2.96

NOTE: 1. Refer to Figure 513 for a description and drawing of the area included in the McCarran Airport Rainfall Area.

2. The 24 hour values presented above are for use with TR-55 only.

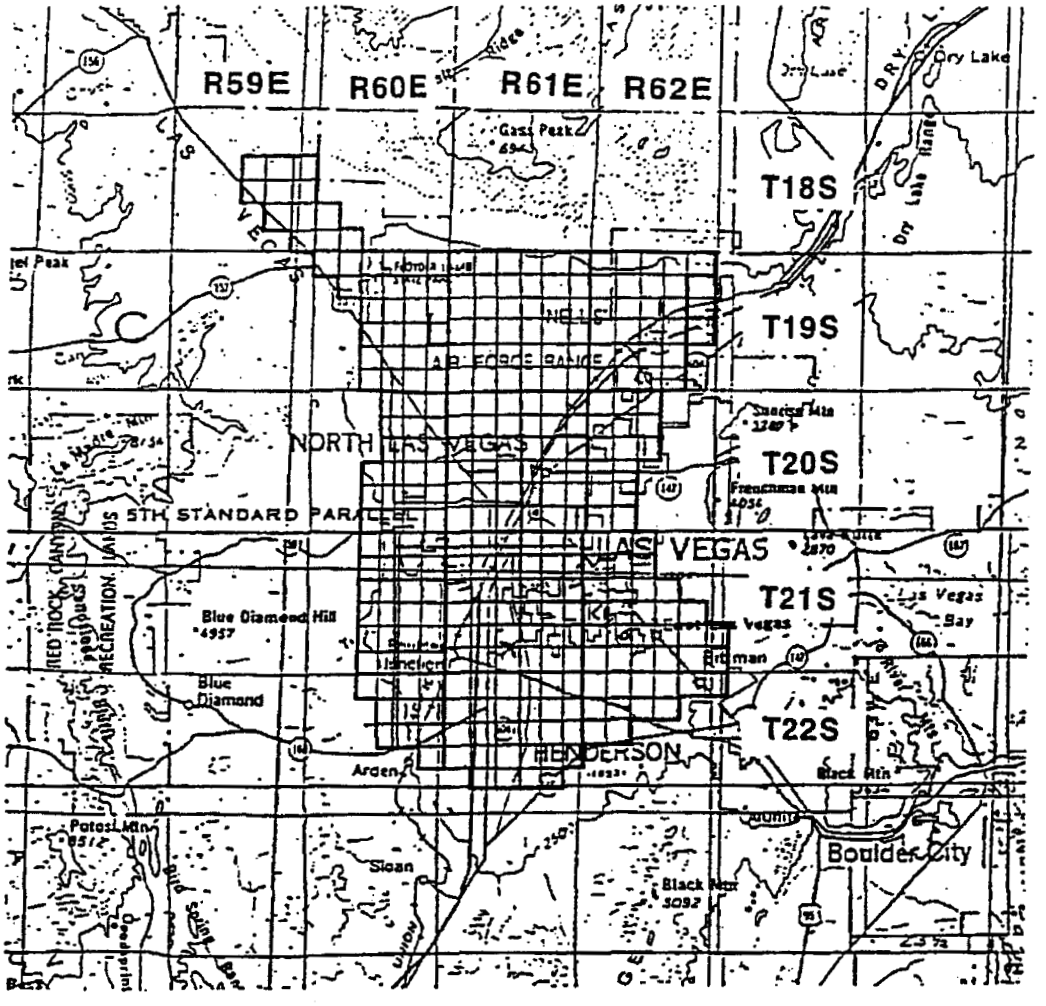
3. Table 501 adjustments not required.

Revision	Date

HEC 1

WRC ENGINEERING	REFERENCE: USACE, Los Angeles District, 1988	TABLE 505

McCARRAN AIRPORT RAINFALL AREA



TOWNSHIP	RANGE	SECTIONS	TOWNSHIP	RANGE	SECTIONS
18 South	59 East	13-15,22-26,36	20 South	62 East	4-9,16-20,29-32
18 South	60 East	30-32	21 South	60 East	1-4,9-16,21-28,33-36
19 South	60 East	1-6,8-16,21-28,33-36	21 South	61 East	ALL SECTIONS
19 South	61 East	ALL SECTIONS	21 South	62 East	4-9,15-23, 25-36
19 South	62 East	2-11,14-23,27-34	22 South	60 East	1-4,10-15,24
20 South	60 East	1-3,10-15,21-28,33-36	22 South	61 East	1-24,26-29
20 South	61 East	ALL SECTIONS	22 South	62 East	1-10,17-18

Notes:
1. Refer to Table 505 and Figure 516 Depth-Duration- Frequency values in the McCarran Airport Rainfall Area.
2. Refer to Table 506 and Figure 517 for Time-Intensity-Frequency values on the McCarran Airport Rainfall Area.

Revision	Date

WRC ENGINEERING

REFERENCE:
USACE, Los Angeles District, 1988

FIGURE 513

RUNOFF CURVE NUMBERS
(URBAN AREAS[1])

Cover description		Curve numbers for hydrologic soil group—			
Cover type and hydrologic condition	Average percent impervious area[2]	A	B	C	D
Fully developed urban areas (vegetation established)					
Open space (lawns, parks, golf courses, cemeteries, etc.)[3]:					
Poor condition (grass cover < 50%)		68	79	86	89
Fair condition (grass cover 50% to 75%)		49	69	79	84
Good condition (grass cover > 75%)		39	61	74	80
Impervious areas:					
Paved parking lots, roofs, driveways, etc. (excluding right-of-way)		98	98	98	98
Streets and roads:					
Paved; curbs and storm sewers (excluding right-of-way)		98	98	98	98
Paved; open ditches (including right-of-way)		83	89	92	93
Gravel (including right-of-way)		76	85	89	91
Dirt (including right-of-way)		72	82	87	89
Western desert urban areas:					
Natural desert landscaping (pervious areas only)[4]		63	77	85	88
Artificial desert landscaping (impervious weed barrier, desert shrub with 1- to 2-inch sand or gravel mulch and basin borders)		96	96	96	96
Urban districts:					
Commercial and business	85	89	92	94	95
Industrial	72	81	88	91	93
Residential districts by average lot size:					
See Table 602A					
Developing urban areas					
Newly graded areas (pervious areas only, no vegetation)[5]		77	86	91	94

1 Average runoff condition, and $I_a = 0.2S$.

2 The average percent impervious area shown was used to develop the composite CN's. Other assumptions are as follows: impervious areas are directly connected to the drainage system. Impervious areas have a CN of 98, and pervious areas are considered equivalent to open space in good hydrologic condition. CN's for other combinations of conditions may be computed using Figure 603.

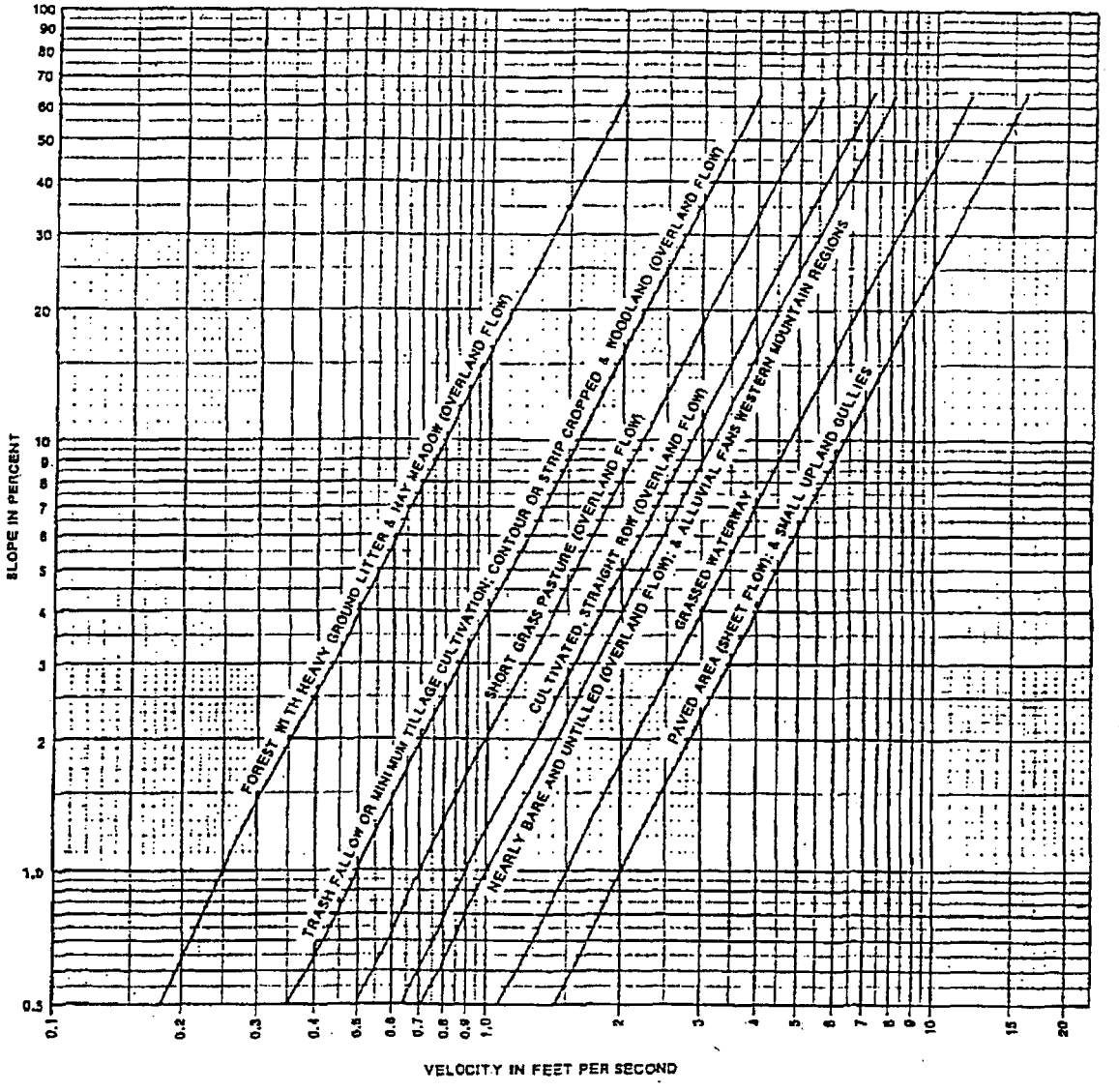
3 CN's shown are equivalent to those of pasture. Composite CN's may be computed for other combinations of open space cover type.

4 Composite CN's for natural desert landscaping should be computed using Figure 603 based on the impervious area percentage (CN #98) and the pervious area CN. The pervious area CN's are assumed equivalent to desert shrub in poor hydrologic condition.

5 Composite CN's to use for the design of temporary measures during grading and construction should be computed using Figure 603 based on the degree of development impervious area percentage) and the CN's for the newly graded pervious areas.

Revision	Date

TRAVEL TIME VELOCITY



Revision	Date

WRC ENGINEERING

REFERENCE: SCS National Engineering Handbook Section 4, Hydrology, March, 1985

FIGURE 602

CCRFCD MPU 2002
OFFSITE HYDROLOGY

```
1*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*             JUN  1998                 *
*           VERSION 4.1                 *
*                                       *
* RUN DATE   31JUL02  TIME  08:07:38    *
*                                       *
*****************************************
```

```
*****************************************
*                                       *
*    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
*** FREE ***
               1    ID    CLARK COUNTY REGIONAL FLOOD CONTROL DISTRICT 2002 MASTER PLAN UPDATE
               2    ID    TROPICANA/FLAMINGO WASH WATERSHED
               3    ID    RECOMMENDED DRAINAGE SYSTEM WITH ULTIMATE DEVELOPMENT
               4    ID    INPUT FILE = FLAM3.DAT
               5    ID    INPUT FILE DATE = 07/12/02
               6    ID    DESIGN STORM = 100-YEAR 6-HOUR STORM
               7    ID    STORM DISTRIBUTION = SDN3
               8    ID    MODELED BY = GCW - RJ/AT
               9    ID    STORM CENTERING = 300+ SQUARE MILES - TROPICANA/FLAMINGO WATERSHED
              10    ID    UPSTREAM OF THE LAS VEGAS WASH
              11    ID
              12    ID    JR CARDS CONTAIN DARFS BASED ON THE FOLLOWING VALUES:
              13    ID
              14    ID    AREA (SQUARE MILES)    DARF
              15    ID
              16    ID   0-0.5   0.99
              17    ID   0.5-1.0   0.975
              18    ID   1.0-2.0   0.95
              19    ID   2.0-3.0   0.925
              20    ID   3.0-4.0   0.915
              21    ID   4.0-5.0   0.908
              22    ID   5.0-6.0   0.903
              23    ID   6.0-7.0   0.895
              24    ID   7.0-8.0   0.885
              25    ID
              26    IT      5       0       0     300
              27    IO      5       0       0
              28    IN      5       0       0
              29    JR    PREC    0.99   0.975    0.95   0.925   0.915   0.908   0.903   0.895   0.885
                    *
              30    KK     RR1
              31    BA   4.225
              32    PB    4.16
              33    PC       0    0.02   0.057    0.07   0.087   0.108   0.124    0.13    0.13    0.13
              34    PC    0.13    0.13    0.13   0.133    0.14   0.142   0.148   0.158   0.172   0.181
              35    PC    0.19   0.197   0.199     0.2   0.201   0.204   0.214   0.229   0.241   0.249
              36    PC   0.251   0.256    0.27   0.278   0.281   0.283   0.295   0.322   0.352   0.409
              37    PC   0.499    0.59    0.71   0.744   0.781   0.812   0.819   0.835   0.851   0.856
              38    PC    0.86   0.868   0.876   0.888    0.91   0.926   0.937    0.95    0.97   0.976
              39    PC   0.982   0.985   0.987   0.989    0.99   0.993   0.993   0.994   0.995   0.998
              40    PC   0.998   0.999       1
              41    LU       0     0.5     0.0
```

```
 2213          KK     TW8
 2214          BA   0.280
 2215          PB    2.77
 2216          LS       0    93.8
 2217          UD   0.257
               *

 2218          KK   CTW8W
 2219          KM   COMBINE CTW7 AND TW8
 2220          HC       2
               *
```



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

 2221          KK    CTW8
 2222          KM   COMBINE CTW3 AND CTW8W
 2223          HC       2
               *

 2224          KK   RCTW8
 2225          KM   ROUTE CTW8 TO CTW9 IN TROPICANA WASH
 2226          KM   FACILITY = TROPICANA WASH
 2227          KM   FACILITY # = TRWA 0234
 2228          KM   LINING = RCB
 2229          RD    1600   0.012   0.015       0    TRAP      32       0
               *

 2230          KK     TW9
 2231          BA   0.235
 2232          PB    2.77
 2233          LS       0    93.7
 2234          UD   0.264
               *

 2235          KK    CTW9
 2236          KM   COMBINE TW8 AND TW9
 2237          HC       2
               *

 2238          KK   RCTW9
 2239          KM   ROUTE CTW9 TO CTW10 IN TROPICANA WASH
 2240          KM   FACILITY = TROPICANA WASH
 2241          KM   FACILITY # = TRWA 0218, 0192, 0150, 0121, 0115, 0107, 0097, 0092
 2242          KM   LINING = RCB/GABION/GRASS
 2243          RD    7850   0.009   0.015       0    TRAP.     25       0
               *

 2244          KK     MC2
 2245          BA   0.282
 2246          PB    2.77
 2247          LS       0    89.0
 2248          UD   0.395
               *

 2249          KK    RMC2
 2250          KM   ROUTE MC2 THROUGH MC4 TO CMC4
 2251          KM   FACILITY = WAGON TRAIL CHANNEL
 2252          KM   LINING = NATURAL WASH
 2253          RD    2450   0.015    0.04       0    TRAP      50       4
               *

 2254          KK     MC4
 2255          BA   0.280
 2256          PB    2.77
 2257          LS       0    71.7
 2258          UD   0.448
               *
```

TRMC BASINS


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

 2259          KK    CMC4
 2260          KM   COMBINE MC2 AND MC4
 2261          HC       2
               *

 2262          KK   RCMC4
 2263          KM   ROUTE CMC4 THROUGH MC5 TO CMC5
 2264          KM   FACILITY = WAGON TRAIL CHANNEL
 2265          KM   LINING = CONCRETE
 2266          RD    1750   0.011   0.015       0    TRAP      12       2
               *

 2267          KK     MC5
 2268          BA   0.181
 2269          PB    2.77
 2270          LS       0    72.2
 2271          UD   0.305
               *

 2272          KK    CMC5
```

```
2273          KM   COMBINE CMC4 AND MC5
2274          HC      2
              *

2275          KK   RCMC5
2276          KM   ROUTE CMC5 THROUGH MC6B TO CMC6B
2277          KM   FACILITY = WAGON TRAIL CHANNEL
2278          KM   FACILITY # = WGTR 0158, 0146
2279          KM   LINING = CONCRETE
2280          RD    2150   0.011   0.015       0    TRAP      12       2
              *

2281          KK    MC3
2282          BA   0.191
2283          PB    2.77
2284          LS       0    89.1
2285          UD   0.313
              *

2286          KK    RMC3
2287          KM   ROUTE MC3 THROUGH MC6B TO CMC6B
2288          KM   FACILITY = LOCAL CONCRETE CHANNEL & WAGON TRAIL CHANNEL
2289          KM   FACILITY # = 0158, 0146
2290          KM   LINING = CONCRETE
2291          RD    3200   0.011   0.015       0    TRAP      12       2
              *

2292          KK    MC6B
2293          BA   0.185
2294          PB    2.77
2295          LS       0    93.1
2296          UD   0.231
              *
```

1 HEC-1 INPUT PAGE 63

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

2297          KK   CMC6B
2298          KM   COMBINE CMC5, MC3, AND MC6B
2299          HC      3
              *

2300          KK  RCMC6B
2301          KM   ROUTE CMC6B THROUGH MC7A TO CMC7A
2302          KM   FACILITY = WAGON TRAIL CHANNEL
2303          KM   FACILITY # = WGTR 0128, 0111, 0098, 0089, 0080
2304          KM   LINING = RIPRAP/CONCRETE
2305          RD    3450    0.01    0.04       0    TRAP      20       2
              *

2306          KK    MC7A
2307          BA   0.185
2308          PB    2.77
2309          LS       0    92.8
2310          UD   0.299
              *

2311          KK  CMC7AS
2312          KM   COMBINE CMC6B AND MC7A
2313          HC      2
              *

2314          KK    MC6A
2315          BA   0.335
2316          PB    2.77
2317          LS       0    94.3
2318          UD   0.347
              *

2319          KK   CMC7A
2320          KM   COMBINE CMC7AS AND MC6A
2321          HC      2
              *

2322          KK  RCMC7A
2323          KM   ROUTE CMC7A THROUGH MC7B TO CMC7B
2324          KM   FACILITY = WAGON TRAIL CHANNEL
2325          KM   FACILITY # = 0065, 0051
2326          KM   LINING = RIPRAP/CONCRETE
2327          RD    1600   0.019   0.015       0    TRAP      12       2
              *

2328          KK    MC7B
2329          BA   0.274
2330          PB    2.77
2331          LS       0    90.0
2332          UD   0.301
              *
```

1 HEC-1 INPUT PAGE 64

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

2333          KK   CMC7B
```

```
2334          KM   COMBINE CMC7A AND MC7B
2335          HC      2
              *
2336          KK   RCMC7
2337          KM   ROUTE CMC7 THROUGH MC8 TO CMC8
2338          KM   FACILITY = CLARK COUNTY GOLF COURSE/TROPICANA WASH - MCCARRAN AIRPORT
2339          KM   FACILITY # = WGTR 0000, TRMC 0263
2340          KM   LINING = GRASS/RCB
2341          RD    3900    0.01    0.03       0    TRAP      20       4
              *
2342          KK     MC8
2343          BA   0.510
2344          PB    2.77
2345          LS       0    79.4
2346          UD    0.51
              *
2347          KK    CMC8
2348          KM   COMBINE CMC7 AND MC8
2349          HC      2
              *
2350          KK   RCMC8
2351          KM   ROUTE CMC8 THROUGH MC9 TO CMC9
2352          KM   FACILITY = TROPICANA WASH - MCCARRAN AIRPORT
2353          KM   FACILITY # = TRMC 0235, 0216, 0195, 0062
2354          KM   LINING = CONCRETE/RCB
2355          RD    8350   0.008   0.015       0    TRAP      30
              *
2356          KK     MC9
2357          BA   0.522
2358          PB    2.77
2359          LS       0    89.7
2360          UD    0.62
              *
2361          KK    CMC9
2362          KM   COMBINE CMC8 AND MC9
2363          HC      2
              *
2364          KK   RCMC9
2365          KM   ROUTE CMC9 THROUGH MC11 TO CMC11
2366          KM   FACILITY = TROPICANA WASH - MCCARRAN AIRPORT
2367          KM   FACILITY # = TRMC 0062
2368          KM   LINING = RCB
2369          RD    2450   0.011   0.015       0    TRAP      30       0
              *
```



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

2370          KK     MC10
2371          BA   0.517
2372          PB    2.77
2373          LS       0    91.7
2374          UD    0.58
              *
2375          KK   RMC10
2376          KM   ROUTE MC10 THROUGH MC11 TO CMC11
2377          KM   MCCARRAN AIRPORT ONSITE DRAINAGE
2378          KM   FUTURE CONCRETE CHANNEL
2379          RD     900   0.005   0.015       0    TRAP      12       2
              *
2380          KK     MC11
2381          BA   0.564
2382          PB    2.77
2383          LS       0    90.6
2384          UD   0.567
              *
2385          KK   CMC11
2386          KM   COMBINE CMC9, MC10, AND MC11
2387          HC      3
              *
2388          KK  RCMC11
2389          KM   ROUTE CMC11 TO TMDB
2390          KM   FACILITY = TROPICANA WASH - MCCARRAN AIRPORT
2391          KM   FACILITY # = TRMC 0030
2392          KM   LINING = CONCRETE
2393          RD    1580   0.005   0.015       0    TRAP      40       0
              *
2394          KK  DIV-DB
2395          KM   ALL OTHER FLOWS BYPASS TROPICANA - MCCARRAN DET BASIN
2396          UTPASSTMDB
2397          DI       0     500    3000
2398          DQ       0     480     480
```

← TRMC 0263 @ LAS VEGAS Blvd

← TRMC0233 @ DEWEY

← @ SITE

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                *
                * ------------------------------------------------------------
2399            KK    TMDB
2400            KM    TROPICANA - MCCARRAN DETENTION BASIN
2401            KM    PROPOSED TO MITIGATE FLOOD ISSUES IN TRMC
2402            KM    100YR COMPUTED PROBABILITY DETENTION DESIGN
2403            KM    FACILITY ID-MILE = TRMC 0033
2404            KM    STORAGE VOLUME = 166 ACRE-FEET
2405            KM    OUTLET = 18" RCP
2406            KM    100-YR DISCHARGE = 20 CFS
2407            KM    SPILLWAY LENGTH = UNKNOWN
2408            KM    SPILLWAY CREST ELEVATION = 2069 FT
2409            KM    PMF DISCHARGE = 26,700 CFS
2410            KM    TOP OF DAM ELEVATION = UNKNOWN
1                                          HEC-1 INPUT                                    PAGE 66

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

2411            KO       3
2412            RS       1    STOR      -1
2413            SA       0       1       4       8      16      24      30      34      34      34
2414            SQ       0       4      10      14      17      20      22      24      26      28
2415            SE    2060    2061    2062    2063    2064    2065    2066    2067    2068    2069
                * ------------------------------------------------------------
                *

2416            KKPASSTMDB
2417            KM    RETRIEVE FLOWS.BYPASSING TROPICANA - MCCARRAN DET BASIN BYPASS
2418            DRPASSTMDB
                *

2419            KK    CTMDB
2420            KM    COMBINE TRMC0033 AND PASSTMDB
2421            KM    COMBINE DETENTION OUTFALL WITH BYPASS
2422            HC       2
                *

2423            KK  RCTMDB
2424            KM    ROUTE CTMDB TO CTW10
2425            KM    FACILITY = TROPICANA WASH - MCCARRAN AIRPORT
2426            KM    FACILITY # = TRMC 0012, TRMC 0000
2427            KM    LINING = CONCRETE
2428            RD     1450   0.004   0.015       0    TRAP      18       0
                *

2429            KK    TW10
2430            BA   0.496
2431            PB    2.77
2432            LS       0    92.4
2433            UD   0.453
                *

2434            KK  CTW10S
2435            KM    COMBINE CTMDB AND TW10
2436            HC       2
                *

2437            KK    CTW10
2438            KM    COMBINE CTW9 AND CTW10S
2439            HC       2
                *

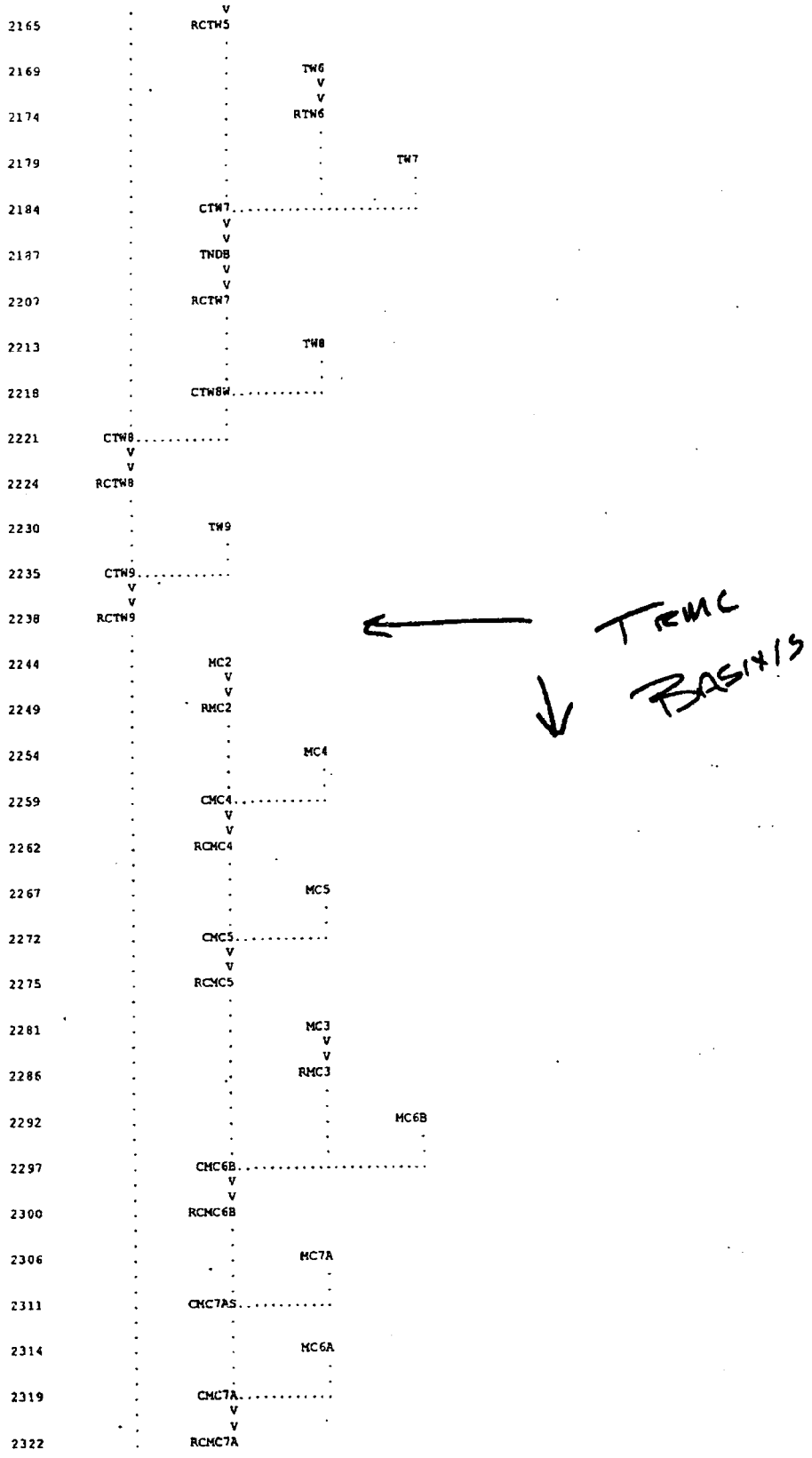
2440            KK  RCTW10
2441            KM    ROUTE CTW10 TO CTW11 IN TROPICANA WASH
2442            KM    FACILITY = TROPICANA WASH
2443            KM    FACILITY # = TRWA 0075, TRWA 0056
2444            KM    LINING = RCB
2445            RD     1840    0.01   0.015       0    TRAP      63       0
                *
1                                          HEC-1 INPUT                                    PAGE 67

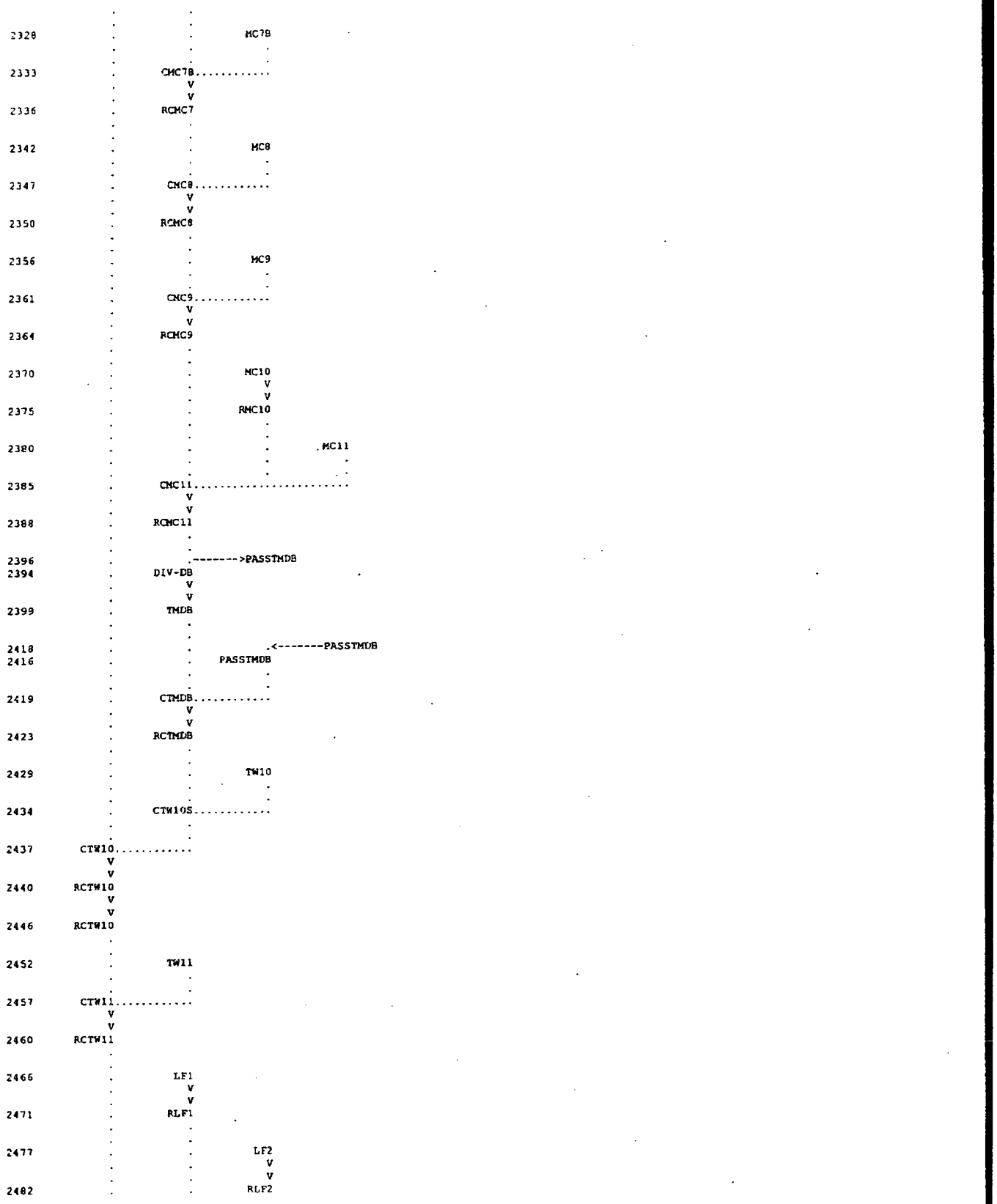
LINE            ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

2446            KK  RCTW10
2447            KM    ROUTE CTW10 TO CTW11 IN TROPICANA WASH
2448            KM    FACILITY = TROPICANA WASH
2449            KM    FACILITY # = TRWA 0040, TRWA 0033, TRWA 0018
2450            KM    LINING = CONCRETE/GABION
2451            RD     1920   0.012   0.015       0    TRAP      50       2
                *

2452            KK    TW11
2453            BA   0.425
2454            PB    2.77
2455            LS       0    90.4
2456            UD   0.442
                *

2457            KK    CTW11
2458            KM    COMBINE CTW10 AND TW11
2459            HC       2
                *
```


2165
RCTW5
2169
TW6
2174
RTW6
2179
TW7
2184
CTW7
2187
TNDB
2207
RCTW7
2213
TW8
2218
CTW8W
2221
CTW8
2224
RCTW8
2230
TW9
2235
CTW9
2238
RCTW9
2244
MC2
2249
RMC2
2254
MC4
2259
CMC4
2262
RCMC4
2267
MC5
2272
CMC5
2275
RCMC5
2281
MC3
2286
RMC3
2292
MC6B
2297
CMC6B
2300
RCMC6B
2306
MC7A
2311
CMC7AS
2314
MC6A
2319
CMC7A
2322
RCMC7A
TRMC
BASINS


2328
MC7B
2333
CMC7B
2336
RCMC7
2342
MC8
2347
CMC8
2350
RCMC8
2356
MC9
2361
CMC9
2364
RCMC9
2370
MC10
2375
RMC10
2380
MC11
2385
CMC11
2388
RCMC11
2396
2394
DIV-DB
2399
TMDB
2418
2416
PASSTMDB
2419
CTMDB
2423
RCTMDB
2429
TW10
2434
CTW10S
2437
CTW10
2440
RCTW10
2446
RCTW10
2452
TW11
2457
CTW11
2460
RCTW11
2466
LF1
2471
RLF1
2477
LF2
2482
RLF2

					** PEAK STAGES IN FEET **								
			1	STAGE	2218.05	2217.91	2217.68	2217.45	2217.36	2217.30	2217.25	2217.18	2217.09
				TIME	4.25	4.25	4.33	4.33	4.33	4.33	4.33	4.33	4.33
ROUTED TO													
+	RCTW7	1.50	1	FLOW	831.	814.	786.	757.	745.	738.	733.	722.	711.
				TIME	4.33	4.33	4.33	4.33	4.33	4.33	4.33	4.33	4.33
HYDROGRAPH AT													
+	TW8	.28	1	FLOW	379.	372.	361.	350.	345.	342.	340.	336.	332.
				TIME	3.67	3.67	3.67	3.67	3.67	3.67	3.67	3.67	3.67
2 COMBINED AT													
+	CTW8W	1.78	1	FLOW	918.	898.	867.	835.	822.	814.	808.	796.	784.
				TIME	4.25	4.25	4.25	4.25	4.25	4.25	4.25	4.25	4.25
2 COMBINED AT													
+	CTW8	177.84	1	FLOW	72412.	69854.	65646.	61392.	59428.	58054.	57348.	56040.	54272.
				TIME	5.50	5.50	5.58	5.58	5.58	5.58	5.67	5.67	5.67
ROUTED TO													
+	RCTW8	177.84	1	FLOW	72353.	69775.	65624.	61324.	59340.	58039.	57336.	56010.	54221.
				TIME	5.50	5.50	5.58	5.58	5.58	5.67	5.67	5.67	5.67
HYDROGRAPH AT													
+	TW9	.23	1	FLOW	314.	308.	299.	289.	285.	283.	281.	278.	274.
				TIME	3.67	3.67	3.67	3.67	3.67	3.67	3.67	3.67	3.67
2 COMBINED AT													
+	CTW9	178.08	1	FLOW	72370.	69791.	65636.	61337.	59352.	58048.	57345.	56019.	54231.
				TIME	5.50	5.50	5.58	5.58	5.58	5.67	5.67	5.67	5.67
ROUTED TO													
+	RCTW9	178.08	1	FLOW	72087.	69522.	65495.	61017.	59203.	58032.	57249.	55902.	53968.
				TIME	5.50	5.58	5.58	5.58	5.67	5.67	5.67	5.67	5.67
HYDROGRAPH AT													
+	MC2	.28	1	FLOW	261.	255.	246.	237.	233.	231.	229.	226.	222.
				TIME	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83
ROUTED TO													
+	RMC2	.28	1	FLOW	261.	256.	247.	237.	233.	231.	229.	226.	222.
				TIME	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92
HYDROGRAPH AT													
+	MC4	.28	1	FLOW	92.	88.	83.	77.	75.	74.	72.	71.	69.
				TIME	3.92	3.92	4.00	4.00	4.00	4.00	4.00	4.00	4.00
2 COMBINED AT													
+	CMC4	.56	1	FLOW	353.	344.	329.	314.	308.	304.	301.	296.	290.
				TIME	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92
ROUTED TO													
+	RCMC4	.56	1	FLOW	348.	340.	325.	310.	305.	301.	298.	293.	288.
				TIME	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
HYDROGRAPH AT													
+	MC5	.18	1	FLOW	75.	72.	68.	63.	62.	60.	59.	58.	56.
				TIME	3.75	3.75	3.75	3.83	3.83	3.83	3.83	3.83	3.83
2 COMBINED AT													
+	CMC5	.74	1	FLOW	413.	402.	384.	364.	357.	352.	348.	342.	334.
				TIME	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92
ROUTED TO													
+	RCMC5	.74	1	FLOW	411.	399.	380.	363.	355.	351.	347.	341.	333.
				TIME	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
HYDROGRAPH AT													
+	MC3	.19	1	FLOW	199.	195.	188.	181.	178.	176.	175.	172.	170.
				TIME	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75
ROUTED TO													
+	RMC3	.19	1	FLOW	194.	190.	184.	179.	176.	172.	170.	168.	167.
				TIME	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83
HYDROGRAPH AT													
+	MC6B	.19	1	FLOW	254.	249.	241.	234.	230.	228.	227.	224.	221.
				TIME	3.67	3.67	3.67	3.67	3.67	3.67	3.67	3.67	3.67
3 COMBINED AT													
•	CMC6B	1.12	1	FLOW	745.	727.	694.	666.	652.	643.	635.	626.	614.
				TIME	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83
ROUTED TO													
+	RCMC6B	1.12	1	FLOW	742.	724.	691.	663.	648.	639.	631.	622.	611.
				TIME	3.92	3.92	3.92	3.92	3.92	4.00	4.00	4.00	3.92
HYDROGRAPH AT													
+	MC7A	.19	1	FLOW	224.	220.	213.	206.	204.	202.	200.	198.	195.
				TIME	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75
2 COMBINED AT													
•	CMC7AS	1.30	1	FLOW	916.	895.	856.	823.	807.	796.	787.	776.	763.
				TIME	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92

HYDROGRAPH AT													
+	MC6A	.34	1	FLOW	402.	395.	383.	371.	366.	363.	360.	357.	352.
				TIME	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75
2 COMBINED AT													
+	CMC7A	1.64	1	FLOW	1289.	1261.	1209.	1161.	1141.	1124.	1115.	1100.	1084.
				TIME	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83
ROUTED TO													
+	RCMC7A	1.64	1	FLOW	1275.	1247.	1196.	1148.	1128.	1113.	1103.	1088.	1072.
				TIME	3.83	3.83	3.83	3.92	3.83	3.92	3.92	3.92	3.92
HYDROGRAPH AT													
+	MC7B	.27	1	FLOW	300.	294.	284.	274.	269.	267.	265.	261.	257.
				TIME	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75
2 COMBINED AT													
+	CMC7B	1.91	1	FLOW	1551.	1518.	1457.	1400.	1377.	1357.	1346.	1328.	1308.
				TIME	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83	3.83
ROUTED TO													
+	RCMC7	1.91	1	FLOW	1551.	1518.	1457.	1399.	1376.	1357.	1346.	1328.	1308.
				TIME	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92
HYDROGRAPH AT													
+	MC8	.51	1	FLOW	257.	249.	237.	225.	220.	217.	214.	211.	206.
				TIME	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
2 COMBINED AT													
+ →	CMC8	2.42	1	FLOW	1803.	1762.	1690.	1620.	1591.	1569.	1555.	1534.	1509.
				TIME	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92	3.92
ROUTED TO													
+	RCMC8	2.42	1	FLOW	1807.	1766.	1694.	1624.	1595.	1573.	1559.	1538.	1512.
				TIME	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
HYDROGRAPH AT													
+	MC9	.52	1	FLOW	383.	375.	361.	348.	343.	339.	337.	332.	327.
				TIME	4.08	4.08	4.08	4.08	4.08	4.08	4.08	4.08	4.08
2 COMBINED AT													
+	CMC9	2.94	1	FLOW	2186.	2137.	2051.	1968.	1934.	1908.	1892.	1866.	1835.
				TIME	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
ROUTED TO													
+	RCMC9	2.94	1	FLOW	2162.	2115.	2026.	1942.	1908.	1882.	1867.	1840.	1809.
				TIME	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
HYDROGRAPH AT													
+	MC10	.52	1	FLOW	427.	419.	405.	391.	386.	382.	379.	375.	369.
				TIME	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
ROUTED TO													
+	RMC10	.52	1	FLOW	424.	416.	402.	388.	383.	379.	376.	372.	366.
				TIME	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
HYDROGRAPH AT													
+	MC11	.56	1	FLOW	453.	444.	429.	414.	408.	403.	400.	395.	389.
				TIME	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
3 COMBINED AT													
+ →	CMC11	4.03	1	FLOW	3040.	2975.	2857.	2744.	2698.	2665.	2643.	2607.	2564.
				TIME	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
ROUTED TO													
+	RCMC11	4.03	1	FLOW	3011.	2946.	2836.	2730.	2688.	2656.	2631.	2598.	2557.
				TIME	4.08	4.08	4.08	4.08	4.08	4.08	4.08	4.08	4.08
DIVERSION TO													
+	PASSTMDB	4.03	1	FLOW	480.	480.	480.	480.	480.	480.	480.	480.	480.
				TIME	3.58	3.58	3.58	3.58	3.58	3.58	3.58	3.58	3.58
HYDROGRAPH AT													
+	DIV-DB	4.03	1	FLOW	2531.	2466.	2356.	2250.	2208.	2176.	2151.	2118.	2077.
				TIME	4.08	4.08	4.08	4.08	4.08	4.08	4.08	4.08	4.08
ROUTED TO													
+	TMDB	4.03	1	FLOW	30.	29.	29.	28.	28.	28.	27.	27.	27.
				TIME	5.83	5.83	5.83	5.83	5.83	5.83	5.75	5.75	5.75
			** PEAK STAGES IN FEET **										
			1	STAGE	2069.78	2069.60	2069.30	2069.01	2068.89	2068.80	2068.75	2068.65	2068.54
				TIME	5.83	5.83	5.83	5.83	5.83	5.83	5.83	5.75	5.75
HYDROGRAPH AT													
+	PASSTMDB	.00	1	FLOW	480.	480.	480.	480.	480.	480.	480.	480.	480.
				TIME	3.58	3.58	3.58	3.58	3.58	3.58	3.58	3.58	3.58
2 COMBINED AT													
+	CTMDB	4.03	1	FLOW	510.	509.	509.	508.	508.	508.	507.	507.	507.
				TIME	5.83	5.75	5.75	5.75	5.75	5.75	5.75	5.75	5.75
ROUTED TO													
+	RCTMDB	4.03	1	FLOW	510.	509.	509.	508.	508.	508.	507.	507.	507.

CMC8 = @ LAS VEGAS Blvd

CMC9 = @ DEWEY

TRMC ADJACENT TO SITE

HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL

TIME OF CONCENTRATION

STANDARD FORM 4

DEVELOPMENT: Premier Park | CALCULATED BY: tlm | DATE: 10-17-02

SUB-BASIN DATA				INITIAL / OVERLAND TIME (*ti*)			TRAVEL TIME (*tt*)						*tc* CHECK (URBANIZED BASINS)		FINAL *tc*	REMARKS SHEET 1 OF 1	
DES.	K	AREA	AREA	LEN.	SLOPE	*ti*	LEN	SLOPE	V1 VEL	V2 VEL	*tt*	TOTAL LENGTH	tc=(L/180) +10		CN	TLAG
		Ac	Sq Mi	Ft	%	Min	Ft	%	fps	fps	Min	Ft	Min			
(1)	(2)	(3a)	(3b)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
Golf Course - Proposed Conditions																
SB1	0.415	5.39	0.0084	150	2.00	6.92	700	0.50	1.05	2.08	9.57	750	N/A	16.48	61.0	0.165
SB2	0.415	3.78	0.0059	150	2.00	6.92	500	0.00	1.48	0.00	5.63	550	N/A	12.55	61.0	0.125
SB3	0.415	3.42	0.0053	150	2.00	6.92	400	0.00	1.48	0.00	4.50	450	N/A	11.42	61.0	0.114
SB4	0.415	1.15	0.0018	150	2.00	6.92	200	0.00	1.48	0.00	2.25	250	N/A	9.17	61.0	0.092
SB5	0.415	7.40	0.0116	150	2.00	6.92	700	1.00	1.48	2.94	6.76	750	N/A	13.68	61.0	0.137
Comercial Area - INTERIM CONDITIONS																
SB6	0.745	7.30	0.0114	200	0.65	10.43	3670	0.69	1.23	2.44	7.94	870	N/A	18.37	86.0	0.184
SB7	0.824	5.60	0.0088	100	2.00	3.94	870	0.83	1.35	2.68	8.48	970	N/A	12.42	92.0	0.124
SB8	0.745	10.50	0.0164	100	0.50	8.05	1250	0.88	1.39	2.76	10.53	1350	N/A	18.58	86.0	0.186
Comercial Area - FUTURE DEVELPED CONDITIONS																
RD1	0.904	0.20	0.0003	20	2.00	1.25	450	1.00	2.02	0.00	3.71	470	12.61	4.97	98.0	0.050
FSB6	0.824	3.01	0.0047	20	1.00	2.22	860	0.98	1.98	3.00	6.21	880	14.89	8.43	92.0	0.084
FSB7	0.824	2.80	0.0044	100	0.50	6.25	795	0.82	1.83	2.77	6.33	895	14.97	12.58	92.0	0.126
FSB8	0.824	5.10	0.0080	110	1.00	5.20	1520	0.70	1.69	2.56	5.06	630	13.50	10.26	92.0	0.103
FSB9	0.824	5.32	0.0083	180	1.00	6.66	660	1.25	2.24	3.39	4.51	840	14.67	11.16	92.0	0.112
FSB10	0.824	3.20	0.0050	300	0.70	9.68	600	0.50	1.43	2.16	6.60	900	15.00	15.00	92.0	0.150
FSB11	0.824	3.75	0.0059	180	1.00	6.66	720	0.82	1.83	2.77	5.88	900	15.00	12.53	92.0	0.125

EQUATIONS:

tc = t(i) + t(t)
t(t) = L/(60 X V)
t(i) = 1.8 x (1.1-K) x L^1/2 /S^1/3
K = 0.0132 x CN - 0.39
T lag = 0.60tc

Travel Time Calculations:

V1 for first 500 feet travel distance

V2 for remaining travel distance

Existing V1 = 14.8 x (S/100)^0.5

Existing V2 = 29.4 x (S/100)^0.5

Developed V1 = 20.2 x (S/100)^0.5

Developed V2 = 30.6 x (S/100)^0.5

STANDARD FORM 4:

ONSITE ANALYSIS - INTERIM CONDITIONS

```
1*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*         JUN  1998                     *
*       VERSION 4.1                     *
*                                       *
*  RUN DATE  23JAN03  TIME  15:27:42    *
*                                       *
*****************************************
```


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
    1     ID        MARTIN & MARTIN, INC.
    2     ID        PEMIER PARK GOLF COURSE
    3     ID        CLARK COUNTY NV
    4     ID
    5     ID        INPUT FILE :I1903PAR.DAT
    6     ID        OUTPUT FILE:I1903PAR.OUT
    7     ID
    8     ID        ************************************************************
    9     ID        *       DRAINAGE BASINS AREA = APP 45 ACRES                *
   10     ID        *       DEPTH-DURATION-FREQUENCY VALUE = 2.77-in           *
   11     ID        *       DEPTH-AREA REDUCTION VALUE = 0.00 (NOT USED)       *
   12     ID        *       STORM DISTRIBUTION #3                              *
   13     ID        *       ABSTRACTION METHOD: SCS CN                         *
   14     ID        *       HYDROLOGIC METHOD: SCS UH                          *
   15     ID        *       ROUTING METHOD:                                    *
   16     ID        *       RATIO 1 = 100-YEAR EVENT                           *
   17     ID        *       RATIO 2 = 10-YEAR EVENT                            *
   18     ID        *       STARTED:  10/17/02                                 *
   19     ID        *       REVISED:  00/00/00                                 *
   20     ID        ************************************************************
   21     ID
   22     ID
          *DIAGRAM
   23     ID
   24     IT      6                    300
   25     IO      5       1
   26     IN      5
   27     JR    PREC    1.00    0.57

   28     KK     SB1
   29     KM     BASIN SB1
   30     PB    2.77
   31     PC     0.0     .02    .057     .07    .087    .108    .124     .13    .130    .130
   32     PC     .13    .130    .130    .133    .140    .142    .148    .158    .172    .181
   33     PC     .19    .197    .199     .20    .201    .204    .214    .229    .241    .249
   34     PC    .251    .256    .270    .278    .281    .283    .295    .322    .352    .409
   35     PC    .499     .59     .71    .744    .781    .812    .819    .835    .851    .856
   36     PC     .86    .868    .876    .888    .910    .926    .937    .950    .970    .976
   37     PC    .982    .985    .987    .989    .990    .993    .993    .994    .995    .998
   38     PC    .998    .999     1.0
   39     BA   .0084
   40     LS      0      61
   41     UD    .165
          *

   42     KK     SB2
   43     KM
   44     BA   .0059
   45     LS      0      61
   46     UD    .125
          *
```

```
LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10
   47     KK    SB3
   48     KM
   49     BA   .0053
   50     LS      0       61
   51     UD    .114
          *
   52     KK    CP1
   53     KM   COMBINED ONSITE FLOW IN CHANNEL @ CP1
   54     HC      3
          *
   55     KK    SB5
   56     KM
   57     BA   .0116
   58     LS      0       61
   59     UD    .137
          *
   60     KK    CP2
   61     KM   COMBINED ONSITE FLOW TO PARADISE @ CP2
   62     HC      2
          *
   63     KK    ISB6
   64     KM    INTERIM CONDITION BASIN-TO SD
   65     BA   .0114
   66     LS      0       86
   67     UD    .184
          *
   68     KK    SB4
   69     KM
   70     BA   .0018
   71     LS      0       61
   72     UD    .092
          *
   73     KK    CP3
   74     KM   COMBINE ALL ONSITE GOLF COURSE HYDROGRAPHS @ CP3
   75     HC      3
          *
   76     KK    ROUT
   77     KM   ROUT CP3 FLOWS TO CP6
   78     RK    460    .003    .017            TRAP      30
          *
   79     KK    ISB7
   80     KM    INTERIM CONDITION
   81     BA   .0088
   82     LS      0       92
   83     UD    .124
          *
```

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

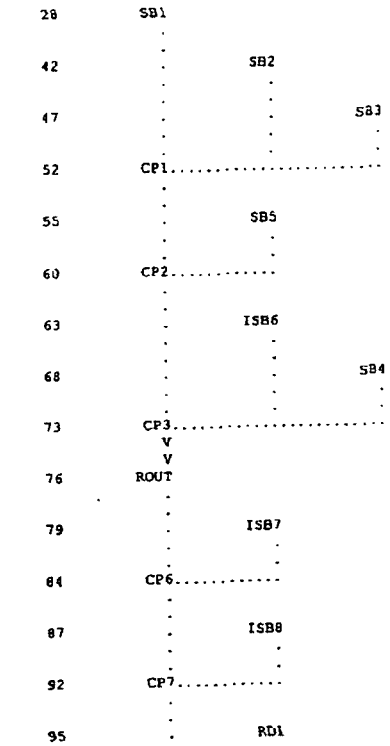
   84     KK    CP6
   85     KM   COMBINE @ CP6
   86     HC      2
          *
   87     KK    ISB8
   88     KM    INTERIM CONDITION
   89     BA   .0164
   90     LS      0      86
   91     UD    .186
          *
   92     KK    CP7
   93     KM   TOTAL COMBINED ONSITE RUNOFF TO PARADISE
   94     HC      2
          *
   95     KK    RD1
   96     KM   BASIN RD1 UNDER PROPOSED CONDITIONS
   97     BA   .0003
   98     LS      0      98
   99     UD    .05
  100     ZZ
```

1

SCHEMATIC DIAGRAM OF STREAM NETWORK

INPUT LINE NO.

(V) ROUTING
(.) CONNECTOR
(---->) DIVERSION OR PUMP FLOW
(<----) RETURN OF DIVERTED OR PUMPED FLOW



(***) RUNOFF ALSO COMPUTED AT THIS LOCATION

```
*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*              JUN  1998                *
*           VERSION 4.1                 *
*                                       *
*  RUN DATE   23JAN03  TIME  15:27:42   *
*                                       *
*****************************************
```


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


MARTIN & MARTIN, INC.
PEMIER PARK GOLF COURSE
CLARK COUNTY NV

INPUT FILE :I1903PAR.DAT
OUTPUT FILE:I1903PAR.OUT

```
*********************************************************
*       DRAINAGE BASINS AREA = APP 45 ACRES             *
*       DEPTH-DURATION-FREQUENCY VALUE = 2.77-in        *
*       DEPTH-AREA REDUCTION VALUE = 0.00 (NOT USED)    *
*       STORM DISTRIBUTION #3                           *
*       ABSTRACTION METHOD: SCS CN                      *
*       HYDROLOGIC METHOD: SCS UH                       *
*       ROUTING METHOD:                                 *
*       RATIO 1 = 100-YEAR EVENT                        *
*       RATIO 2 = 10-YEAR EVENT                         *
*       STARTED:  10/17/02                              *
*       REVISED:  00/00/00                              *
*********************************************************
```

```
25 IO          OUTPUT CONTROL VARIABLES
                    IPRNT          5  PRINT CONTROL
                    IPLOT          1  PLOT CONTROL
                    QSCAL          0.  HYDROGRAPH PLOT SCALE

   IT          HYDROGRAPH TIME DATA
                    NMIN           6  MINUTES IN COMPUTATION INTERVAL
                    IDATE      1   0  STARTING DATE
                    ITIME         0000  STARTING TIME
                      NQ           300  NUMBER OF HYDROGRAPH ORDINATES
                   NDDATE      2   0  ENDING DATE
                   NDTIME         0554  ENDING TIME
                    ICENT         19  CENTURY MARK

                 COMPUTATION INTERVAL      .10 HOURS
                      TOTAL TIME BASE    29.90 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
                 1.00       .57
```

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 1.00	RATIO 2 .57
HYDROGRAPH AT +	SB1	.01	1	FLOW	2.	0.
				TIME	3.70	4.90
HYDROGRAPH AT +	SB2	.01	1	FLOW	1.	0.
				TIME	3.60	4.90
HYDROGRAPH AT +	SB3	.01	1	FLOW	1.	0.
				TIME	3.60	4.90
3 COMBINED AT +	CP1	.02	1	FLOW	4.	0.
				TIME	3.60	4.90
HYDROGRAPH AT +	SB5	.01	1	FLOW	2.	0.
				TIME	3.60	4.90
2 COMBINED AT +	CP2	.03	1	FLOW	6.	0.
				TIME	3.60	4.90
HYDROGRAPH AT +	ISB6	.01	1	FLOW	13.	5.
				TIME	3.60	3.60
HYDROGRAPH AT +	SB4	.00	1	FLOW	0.	0.
				TIME	3.60	4.80
3 COMBINED AT +	CP3	.04	1	FLOW	19.	5.
				TIME	3.60	3.60
ROUTED TO +	ROUT	.04	1	FLOW	18.	5.
				TIME	3.60	3.70
HYDROGRAPH AT +	ISB7	.01	1	FLOW	14.	6.
				TIME	3.50	3.60
2 COMBINED AT +	CP6	.05	1	FLOW	31.	11.
				TIME	3.60	3.60
HYDROGRAPH AT +	ISB8	.02	1	FLOW	19.	7.
				TIME	3.60	3.60
2 COMBINED AT +	CP7	.07	1	FLOW	50.	18.
				TIME	3.60	3.60
HYDROGRAPH AT +	RD1	.00	1	FLOW	1.	0.
				TIME	3.50	3.50

1

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= 1.00									
	ROUT MANE	.78	19.17	217.55	.59	6.00	18.03	216.00	.59

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1389E+01 EXCESS= .0000E+00 OUTFLOW= .1390E+01 BASIN STORAGE= .3540E-05 PERCENT ERROR= -.1

FOR PLAN = 1 RATIO= .57									
	ROUT MANE	1.29	4.86	218.74	.15	6.00	4.66	222.00	.15

CONTINUITY SUMMARY (AC-FT) - INFLOW= .3552E+00 EXCESS= .0000E+00 OUTFLOW= .3561E+00 BASIN STORAGE= .3479E-05 PERCENT ERROR= -.3

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

ONSITE ANALYSIS - FUTURE CONDITIONS

```
1*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*             JUN  1998                 *
*           VERSION 4.1                 *
*                                       *
*  RUN DATE   23JAN03  TIME  15:18:20   *
*                                       *
*****************************************
```


```
*****************************************
*                                       *
*    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 -ANSKK- 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

    1     ID        MARTIN & MARTIN, INC.
    2     ID        PEMIER PARK GOLF COURSE
    3     ID        CLARK COUNTY NV
    4     ID
    5     ID        INPUT FILE :F1903PAR.DAT
    6     ID        OUTPUT FILE:F1903PAR.OUT
    7     ID
    8     ID        ************************************************************
    9     ID        *       DRAINAGE BASINS AREA = APP 45 ACRES                *
   10     ID        *       DEPTH-DURATION-FREQUENCY VALUE = 2.77-in           *
   11     ID        *       DEPTH-AREA REDUCTION VALUE = 0.00 (NOT USED)       *
   12     ID        *       STORM DISTRIBUTION #3                              *
   13     ID        *       ABSTRACTION METHOD: SCS CN                         *
   14     ID        *       HYDROLOGIC METHOD: SCS UH                          *
   15     ID        *       ROUTING METHOD:                                    *
   16     ID        *       RATIO 1 = 100-YEAR EVENT                           *
   17     ID        *       RATIO 2 = 10-YEAR EVENT                            *
   18     ID        *       STARTED:  10/17/02                                 *
   19     ID        *       REVISED:  00/00/00                                 *
   20     ID        ************************************************************
   21     ID
   22     ID
          *DIAGRAM
   23     ID
   24     IT      6                       300
   25     IO      5       1
   26     IN      5
   27     JR    PREC    1.00    0.57

   28     KK     SB1
   29     KM     BASIN SB1
   30     PB    2.77
   31     PC     0.0     .02     .057    .07     .087    .108    .124    .13     .130    .130
   32     PC     .13     .130    .130    .133    .140    .142    .148    .158    .172    .181
   33     PC     .19     .197    .199    .20     .201    .204    .214    .229    .241    .249
   34     PC    .251    .256    .270    .278    .281    .283    .295    .322    .352    .409
   35     PC    .499     .59     .71    .744    .781    .812    .819    .835    .851    .856
   36     PC     .86    .868    .876    .888    .910    .926    .937    .950    .970    .976
   37     PC    .982    .985    .987    .989    .990    .993    .993    .994    .995    .998
   38     PC    .998    .999    1.0
   39     BA   .0084
   40     LS      0      61
   41     UD    .165
          *

   42     KK     SB2
   43     KM
   44     BA   .0059
   45     LS      0      61
   46     UD    .125
          *
```

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

  47      KK    SB3
  48      KM
  49      BA  .0053
  50      LS     0      61
  51      UD   .114
          *

  52      KK    CP1
  53      KM  COMBINED ONSITE FLOW IN CHANNEL @ CP1
  54      HC     3
          *

  55      KK    SB5
  56      KM
  57      BA  .0116
  58      LS     0      61
  59      UD   .137
          *

  60      KK    CP2
  61      KM  COMBINED ONSITE FLOW TO PARADISE @ CP2
  62      HC     2
          *

  63      KK    SB4
  64      KM
  65      BA  .0018
  66      LS     0      61
  67      UD   .092
          *

  68      KK    CP3
  69      KM  COMBINE ALL ONSITE GOLF COURSE HYDROGRAPHS @ CP3
  70      HC     2
          *

  71      KK   ROUT
  72      KM  ROUT CP3 FLOWS TO CP6
  73      RK    460    .003    .017          TRAP     30
          *

  74      KK   FSB6
  75      KM
  76      BA  .0047
  77      LS     0      92
  78      UD   .084
          *

  79      KK   ROUT
  80      KM  ROUT FSB6 FLOWS THRU SB8
  81      RK    520    .007    .017          TRAP     30
          *
```

```
LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10
   82     KK   FSB8
   83     KM
   84     BA  .0080
   85     LS     0      92
   86     UD  .103
          *
   87     KK    CP4
   88     KM  COMBINE SB6 & SB7
   89     HC     2
          *
   90     KK   FSB9
   91     KM
   92     BA  .0083
   93     LS     0      92
   94     UD  .112
          *
   95     KK    CP5
   96     KM  Combined flow @ CP5
   97     HC     2
          *
   98     KK   ROUT
   99     KM  Rout combined flows to CP6
  100     RK    380    .007    .017           TRAP      30
          *
  101     KK  FSB10
  102     KM
  103     BA  .0050
  104     LS     0      92
  105     UD  .150
          *
  106     KK    CP6
  107     KM    Combined flows from site @ CP6
  108     HC     3
          *
  109     KK   FSB7
  110     KM
  111     BA  .0044
  112     LS     0      92
  113     UD  .126
          *
  114     KK  FSB11
  115     KM
  116     BA  .0059
  117     LS     0      92
  118     UD  .125
          *
```

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

  119     KK   COMB
  120     KM   COMBINE SB7 & SB11
  121     HC     2
                 *

  122     KK   CP7
  123     KM   TOTAL COMBINED ONSITE RUNOFF TO PARADISE
  124     HC     2
                 *

  125     KK   RD1
  126     KM   BASIN RD1 UNDER PROPOSED CONDITIONS
  127     BA   .0003
  128     LS     0     98
  129     UD    .05
  130     ZZ
```

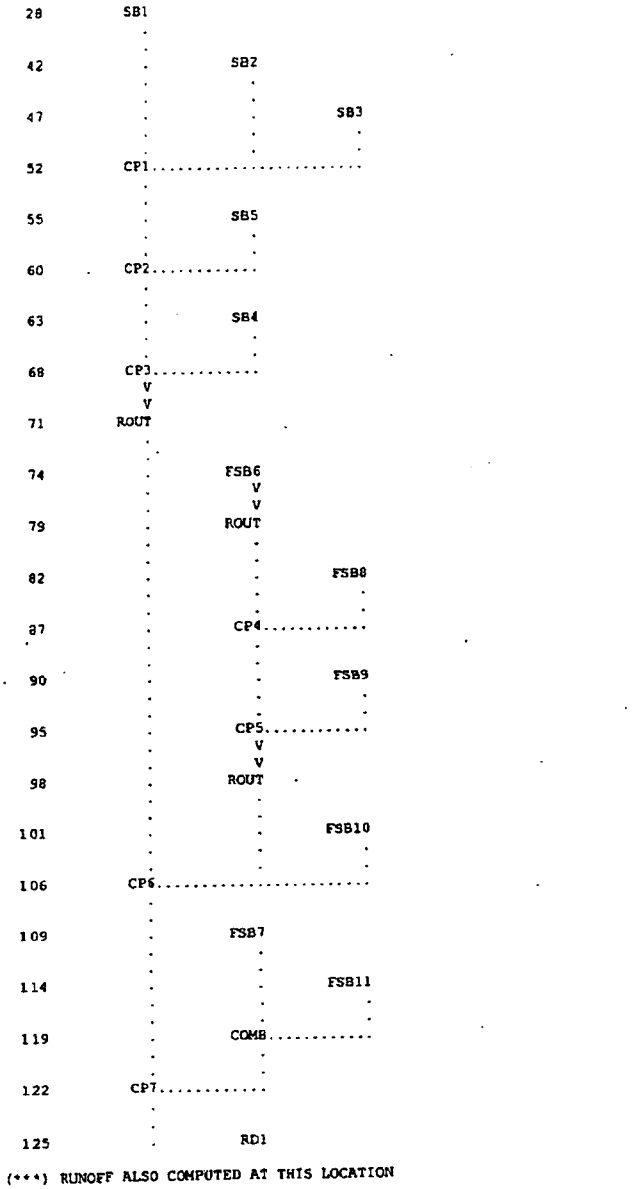
1

SCHEMATIC DIAGRAM OF STREAM NETWORK

INPUT LINE NO.

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

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



(***) RUNOFF ALSO COMPUTED AT THIS LOCATION

```
1*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE (HEC-1)    *
*             JUN  1998                 *
*          VERSION 4.1                  *
*                                       *
*  RUN DATE   23JAN03  TIME  15:18:20   *
*                                       *
*****************************************
```


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

MARTIN & MARTIN, INC.
PEMIER PARK GOLF COURSE
CLARK COUNTY NV

INPUT FILE :F1903PAR.DAT
OUTPUT FILE:F1903PAR.OUT

```
*********************************************************
*       DRAINAGE BASINS AREA = APP 45 ACRES             *
*       DEPTH-DURATION-FREQUENCY VALUE = 2.77-in        *
*       DEPTH-AREA REDUCTION VALUE = 0.00 (NOT USED)    *
*       STORM DISTRIBUTION #3                           *
*       ABSTRACTION METHOD: SCS CN                      *
*       HYDROLOGIC METHOD: SCS UH                       *
*       ROUTING METHOD:                                 *
*       RATIO 1 = 100-YEAR EVENT                        *
*       RATIO 2 = 10-YEAR EVENT                         *
*       STARTED:  10/17/02                              *
*       REVISED:  00/00/00                              *
*********************************************************
```

```
25 IO          OUTPUT CONTROL VARIABLES
                     IPRNT          5  PRINT CONTROL
                     IPLOT          1  PLOT CONTROL
                     QSCAL         0.  HYDROGRAPH PLOT SCALE

   IT          HYDROGRAPH TIME DATA
                     NMIN           6  MINUTES IN COMPUTATION INTERVAL
                    IDATE      1    0  STARTING DATE
                    ITIME         0000  STARTING TIME
                       NQ          300  NUMBER OF HYDROGRAPH ORDINATES
                    NDDATE     2    0  ENDING DATE
                    NDTIME        0554  ENDING TIME
                    ICENT           19  CENTURY MARK

                  COMPUTATION INTERVAL      .10 HOURS
                     TOTAL TIME BASE   29.90 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
                  1.00       .57
```

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 1.00	RATIO 2 .57
HYDROGRAPH AT	SB1	.01	1	FLOW	2.	0.
+				TIME	3.70	4.90
HYDROGRAPH AT	SB2	.01	1	FLOW	1.	0.
+				TIME	3.60	4.90
HYDROGRAPH AT	SB3	.01	1	FLOW	1.	0.
+				TIME	3.60	4.90
3 COMBINED AT	CP1	.02	1	FLOW	4.	0.
+				TIME	3.60	4.90
HYDROGRAPH AT	SB5	.01	1	FLOW	2.	0.
+				TIME	3.60	4.90
2 COMBINED AT	CP2	.03	1	FLOW	6.	0.
+				TIME	3.60	4.90
HYDROGRAPH AT	SB4	.00	1	FLOW	0.	0.
+				TIME	3.60	4.80
2 COMBINED AT	CP3	.03	1	FLOW	6.	0.
+				TIME	3.60	4.90
ROUTED TO	ROUT	.03	1	FLOW	6.	0.
+				TIME	3.70	5.00
HYDROGRAPH AT	FSB6	.00	1	FLOW	8.	4.
+				TIME	3.50	3.50
ROUTED TO	ROUT	.00	1	FLOW	8.	3.
+				TIME	3.50	3.50
HYDROGRAPH AT	FSB8	.01	1	FLOW	13.	6.
+				TIME	3.50	3.50
2 COMBINED AT	CP4	.01	1	FLOW	21.	10.
+				TIME	3.50	3.50
HYDROGRAPH AT	FSB9	.01	1	FLOW	13.	6.
+				TIME	3.50	3.50
2 COMBINED AT	CP5	.02	1	FLOW	35.	16.
+				TIME	3.50	3.50
ROUTED TO	ROUT	.02	1	FLOW	33.	15.
+				TIME	3.50	3.50
HYDROGRAPH AT	FSB10	.00	1	FLOW	8.	4.
+				TIME	3.60	3.60
3 COMBINED AT	CP6	.06	1	FLOW	44.	19.
+				TIME	3.60	3.60
HYDROGRAPH AT	FSB7	.00	1	FLOW	7.	3.
+				TIME	3.50	3.60
HYDROGRAPH AT	FSB11	.01	1	FLOW	9.	4.
+				TIME	3.50	3.60
2 COMBINED AT	COMB	.01	1	FLOW	16.	7.
+				TIME	3.50	3.60

2 COMBINED AT	CP7	.07	1	FLOW	60.	26.
				TIME	3.60	3.60
HYDROGRAPH AT	RD1	.00	1	FLOW	1.	0.
				TIME	3.50	3.50

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= 1.00									
ROUT	MANE	1.26	6.15	218.42	.28	6.00	6.02	222.00	.28

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4964E+00 EXCESS= .0000E+00 OUTFLOW= .4972E+00 BASIN STORAGE= .3594E-05 PERCENT ERROR= -.2

FOR PLAN = 1 RATIO= .57									
ROUT	MANE	3.66	.34	299.59	.01	6.00	.34	300.00	.01

CONTINUITY SUMMARY (AC-FT) - INFLOW= .2370E-01 EXCESS= .0000E+00 OUTFLOW= .2388E-01 BASIN STORAGE= .3021E-05 PERCENT ERROR= -.8

FOR PLAN = 1 RATIO= 1.00									
ROUT	MANE	.87	8.37	211.64	1.95	6.00	7.73	210.00	1.95

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4875E+00 EXCESS= .0000E+00 OUTFLOW= .4891E+00 BASIN STORAGE= .2173E-05 PERCENT ERROR= -.3

FOR PLAN = 1 RATIO= .57									
ROUT	MANE	1.30	3.91	212.59	.87	6.00	3.45	210.00	.87

CONTINUITY SUMMARY (AC-FT) - INFLOW= .2175E+00 EXCESS= .0000E+00 OUTFLOW= .2186E+00 BASIN STORAGE= .2493E-05 PERCENT ERROR= -.5

FOR PLAN = 1 RATIO= 1.00									
ROUT	MANE	.45	34.38	211.03	1.95	6.00	33.36	210.00	1.95

CONTINUITY SUMMARY (AC-FT) - INFLOW= .2180E+01 EXCESS= .0000E+00 OUTFLOW= .2181E+01 BASIN STORAGE= .3719E-05 PERCENT ERROR= -.1

FOR PLAN = 1 RATIO= .57									
ROUT	MANE	.52	15.86	211.15	.87	6.00	15.02	210.00	.87

CONTINUITY SUMMARY (AC-FT) - INFLOW= .9727E+00 EXCESS= .0000E+00 OUTFLOW= .9739E+00 BASIN STORAGE= .4038E-05 PERCENT ERROR= -.1

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

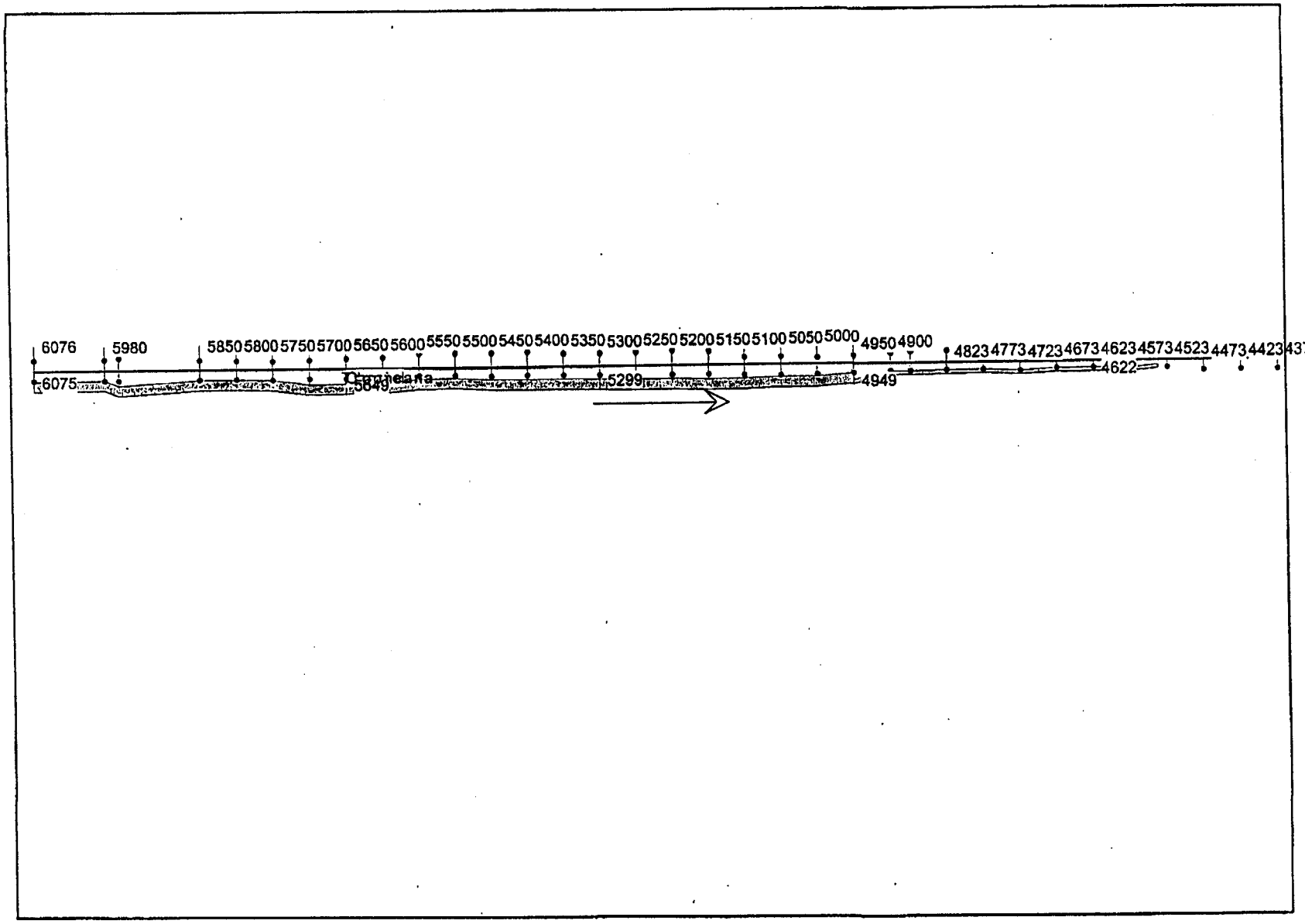
APPENDIX C

(HYDRAULICS)

- Table 1C - TRMC Breakout Flow Summary
- Tropicana Wash - McCarran Airport Channel Calculations
- Street Flow Calculations
- TRMC 0263 - Capacity Calculations
- TRMC 0233 - Capacity Calculations
- On-Site 5: 8 x 3 Culvert Calculations
- Las Vegas Boulevard West ½ Street Capacity Calculations
- On-Site WEIR Calculations
- Golf Course Channel Calculations
- Golf Course Channel Freeboard Calculations
- On-Site 18" Storm Drain Calculation
- 24" x 24" D1 Calculations

TABLE 1C
TRMC BREAKOUT FLOW SUMMARY

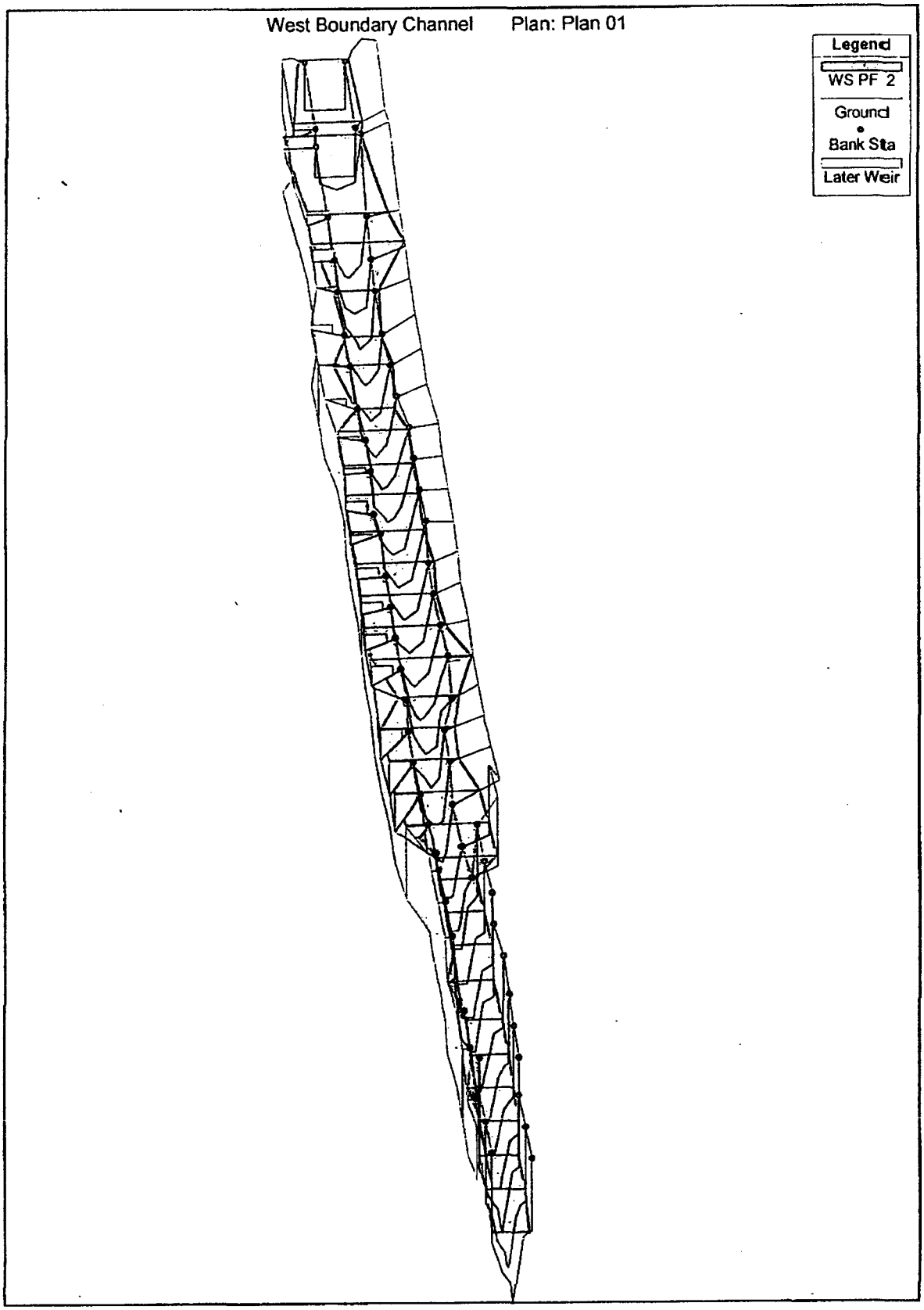
X - Section	Q' Main Channel (cfs)	Section Breakout (cfs)	Total Breakout (cfs)	Breakout to Golf Course Channel (cfs)	Breakout to North (cfs)	Breakout to Naples Dr. (cfs)
6076	1971					
		48	48			
5980	1923					
		42	90			
5961	1881					
		111	201			
5850	1770					
		16	217			
5800	1754					
		13	230			
5750	1741					
		0	230			
5700	1741					
		0	230			
5650	1741					
		0	230			
5600	1741					
		8	238			
5550	1733					
		39	277			
5500	1694					
		43	320			
5450	1651					
		45	365			
5400	1606					
		32	397			
5350	1574			456		
		59	456			
5300	1515					
		77	533			
5250	1438					
		73	606			
5200	1365					
		32	638			
5150	1333					
		4	642			
5100	1329					
		4	646			
5050	1325					
		5	651			
5000	1320					
		5	656			
4950	1315					
		1	657			
4900	1314					
		0	657			
4873	1314					
		0	657			
4823	1314					
		0	657			
4773	1314					
		0	657			
4723	1314					
		0	657			
4673	1314					
		0	657			
4623	1314					
		37	694		238	
4573	1277					
		124	818			
4523	1153					
		0	818			
4473	1153					
		0	818			
4423	1153					124
		0	818			
4373	1153					

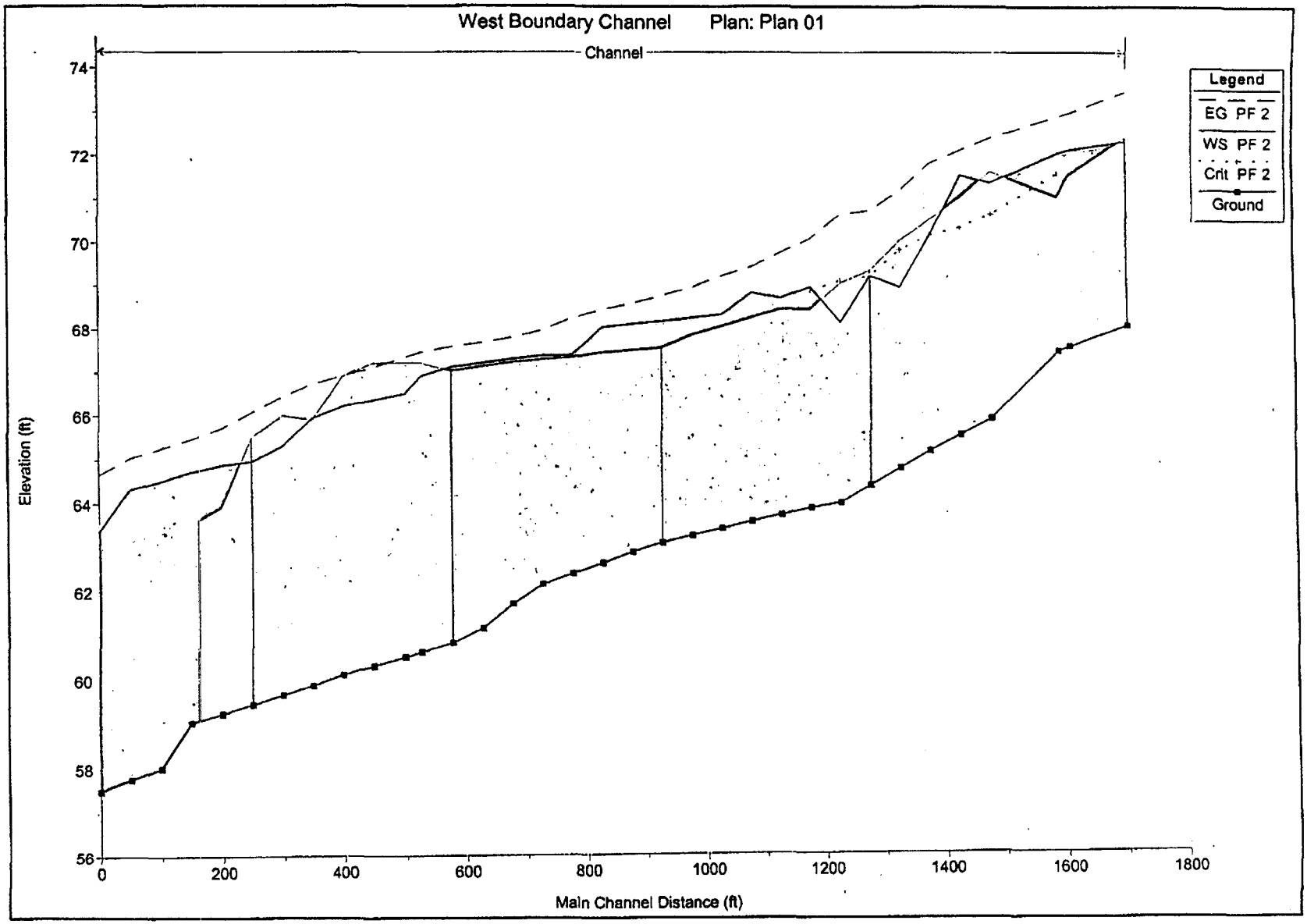

6076
5980
5850
5800
5750
5700
5650
5600
5550
5500
5450
5400
5350
5300
5250
5200
5150
5100
5050
5000
4950
4900
4823
4773
4723
4673
4623
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4473
4423
4373
4622
6075
5843
5299
4949

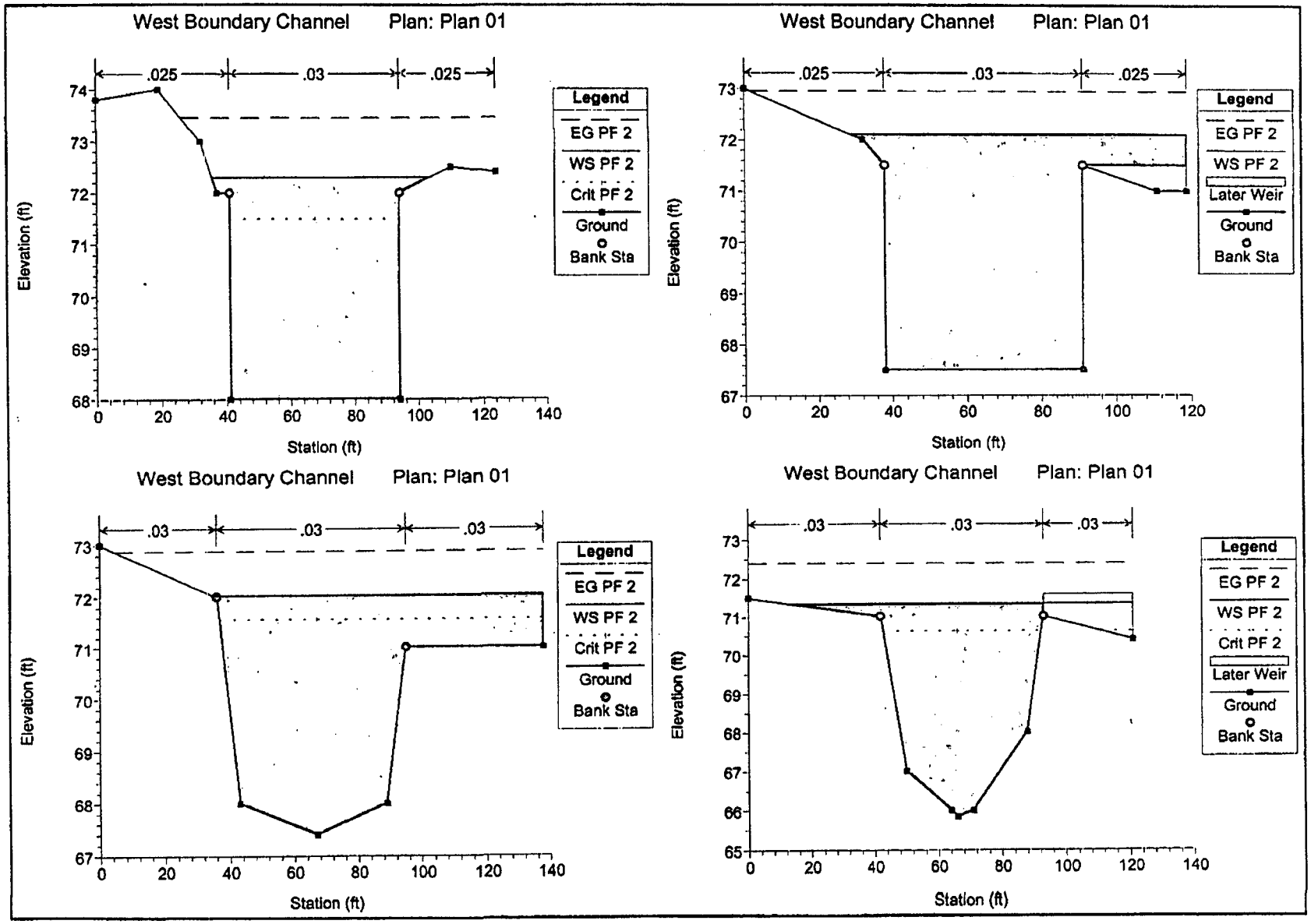
HEC-RAS Plan: Plan 01 River: Tropicana Reach: Channel Profile: PF 2

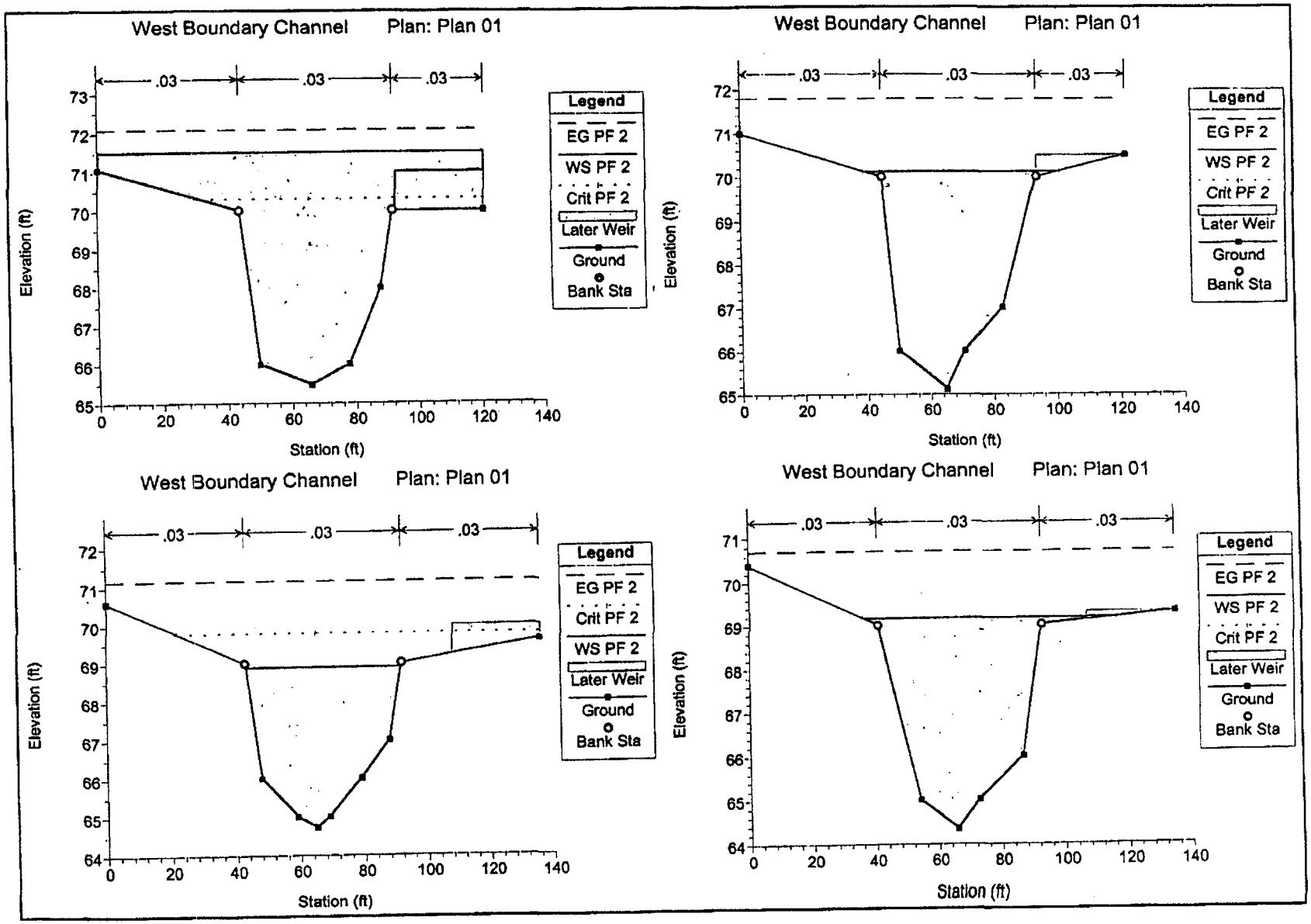
Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Channel	6076	1971.00	68.00	72.31	71.49	73.46	0.005203	8.61	231.31	68.39	0.73
Channel	6075	Lat. Weir									
Channel	5980	1923.46	67.50	72.11		72.95	0.003612	7.51	272.67	90.49	0.62
Channel	5961	1880.85	67.40	72.03	71.56	72.88	0.004045	7.62	272.84	103.07	0.68
Channel	5850	1769.56	65.84	71.34	70.62	72.38	0.004536	8.29	230.40	107.73	0.72
Channel	5800	1754.46	65.47	71.52	70.32	72.09	0.002087	6.42	325.93	121.00	0.51
Channel	5750	1741.20	65.11	70.13	70.13	71.79	0.008844	10.34	169.29	62.49	0.98
Channel	5700	1741.20	64.72	68.91	69.79	71.16	0.014394	12.04	144.56	48.67	1.23
Channel	5650	1741.20	64.33	69.17	69.17	70.70	0.008263	9.94	177.40	80.24	0.95
Channel	5649	Lat. Weir									
Channel	5600	1741.20	63.93	68.10	69.05	70.61	0.016849	12.72	137.04	52.21	1.33
Channel	5550	1732.75	63.82	68.92	68.85	70.05	0.006164	8.69	217.01	93.66	0.83
Channel	5500	1694.28	63.66	68.67		69.72	0.005662	8.40	218.03	90.60	0.79
Channel	5450	1651.07	63.51	68.79		69.38	0.002968	6.49	280.65	96.14	0.59
Channel	5400	1606.26	63.35	68.29		69.18	0.004649	7.70	227.09	96.31	0.72
Channel	5350	1573.86	63.20	68.22		68.91	0.003681	6.98	250.83	102.34	0.65
Channel	5300	1514.50	63.04	68.15		68.72	0.002939	6.38	264.29	100.10	0.58
Channel	5299	Lat. Weir									
Channel	5250	1437.93	62.84	68.08		68.55	0.002442	5.75	278.01	106.47	0.53
Channel	5200	1364.50	62.59	68.01		68.42	0.002339	5.41	278.61	132.00	0.51
Channel	5150	1332.55	62.36	67.37		68.22	0.005262	7.41	183.30	82.12	0.75
Channel	5100	1328.96	62.12	67.35		67.94	0.003168	6.51	232.06	98.46	0.60
Channel	5050	1324.52	61.67	67.29		67.77	0.002199	5.84	253.78	92.61	0.50
Channel	5000	1319.96	61.13	67.20		67.66	0.001953	5.80	272.42	112.01	0.48
Channel	4950	1314.74	60.80	67.11		67.56	0.002049	5.76	272.16	108.00	0.49
Channel	4949	Lat. Weir									
Channel	4900	1314.15	60.60	66.89		67.43	0.002392	6.15	237.44	78.31	0.53
Channel	4873	1314.15	60.49	66.48		67.32	0.004187	7.34	178.99	48.27	0.67
Channel	4823	1314.15	60.29	66.34		67.10	0.003577	6.97	188.47	48.34	0.62
Channel	4773	1314.15	60.10	66.20		66.91	0.003358	6.76	194.37	49.77	0.60
Channel	4723	1314.13	59.86	65.93		66.72	0.003934	7.10	185.34	60.00	0.65
Channel	4673	1314.11	59.65	65.29		66.43	0.006900	8.55	153.66	48.58	0.85
Channel	4623	1314.11	59.44	64.96		66.07	0.006709	8.47	155.08	48.81	0.84
Channel	4622	Lat. Weir									
Channel	4573	1276.77	59.23	64.88		65.71	0.004634	7.38	178.67	60.00	0.71
Channel	4523	1153.11	59.02	64.73		65.46	0.004134	6.84	168.52	50.00	0.66

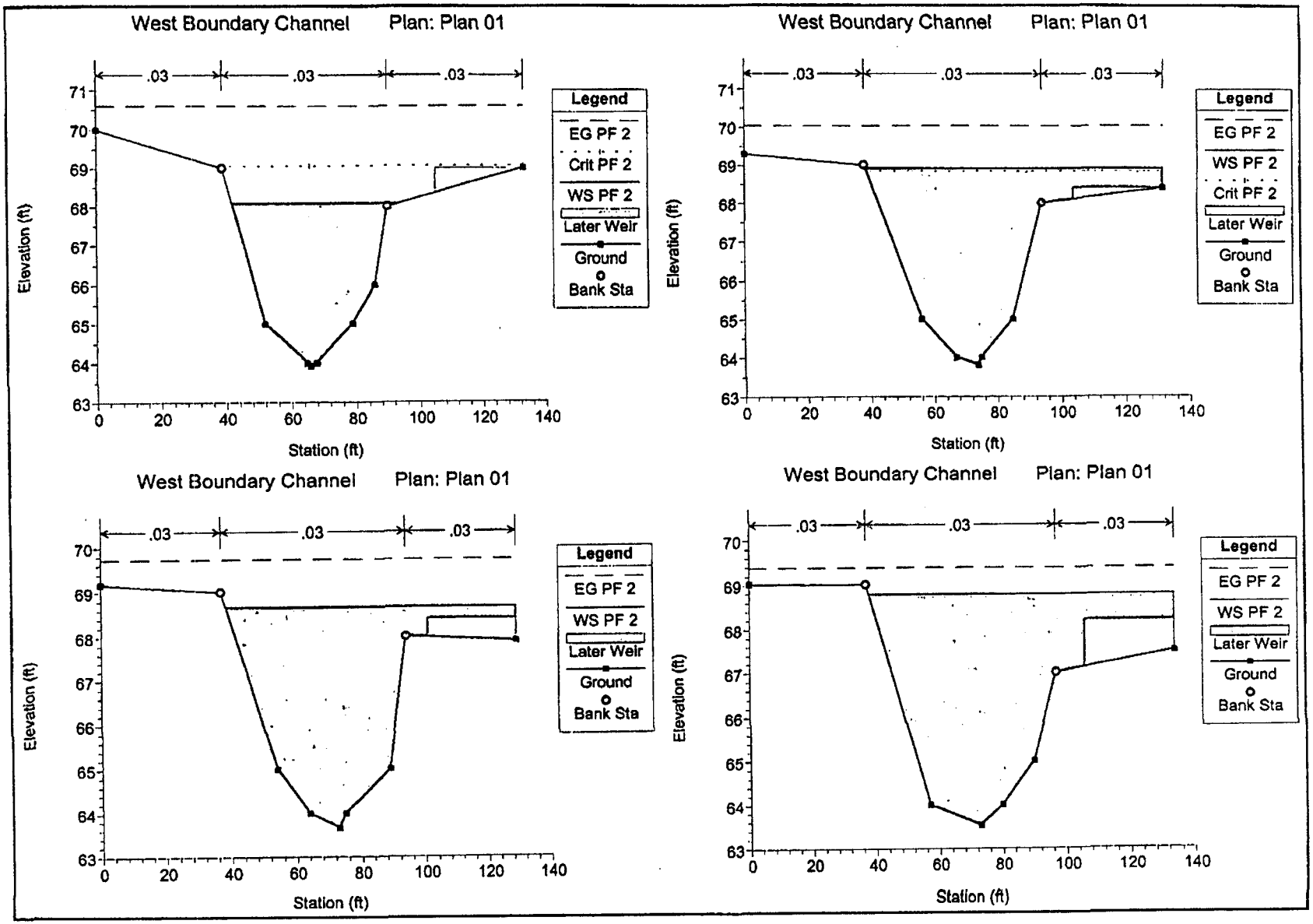
Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Channel	4473	1153.11	58.00	64.52		65.25	0.004285	6.86	168.08	51.00	0.67
Channel	4423	1153.11	57.75	64.33		65.03	0.004017	6.71	171.72	51.00	0.64
Channel	4373	1153.11	57.50	63.36	63.36	64.67	0.010151	9.16	125.90	48.01	1.00

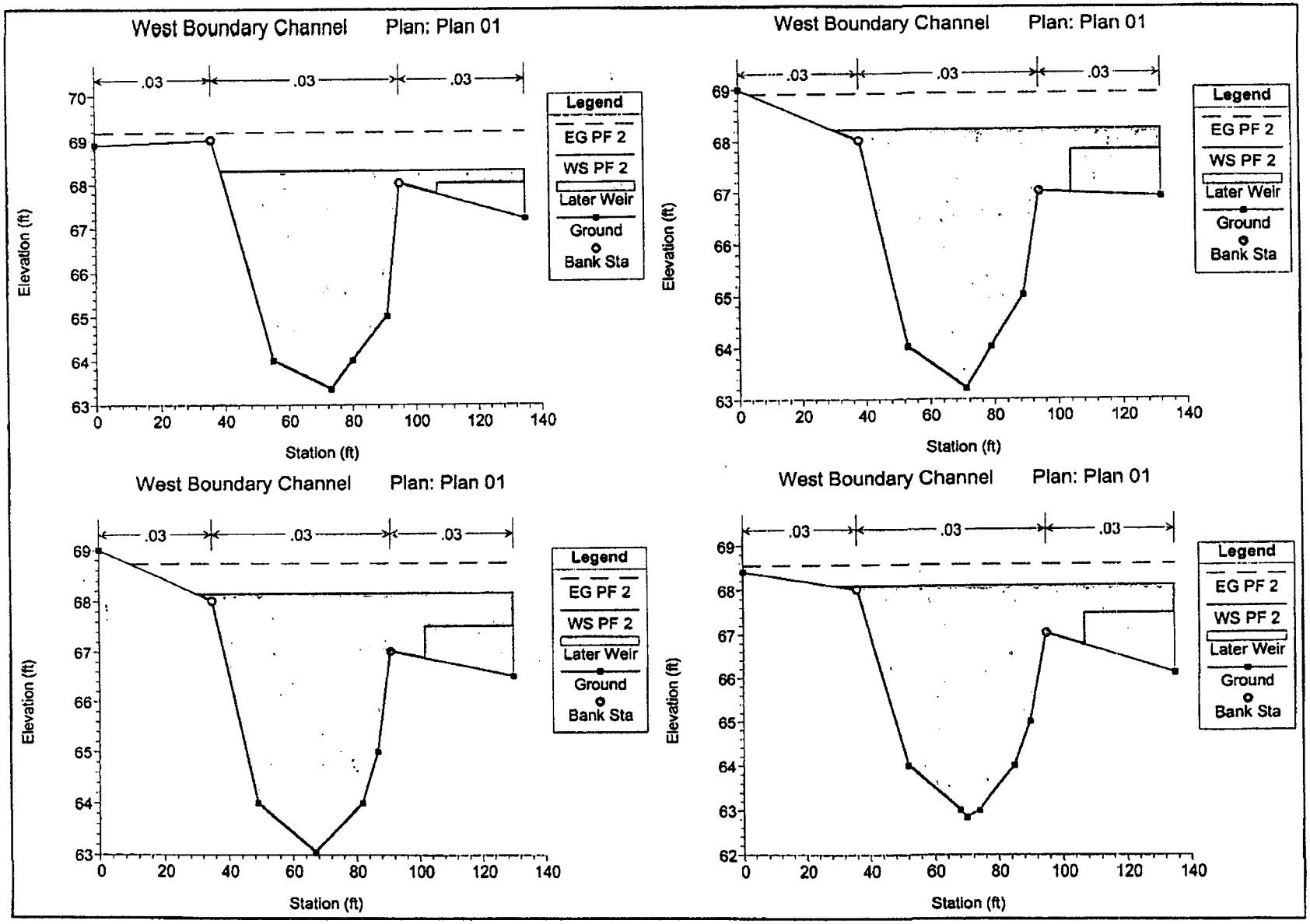

West Boundary Channel
Plan: Plan 01
Legend
WS PF 2
Ground
Bank Sta
Later Weir

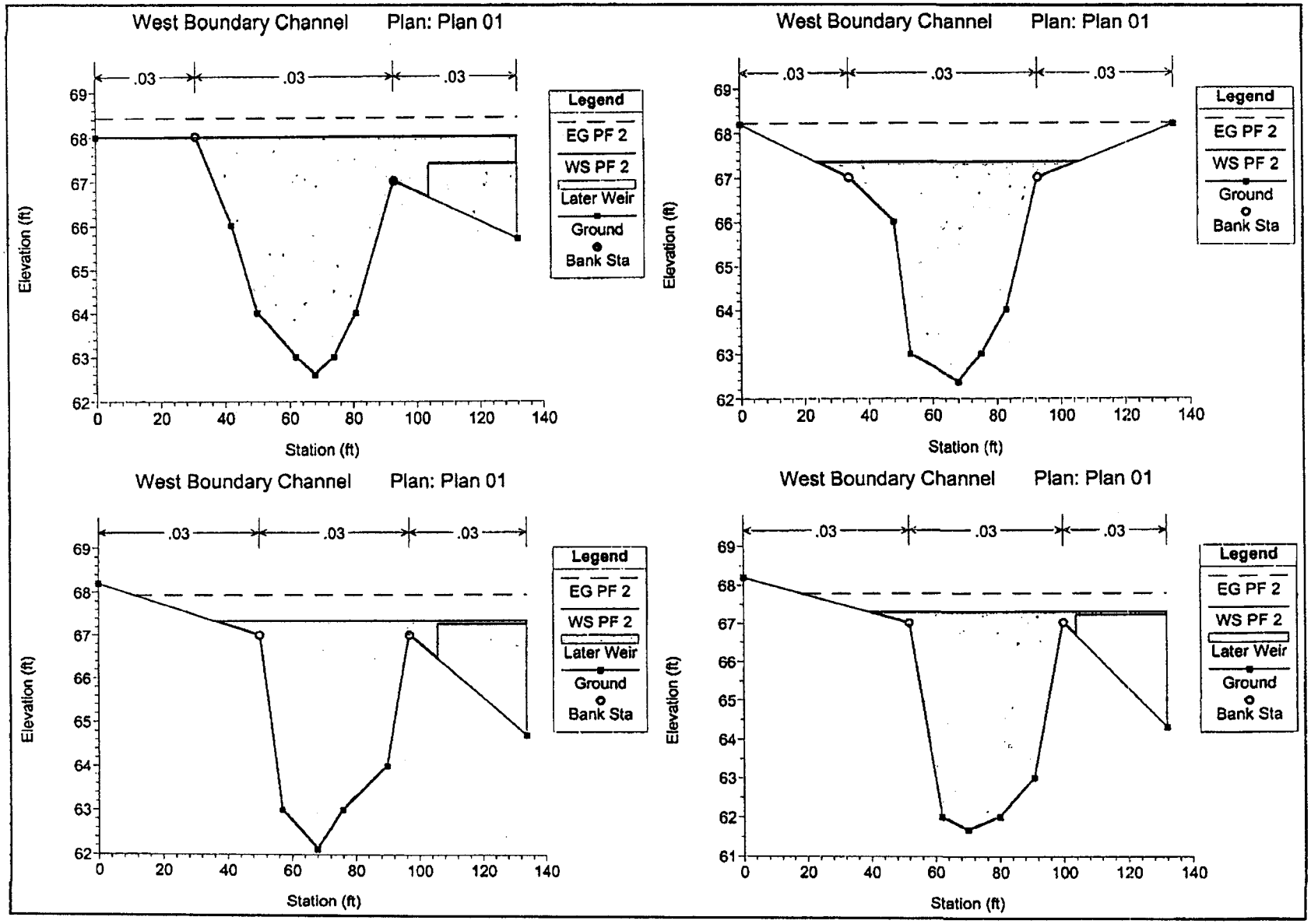

West Boundary Channel Plan: Plan 01
Channel
Legend
EG PF 2
WS PF 2
Crit PF 2
Ground
Elevation (ft)
74
72
70
68
66
64
62
60
58
56
0
200
400
600
800
1000
1200
1400
1600
1800
Main Channel Distance (ft)

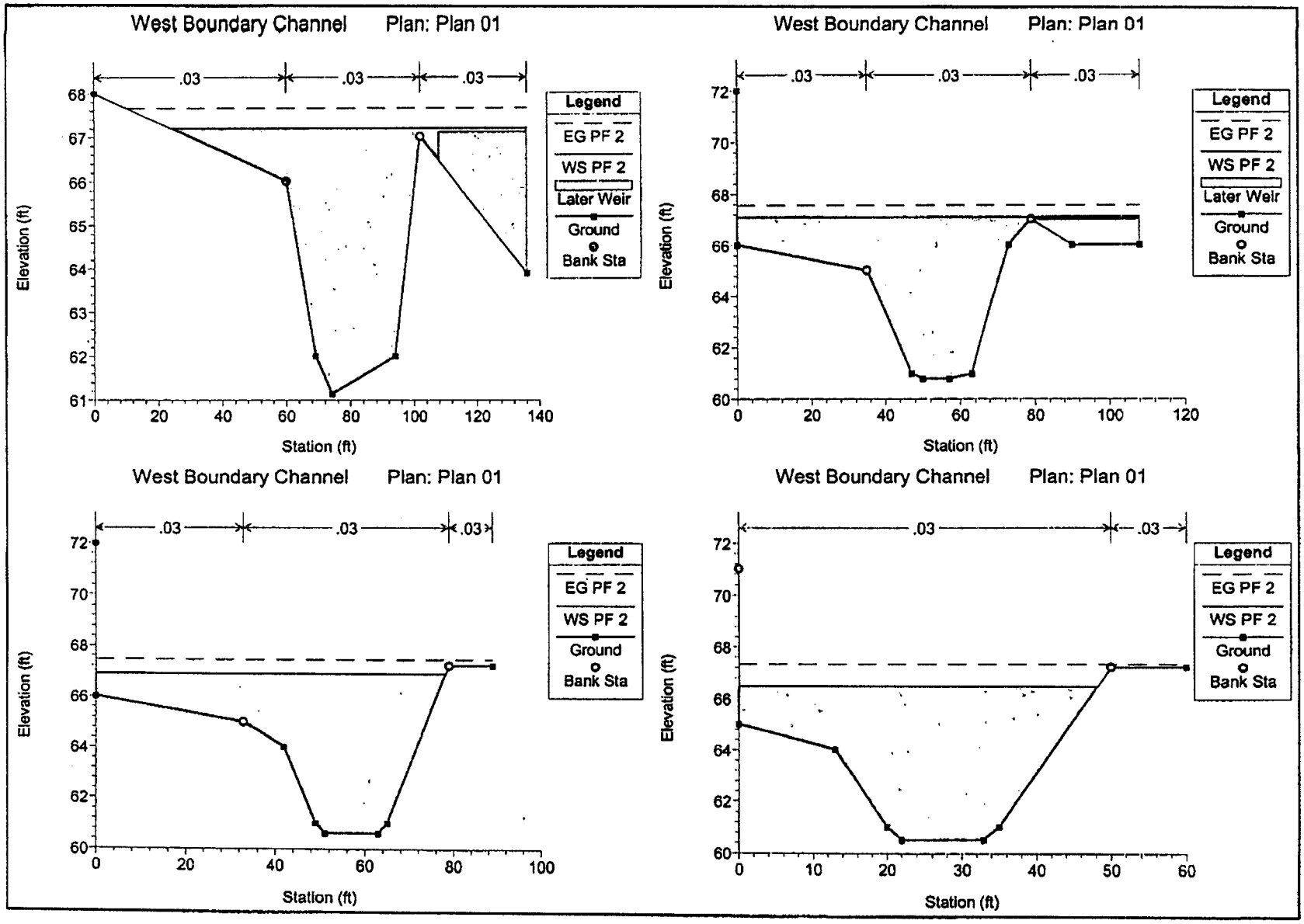

West Boundary Channel Plan: Plan 01
.025
.03
.025
Legend
EG PF 2
WS PF 2
Crit PF 2
Ground
Bank Sta
Elevation (ft)
Station (ft)
West Boundary Channel Plan: Plan 01
.025
.03
.025
Legend
EG PF 2
WS PF 2
Later Weir
Ground
Bank Sta
Elevation (ft)
Station (ft)
West Boundary Channel Plan: Plan 01
.03
.03
.03
Legend
EG PF 2
WS PF 2
Crit PF 2
Ground
Bank Sta
Elevation (ft)
Station (ft)
West Boundary Channel Plan: Plan 01
.03
.03
.03
Legend
EG PF 2
WS PF 2
Crit PF 2
Later Weir
Ground
Bank Sta
Elevation (ft)
Station (ft)

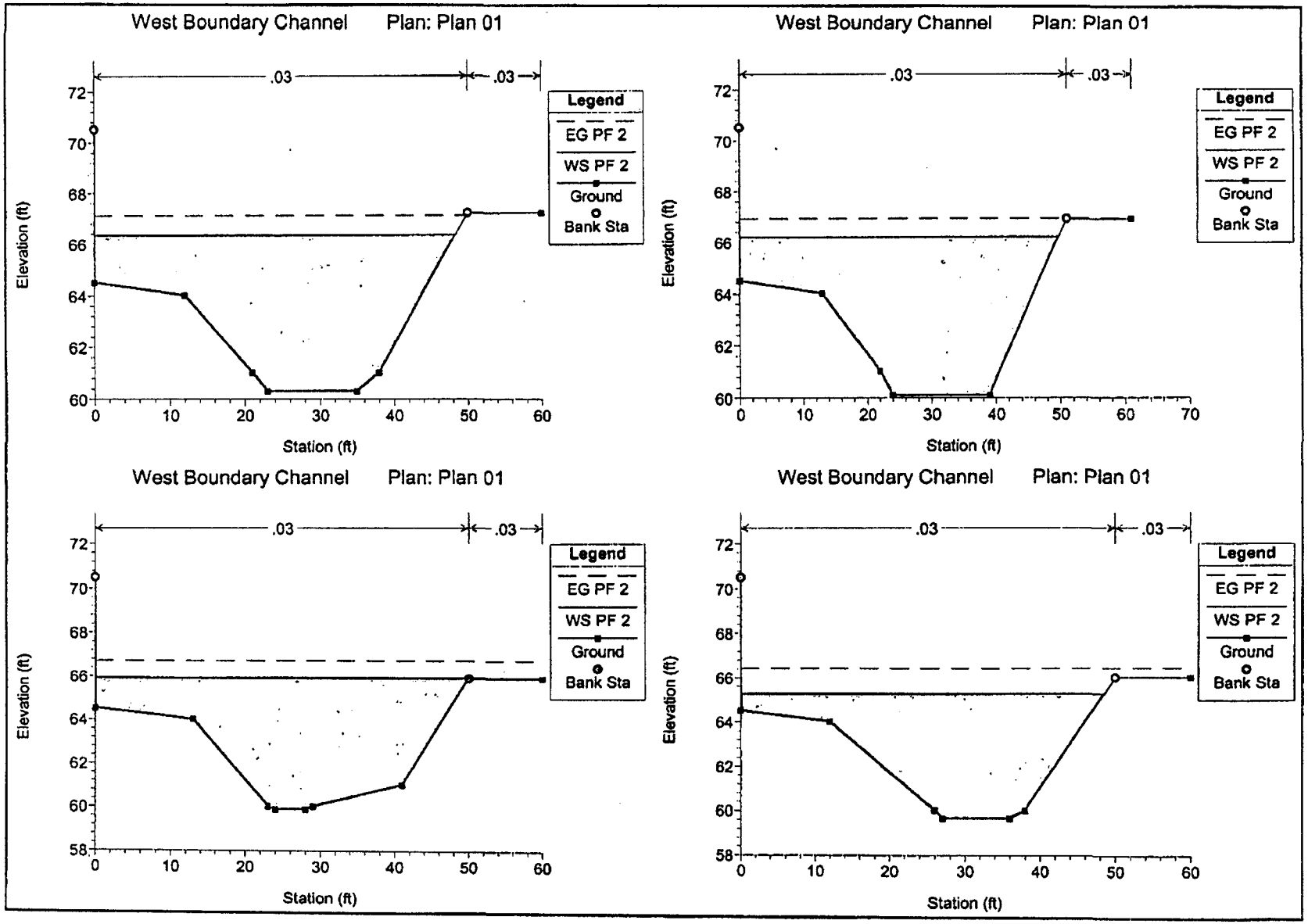

West Boundary Channel Plan: Plan 01
.03
.03
.03
Legend
EG PF 2
WS PF 2
Crit PF 2
Later Weir
Ground
Bank Sta
Elevation (ft)
Station (ft)
West Boundary Channel Plan: Plan 01
West Boundary Channel Plan: Plan 01
West Boundary Channel Plan: Plan 01

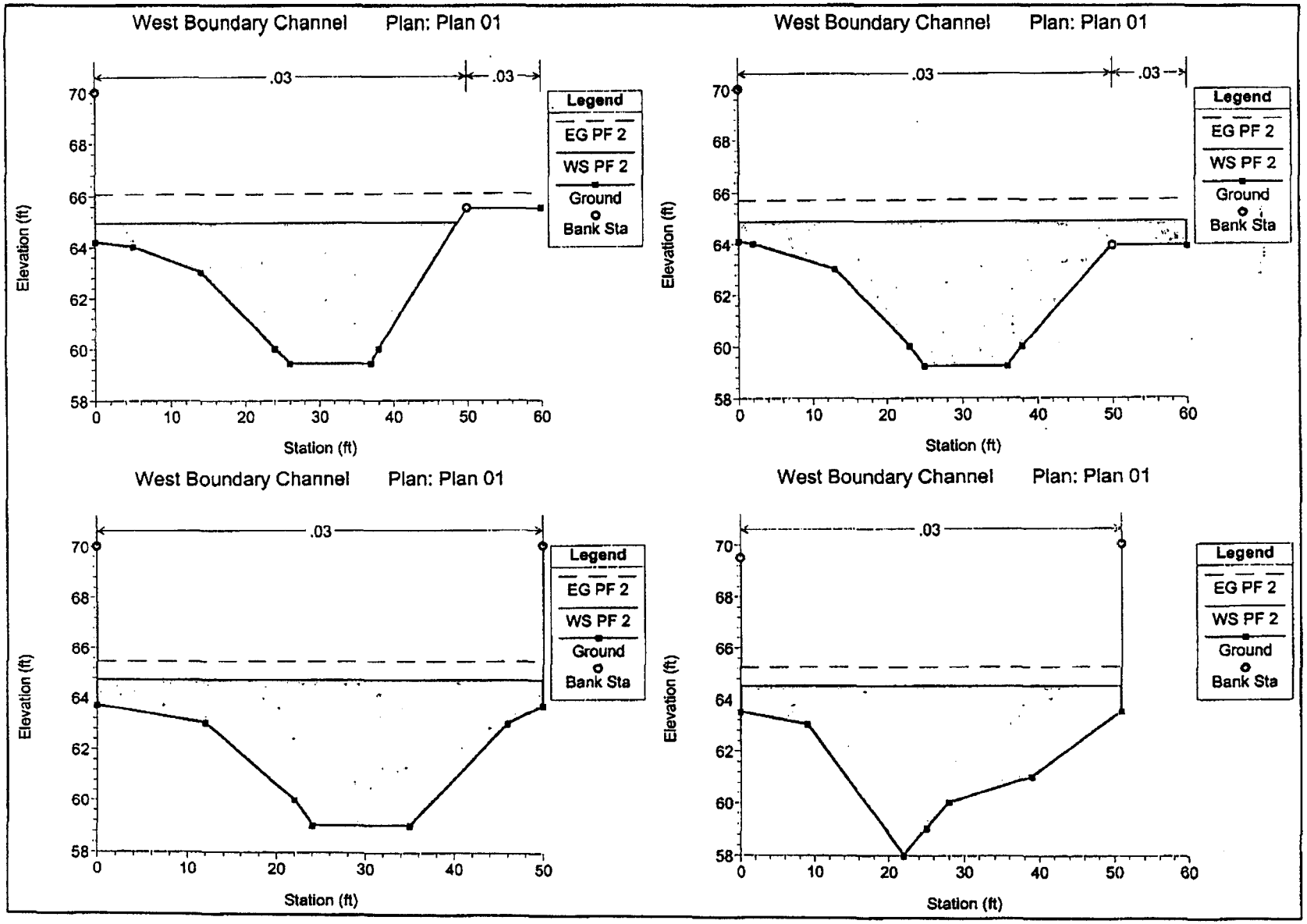

West Boundary Channel Plan: Plan 01
.03
.03
.03
Legend
EG PF 2
Crit PF 2
WS PF 2
Later Weir
Ground
Bank Sta
Elevation (ft)
Station (ft)
West Boundary Channel Plan: Plan 01
.03
.03
.03
Legend
EG PF 2
WS PF 2
Crit PF 2
Later Weir
Ground
Bank Sta
Elevation (ft)
Station (ft)
West Boundary Channel Plan: Plan 01
.03
.03
.03
Legend
EG PF 2
WS PF 2
Later Weir
Ground
Bank Sta
Elevation (ft)
Station (ft)
West Boundary Channel Plan: Plan 01
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Legend
EG PF 2
WS PF 2
Later Weir
Ground
Bank Sta
Elevation (ft)
Station (ft)

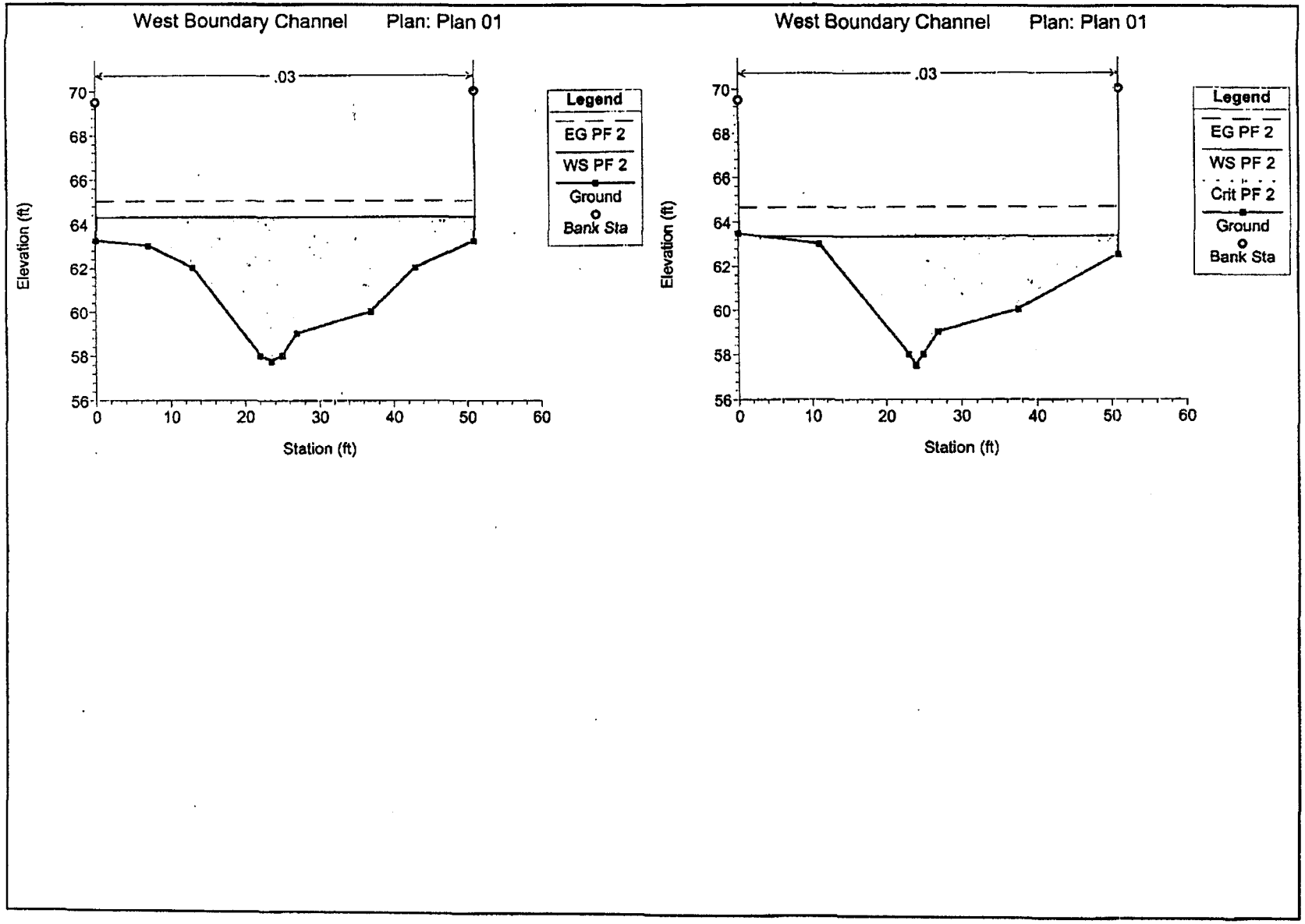

West Boundary Channel Plan: Plan 01
.03
.03
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Legend
EG PF 2
WS PF 2
Later Weir
Ground
Bank Sta
Elevation (ft)
Station (ft)
West Boundary Channel Plan: Plan 01
West Boundary Channel Plan: Plan 01
West Boundary Channel Plan: Plan 01


West Boundary Channel Plan: Plan 01
.03
.03
.03
Legend
EG PF 2
WS PF 2
Later Weir
Ground
Bank Sta
Elevation (ft)
Station (ft)
West Boundary Channel Plan: Plan 01
.03
.03
.03
Legend
EG PF 2
WS PF 2
Ground
Bank Sta
Elevation (ft)
Station (ft)
West Boundary Channel Plan: Plan 01
.03
.03
.03
Legend
EG PF 2
WS PF 2
Later Weir
Ground
Bank Sta
Elevation (ft)
Station (ft)
West Boundary Channel Plan: Plan 01
.03
.03
.03
Legend
EG PF 2
WS PF 2
Later Weir
Ground
Bank Sta
Elevation (ft)
Station (ft)


West Boundary Channel Plan: Plan 01
.03
.03
.03
Legend
EG PF 2
WS PF 2
Later Weir
Ground
Bank Sta
Elevation (ft)
Station (ft)
West Boundary Channel Plan: Plan 01
.03
.03
.03
Legend
EG PF 2
WS PF 2
Later Weir
Ground
Bank Sta
Elevation (ft)
Station (ft)
West Boundary Channel Plan: Plan 01
.03
.03
.03
Legend
EG PF 2
WS PF 2
Ground
Bank Sta
Elevation (ft)
Station (ft)
West Boundary Channel Plan: Plan 01
.03
.03
Legend
EG PF 2
WS PF 2
Ground
Bank Sta
Elevation (ft)
Station (ft)


West Boundary Channel Plan: Plan 01
.03
.03
Legend
EG PF 2
WS PF 2
Ground
Bank Sta
Elevation (ft)
Station (ft)
West Boundary Channel Plan: Plan 01
.03
.03
Legend
EG PF 2
WS PF 2
Ground
Bank Sta
Elevation (ft)
Station (ft)
West Boundary Channel Plan: Plan 01
.03
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Legend
EG PF 2
WS PF 2
Ground
Bank Sta
Elevation (ft)
Station (ft)
West Boundary Channel Plan: Plan 01
.03
.03
Legend
EG PF 2
WS PF 2
Ground
Bank Sta
Elevation (ft)
Station (ft)


West Boundary Channel Plan: Plan 01
.03
.03
Legend
EG PF 2
WS PF 2
Ground
Bank Sta
Elevation (ft)
Station (ft)
West Boundary Channel Plan: Plan 01
.03
.03
Legend
EG PF 2
WS PF 2
Ground
Bank Sta
Elevation (ft)
Station (ft)
West Boundary Channel Plan: Plan 01
.03
Legend
EG PF 2
WS PF 2
Ground
Bank Sta
Elevation (ft)
Station (ft)
West Boundary Channel Plan: Plan 01
.03
Legend
EG PF 2
WS PF 2
Ground
Bank Sta
Elevation (ft)
Station (ft)


West Boundary Channel Plan: Plan 01
.03
Elevation (ft)
Station (ft)
Legend
EG PF 2
WS PF 2
Ground
Bank Sta
West Boundary Channel Plan: Plan 01
.03
Elevation (ft)
Station (ft)
Legend
EG PF 2
WS PF 2
Crit PF 2
Ground
Bank Sta

HEC-RAS Version 3.0.1 Mar 2001
U.S. Army Corp of Engineers
Hydrologic Engineering Center
609 Second Street, Suite D
Davis, California 95616-4687
(916) 756-1104

```
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    X     X  X        X           X  X      X    X
X
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X
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PROJECT DATA
Project Title: West Boundary Channel
Project File : TRMC.prj
Run Date and Time: 1/10/2003 10:31:30 AM

Project in English units

Project Description:
Channel Flow Analysis - Existing Conditions

PLAN DATA

Plan Title: Plan 01
Plan File : c:\HEC\RAS\1903Park\TRMC.p01

Geometry Title: geomdata
Geometry File : c:\HEC\RAS\1903Park\TRMC.g01

Flow Title : Flow 02
Flow File : c:\HEC\RAS\1903Park\TRMC.f02

Plan Summary Information:

Number of:	Cross Sections	= 34	Mulitple Openings	=	0
	Culverts	= 0	Inline Weirs	=	0
	Bridges	= 0			

Computational Information

Water surface calculation tolerance	=	0.01
Critical depth calculaton tolerance	=	0.01
Maximum number of interations	=	20
Maximum difference tolerance	=	0.3
Flow tolerance factor	=	0.001

Computation Options

Critical depth computed only where necessary
Conveyance Calculation Method: At breaks in n values only
Friction Slope Method: Average Conveyance
Computational Flow Regime: Mixed Flow

FLOW DATA

Flow Title: Flow 02
Flow File : c:\HEC\RAS\1903Park\TRMC.f02

Flow Data (cfs)

River	Reach	RS	PF 2
PF 2	PF 3		
Tropicana	Channel	6076	2665
1971	1674		

Boundary Conditions

River	Reach	Profile	Up stream	Downstream
Tropicana	Channel	PF 2	Critical	Critical

GEOMETRY DATA

Geometry Title: geomdata
Geometry File : c:\HEC\RAS\1903Park\TRMC.g01

CROSS SECTION RIVER: Tropicana
REACH: Channel RS: 6076

INPUT
Description:
Station Elevation Data num= 10

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	73.8	19	74	32	73	37	72	41	72
41	68	94	68	94	72	110	72.5	124	72.4

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.025	41	.03	94	.025

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
41	94	96	96	.1	.3

LATERAL WEIR RIVER: Tropicana
REACH: Channel RS: 6075

INPUT
Description:
Lateral weir position = Right overbank
Distance from Upstream XS = 0
Deck/Roadway Width = 28
Weir Coefficient = 3
Weir Flow Reference = Water Surface
Weir Embankment Coordinates num = 8

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	72.4	96	71.5	115	71	226	71.6
276	71	326	70.5	376	70	426	69.3

Weir crest shape = Broad Crested

CROSS SECTION RIVER: Tropicana
REACH: Channel RS: 5980

INPUT
Description:
Station Elevation Data num= 8

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	73	32	72	38	71.5	38	67.5
91	67.5						
91	71.5	111	71	119	71		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.025	38	.03	91	.025

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
38	91	19	19	19	
.1	.3				

CROSS SECTION RIVER: Tropicana
REACH: Channel RS: 5961

INPUT
Description:
Station Elevation Data num= 7

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	73	36	72	43	68	67	67.4
89	68						
95	71	138	71				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.03	36	.03	95	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
36	95	111	111	111	
.1	.3				

CROSS SECTION RIVER: Tropicana
REACH: Channel RS: 5850

```
INPUT
Description:
Station Elevation Data    num=       9
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
   Sta    Elev
       0    71.5      42      71      50      67      64      66
    66   65.84
      71      66      88      68      93      71     121    70.4

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .03      42     .03      93     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff
Contr.   Expan.
              42      93              50      50      50
  .1       .3

CROSS SECTION          RIVER: Tropicana
REACH: Channel            RS: 5800

INPUT
Description:
Station Elevation Data    num=       8
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
   Sta    Elev
       0   71.07      44      70      50      66      66   65.47
    78      66
      88      68      92      70     121      70

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .03      44     .03      92     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff
Contr.   Expan.
              44      92              50      50      50
  .1       .3

CROSS SECTION          RIVER: Tropicana
REACH: Channel            RS: 5750

INPUT
Description:
Station Elevation Data    num=       8
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
   Sta    Elev
       0      71      45      70      50      66      65   65.11
```

```
    71      66
      83      67      94      70      122     70.5

Manning's n Values          num=        3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .03      45     .03      94     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff
Contr.   Expan.
            45      94              50      50      50
  .1       .3

CROSS SECTION          RIVER: Tropicana
REACH: Channel            RS: 5700

INPUT
Description:
Station Elevation Data     num=       10
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
   Sta    Elev
       0    70.6      43      69      48      66      59      65
    65   64.72
      69      65      79      66      88      67      92      69
   136    69.6

Manning's n Values          num=        3
     Sta   n Val     Sta   n Val     Sta   n Val
       0     .03      43     .03      92     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff
Contr.   Expan.
            43      92              50      50      50
  .1       .3

CROSS SECTION          RIVER: Tropicana
REACH: Channel            RS: 5650

INPUT
Description:
Station Elevation Data     num=        8
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
   Sta    Elev
       0    70.4      41      69      54      65      66   64.33
    73      65
      87      66      93      69     135    69.3

Manning's n Values          num=        3
     Sta   n Val     Sta   n Val     Sta   n Val
```

0	.03	41	.03	93	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
41	93	50	50	50	
.1	.3				

LATERAL WEIR RIVER: Tropicana
REACH: Channel RS: 5649

INPUT
Description:
Lateral weir position = Right overbank
Distance from Upstream XS = 0
Deck/Roadway Width = 28
Weir Coefficient = 3
Weir Flow Reference = Water Surface
Weir Embankment Coordinates num = 8

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	69.3	50	69	100	68.4	150	68.4
200	68.2						
250	68	300	67.8	350	67.5		

Weir crest shape = Broad Crested

CROSS SECTION RIVER: Tropicana
REACH: Channel RS: 5600

INPUT
Description:
Station Elevation Data num= 10

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	70	39	69	52	65	65	64
66	63.93						
68	64	79	65	86	66	90	68
133	69						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.03	39	.03	90	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
39	90	50	50	50	
.1	.3				

CROSS SECTION RIVER: Tropicana
REACH: Channel RS: 5550

INPUT
Description:
Station Elevation Data num= 9

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	69.3	38	69	56	65	67	64	74	63.82
75	64	85	65	94	68	132	68.4		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.03	38	.03	94	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
38	94	50	50	50	.1	.3

CROSS SECTION RIVER: Tropicana
REACH: Channel RS: 5500

INPUT
Description:
Station Elevation Data num= 9

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	69.18	37	69	54	65	64	64	73	63.66
75	64	89	65	94	68	129	67.9		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.03	37	.03	94	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
37	94	50	50	50	.1	.3

CROSS SECTION RIVER: Tropicana
REACH: Channel RS: 5450

INPUT
Description:

```
Station Elevation Data    num=       8
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
   Sta     Elev
       0    69.03       37       69       57       64       73    63.51
      80       64
      90       65       97       67      134     67.5

Manning's n Values        num=       3
     Sta    n Val      Sta    n Val      Sta    n Val
       0      .03       37      .03       97      .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff
Contr.   Expan.
             37      97                50      50      50
  .1        .3

CROSS SECTION          RIVER: Tropicana
REACH: Channel            RS: 5400

INPUT
Description:
Station Elevation Data    num=       8
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
   Sta     Elev
       0     68.9       36       69       55       64       73    63.35
      80       64
      91       65       95       68      135     67.2

Manning's n Values        num=       3
     Sta    n Val      Sta    n Val      Sta    n Val
       0      .03       36      .03       95      .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff
Contr.   Expan.
             36      95                50      50      50
  .1        .3

CROSS SECTION          RIVER: Tropicana
REACH: Channel            RS: 5350

INPUT
Description:
Station Elevation Data    num=       8
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
   Sta     Elev
       0       69       38       68       53       64       71     63.2
      79       64
      89       65       94       67      132     66.9
```

```
Manning's n Values          num=        3
     Sta   n Val      Sta   n Val      Sta   n Val
       0     .03       38     .03       94     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff
Contr.   Expan.
             38      94              50      50      50
  .1       .3

CROSS SECTION           RIVER: Tropicana
REACH: Channel             RS: 5300

INPUT
Description:
Station Elevation Data     num=        8
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
   Sta     Elev
       0       69       35       68       49       64       67    63.04
    82       64
      87       65       91       67      130     66.5

Manning's n Values          num=        3
     Sta   n Val      Sta   n Val      Sta   n Val
       0     .03       35     .03       91     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff
Contr.   Expan.
             35      91              50      50      50
  .1       .3

LATERAL WEIR            RIVER: Tropicana
REACH: Channel             RS: 5299

INPUT
Description:
Lateral weir position      = Right overbank
Distance from Upstream XS =        0
Deck/Roadway Width         =       28
Weir Coefficient           =        3
Weir Flow Reference        = Water Surface
 Weir Embankment Coordinates    num =         8
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
   Sta     Elev
       0     67.5       50    67.45      100     67.4      150     67.3
   200    67.25
     250     67.2      300     67.1      350       67
```

Weir crest shape = Broad Crested

CROSS SECTION RIVER: Tropicana
REACH: Channel RS: 5250

INPUT
Description:
Station Elevation Data num= 10

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	68.4	36	68	52	64	68	63	70	62.84
74	63	85	64	90	65	95	67	135	66.1

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.03	36	.03	95	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
36	95	50	50	50	.1	.3

CROSS SECTION RIVER: Tropicana
REACH: Channel RS: 5200

INPUT
Description:
Station Elevation Data num= 10

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	68	31	68	42	66	50	64	62	63
68	62.59	74	63	81	64	93	67	132	65.7

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.03	31	.03	93	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
31	93	50	50	50	.1	.3

CROSS SECTION RIVER: Tropicana

REACH: Channel RS: 5150

INPUT
Description:
Station Elevation Data num= 9

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	68.2	34	67	48	66	53	63	68	62.36
75	63	83	64	93	67	135	68.2		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.03	34	.03	93	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
34	93	50	50	50	.1	.3

CROSS SECTION RIVER: Tropicana
REACH: Channel RS: 5100

INPUT
Description:
Station Elevation Data num= 8

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	68.2	50	67	57	63	68	62.12	76	63
90	64	97	67	134	64.7				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.03	50	.03	97	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
50	97	50	50	50	.1	.3

CROSS SECTION RIVER: Tropicana
REACH: Channel RS: 5050

INPUT
Description:
Station Elevation Data num= 8

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev

```
    Sta     Elev
        0     68.2       52       67       62       62       70    61.67
     80       62
       91       63      100       67      132     64.3

Manning's n Values          num=        3
      Sta    n Val      Sta    n Val      Sta    n Val
        0      .03       52      .03      100      .03

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff
Contr.    Expan.
             52     100                50       50       50
   .1        .3

CROSS SECTION           RIVER: Tropicana
REACH: Channel             RS: 5000

INPUT
Description:
Station Elevation Data      num=        7
      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
    Sta     Elev
        0       68       60       66       69       62       74    61.13
     94       62
      102       67      136     63.9

Manning's n Values          num=        3
      Sta    n Val      Sta    n Val      Sta    n Val
        0      .03       60      .03      102      .03

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff
Contr.    Expan.
             60     102                50       50       50
   .1        .3

CROSS SECTION           RIVER: Tropicana
REACH: Channel             RS: 4950

INPUT
Description:
Station Elevation Data      num=       11
      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
    Sta     Elev
        0       72        0       66       35       65       47       61
     50     60.8
       57     60.8       63       61       73       66       79       67
     90       66
      108       66
```

```
Manning's n Values          num=        3
     Sta   n Val      Sta   n Val      Sta   n Val
       0     .03       35     .03       79     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff
Contr.   Expan.
            35       79                50       50       50
  .1       .3

LATERAL WEIR            RIVER: Tropicana
REACH: Channel             RS: 4949

INPUT
Description:
Lateral weir position      = Right overbank
Distance from Upstream XS =        0
Deck/Roadway Width         =       10
Weir Coefficient           =        3
Weir Flow Reference        = Water Surface
 Weir Embankment Coordinates    num =         8
     Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev
   Sta    Elev
       0      67       50    67.2       77    67.2      127    67.2
   177    66.9
     227    65.9      277      66      327    65.5

Weir crest shape                            = Broad Crested


CROSS SECTION           RIVER: Tropicana
REACH: Channel             RS: 4900

INPUT
Description:
Station Elevation Data    num=       10
     Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev
   Sta    Elev
       0      72        0      66       33       65       42       64
    49       61
      51    60.6       63    60.6       65       61       79    67.2
    89    67.2

Manning's n Values          num=        3
     Sta   n Val      Sta   n Val      Sta   n Val
       0     .03       33     .03       79     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff
```

```
Contr.    Expan.
             33       79                27       27       27
  .1        .3

CROSS SECTION          RIVER: Tropicana
REACH: Channel            RS: 4873

INPUT
Description:
Station Elevation Data    num=        9
     Sta     Elev     Sta     Elev     Sta     Elev     Sta     Elev
   Sta     Elev
       0       71        0       65       13       64       20       61
    22    60.49
      33    60.49       35       61       50     67.2       60     67.2

Manning's n Values        num=        3
     Sta    n Val     Sta    n Val     Sta    n Val
       0      .03       0      .03       50      .03

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff
Contr.    Expan.
             0       50                50       50       50
  .1        .3

CROSS SECTION          RIVER: Tropicana
REACH: Channel            RS: 4823

INPUT
Description:
Station Elevation Data    num=        9
     Sta     Elev     Sta     Elev     Sta     Elev     Sta     Elev
   Sta     Elev
       0     70.5        0     64.5       12       64       21       61
    23    60.29
      35    60.29       38       61       50     67.2       60     67.2

Manning's n Values        num=        3
     Sta    n Val     Sta    n Val     Sta    n Val
       0      .03       0      .03       50      .03

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff
Contr.    Expan.
             0       50                50       50       50
  .1        .3

CROSS SECTION          RIVER: Tropicana
REACH: Channel            RS: 4773
```

```
INPUT
Description:
Station Elevation Data    num=       8
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
   Sta     Elev
       0     70.5        0     64.5       13       64       22       61
    24     60.1
      39     60.1       51     66.9       61     66.9

Manning's n Values        num=       3
     Sta    n Val      Sta    n Val      Sta    n Val
       0      .03        0      .03       51      .03

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff
Contr.   Expan.
              0      51                50       50       50
  .1       .3

CROSS SECTION          RIVER: Tropicana
REACH: Channel            RS: 4723

INPUT
Description:
Station Elevation Data    num=      10
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
   Sta     Elev
       0     70.5        0     64.5       13       64       23       60
    24    59.86
      28    59.86       29       60       41       61       50     65.9
    60     65.9

Manning's n Values        num=       3
     Sta    n Val      Sta    n Val      Sta    n Val
       0      .03        0      .03       50      .03

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff
Contr.   Expan.
              0      50                50       50       50
  .1       .3

CROSS SECTION          RIVER: Tropicana
REACH: Channel            RS: 4673

INPUT
Description:
Station Elevation Data    num=       9
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
```

```
   Sta     Elev
     0     70.5        0     64.5       12       64       26       60
    27    59.65
    36    59.65       38       60       50       66       60       66

Manning's n Values          num=         3
     Sta   n Val      Sta   n Val      Sta   n Val
       0     .03        0     .03       50     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff
Contr.   Expan.
               0      50                50       50       50
  .1       .3

CROSS SECTION           RIVER: Tropicana
REACH: Channel             RS: 4623

INPUT
Description:
Station Elevation Data      num=       10
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
   Sta     Elev
     0       70        0     64.2        5       64       14       63
    24       60
    26    59.44       37    59.44       38       60       50     65.5
    60     65.5

Manning's n Values          num=         3
     Sta   n Val      Sta   n Val      Sta   n Val
       0     .03        0     .03       50     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff
Contr.   Expan.
               0      50                50       50       50
  .1       .3

LATERAL WEIR            RIVER: Tropicana
REACH: Channel             RS: 4622

INPUT
Description:
Lateral weir position      = Right overbank
Distance from Upstream XS =         0
Deck/Roadway Width         =        10
Weir Coefficient           =         3
Weir Flow Reference        = Water Surface
 Weir Embankment Coordinates    num =          3
     Sta     Elev      Sta     Elev      Sta     Elev
```

```
       0     65.5       50     63.9       87     63.6

Weir crest shape                                 = Broad Crested


CROSS SECTION          RIVER: Tropicana
REACH: Channel            RS: 4573

INPUT
Description:
Station Elevation Data    num=      10
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
   Sta     Elev
       0       70        0     64.1        2       64       13       63
    23       60
      25    59.23       36    59.23       38       60       50     63.9
    60     63.9

Manning's n Values        num=       3
     Sta    n Val      Sta    n Val      Sta    n Val
       0      .03        0      .03       50      .03

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff
Contr.   Expan.
              0      50                 50       50       50
  .1       .3

CROSS SECTION          RIVER: Tropicana
REACH: Channel            RS: 4523

INPUT
Description:
Station Elevation Data    num=       9
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
   Sta     Elev
       0       70        0     63.7       12       63       22       60
    24    59.02
      35    59.02       46       63       50     63.7       50       70

Manning's n Values        num=       3
     Sta    n Val      Sta    n Val      Sta    n Val
       0      .03        0      .03       50      .03

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff
Contr.   Expan.
              0      50                 50       50       50
  .1       .3
```

CROSS SECTION RIVER: Tropicana
REACH: Channel RS: 4473

INPUT
Description:
Station Elevation Data num= 9

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	69.5	0	63.5	9	63	22	58	25	59
28	60	39	61	51	63.5	51	70		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.03	0	.03	51	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	51	50	50	.1	.3

CROSS SECTION RIVER: Tropicana
REACH: Channel RS: 4423

INPUT
Description:
Station Elevation Data num= 12

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	69.5	0	63.25	7	63	13	62	22	58
23.5	57.75	25	58	27	59	37	60	43	62
51	63.2	51	70						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.03	0	.03	51	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	51	50	50	.1	.3

CROSS SECTION RIVER: Tropicana
REACH: Channel RS: 4373

INPUT

Description:
Station Elevation Data num= 10

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	69.5	0	63.5	11	63	23	58	24	57.5
25	58	27	59	37.5	60	51	62.5	51	70

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.03	0	.03	51	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
0	51	0	0	0	.1	.3

SUMMARY OF MANNING'S N VALUES

River:Tropicana

Reach	River Sta.	n1	n2	n3
Channel	6076	.025	.03	.025
Channel	6075	Lat. Weir		
Channel	5980	.025	.03	.025
Channel	5961	.03	.03	.03
Channel	5850	.03	.03	.03
Channel	5800	.03	.03	.03
Channel	5750	.03	.03	.03
Channel	5700	.03	.03	.03
Channel	5650	.03	.03	.03
Channel	5649	Lat. Weir		
Channel	5600	.03	.03	.03
Channel	5550	.03	.03	.03
Channel	5500	.03	.03	.03
Channel	5450	.03	.03	.03
Channel	5400	.03	.03	.03
Channel	5350	.03	.03	.03
Channel	5300	.03	.03	.03
Channel	5299	Lat. Weir		
Channel	5250	.03	.03	.03
Channel	5200	.03	.03	.03
Channel	5150	.03	.03	.03

Channel	5100	.03	.03	.03
Channel	5050	.03	.03	.03
Channel	5000	.03	.03	.03
Channel	4950	.03	.03	.03
Channel	4949	Lat. Weir		
Channel	4900	.03	.03	.03
Channel	4873	.03	.03	.03
Channel	4823	.03	.03	.03
Channel	4773	.03	.03	.03
Channel	4723	.03	.03	.03
Channel	4673	.03	.03	.03
Channel	4623	.03	.03	.03
Channel	4622	Lat. Weir		
Channel	4573	.03	.03	.03
Channel	4523	.03	.03	.03
Channel	4473	.03	.03	.03
Channel	4423	.03	.03	.03
Channel	4373	.03	.03	.03

SUMMARY OF REACH LENGTHS

River: Tropicana

Reach	River Sta.	Left	Channel	Right
Channel	6076	96	96	96
Channel	6075	Lat. Weir		
Channel	5980	19	19	19
Channel	5961	111	111	111
Channel	5850	50	50	50
Channel	5800	50	50	50
Channel	5750	50	50	50
Channel	5700	50	50	50
Channel	5650	50	50	50
Channel	5649	Lat. Weir		
Channel	5600	50	50	50
Channel	5550	50	50	50
Channel	5500	50	50	50
Channel	5450	50	50	50
Channel	5400	50	50	50
Channel	5350	50	50	50
Channel	5300	50	50	50
Channel	5299	Lat. Weir		
Channel	5250	50	50	50

Channel	5200	50	50	50
Channel	5150	50	50	50
Channel	5100	50	50	50
Channel	5050	50	50	50
Channel	5000	50	50	50
Channel	4950	50	50	50
Channel	4949	Lat. Weir		
Channel	4900	27	27	27
Channel	4873	50	50	50
Channel	4823	50	50	50
Channel	4773	50	50	50
Channel	4723	50	50	50
Channel	4673	50	50	50
Channel	4623	50	50	50
Channel	4622	Lat. Weir		
Channel	4573	50	50	50
Channel	4523	50	50	50
Channel	4473	50	50	50
Channel	4423	50	50	50
Channel	4373	0	0	0

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: Tropicana

Reach	River Sta.	Contr.	Expan.
Channel	6076	.1	.3
Channel	6075	Lat. Weir	
Channel	5980	.1	.3
Channel	5961	.1	.3
Channel	5850	.1	.3
Channel	5800	.1	.3
Channel	5750	.1	.3
Channel	5700	.1	.3
Channel	5650	.1	.3
Channel	5649	Lat. Weir	
Channel	5600	.1	.3
Channel	5550	.1	.3
Channel	5500	.1	.3
Channel	5450	.1	.3
Channel	5400	.1	.3
Channel	5350	.1	.3
Channel	5300	.1	.3

Channel	5299	Lat. Weir	
Channel	5250	.1	.3
Channel	5200	.1	.3
Channel	5150	.1	.3
Channel	5100	.1	.3
Channel	5050	.1	.3
Channel	5000	.1	.3
Channel	4950	.1	.3
Channel	4949	Lat. Weir	
Channel	4900	.1	.3
Channel	4873	.1	.3
Channel	4823	.1	.3
Channel	4773	.1	.3
Channel	4723	.1	.3
Channel	4673	.1	.3
Channel	4623	.1	.3
Channel	4622	Lat. Weir	
Channel	4573	.1	.3
Channel	4523	.1	.3
Channel	4473	.1	.3
Channel	4423	.1	.3
Channel	4373	.1	.3

Profile Output Table - HEC-FDA

Reach	River Sta	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)
Channel	6076	1971.00	68.00	72.31
Channel	6075	Lat. Weir		
Channel	5980	1923.46	67.50	72.11
Channel	5961	1880.85	67.40	72.03
Channel	5850	1769.56	65.84	71.34
Channel	5800	1754.46	65.47	71.52
Channel	5750	1741.20	65.11	70.13
Channel	5700	1741.20	64.72	68.91
Channel	5650	1741.20	64.33	69.17
Channel	5649	Lat. Weir		
Channel	5600	1741.20	63.93	68.10
Channel	5550	1732.75	63.82	68.92
Channel	5500	1694.28	63.66	68.67
Channel	5450	1651.07	63.51	68.79
Channel	5400	1606.26	63.35	68.29
Channel	5350	1573.86	63.20	68.22
Channel	5300	1514.50	63.04	68.15
Channel	5299	Lat. Weir		
Channel	5250	1437.93	62.84	68.08

Channel	5200	1364.50	62.59	68.01
Channel	5150	1332.55	62.36	67.37
Channel	5100	1328.96	62.12	67.35
Channel	5050	1324.52	61.67	67.29
Channel	5000	1319.96	61.13	67.20
Channel	4950	1314.74	60.80	67.11
Channel	4949	Lat. Weir		
Channel	4900	1314.15	60.60	66.89
Channel	4873	1314.15	60.49	66.48
Channel	4823	1314.15	60.29	66.34
Channel	4773	1314.15	60.10	66.20
Channel	4723	1314.13	59.86	65.93
Channel	4673	1314.11	59.65	65.29
Channel	4623	1314.11	59.44	64.96
Channel	4622	Lat. Weir		
Channel	4573	1276.77	59.23	64.88
Channel	4523	1153.11	59.02	64.73
Channel	4473	1153.11	58.00	64.52
Channel	4423	1153.11	57.75	64.33
Channel	4373	1153.11	57.50	63.36

Tropicana - 100-yr flow
Worksheet for Irregular Channel

Project Description	
Worksheet	Tropicana
Flow Element	Irregular Channel
Method	Manning's Formul
Solve For	Channel Depth

Input Data		
Slope	0.018100	ft/ft
Discharge	433.00	cfs

Options	
Current Roughness Method	mproved Lotter's Method
Open Channel Weighting Metho	mproved Lotter's Method
Closed Channel Weighting Met	Horton's Method

Results		
Mannings Coefficient	0.016	
Water Surface Elevatio	1.43	ft
Elevation Range	0.00 to 2.00	
Flow Area	57.0	ft²
Wetted Perimeter	118.50	ft
Top Width	116.35	ft
Actual Depth	1.43	ft
Critical Elevation	1.70	ft
Critical Slope	0.004393	ft/ft
Velocity	7.59	ft/s
Velocity Head	0.90	ft
Specific Energy	2.33	ft
Froude Number	1.91	
Flow Type	Supercritical	

D x V = 1.43 * 7.59

= 10.85 > 8.0

EXISTING CONDITION

Calculation Messages:
Water elevation exceeds lowest end station by 0.83120439 ft.
Flow is divided.

Roughness Segments		
Start Station	End Station	Mannings Coefficient
0+00.0	0+07.0	0.015
0+07.0	1+21.0	0.017
1+21.0	1+28.0	0.015

Natural Channel Points	
Station (ft)	Elevation (ft)
0+00.0	0.60
0+05.5	0.50
0+05.5	0.00
0+07.0	0.13
0+07.0	0.17
0+40.0	1.00
0+65.0	1.50

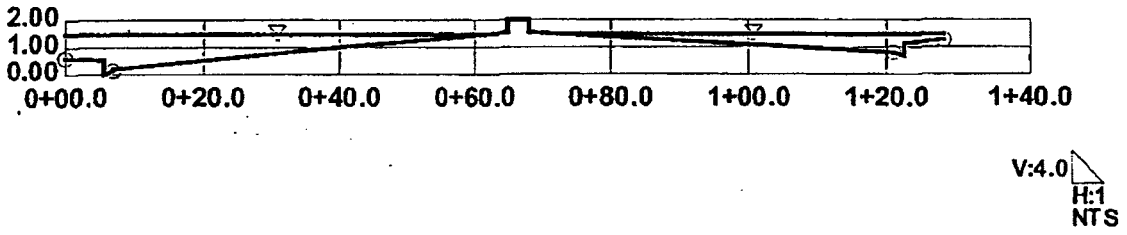
Tropicana - 100-yr flow
Worksheet for Irregular Channel

Natural Channel Points	
Station (ft)	Elevation (ft)
0+65.0	2.00
0+68.0	2.00
0+68.0	1.50
1+21.0	0.80
1+21.0	0.76
1+22.5	0.63
1+22.5	1.13
1+28.0	1.23

Tropicana - Q100
Cross Section for Irregular Channel

Project Description	
Worksheet	Tropicana
Flow Element	Irregular Channel
Method	Manning's Formul
Solve For	Channel Depth

Section Data		
Mannings Coefficient	0.016	
Slope	0.018100	ft/ft
Water Surface Elevatio	1.43	ft
Elevation Range	0.00 to 2.00	
Discharge	433.00	cfs



Paradise RD. Q100 @ X-sect E2
Worksheet for Irregular Channel

EXISTING & FUTURE

Project Description	
Worksheet	80 FOOT ROW
Flow Element	Irregular Channel
Method	Manning's Formul
Solve For	Channel Depth

Input Data		
Slope	0.003200	ft/ft
Discharge	456.00	cfs

Options	
Current Roughness Method	mproved Lotter's Method
Open Channel Weighting Metho	mproved Lotter's Method
Closed Channel Weighting Met	Horton's Method

Results		
Mannings Coefficient	0.017	
Water Surface Elevatio	1.57	ft
Elevation Range	0.00 to 0.83	
Flow Area	86.4	ft²
Wetted Perimeter	81.106	ft
Top Width	80.000	ft
Actual Depth	1.57	ft ←
Critical Elevation	1.49	ft
Critical Slope	0.004085	ft/ft
Velocity	5.28	ft/s ←
Velocity Head	0.43	ft
Specific Energy	2.00	ft
Froude Number	0.90	
Flow Type	Subcritical	

$D \times V = 1.57 \times 5.28$

$= 8.29 > 8.00$

HOWEVER, IT IS AN EXISTING CONDITION

Calculation Messages:
Water elevation exceeds lowest end station by 0.97010462 ft.

Roughness Segments		
Start Station	End Station	Mannings Coefficient
0+00.0	0+07.0	0.015
0+07.0	0+73.0	0.017
0+73.0	0+80.0	0.015

Natural Channel Points	
Station (ft)	Elevation (ft)
0+00.0	0.600
0+05.5	0.500
0+05.5	0.000
0+07.0	0.130
0+07.0	0.170
0+40.0	0.830
0+73.0	0.170
0+73.0	0.130

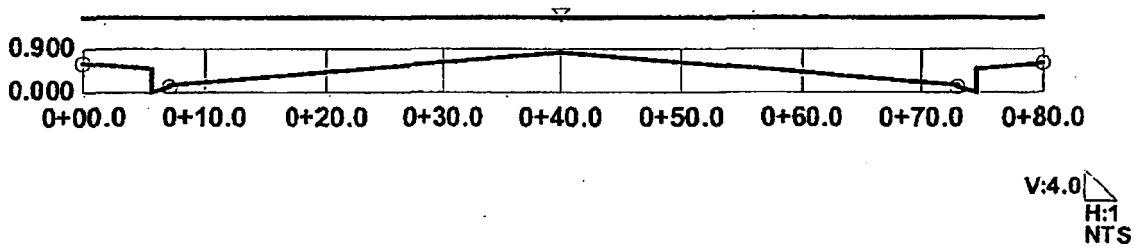
Paradise RD. Q100 @ X-sect E2
Worksheet for Irregular Channel

Natural Channel Points	
Station (ft)	Elevation (ft)
0+74.5	0.000
0+74.5	0.500
0+80.0	0.600

Paradise RD. D100 @ E2
Cross Section for Irregular Channel

Project Description	
Worksheet	80 FOOT ROW
Flow Element	Irregular Channel
Method	Manning's Formul
Solve For	Channel Depth

Section Data		
Mannings Coefficient	0.017	
Slope	0.003200	ft/ft
Water Surface Elevatio	1.57	ft
Elevation Range	0.00 to 0.83	
Discharge	456.00	cfs



V:4.0
H:1
NTS

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Paradise RD. Q100 @ X-sect E3
Worksheet for Irregular Channel

Project Description	
Worksheet	80 FOOT ROW
Flow Element	Irregular Channel
Method	Manning's Formul
Solve For	Channel Depth

Input Data		
Slope	0.010000	ft/ft
Discharge	694.00	cfs

Options	
Current Roughness Method	mproved Lotter's Method
Open Channel Weighting Metho	mproved Lotter's Method
Closed Channel Weighting Met	Horton's Method

Results		
Mannings Coefficient	0.017	
Water Surface Elevatio	1.48	ft
Elevation Range	0.00 to 0.83	
Flow Area	78.9	ft²
Wetted Perimeter	81.106	ft
Top Width	80.000	ft
Actual Depth	1.48	ft
Critical Elevation	1.82	ft
Critical Slope	0.003720	ft/ft
Velocity	8.79	ft/s
Velocity Head	1.20	ft
Specific Energy	2.68	ft
Froude Number	1.56	
Flow Type	Supercritical	

D x V = 1.48 * 8.79
= 13.0 > 8.0

HOWEVER, IT IS AN EXISTING CONDITION

Calculation Messages:
Water elevation exceeds lowest end station by 0.87726654 ft.

Roughness Segments		
Start Station	End Station	Mannings Coefficient
0+00.0	0+07.0	0.015
0+07.0	0+73.0	0.017
0+73.0	0+80.0	0.015

Natural Channel Points	
Station (ft)	Elevation (ft)
0+00.0	0.600
0+05.5	0.500
0+05.5	0.000
0+07.0	0.130
0+07.0	0.170
0+40.0	0.830
0+73.0	0.170
0+73.0	0.130

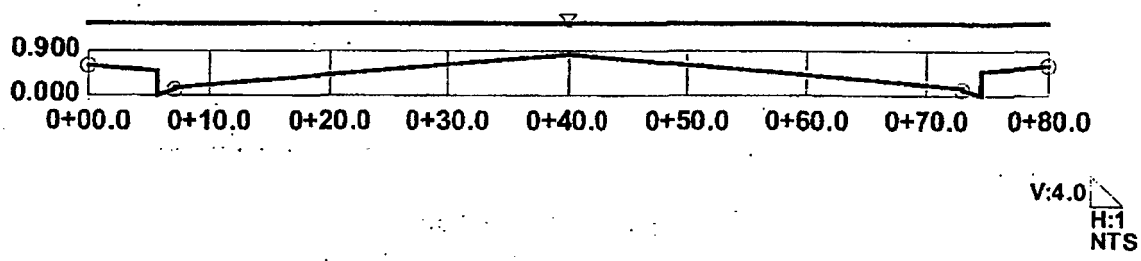
Paradise RD. Q100 @ X-sect E3
Worksheet for Irregular Channel

Natural Channel Points	
Station (ft)	Elevation (ft)
0+74.5	0.000
0+74.5	0.500
0+80.0	0.600

Paradise RD. D100 @ E3
Cross Section for Irregular Channel

Project Description	
Worksheet	80 FOOT ROW
Flow Element	Irregular Channel
Method	Manning's Formul
Solve For	Channel Depth

Section Data		
Mannings Coefficient	0.017	
Slope	0.010000	ft/ft
Water Surface Elevatio	1.48	ft
Elevation Range	0.00 to 0.83	
Discharge	694.00	cfs



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Martin & Martin
37 Brookside Road Waterbury, CT 06708 USA (203) 755-1666

LAS VEGAS BLVD - CAPACITY

Culvert Calculator Report
LVBLVD - 2:10x6 RCB - TRMC 0263

Solve For: Discharge

Culvert Summary			
Allowable HW Elevation	9.53 ft	Headwater Depth/ Height	1.42
Computed Headwater Elevation	9.53 ft	Discharge	1,165.79 cfs
Inlet Control HW Elev	9.53 ft	Tailwater Elevation	0.00 ft
Outlet Control HW Elev	9.27 ft	Control Type	Inlet Control

Grades			
Upstream Invert	1.00 ft	Downstream Invert	0.00 ft
Length	100.00 ft	Constructed Slope	0.010000 ft/ft

Hydraulic Profile			
Profile	S2	Depth, Downstream	3.73 ft
Slope Type	Steep	Normal Depth	3.25 ft
Flow Regime	Supercritical	Critical Depth	4.73 ft
Velocity Downstream	15.62 ft/s	Critical Slope	0.003563 ft/ft

Section			
Section Shape	Box	Mannings Coefficient	0.013
Section Material	Concrete	Span	10.00 ft
Section Size	10 x 6 ft	Rise	6.00 ft
Number Sections	2		

Outlet Control Properties			
Outlet Control HW Elev	9.27 ft	Upstream Velocity Head	2.36 ft
Ke	0.50	Entrance Loss	1.18 ft

Inlet Control Properties			
Inlet Control HW Elev	9.53 ft	Flow Control	N/A
Inlet Type	90 and 15 ° wingwall flares	Area Full	120.0 ft²
K	0.06100	HDS 5 Chart	8
M	0.75000	HDS 5 Scale	2
C	0.04000	Equation Form	1
Y	0.80000		

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37 Brookside Road Waterbury, CT 06708 USA (203) 755-1666

CAPACITY

Culvert Calculator Report
TRMC 0233 - Dewey 2: 8x6 RCB

Solve For: Discharge

Culvert Summary			
Allowable HW Elevation	14.20 ft	Headwater Depth/ Height	2.20
Computed Headwater Elevation	14.20 ft	Discharge	1,392.76 cfs
Inlet Control HW Elev	14.20 ft	Tailwater Elevation	0.00 ft
Outlet Control HW Elev	12.05 ft	Control Type	Inlet Control

Grades			
Upstream Invert	1.00 ft	Downstream Invert	0.36 ft
Length	100.00 ft	Constructed Slope	0.006400 ft/ft

Hydraulic Profile			
Profile	Pressure	Depth, Downstream	6.00 ft
Slope Type	N/A	Normal Depth	N/A ft
Flow Regime	N/A	Critical Depth	6.00 ft
Velocity Downstream	14.51 ft/s	Critical Slope	0.007852 ft/ft

Section			
Section Shape	Box	Mannings Coefficient	0.013
Section Material	Concrete	Span	8.00 ft
Section Size	8 x 6 ft	Rise	6.00 ft
Number Sections	2		

Outlet Control Properties			
Outlet Control HW Elev	12.05 ft	Upstream Velocity Head	3.27 ft
Ke	0.50	Entrance Loss	1.64 ft

Inlet Control Properties			
Inlet Control HW Elev	14.20 ft	Flow Control	N/A
Inlet Type	90 and 15 ° wingwall flares	Area Full	96.0 ft²
K	0.06100	HDS 5 Chart	8
M	0.75000	HDS 5 Scale	2
C	0.04000	Equation Form	1
Y	0.80000		

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Culvert Calculator Report
Onsite RCBC

Solve For: Headwater Elevation

Culvert Summary			
Allowable HW Elevation	3.00 ft	Headwater Depth/ Height	0.93
Computed Headwater Elevation	2.79 ft	Discharge	456.00 cfs
Inlet Control HW Elev	2.71 ft	Tailwater Elevation	0.00 ft
Outlet Control HW Elev	2.79 ft	Control Type	Entrance Control

Grades			
Upstream Invert	0.00 ft	Downstream Invert	-0.25 ft
Length	50.00 ft	Constructed Slope	0.005000 ft/ft

Hydraulic Profile			
Profile	S2	Depth, Downstream	1.41 ft
Slope Type	Steep	Normal Depth	1.38 ft
Flow Regime	*Supercritical*	*Critical Depth*	1.59 ft
Velocity Downstream	8.06 ft/s	Critical Slope	0.003297 ft/ft

Section			
Section Shape	Box	Mannings Coefficient	0.013
Section Material	Concrete	Span	8.00 ft
Section Size	8 x 3 ft	Rise	3.00 ft
Number Sections	5		

Outlet Control Properties			
Outlet Control HW Elev	2.79 ft	Upstream Velocity Head	0.80 ft
Ke	0.50	Entrance Loss	0.40 ft

Inlet Control Properties			
Inlet Control HW Elev	2.71 ft	Flow Control	N/A
Inlet Type	90 and 15 ° wingwall flares	Area Full	120.0 ft²
K	0.06100	HDS 5 Chart	8
M	0.75000	HDS 5 Scale	2
C	0.04000	Equation Form	1
Y	0.80000		

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37 Brookside Road Waterbury, CT 06708 USA (203) 755-1666

Las Vegas Blvd - West 1/2 Street Capacity
Worksheet for Gutter Section

Project Description	
Worksheet	Gutter Section - 1
Type	Gutter Section
Solve For	Discharge

Input Data		
Slope	0.008330	ft/ft
Gutter Width	1.500	ft
Gutter Cross Slope	0.086600	ft/ft
Road Cross Slope	0.020000	ft/ft
Spread	60.000	ft
Mannings Coefficient	0.016	

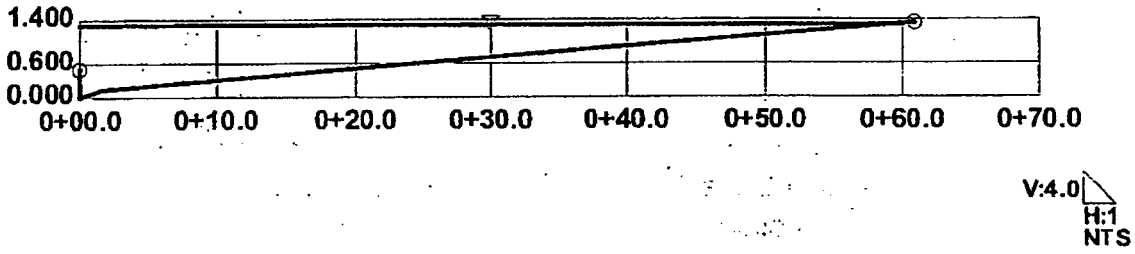
Results		
Discharge	261.10	cfs
Flow Area	36.1	ft²
Depth	1.30	ft
Gutter Depression	1.2	in
Velocity	7.24	ft/s

← CONTAINED IN WEST 1/2 STREET

Las Vegas Blvd - West 1/2 Street Capacity
Cross Section for Gutter Section

Project Description	
Worksheet	Gutter Section - 1
Type	Gutter Section
Solve For	Discharge

Section Data		
Slope	0.008330	ft/ft
Discharge	261.10	cfs
Gutter Width	1.500	ft
Gutter Cross Slope	0.086600	ft/ft
Road Cross Slope	0.020000	ft/ft
Spread	60.000	ft
Mannings Coefficient	0.016	



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Martin & Martin
37 Brookside Road Waterbury, CT 06708 USA (203) 755-1666

MARTIN & MARTIN
CIVIL ENGINEERS

Title PREMIER PARK Job No.

Subject WEIR SECTION TO GOLF COURSE CHANNEL

Date 1/24/03 By Sheet of

USE BROAD CRESTED WEIR FLOW EQ.

$$Q = CLH^{3/2}$$

WHERE Q = FLOW (CFS) = 456

C = WEIR COEFF = 3.0

H = DEPTH OVER WEIR (SOLVE FOR)

L = LENGTH OF WEIR SECT = 200'

$$\rightarrow H = \left[\frac{Q}{CL}\right]^{2/3} = \left[\frac{456}{(3)(200)}\right]^{2/3}$$

$$= 0.83 \text{ ft.}$$

Golf Course Channel - Q100 = 456 cfs
Worksheet for Trapezoidal Channel

Project Description	
Worksheet	Golf Course Chann
Flow Element	Trapezoidal Channe
Method	Manning's Formula
Solve For	Channel Depth

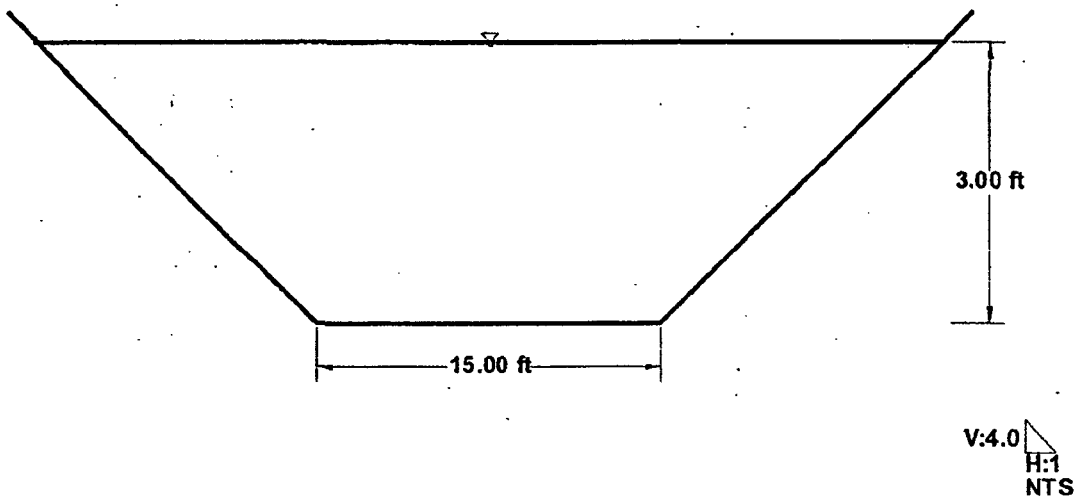
Input Data		
Mannings Coefficient	0.030	
Slope	0.005000	ft/ft
Left Side Slope	4.00	H : V
Right Side Slope	4.00	H : V
Bottom Width	15.00	ft
Discharge	456.00	cfs

Results		
Depth	3.00	ft
Flow Area	81.0	ft²
Wetted Perimete	39.74	ft
Top Width	39.00	ft
Critical Depth	2.45	ft
Critical Slope	0.011126	ft/ft
Velocity	5.63	ft/s
Velocity Head	0.49	ft
Specific Energy	3.49	ft
Froude Number	0.69	
Flow Type	Subcritical	

Golf Course Channel
Cross Section for Trapezoidal Channel

Project Description	
Worksheet	Golf Course Chann
Flow Element	Trapezoidal Channe
Method	Manning's Formula
Solve For	Channel Depth

Section Data		
Mannings Coefficient	0.030	
Slope	0.005000	ft/ft
Depth	3.00	ft
Left Side Slope	4.00	H : V
Right Side Slope	4.00	H : V
Bottom Width	15.00	ft
Discharge	456.00	cfs



OPEN CHANNELS

(SUB-CRITICAL FLOW)

FREEBOARD: In no case shall the freeboard be less than 1 foot.
Add 0.5 feet to computed freeboard at bend sections.

$$Fb = 0.5 + V^2 / 2g$$ EQ 741

Where: Fb = Freeboard Height (ft)
V = Mean Design Velocity (fps) = 5.63
g = Acceleration of Gravity (ft / sec^2) = 32.2

Fb = 1.00

FLOW DEPTH = 3.0 ft

CHANNEL DEPTH = 4.5 ft OK

18" Storm Drain Capacity
Worksheet for Circular Channel

Project Description	
Worksheet	18" SD
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Full Flow Capacity

Input Data		
Mannings Coefficient	0.013	
Slope	0.005000	ft/ft
Diameter	18	in

Results		
Depth	1.50	ft
Discharge	7.43	cfs
Flow Area	1.8	ft²
Wetted Perimeter	4.71	ft
Top Width	0.00	ft
Critical Depth	1.06	ft
Percent Full	100.0	%
Critical Slope	0.007032	ft/ft
Velocity	4.20	ft/s
Velocity Head	0.27	ft
Specific Energy	1.77	ft
Froude Number	0.00	
Maximum Dischar	7.99	cfs
Discharge Full	7.43	cfs
Slope Full	0.005000	ft/ft
Flow Type	N/A	

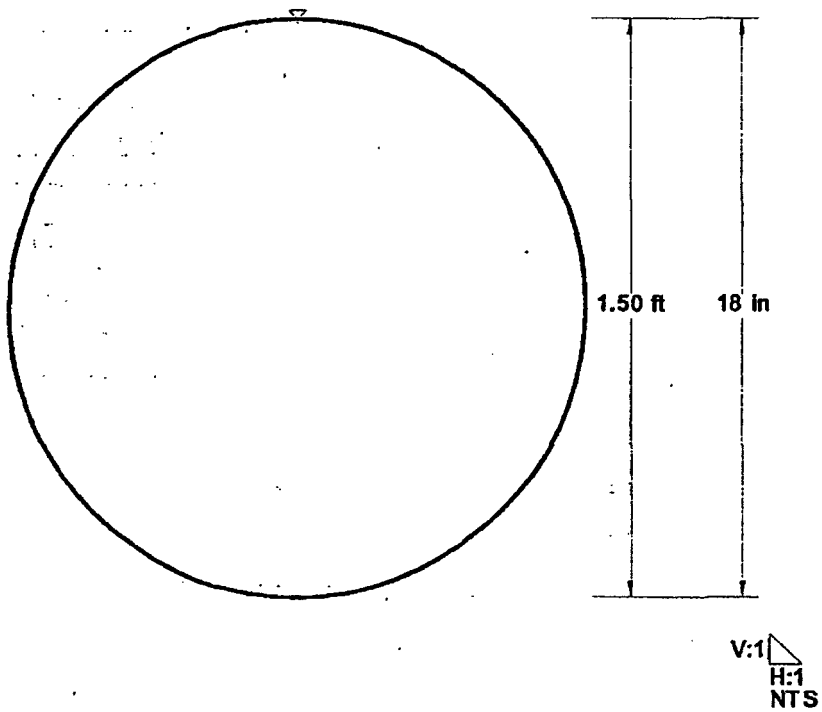
← ok

SIZED FOR 10 YR FLOW = 5 cfs

18" SD
Cross Section for Circular Channel

Project Description	
Worksheet	18" SD
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Full Flow Capacity

Section Data		
Mannings Coefficient	0.013	
Slope	0.005000	ft/ft
Depth	1.50	ft
Diameter	18	in
Discharge	7.43	cfs



Determine Grate Capacity: ***2' x 2' area drain***

Use Weir Flow Equation:*

$$Q_i = CPH^{1.5}$$

Where:

P = 2(L+ w) without curb
P = 2w + L with curb
Q_i = Ideal Inlet Capacity
P = Wetted Perimeter (ft.)
H = flow depth (ft.)
C = Weir Coefficient = 3.0

P = 8.00 ft.
H= 0.60 ft.

Q_i = 11.2 cfs Use Reduction factor of 0.50

$^*Q_{grate}$= 5.58 cfs

APPENDIX D

(REFERENCES)

- Reference from approved Studies – (***Technical Drainage Study for the Las Vegas Sports Center)*** November 1995.

- Reference - ***(McCarran International Airport West Side Drainage System Design Hydrologic & Hydraulic Report)*** by Kennedy/Jenks, September 1993.

DRAINAGE STUDY

PROJECT NAME:

LAS VEGAS SPORTS CENTER

SECTION-TOWNSHIP-RANGE:

SEC 22 T21S R61E

CROSS STREETS:

TROPICANA / PARADISE

ASSESSOR'S PARCEL NUMBER:

NEW ASSESSOR'S PARCEL NUMBER:

162-22-401-002

ACREAGE:

± 33.6AC

SUBMITTAL DATE:

11/3/95

C.C.R.F.C.D. REGIONAL FLOOD CONTROL DISTRICT

Clark County

Department of Public Works

M. J. MANNING
DIRECTOR

6600 WEST SAHARA AVENUE
BUILDING C-204
LAS VEGAS, NEVADA 89102
(702) 455-7750
FAX: (702) 455-7764

Progress As Promised

December 21, 1995

CVL Consulting Engineers
6655 West Sahara Avenue, Suite A-200
Las Vegas, Nevada 89102

Dear Sirs:

Re: Willdan/Clark County Public Works Plan Review Contract
Technical Drainage Study for Las Vegas Sports Center
(1651)
Study Dated: November 6, 1995
Addendum Dated: December 4, 1995
Location: Northwest corner of Tropicana Avenue and Paradise Road
(Sec. 22, T. 21 S. R. 61 E.)
HTE #95-24856

The referenced Technical Drainage Study has been reviewed and is accepted as complying with minimum improvement standards. As set forth in the subject drainage study, the following measures will be taken to mitigate flood hazards:

1. The site shall be graded with respect to drainage as shown on "Rough & Precise Grading Plan for Las Vegas Sports Center C.U.P. No.," sheets 2, 3, 4, 5, 6, and 7 of 7, signed and sealed by Randolph F. Flemming, P.E., on December 4, 1995;

2. The following drainage facilities shall be constructed:

   a. Onsite 4-foot-wide concrete swales in various locations as shown on the above mentioned grading plans

   b. Onsite 2-foot-wide concrete swales in various locations as shown on the above mentioned grading plans

   c. An onsite 2-foot-wide curb opening at the southwest end of the site as shown on sheet 6 of 7 of the above mentioned grading plans

COMMISSIONERS
Yvonne Atkinson Gates, Chairman • Paul J. Christensen, Vice-Chairman
Jay Bingham, Lorraine Hunt, Erin Kenny, Myrna Williams, Bruce L. Woodbury
Donald L. "Pat" Shalmy, County Manager

WILLDAN ASSOCIATES ☐ ENGINEERS & PLANNERS

TECHNICAL DRAINAGE STUDY
FOR
LAS VEGAS SPORTS CENTER

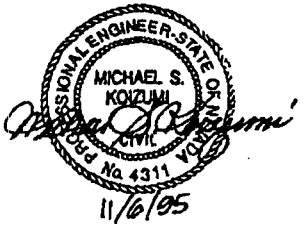
November 6, 1995

Prepared for:

Clark County
P.O. Box 1105
Las Vegas, Nevada 89110-1005
(702) 261-5162

Prepared by:

CVL Consultants, Inc.
6655 W. Sahara Ave., Suite A-200
Las Vegas, Nevada 89102
(702) 368-3008



CVL

HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL

DRAINAGE STUDY INFORMATION FORM

Name of Development: LAS VEGAS SPORTS CENTER Date: November 3, 1995

Location of Development: a) Description NW corner of Tropicana Ave. & Paradise Rd.
b) Sect. 22 Twn. 21S Rng. 61E

Name of Owner: County of Clark Assessor Parcel No: 162-22-401-002

Contact Person-Name: Andrew R. Trelease Telephone No: (702) 368-3008

Firm: CVL CONSULTANTS, INC.

Address: 6655 West Sahara Avenue, Suite A-200
Las Vegas, Nevada 89102

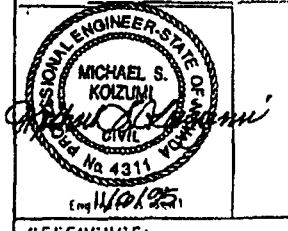
RECEIVED
NOV 04 1995
CLARK COUNTY
BUILDING DEPARTMENT

Type of Land Development/Land Maintenance Process:

- [ ] Rezoning
- [ ] Parcel Map
- [ ] Large Parcel Map
- [ ] Subdivision Map
- [ ] Planned Unit Development
- [ ] Building Permit
- [ ] Clearing and Grading Only
- [ ] Other (Please specify below)

Commercial Site

1. Total Gross Land Area of Site: 44.2 Acres Being Developed (Disturbed): 33.6 Acres
2. Is a portion or all of the subject property located in a designated FEMA Flood Hazard Area? YES* [NO]
3. Is the property bordered or crossed by an existing or proposed Clark County Regional Flood Control District Master Planned Facility? [YES] [NO]
4. Proposed Type of Development (Residential, Commercial, Etc.): Commercial
5. Approximate upstream land area which drains to the subject site: None
6. Has the site drainage been evaluated in the past? YES [NO] If yes, please identify documentation: _____
7. If known, please briefly identify the proposed discharge point(s) of runoff from the site: To Tropicana Avenue and Paradise Road at the south and east boundaries.
8. Briefly describe your proposed schedule for the subject project: _____



Submit this form as part of the required drainage study to the local entity which has jurisdiction over the subject property. This form may provide sufficient information to serve as the Conceptual Drainage Study.

* Review and concurrence of the Clark County Regional Flood Control District is required.

95-24856
(Local Entity File No.)

Reviewer	Date

REFERENCE:

STANDARD FORM 1

I. GENERAL LOCATION AND DEVELOPMENT DESCRIPTION

channel). Instead, the site drains northeast to Paradise Road, eventually impacting

d. A 3-foot-wide sidewalk underdrain on the east side of the site, south of the 'Pro' Tees, on the west side of Paradise Road

3. A bond estimate must be submitted to Clark County Public Works for the stormwater management facility 2(d) mentioned above;

4. The minimum finished floor elevations for the proposed structures shall be constructed as shown on the above-mentioned grading plans;

5. The subject site is located within Zone X, as shown on F.I.R.M. Community-Panel Number 32003C 2557 D, revised August 16, 1989. Zone X is determined to be outside the 500-year flood plain;

6. A precise grading plan for the rough graded areas must be approved by Clark County Public Works prior to building permit issuance;

7. Clark County Regional Flood Control District concurrence is required since the site is adjacent to a regional facility. As a condition of final approval, the applicant must submit a copy of the drainage study and any addenda to the Clark County Regional Flood Control District. Permits will not be issued until concurrence is obtained from the Clark County Regional Flood Control District;

8. Right-of-way dedication must be verified;

9. Mylars of the grading plan must be submitted to the Clark County Plan Check department for approval signatures prior to permit issuance;

10. The grading plan will be reviewed by the building department to ensure compliance with the handicap access requirements. Revisions to the grading plan may be required if the site accessibility design does not comply with the requirements set forth in the Accessibility Chapter of the Clark County Building Code;

11. At the request of Clark County Public Works, grading plans for the proposed development have been reviewed for compliance to permitting requirements according to Section 34.030 of the "Uniform Regulations for the Control of Drainage," revised November 12, 1990. **As a condition of final approval, the grading plans submitted for this project require the following modifications to meet the minimum standards outlined in the above regulation:**

a. Incorrect high point elevation labeled on the "grade tees" on sheet 4 of 7

b. Add the abbreviation "R.O.W." for all right-of-way widths

No liability is assumed by the County for information, data, and conclusions of the consulting engineer.

Yours truly,

Robert Thompson, P.E.
Civil Engineer III

RT/li

cc: Barbara Ginoulias
Selleck Properties, Inc.

03226\projects\1851-4

II. DRAINAGE BASIN DESCRIPTION

A. Offsite Drainage Description

The entire upstream watershed which impacts the adjacent Bermuda Wash channel has previously been studied in the report *McCarran International Airport Westside Drainage System Design Hydrologic and Hydraulic Report*, by Kennedy/Jenks Consultants, September 1993 (Ref .5). This report documents an existing condition 100-year flow to the channel of 689 cfs, and an ultimate development 100-year flow to the channel of 1,674 cfs. Offsite flows impact the channel adjacent to the site through five 10' x 4' (span x rise) RCB culverts under Tropicana Avenue. Please refer to the appendix for excerpts from the Kennedy/Jenks Consultants study. Most of the upstream tributary area to the site is intercepted by the Bermuda Wash Channel as described above. All offsite flows south of Tropicana Avenue are conveyed by McCarran Airport drainage facilities to the Airport Channel. The Airport Channel crosses Tropicana Avenue through five - 10' x 4' box culverts and discharges to the Bermuda Wash Channel. All offsite flows north of Tropicana Avenue naturally flow away from the site. Therefore, the only offsite impacts to the site are from rainfall which falls directly on the Tropicana Right-of-Way east of the site. Field investigations and topographic mapping indicate that this offsite basin specifically includes the north side of Tropicana Avenue between Koval Lane and Paradise Road, and the west side of Paradise Road north of Tropicana. Please refer to the appendix for offsite hydrology and street capacity calculations.

According to the Kennedy/Jenks Consultants study (Ref. 4), the ultimate 100-year flow to the Bermuda Wash channel will be 1,674 cubic feet per second (cfs). For the purpose of this report, it is conservatively assumed that the ultimate

development condition exists prior to the development of the site. Analysis indicates that a 100-year peak flow of 1,674 cfs cannot be contained within the five 10 foot x 4 foot (span x rise) reinforced concrete box (RCB) culverts under Tropicana Avenue. In the 100-year storm event, an estimated 88 cfs will weir onto the south side of Tropicana Avenue, and will be conveyed away from the site. The existing Bermuda Wash channel is not capable of conveying the remaining 1,586 cfs. In this event, approximately 559 cfs will overtop the channel at the southwest corner of the site. Of the 559 cfs, approximately 435 cfs will be immediately conveyed to the southeast, and will impact the north side of Tropicana Avenue. The remaining 124 cfs will flow across the site easterly to Paradise Road. Please refer to the appendix for the culvert, channel, and flow split analysis.

The proposed development of the site will not alter the natural flow patterns. The onsite grading plan has been designed to accept and convey the channel flows in the same manner as the undeveloped condition. No modifications of the existing flows have been made as a result of this development which would adversely impact surrounding properties.

B. Onsite Drainage Description

Onsite runoff is conveyed through the site as shallow or sheet flow. Onsite runoff is conveyed to the east and northeast to Paradise Road.

C. Master Planning Information

The *1991 Flood Control Master Plan Update, Las Vegas Valley*, as prepared by James J. Montgomery Consulting Engineers, Inc. (Ref. 3) for the Clark County Regional Flood Control District (CCRFCD) encompasses the proposed site on

Figure F-18. No Master Planned Facilities cross the site, however, an existing facility designated as TRMC 0009 is adjacent to the site on the west.

D. Floodplain Information

The project site is covered by the Flood Insurance Rate Map (FIRM) for the Clark County, Nevada and unincorporated areas, Community Parcel Number: 32003C 2557 D, Effective Date: August 16, 1995 (Plate 2). The site is located completely within Zone "X" (unshaded). Zone "X" (unshaded) is described by FEMA as "areas determined to be outside 500-year flood plain."

E. Previous Drainage Studies

The overall area is covered within the CCRFCD Flood Control Master Plan (Ref. 2) and the *1991 Flood Control Master Plan Update for Las Vegas Valley* (Ref. 3).

These reports, and others in the area, have been considered in the preparation of the report.

III. Proposed Drainage Facilities

A. General Description

The proposed drainage plan consists of shallow and sheet flows across the southern (driving range) portion of the site to the parking areas. The parking areas will convey flows to Paradise Road at the northeast corner of the site. The proposed onsite drainage plan will follow historic drainage patterns. All onsite flows will impact Paradise Road along the eastern boundary of the site (see attached grading plans and Plate 3B). Due to the increased flow lengths and times of concentrations in the developed condition, there will be no additional impact to Paradise Road as a result of the development of this site.

B. Compliance with Regulations and Adopted Plans

The design of this development is in compliance with local requirements, including the CCRFCD Flood Control Master Plan update and FEMA.

C. Hydrologic Criteria

The United States Army Corps of Engineers *HEC-1 Flood Hydrograph Package* was used to compute onsite existing and proposed conditions hydrology. The site is within the boundary for using the McCarran Airport Rainfall Data, therefore precipitation data was taken from Table 505 of the Clark County Regional Flood Control District *Hydrologic Criteria and Drainage Design Manual* (Ref. 1) see appendix for the calculations used in the analysis of the 10-year and 100-year 6-hour storms.

D. Facility Design Calculations

All drainage facilities within this project have been designed in accordance with the CCRFCD *Hydrologic Criteria and Drainage Design Manual* (Ref. 1). Street capacities were calculated based on Manning's equation. Because the site slopes away from the channel, the finished floors of the buildings could not reasonably be set 18-inches above the adjacent channel water surfaces in the 100-year storm event. The onsite drainage plan has been developed to include positive flow patterns away from the building pads in case any channel flows should break out in this area.

PEAK FLOW SUMMARY*

POST-DEVELOPED CONDITION

HEC-1 I.D.	AREA (acres)	Q_{10} (cfs)	Q_{100} (cfs)	COMMENTS
TRPN	3.03	3	7	Offsite flow: north side of Tropicana Ave.
SUB1	2.53	1	3	
CM0	-	4	10	Sub-basins TRPN & 1
SUB2	8.04	2	10	
CM1	-	6	19	Sub-basins TRPN, 1, & 2
SUB3	17.06	8	24	
CM2	-	14	43	Sub-basins TRPN, 1, 2, & 3
SUB4	0.78	1	2	
CM3	-	14	44	Sub-basins TRPN, 1, 2, 3, & 4
SUB5	1.74	1	3	
SUB6	7.95	3	11	
CM4	-	18	57	Sub-basins TRPN, 1, 2, 3, 4, 5, & 6
SUB7	1.44	Less Than 1	1	
SUB8	1.96	2	4	
CM5	-	2	5	Sub-basins 7 & 8
SUB9	2.21	3	5	
PARW	2.01	2	5	Offsite flow: west side of Paradise Rd.
CM6	-	24	73	Total site discharge Paradise Road

*Not including flow from airport channel (Refer to RESPONSE #6 for HEC-1 model which includes 435 cfs, and 124 cfs from airport channel flows).

STANDARD FORM A

REFERENCE:

REVISED AREAS — DEVELOPMENT Las Vegas Sports Center — CALCULATED BY: ART — DATE Nov '95 — POST-DEVELOPED (ONSITE)

DESIGN	SUB-BASIN DATA: N	AREA (AC)	INITIAL/OVERLAND TIME (t_i): LENGTH (FT)	SLOPE (%)	SLOPE (FT/MI)	TRAVEL TIME (t_t): LENGTH (FT)	SLOPE (%)	VEL. (FPS)	t_t (MIN)	t_c: TOTAL LENGTH (FT)	CHECK BASIN SLOPE (%)	FINAL t_c (MIN)	REMARKS
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	Soil Type 'B'
177	SUB1 0.6764	2.73	50	0.5	0.6	750	0.80	0.90	13.9	-	-	21.5	t_{LAG}=0.215 HRS
177	SUB2 0.6764	8.34	120	1.4	8.3	1043	0.91	1.90	9.1	-	-	17.4	t_{LAG}=0.174 HRS
81.6	SUB3 0.6871	17.06	310	2.7	15.0	1480	0.50	1.10	22.4	1800	20.0	100	t_{LAG}=0.200 HRS
82	SUB4 0.8244	0.78	100	1.0	5.0	180	1.00	2.0	1.5	280	11.6	6.5	t_{LAG}=0.065 HRS
78.6	SUB5 0.6407	1.74	120	1.0	8.7	240	1.50	2.5	1.9	410	12.3	10.6	t_{LAG}=0.106 HRS
74.6	SUB6 0.6407	7.95	100	1.0	7.4	1250	0.75	1.65	12.6	1350	17.5	17.5	t_{LAG}=0.175 HRS
69	SUB7 0.5208	1.44	330	0.5	23.9	-	-	-	-	930	11.8	11.8	t_{LAG}=0.118 HRS
89	SUB8 0.7848	1.96	20	2.0	2.0	1660	0.95	1.65	14.2	1680	19.3	16.2	t_{LAG}=0.162 HRS
92	SUB9 0.8244	2.21	130	0.5	7.1	665	1.0	2.0	5.5	795	19.4	12.6	t_{LAG}=0.126 HRS

$t_c = t_i + t_t$

$t_i = 1.8(1.1 - K)\,L^{1/2} / S^{1/3}$

$K = 0.0152\,CN - 0.39$

$t_t = L/60V$

$t_{LAG} = 0.6\,t_c$

TIME OF CONCENTRATION

HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL

```
*****************************************
*                                       *
*  FLOOD HYDROGRAPH PACKAGE (HEC-1)     *
*            MAY  1991                  *
*         VERSION 4.0.1E                *
*                                       *
*  RUN DATE  11/30/95  TIME  17:04:44   *
*                                       *
*****************************************
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*****************************************
*                                       *
*  U.S. ARMY CORPS OF ENGINEERS         *
*  HYDROLOGIC ENGINEERING CENTER        *
*       609 SECOND STREET               *
*     DAVIS, CALIFORNIA 95616           *
*       (916) 551-1748                  *
*                                       *
*****************************************
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H     H  EEEEEEE  CCCCC          1
H     H  E       C     C       11
H     H  E       C             1 1
HHHHHHH  EEEEE   C       ----    1
H     H  E       C             1
H     H  E       C     C       1
H     H  EEEEEEE  CCCCC       11111
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THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1SN.

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
    1     ID  Las Vegas Sports Center
    2     ID
    3     ID  November 1995
    4     ID
    5     ID  10-YEAR AND 100-YEAR STORM EVENTS
    6     ID  6-HOUR RAINFALL, 5 MIN INTERVALS
    7     ID
    8     ID  SCS UNIT HYDROGRAPH METHOD
    9     ID
   10     ID  ONSITE RUNOFF, AND
   11     ID  OFFSITE RUNOFF FROM TROPICANA AVE AND PARADISE ROAD
   12     ID
   13     ID  ************************************************************
   14     ID  **** THIS MODEL DOES NOT INCLUDE OFFSITE FLOWS FROM THE AIRPORT CHANNEL ****
   15     ID  **** SEE COMMENT 26 FOR HEC-1 ANALYSIS WHICH INCLUDES THE 435 CFS AND  ****
   16     ID  **** 124 CFS IMPACTING THE SITE FROM THE AIRPORT CHANNEL               ****
   17     ID  ************************************************************
   18     ID
   19     ID  POST-DEVELOPED CONDITIONS
   20     ID
   21     ID
   22     ID  MCCARRAN INTERNATIONAL AIRPORT RAINFALL AREA
   23     ID  10-YEAR, 6-HOUR STORM (DEPTH=1.50 IN, ADJ. RATIO=0.8) ADJ DEPTH=1.51 IN
   24     ID  100-YEAR, 6-HOUR STORM (DEPTH=2.51 IN, ADJ. RATIO=0.81 ADJ DEPTH=2.77 IN
   25     ID
   26     ID  FILE:  AIRLPD.DAT
   27     ID
          *DIAGRAM
   28     IO
   29     IT      5       0       0     288
   30     IO      5       0
   31     IN      5       0       0
   32     JR   PREC   .5784     1.0

   33     KK   TRPW  SCS
   34     KM   RUNOFF FROM NORTH SIDE OF TROPICANA AVENUE
   35     KM   FROM EQUAL LANE TO PARADISE ROAD
   36     BA   .0847
   37     PB   2.77
   38     PC      0     .02    .057    .07    .087    .108    .124    .13    .13    .13
   39     PC    .13     .13     .13    .131    .16    .162    .168    .158    .172    .181
   40     PC    .19    .197    .199    .20    .202    .204    .214    .229    .241    .249
   41     PC   .251    .266    .29    .276    .281    .283    .295    .322    .353    .409
   42     PC   .499    .598    .71    .764    .781    .812    .819    .835    .851    .856
   43     PC    .86    .868    .876    .884    .91    .926    .937    .95    .97    .976
   44     PC   .982    .985    .987    .989    .99    .993    .993    .994    .995    .998
   45     PC   .998    .999   1.00
   46     LS             93
   47     UD  0.265
```

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

  40      KK   SUB1  SUB
  41      KM   RUNOFF FROM SUB-BASIN 1
  50      BA   .0042
  51      LS              77
  52      UD   0.715

  53      KK    CH0  CH
  54      KM   COMBINE RUNOFF FROM SUB1 WITH RUNOFF FROM TROPICANA AVE
  55      HC      2

  56      KK   SUB2  SUB
  57      KM   RUNOFF FROM SUB-BASIN 2
  58      BA   .0130
  59      LS              77
  60      UD   0.174

  61      KK    CH1  CH
  62      KM   COMBINE RUNOFF FROM SUB2 WITH CH0
  63      HC      2

  64      KK   SUB3  SUB
  65      KM   RUNOFF FROM SUB-BASIN 3
  66      BA   .0247
  67      LS              81.5
  68      UD   .350

  69      KK    CH2  CH
  70      KM   COMBINE RUNOFF FROM SUB1 WITH CH0
  71      HC      2

  72      KK   SUB4  SUB
  73      KM   RUNOFF FROM SUB-BASIN 4
  74      BA   .0019
  75      LS              92
  76      UD   0.065

  77      KK    CH3  CH
  78      KM   COMBINE RUNOFF FROM SUB4 WITH CH2
  79      HC      2

  80      KK   SUB5  SUB
  81      KM   RUNOFF FROM SUB-BASIN 5
  82      BA   .0027
  83      LS              78.5
  84      UD   0.186

  85      KK   SUB6  SUB
  86      KM   RUNOFF FROM SUB-BASIN 6
  87      BA   .0134
  88      LS              79.5
  89      UD   0.175
```



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

  90      KK    CH4  CH
  91      KM   COMBINE RUNOFF FROM SUB5 AND SUB6 WITH CH3
  92      HC      2

  93      KK   SUB7  SUB
  94      KM   RUNOFF FROM SUB-BASIN 7
  95      BA   .0023
  96      LS              69
  97      UD   0.118

  98      KK   SUB8  SUB
  99      KM   RUNOFF FROM SUB-BASIN 8
 100      BA   .0031
 101      LS              89
 102      UD   0.147

 103      KK    CH5  CH
 104      KM   COMBINE RUNOFF FROM SUB7 WITH SUB8
 105      HC      2

 106      KK   SUB9  SUB
 107      KM   RUNOFF FROM SUB-BASIN 9
 108      BA   .0024
 109      LS              82
 110      UD   0.126

 111      KK   PARK  SUB
 112      KM   RUNOFF FROM THE WEST SIDE OF PARADISE ROAD
 113      BA   .0021
 114      LS              93
 115      UD   0.197

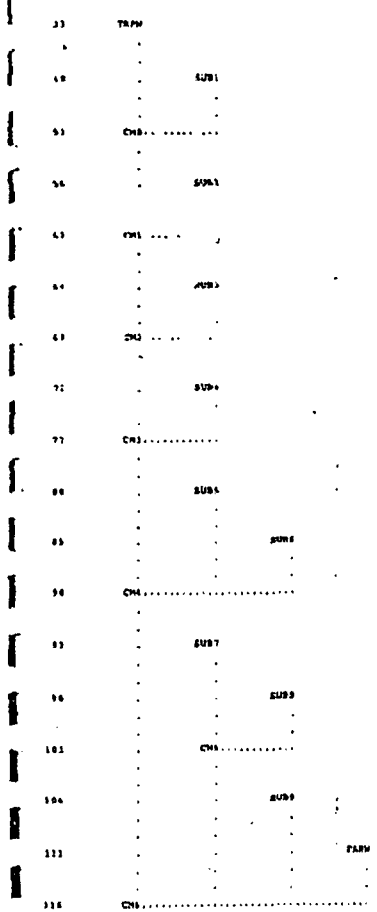
 116      KK    CH6  CH
 117      KM   COMBINE HYDROGRAPHS FROM SUB-BASINS, SUB1-SUB10, TRPM, & PARK.
 118      HC      4
 119      ZZ
```

SCHEMATIC DIAGRAM OF STREAM NETWORK

INPUT LINE NO.

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

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



(***) RUNOFF ALSO COMPUTED AT THIS LOCATION

TIME 1.50 3.50

```
*************************************
*                                   *
*  FLOOD HYDROGRAPH PACKAGE (HEC-1) *
*            MAY  1991              *
*         VERSION 4.0.1E            *
*                                   *
* RUN DATE 11/30/95  TIME 17:06:49  *
*                                   *
*************************************

*************************************
*                                   *
*  U.S. ARMY CORPS OF ENGINEERS     *
*  HYDROLOGIC ENGINEERING CENTER    *
*       609 SECOND STREET           *
*     DAVIS, CALIFORNIA 95616       *
*       (916) 551-1748              *
*                                   *
*************************************
```

Las Vegas Sports Center

November 1995

10-YEAR AND 100-YEAR STORM EVENTS
6-HOUR RAINFALL, 5 MIN INTERVALS

SCS UNIT HYDROGRAPH METHOD

ONSITE RUNOFF, AND
OFFSITE RUNOFF FROM TROPICANA AVE AND PARADISE ROAD

```
*********************************************************************
**** THIS MODEL DOES NOT INCLUDE OFFSITE FLOWS FROM THE AIRPORT CHANNEL ****
**** SEE COMMENT #5 FOR HEC-1 ANALYSIS WHICH INCLUDES THE 635 CFS AND  ****
**** 126 CFS IMPACTING THE SITE FROM THE AIRPORT CHANNEL               ****
*********************************************************************
```

POST-DEVELOPED CONDITIONS

McCARRAN INTERNATIONAL AIRPORT RAINFALL AREA
10-YEAR, 6-HOUR STORM (DEPTH=1.50 IN, ADJ. RATIO=0.8) ADJ DEPTH=1.56 IN
100-YEAR, 6-HOUR STORM (DEPTH=2.77 IN, ADJ. RATIO=0.8) ADJ DEPTH=2.77 IN

FILE: A:\HIPO.DAT

```
IO  10        OUTPUT CONTROL VARIABLES
                   IPRNT        5  PRINT CONTROL
                   IPLOT        0  PLOT CONTROL
                   QSCAL        0. HYDROGRAPH PLOT SCALE

    17        HYDROGRAPH TIME DATA
                   NMIN         5  MINUTES IN COMPUTATION INTERVAL
                   IDATE     1    0  STARTING DATE
                   ITIME     0000  STARTING TIME
                   NQ         288  NUMBER OF HYDROGRAPH ORDINATES
                   NDDATE    2    0  ENDING DATE
                   NDTIME    0055  ENDING TIME
                   ICENT       19  CENTURY MARK

                 COMPUTATION INTERVAL     0.08 HOURS
                     TOTAL TIME BASE    24.92 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

    39        MULTI-PLAN OPTION
                   NPLAN          1  NUMBER OF PLANS

    56        MULTI-RATIO OPTION
                 RATIOS OF PRECIPITATION
                   0.57     1.00
```

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		RATIO APPLIED TO PRECIPITATION RATIO 1	RATIO 2
					0.57	1.00
HYDROGRAPH AT	TRPJ	0.00	1	FLOW	3.	7.
				TIME	3.50	3.50
HYDROGRAPH AT	SUB1	0.00	1	FLOW	1.	3.
				TIME	3.75	3.67
2 COMBINED AT	CH6	0.01	1	FLOW	4.	10.
				TIME	3.67	3.67
HYDROGRAPH AT	SUB2	0.01	1	FLOW	2.	10.
				TIME	3.67	3.58
2 COMBINED AT	CH1	0.02	1	FLOW	6.	19.
				TIME	3.67	3.58
HYDROGRAPH AT	SUB3	0.03	1	FLOW	8.	24.
				TIME	3.67	3.67
2 COMBINED AT	CH2	0.05	1	FLOW	14.	43.
				TIME	3.67	3.67
HYDROGRAPH AT	SUB4	0.00	1	FLOW	1.	2.
				TIME	3.50	3.58
2 COMBINED AT	CH3	0.05	1	FLOW	14.	44.
				TIME	3.67	3.58
HYDROGRAPH AT	SUB5	0.00	1	FLOW	1.	3.
				TIME	3.58	3.58
HYDROGRAPH AT	SUB6	0.01	1	FLOW	3.	11.
				TIME	3.67	3.58
3 COMBINED AT	CH4	0.06	1	FLOW	18.	57.
				TIME	3.67	3.58
HYDROGRAPH AT	SUB7	0.00	1	FLOW	0.	1.
				TIME	3.75	3.58
HYDROGRAPH AT	SUB8	0.00	1	FLOW	2.	4.
				TIME	3.50	3.58
2 COMBINED AT	CH5	0.01	1	FLOW	2	5.
				TIME	3.50	3.58
HYDROGRAPH AT	SUB9	0.00	1	FLOW	1.	5.
				TIME	3.58	3.58
HYDROGRAPH AT	FARM	0.00	1	FLOW	2.	5.
				TIME	3.50	3.58
4 COMBINED AT	CH4	0.08	1	FLOW	24.	73.
				TIME	3.58	3.58

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

McCarran International Airport
Westside Drainage Study
Hydrologic and Hydraulic Report

September 1993

• LAS VEGAS • McCARRAN • INTERNATIONAL • AIRPORT •
CLARK COUNTY NEVADA

Prepared for:
Clark County Department of Aviation

REGISTERED PROFESSIONAL ENGINEER STATE OF NEVADA
MARK E. FOREST
CIVIL
No. 8022
4/23/93

Prepared By:
Kennedy/Jenks Consultants

Project Office
1455 E. Tropicana Ave, Suite 500
Las Vegas, Nevada 89119
702-795-3980

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FROM KENNEDY / JENKS

McCARRAN INTERNATIONAL AIRPORT WEST SIDE DRAINAGE SYSTEM DESIGN HYDROLOGIC & HYDRAULIC REPORT - SEPT 1993

Storm Drains

There are three separate storm drains associated with this analysis. Storm Drain A drains the west infield and outlets at a collector at Tropicana Avenue. Storm Drain B drains the east infield and outlets at the same location as Storm Drain A. Storm drain C drains the far east infield and outlets into Storm Drain B. These alignments are shown on Figure 3-3. The hydraulic analysis for the storm drains used a pressure flow analysis similar to the methods outlined in the Los Angeles County Flood Control Districts Hydraulic Design Manual, (LACFCD, 1982) and the Pima County's Guidelines and Standard Plans for Storm Drain Design, (Pima Co., 1981). The energy grade line is calculated as the sum of the appropriate losses associated with a particular location. The losses are generally comprised of junction loss, friction loss, manhole loss, and transition loss. They were calculated for each junction, manhole, and transition using the methods outlined in the Pima Co Manual, (Pima Co., 1981). The hydraulic grade line is calculated by subtracting the velocity head from the elevation of the energy grade line.

Storm Drain A

Several different storm drain shapes, sizes and number of cells were evaluated for this alignment. A single large rectangular RCB was determined to be the most practical configuration. Storm Drain A is a single six foot high by seven foot wide RCB at the outlet and decreases in size moving up stream. Table 4-7 is a summary of the hydraulic analysis for Storm Drain A. The vertical alignment was dictated by utility constraints, future grading profiles and existing flow lines. The construction drawings, (Appendix B), show that portion of the alignment to be built in this phase.

Storm Drain B

The design of Storm Drain B was based on the ultimate buildout configuration. However more flow will arrive at Storm Drain B in the intermediate phase than the system will have capacity to convey if the five year storm occurs during the interim. This will not be the case in the ultimate buildout configuration where the flows arriving at this infield will be partially blocked by the new Commercial Runway 1L/19R. If a five year storm does occur before the completion of the ultimate configuration the flooding on the taxiway will be improved. The discharge on the surface will be reduced by the discharge in the pipe. A large single round conduit was found to be the most practical configuration for this area. At the outlet the configuration is a single 66 inch diameter RCP. The size is reduced to a 54 inch diameter above the confluence with Storm Drain C. At station 222+50 the size is reduced to a 36 inches which is the size for most of the design. At station 239+53 the alignment ties into an existing 300 foot long 54 inch diameter RCP. In order to use this existing pipe the horizontal alignment has four 45 degree bends. The intention of using the existing 54 inch RCP is to reduce the intermediate construction cost. Table 4-8 is a summary of the hydraulic analysis for Storm Drain B. The vertical alignment was dictated by utility constraints, future grading profiles and existing flow lines. The construction drawings, (Appendix B), show that portion of the alignment to be built in this phase.

Revised23-Sep-93

PROJECT: McCarran International Airport
JOB NO.: 937011.00
BY: VAP/SNG

West Infield Drainage Design
Rectangular Pipe

TABLE 4-7

Structure Location	STA	Number Cells	Width of BOX ft	Depth of BOX ft	Manning's n	Q cfs	AREA ft^2	VEL fps	K	Sf	L	ANGLE	HL	Hvn	HnAq	H Total	EG	HV	HG
Outlet	0+00																		
SDW	0+00	1	6	6	0.013	427	42.00	10.16	6610	0.004	0	0	0.000	0.000	0.321	0.321	2074.00	1.60	2073.20
	4+00	1	6	6	0.013	427	42.00	10.16	6610	0.004	400	0	1.667	0.000	0.00	1.747	2075.12	1.60	2073.52
1W	8+00	1	6	6	0.013	427	42.00	10.15	6610	0.004	400	0	1.67	0.000	0.00	1.75	2076.87	1.60	2075.27
2W	11+10	1	6	6	0.013	427	36.00	11.86	5382	0.005	310	0	1.94	0.109	0.00	2.05	2078.92	1.60	2077.01
2WA	13+00	1	6	6	0.013	427	36.00	11.86	5382	0.005	90	0	0.56	0.109	0.24	0.92	2081.58	2.19	2079.40
2WB	16+00	1	6	6	0.013	406	36.00	11.31	5382	0.005	400	0	2.30	0.102	0.23	2.63	2084.22	2.00	2082.21
2WC	20+00	1	6	6	0.013	390	36.00	10.84	5382	0.005	400	0	2.10	0.091	0.00	2.19	2086.40	1.83	2084.58
2WD	21+70	1	6	5	0.013	379	30.00	12.60	4217	0.008	370	0	2.86	0.123	1.00	4.10	2090.50	2.47	2088.03
2WE	28+00	1	6	4	0.013	317	24.00	13.21	3098	0.010	430	0	4.50	0.138	0.00	4.64	2095.14	2.71	2092.43
2W	31+12	1	6	4	0.013	303	24.00	12.70	3098	0.010	212	0	3.89	0.125	0.19	4.30	2099.44	2.51	2096.94
2WA	35+00	1	6	4	0.013	299	24.00	12.47	3098	0.000	286	0	2.69	0.121	0.18	2.99	2102.43	2.42	2100.02
2WB	38+00	1	6	4	0.013	294	24.00	12.23	3098	0.009	450	0	4.04	0.116	0.00	4.16	2106.59	2.33	2104.26
4W	44+00	1	6	4	0.013	288	24.00	12.00	3098	0.009	450	0	3.89	0.112	0.00	4.00	2110.59	2.24	2108.35
DITCH	45+00	1	6	4	0.013	285	24.00	11.86	3098	0.008	100	0	0.84	0.000	0.47	1.31	2111.90	2.19	2109.71
4WA	48+00	1	6	4	0.013	284	20.00	13.30	2453	0.012	300	0	3.48	0.125	0.00	3.61	2115.51	2.71	2112.81
5W	53+00	1	6	4	0.013	256	20.00	12.81	2453	0.011	400	0	4.36	0.127	0.00	4.49	2120.00	2.55	2117.46
End Phase 1	56+50	1	6	4	0.013	244	20.00	12.20	2453	0.010	350	0	3.46	0.116	0.19	3.77	2123.78	2.31	2121.47
6W	60+50	1	6	4	0.013	230	20.00	11.94	2453	0.009	500	0	4.74	0.111	0.00	4.85	2128.63	2.22	2126.41
7W	73+50	1	6	4	0.013	176	16.00	11.00	1639	0.006	1300	0	12.05	0.084	1.82	13.96	2142.59	1.86	2140.71
	83+80	1	6	3	0.013	83	12.00	7.77	1238	0.006	1030	0	5.85	0.047	0.00	5.89	2148.48	0.94	2147.55
8W	85+30	1	6	3	0.013	39	6.00	6.53	499	0.006	1150	0	7.42	0.033	0.00	7.45	2155.94	0.66	2155.28

FLOW @ DEWEY = 1393 cfs
SD A = 427 cfs
SD B = 151 cfs
TOTAL = 1971 cfs

Storm Drain C

The original design of Storm Drain C was done as part of another contract. In this study, Storm Drain C was evaluated to verify the design capacities and grades. At the junction with Storm Drain B, the configuration is a single 60-inch RCP. The discharge is 91 cfs. Storm Drain C will flow under pressure in the lower 1,700 feet of the system. At this point, the slope of the pipe exceeds the slope of the pressure flow energy grade line and the system flows as open channel. At Station 324 + 57, Storm Drain C ties into an existing double 36-inch RCP. The entrance of this existing pipe is a catch basin.

This structure does not have adequate capacity to accept the five-year peak discharge arriving at this inlet. Therefore, a portion of the five-year discharge would overflow the taxiway at this location. Future airport improvement will need to address this system deficiency. Improvements behind the outlet of these two 36-inch culverts are outside of this contract.

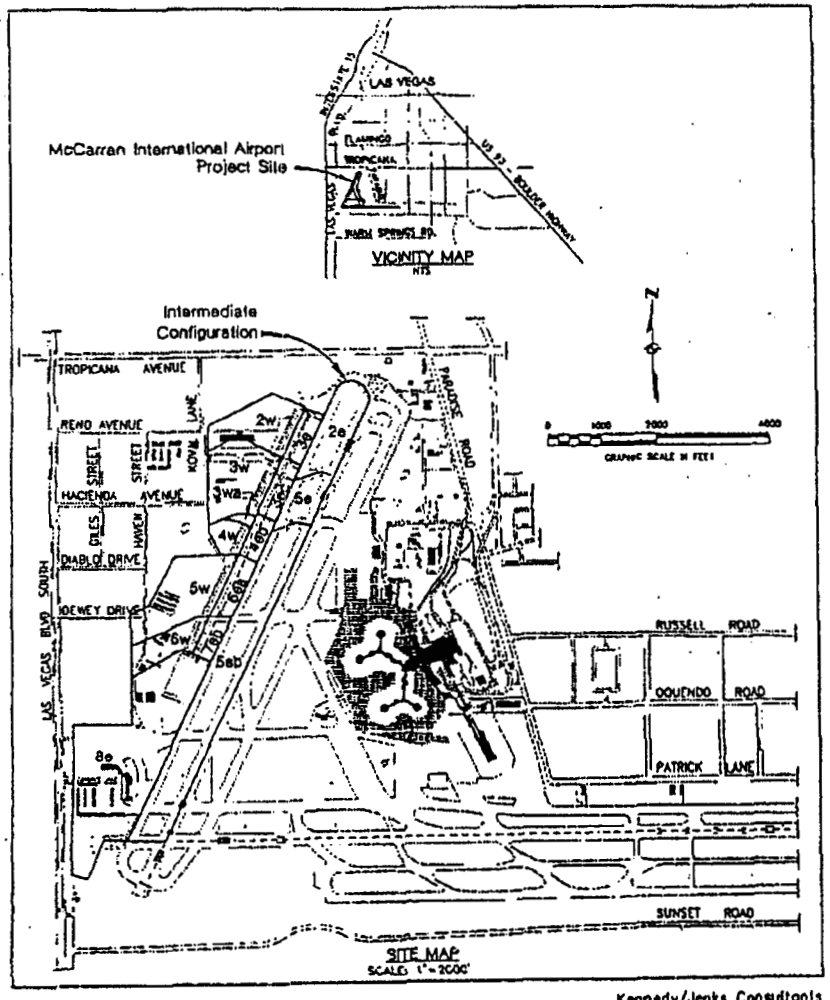
Table 4-9 is a summary of the hydraulic analysis for Storm Drain C. The plans and profiles for the alignment are located in Appendix B.

PROJECT McCarran International Airport
JOB NO. 937011.00
BY WHITMORE

East Inlet Drainage Design
Circular Pipe

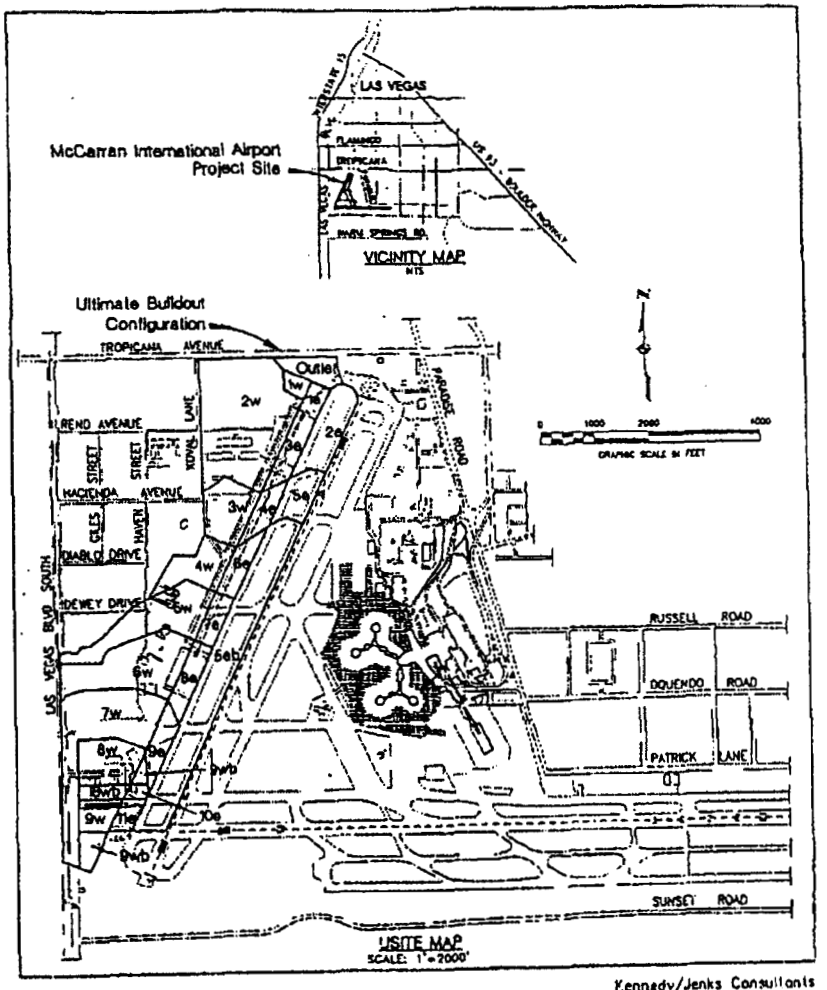
TABLE 4-8

STRUCTURE LOCATION	STA	Number Conc	PIPE Dia Hwp Rcp	n	Q cfs	AREA ft²	VEL fps	K	SF	L	ANGLE	LOSSES M	H min	Hentry	H Total	RESULTS E.G.	hv	HG
Outfall	0+00	1	96	0.013	151	77.75	6.35	3338	0.0020	0	0	0.00	0.13	0.00	0.13	2072.33	0.63	2072.96
MH	4+00	1	96	0.013	151	77.75	6.35	3338	0.0020	400	0	0.81	0.063	0.00	0.87	2073.45	0.63	2074.07
MH	8+04	1	96	0.013	151	77.75	6.35	3338	0.0020	804	0	0.56	0.063	0.56	1.25	2074.57	0.63	2075.20
HE	8+50	1	54	0.013	91	15.90	5.70	1883	0.0021	796	0	0.83	0.050	0.04	0.72	2074.93	0.50	2075.78
HEA	8+50	1	54	0.013	91	15.90	5.70	1883	0.0021	310	0	0.83	0.046	0.04	0.72	2074.93	0.50	2075.78
HE	13+65	1	54	0.013	91	15.90	5.56	1863	0.0020	310	0	0.77	0.046	0.00	0.87	2075.71	0.44	2076.15
HE4	17+00	1	48	0.013	91	15.90	5.42	1863	0.0018	400	0	1.26	0.048	0.18	1.57	2077.69	0.46	2078.15
HE8	20+56	1	42	0.013	64	12.56	6.88	1434	0.0034	356	0	1.32	0.058	0.20	1.52	2079.36	0.69	2080.04
HEC	23+50	1	42	0.013	64	12.56	6.88	1434	0.0034	300	0	1.32	0.058	0.20	1.52	2080.78	1.12	2081.89
HE	28+50	1	36	0.013	60	7.07	8.50	867	0.0074	500	0	4.27	0.107	0.25	4.71	2085.49	1.01	2086.50
HE4	29+00	1	36	0.013	77	7.07	10.94	867	0.0134	500	0	4.78	0.166	0.29	5.10	2090.67	1.86	2092.53
HE8	33+00	1	36	0.013	74	7.07	10.46	867	0.0123	400	0	4.03	0.080	0.27	5.10	2095.84	1.70	2097.55
HEC	33+50	1	36	0.013	71	7.07	9.88	867	0.0112	50	0	0.56	0.155	0.21	0.82	2096.53	1.55	2098.07
HE	38+00	1	36	0.013	68	7.07	9.67	867	0.0105	510	45	5.39	0.145	0.22	5.72	2102.48	1.45	2103.94
Existing S-	39+53	1	36	0.015	68	7.07	9.61	867	0.0105	87	45	5.98	0.145	0.22	1.34	2103.83	1.45	2105.28
MH	42+53	1	54	0.013	83	15.90	4.10	1863	0.0011	300	45	0.33	0.112	0.41	0.85	2104.68	0.26	2104.93
MH	42+73	1	36	0.013	43	7.07	6.04	867	0.0030	22	0	0.20	0.000	0.20	0.40	2105.08	1.04	2106.04
HE4	43+40	1	36	0.013	60	7.07	8.50	867	0.0061	75	45	0.81	0.112	0.25	0.81	2105.89	1.13	2106.83
HE8	47+00	1	36	0.013	60	7.07	8.50	867	0.0061	350	0	2.64	0.112	0.15	3.11	2108.94	1.12	2109.95
HE	51+00	1	36	0.013	56	7.07	8.31	867	0.0074	400	0	3.03	0.102	0.19	3.33	2112.48	1.05	2113.44
HE	51+02	1	36	0.013	55	7.07	7.72	867	0.0063	300	0	2.01	0.093	0.20	2.30	2114.79	0.92	2115.67
HE8	54+00	1	36	0.013	56	7.07	7.10	867	0.0053	400	0	2.26	0.079	0.06	2.40	2117.22	0.78	2118.00
HE	62+50	1	36	0.013	49	7.07	6.90	867	0.0055	450	0	2.46	0.076	0.27	2.80	2120.02	0.74	2120.76
SEC	63+50	1	36	0.013	43	7.07	6.06	867	0.0039	300	0	1.17	0.054	0.11	1.33	2121.35	0.54	2121.89
HE	68+24	1	30	0.013	38	7.07	5.44	667	0.0033	274	0	0.91	0.044	0.11	1.06	2122.53	0.46	2122.98
HE	72+55	1	24	0.013	34	4.91	6.88	410	0.0058	1031	0	7.02	0.074	0.03	8.02	2130.54	0.74	2129.80
HE	80+80	1	24	0.013	15	3.14	4.65	296	0.0042	1225	0	5.10	0.054	0.11	5.34	2135.88	0.34	2135.54
HE	83+53	1	24	0.013	10	3.14	3.27	226	0.0020	275	0	0.55	0.016	0.00	0.56	2134.43	0.16	2134.28



Kennedy/Jenks Consultants
McCarran International Airport

Intermediate Configuration
Watershed Boundary Map
K/J 937011.00
September 1993
Figure 4-1



Kennedy/Jenks Consultants
McCarran International Airport

Ultimate Buildout Configuration
Watershed Boundary Map
K/J 937011.00
September 1993
Figure 4-2

TABLE 4-2

McCarran Airport Infield Hydrology, CIRCULAR PIPE FLOW, USING THE AIRPORT DRAINAGE MANUAL-RATIONAL METHOD

East Infield Hydrology

** INLET	** LINE SEGMENT	** SEGMENT Length FT	** INLET TIME MIN	FLOW TI (IN PIPE) MIN	* Tc MIN	* RF Int IN/HR	** TRIBUTAR AREA ACRES	CUMULA AREAS ACRES	AVE C	SUM OF C x A	Q CUM RO (CFS)	No Cells	Q Mult FLOW CFS	VELOCITY OF DRAIN FT/SEC		* SIZE OF PIPE IN
11E***			13.5		13.5	2.41	5.9	5.90	0.71	4.19	10	1	10	5.40		24
	11E-10E	1225		3.8												
10E***			9.5		17.3	2.19	3.0	8.90	0.75	6.68	15	1	15	8.50		30
	10E-9E	1031		2.0												
9E***			18.1		19.3	2.08	12.3	21.20	0.77	16.27	34	1	34	9.70		36
	9E-8E	1024		1.8												
8E			24.8		24.8	1.83	14.9	36.10	0.75	27.00	49	1	49	10.60		36
	8E-7E	1100		1.7												
7E			18.8		26.5	1.75	8.3	44.40	0.74	33.06	58	1	58	11.00		36
	7E-6E	1350		2.0												
6E			19.3		28.6	1.68	10.4	54.80	0.74	40.76	68	1	68	9.67		36
	6E-4E	1100		1.8												
4E			21.4		30.5	1.61	11.8	66.60	0.74	49.49	80	1	80	8.27		42
	4E-3E	1260		2.5												
3E			24.0		33.0	1.52	14.0	80.60	0.74	59.57	91	1	91	5.70		54
	3E-1E	590		1.7												
1,2SE			51.0		51.0	1.03	118.2	198.80	0.73	145.85	151	1	151	6.35		66
	1E-OUT	400		1.0												
OUT					52.0	1.01	0.0	198.80	0.73	145.85	148	1	148	6.21		66

* THESE COLUMNS REQUIRE VALUES FROM ASSOCIATED TABLES AND FIGURES.
** THESE COLUMNS REQUIRE INITIAL VALUES COLLECTED FROM SYSTEM
***THESE AREAS ARE NOT IN KJ'S SCOPE OF WORK AT THIS TIME.
INTENSITY VALUES ARE BASED ON THE McCARRAN 5-YEAR INTENSITY CURVE
PRODUCED BY Clark Co. Regional Flood Control District,1988.

SD

Revised 23-Sep-93

TABLE 4-1

McCarran Airport Infield Hydrology, CIRCULAR PIPE FLOW, USING THE AIRPORT DRAINAGE MANUAL-RATIONAL METHOD

West Infield Hydrology

** INLET	** LINE SEGMENT	** Seg. Length FT	** INLET TIME MIN	FLOW (IN PIPE) MIN	* Tc MIN	* RF Int IN/HR	** TRIBUTAR AREA ACRES	CUM. AREA ACRES	AVER C	SUM OF C x A	Q CUM RO (CFS)	No Cells	MULT. FLOW CFS	VELOCITY OF DRAIN FT/SEC	Box Height (ft)	Box Width (ft)
9W***			6.6		6.6	2.95	16.2	16.20	0.82	13.28	39	1	39	3.27	3	4
	9W-8W	1150		5.9												
8W**			8.6		12.7	2.47	29.9	46.10	0.82	37.80	93	1	93	5.83	4	4
	8W-7W	1030		2.9												
7W***			16.8		16.8	2.21	52.9	99.00	0.80	79.59	176	1	176	8.80	4	5
	7W-6W	1300		2.5												
6W***			12.6		19.3	2.09	42.9	141.90	0.81	114.77	239	1	239	11.94	4	5
	6W-5W	650		1.2												
5W			25.4		25.4	1.80	32.7	174.60	0.81	142.24	256	1	256	12.81	4	5
	5W-4W	800		1.0												
4W			8.6		26.4	1.78	26.9	201.48	0.81	163.74	288	1	288	12.00	4	6
	4W-3W	1188		1.7												
3W			13.6		28.1	1.69	18.6	220.06	0.82	179.93	305	1	305	12.70	4	6
	3W-2W	2102		2.8												
2W			9.6		30.6	1.59	102.4	322.44	0.83	267.95	427	1	427	11.86	6	6
	2W-1W	310		0.4												
1W			6.1		31.3	1.58	2.9	325.34	0.83	270.30	427	1	427	10.16	6	7
	1W-0W	400		0.7												
0W			0.00		31.8	1.56	0.0	325.34	0.83	270.30	421	1	421	10.01	6	7
	0W-OUW	400		0.7												
Outlet			0.00		32.6	1.53	0.0	325.34	0.83	270.30	414	1	414	9.87	6	7
	0OW-1OUT															

* THESE COLUMNS REQUIRE VALUES FROM ASSOCIATED TABLES AND FIGURES.
** THESE COLUMNS REQUIRE INITIAL VALUES COLLECTED FROM SYSTEM.
***THESE AREAS ARE NOT IN KJ'S SCOPE OF WORK AT THIS TIME.

Revised 23-Sep-93

GOLF COURSE PLANS
FOR
PREMIERE PARK

APN: 162-22-401-002

BENCHMARK

CLARK COUNTY DATUM 6C11-22SSW6, A RIVET AND SQUARE PLATE IN TOP OF CURB, NORTHEAST CORNER OF TROPICANA AVENUE AND PARADISE ROAD.

ELEVATION 2058.93

BASIS OF BEARING

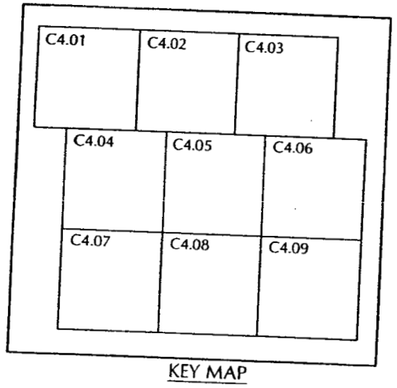
N 89°36'15" E, BEING THE SOUTH LINE OF THE SOUTHWEST ONE QUARTER (SW1/4) OF SECTION 22, TOWNSHIP 21 SOUTH, RANGE 61 EAST, M.D.M., CLARK COUNTY, NEVADA AS SHOWN ON THAT CERTAIN RECORD OF SURVEY, FILE 67, PAGE 7, RECORDED JUNE 23, 1993 AS DOC. NO. 01360.

OWNER/DEVELOPER

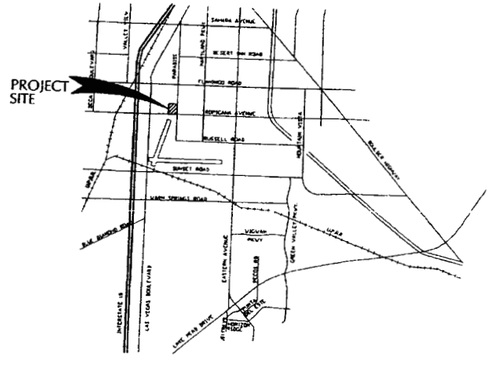
ILX RESORTS INCORPORATED
4813 PARADISE ROAD
LAS VEGAS, NEVADA 89109
PHONE: (702) 798-8700
CONTACT: JOE MARTORI

SHEET INDEX

1 OF 13	C1.01	COVER & APROVAL SHEET
2 OF 13	C1.02	GENERAL NOTES SHEET
3 OF 13	C1.03	OVERALL SITE PLAN
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9 OF 13	C4.06	GRADING PLAN
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11 OF 13	C4.08	GRADING PLAN
12 OF 13	C4.09	GRADING PLAN
13 OF 13	C8.01	DETAIL SHEET



KEY MAP



VICINITY MAP

APPROVALS

NEVADA POWER COMPANY ACKNOWLEDGES THAT WE HAVE RECEIVED YOUR PLANS AND WILL PROVIDE SERVICE TO ALL ELECTRICAL NEEDS ASSOCIATED WITH THIS PROJECT. NEVADA POWER COMPANY RESERVES THE RIGHT TO ADDRESS ANY EXISTING OR FUTURE CONFLICTS ONCE THE FINAL DESIGN IS COMPLETED. THE NEW SERVICE AND THE RESOLUTION OF ANY CONFLICTS WILL BE ACCOMPLISHED PURSUANT TO THE NEVADA PUBLIC UTILITY COMMISSION'S RULES AND REGULATIONS.

NEVADA POWER COMPANY _____ DATE

"THE AFFIXED SPRINT NEVADA APPROVAL DOES NOT ASSUME OR GUARANTEE LIABILITY FOR KNOWN OR UNKNOWN CONFLICTS WITH EXISTING OR PROPOSED IMPROVEMENTS. RESOLUTION OF ANY CONFLICT WILL BE ACCOMPLISHED PURSUANT TO LOCAL ORDINANCES, NEVADA REVISED STATUTES AND/OR PUBLIC UTILITY COMMISSION RULES AND REGULATIONS."

SPRINT _____ DATE

SOUTHWEST GAS CORPORATION _____ DATE

LAS VEGAS VALLEY WATER DISTRICT _____ DATE

CLARK COUNTY RECLAMATION DISTRICT

CLARK COUNTY WATER RECLAMATION DISTRICT
PROJECT CONTROL NUMBER IS _____
SIGNATURE ON THESE PLANS SHALL NOT BE CONSTRUED TO BE A PERMIT FOR OR AN APPROVAL OF ANY VIOLATION OF CLARK COUNTY SANITATION DISTRICT RULES, REGULATIONS, OR DESIGN AND CONSTRUCTION STANDARDS. THE APPROVAL OF THESE DRAWINGS DOES NOT GUARANTEE CAPACITY IN THE DISTRICT'S COLLECTION OR TREATMENT SYSTEM.

COUNTY OF CLARK
FIRE DEPARTMENT APPROVED

BY: _____
APPROVAL OF THESE PLANS SHALL NOT BE CONSTRUED TO BE A PERMIT FOR, OR AN APPROVAL OF, ANY VIOLATION OF ANY OF THE PROVISIONS OF THE STATE OR COUNTY LAWS.

FIRE FLOW _____ GPM AT 20 PSI RESIDUAL

MARTIN & MARTIN
MARTIN & MARTIN
CIVIL ENGINEERS
2101 SOUTH JONES BLVD.
SUITE 120
LAS VEGAS, NEVADA 89146
PHONE (702) 248-8000
FAX (702) 248-8070
E-MAIL: MARTMART@VCN.COM

PROFESSIONAL ENGINEER STATE OF NEVADA
JOHN P. WAKENHUT
Exp. 6-30-04
CIVIL
No. 13770
2-26-03

PREMIERE PARK
GOLF COURSE

COVER & APPROVAL SHEET

no	description of revisions	date	name

date 02-17-03
job number 1903.05
design by J. WAKENHUT, P.E.
drawn by V. WHIFORD
checked by J. DAVIS, P.E.

sheet number
C1.01

SHEET 1 OF 13
HTE #03-7719

GENERAL NOTES

1. CONTRACTOR SHALL PROVIDE ALL NECESSARY HORIZONTAL AND VERTICAL TRANSITIONS BETWEEN NEW CONSTRUCTION AND EXISTING SURFACES TO PROVIDE FOR PROPER DRAINAGE AND INGRESS AND EGRESS TO SAID CONSTRUCTION. EXTENT OF TRANSITIONS TO BE DETERMINED BY THE COUNTY ENGINEER.

2. LOCATIONS OF UNDERGROUND UTILITIES SHOWN ON THE DRAWINGS WERE OBTAINED FROM INFORMATION RECEIVED FROM THE APPLICABLE UTILITY CO'S. NEITHER THE OWNER NOR ENGINEER ASSUMES ANY RESPONSIBILITY FOR UTILITIES OR STRUCTURES NOT IN THE LOCATION SHOWN PRIOR TO START OF CONSTRUCTION. THE CONTRACTOR'S RESPONSIBILITY REGARDING UTILITIES SHALL BE AS REQUIRED UNDER SECTION 107.17 OF THE UNIFORM STANDARD SPECIFICATIONS FOR CLARK COUNTY AREA, NEVADA AND AS PROVIDED IN THE SPECIFICATIONS. THE CONTRACTOR SHALL USE EXTREME CAUTION WHEN WORKING OVER OR NEAR EXISTING GAS MAINS AND UNDERGROUND POWER LINES.

3. 48 HOURS PRIOR TO START OF CONSTRUCTION THE CONTRACTOR SHALL CONTACT:

LAS VEGAS VALLEY WATER DISTRICT	870-2011
NEVADA POWER COMPANY	1-800-227-2600
CENTRAL TELEPHONE COMPANY	1-800-227-2600
SOUTHWEST GAS CORPORATION	876-7220
VALLEY COMMUNICATIONS (CABLE CO.)	1-298-3214

4. THE CONTRACTOR SHALL TAKE ALL PRECAUTIONARY MEASURES NECESSARY TO PROTECT EXISTING IMPROVEMENTS, WHICH ARE TO REMAIN IN PLACE FROM DAMAGE AND ALL SUCH IMPROVEMENTS OR STRUCTURES DAMAGED BY THE CONTRACTOR'S OPERATIONS SHALL BE REPAIRED OR RECONSTRUCTED SATISFACTORY TO THE ENGINEER AT THE EXPENSE OF THE CONTRACTOR.

5. ALL BARRICADING AND TEMPORARY TRAFFIC CONTROL DEVICES OR METHODS USED DURING CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE CLARK COUNTY TRAFFIC CONTROL PLANS EXCEPT AS OTHERWISE PROVIDED IN THE CONTRACT SPECIFICATIONS OR REQUIRED BY THE ENGINEER.

6. THE QUANTITIES GIVEN IN THE DRAWINGS ARE APPROXIMATE ONLY, BEING GIVEN AS A BASIS FOR THE COMPARISON OF BIDS, AND THE OWNER DOES NOT EXPRESSLY OR BY IMPLICATION, AGREE THAT THE ACTUAL AMOUNT OF WORK WILL CORRESPOND THEREWITH, BUT RESERVES THE RIGHT TO MAKE SUCH ALTERATIONS, DEVIATIONS, ADDITIONS TO OR OMISSIONS FROM THE PLANS AND SPECIFICATIONS, INCLUDING THE RIGHT TO INCREASE OR DECREASE THE QUANTITY OF ANY ITEM OR PORTION OF THE WORK, AS MAY BE DEEMED BY THE OWNER TO BE NECESSARY. ANY SUCH CHANGES WILL BE SET FORTH IN A CONTRACT CHANGE ORDER WHICH WILL SPECIFY, IN ADDITION TO THE WORK TO BE DONE IN CONNECTION WITH THE CHANGE MADE, ADJUSTMENT OF CONTRACT TIME, IF ANY, AND THE BASIS OF COMPENSATION FOR SUCH WORK. A CONTRACT CHANGE ORDER WILL NOT BECOME EFFECTIVE UNTIL APPROVED BY THE OWNER.

7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE VERTICAL ADJUSTMENT OF ALL EXISTING SANITARY, WATER AND STORM SEWER MANHOLES TO THE FINAL FINISH GRADES IN ACCORDANCE WITH SECTION 609 OF THE STANDARD SPECIFICATIONS.

8. REMOVAL OR RELOCATION OF POWER POLES, TELEPHONE POLES, JOINTLY-OWNED POLES AND APPURTENANCES WHICH INTERFERE WITH IMPROVEMENTS REQUIRED TO BE CONSTRUCTED UNDER THIS CONTRACT, SHALL BE THE RESPONSIBILITY OF CONTRACTOR.

9. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE VERTICAL ADJUSTMENT OF ALL TELEPHONE COMPANY MANHOLES TO THE FINAL FINISH GRADES AS SHOWN ON THE CONTRACT DRAWINGS.

10. THE SOUTHWEST GAS CORPORATION SHALL BE RESPONSIBLE FOR THE REMOVAL OR RELOCATION OF ALL GAS LINES AND APPURTENANCES WHICH INTERFERE WITH IMPROVEMENTS SHOWN ON THE CONTRACT DRAWINGS.

11. ALL CONCRETE FOR THIS PROJECT SHALL USE TYPE V CEMENT.

12. SLOPES STEEPER THAN 4:1 AND FINE-GRAINED MATERIALS THAT HAVE BEEN DISTURBED (SANDY AND SILTY MATERIALS), SHOULD BE PROTECTED WITH BURLAP AND OTHER EROSION CONTROL FABRIC/MATERIAL, UNLESS OTHERWISE SPECIFIED BY THE LANDSCAPE DRAWINGS AND SPECIFICATIONS, OR THE SOILS REPORT.

13. CONTRACTOR SHALL DETERMINE HIS OWN FOOTING OR BASEMENT EXCAVATION QUANTITIES, EVEN THOUGH SHOWN ON ROUGH GRADING PLANS. ADDITIONALLY, STRUCTURE BACKFILL COSTS SHOULD BE INCLUDED IN THE COST OF THE STRUCTURE, UNLESS OTHERWISE SPECIFIED IN THE CONTRACT DOCUMENTS.

14. CONTRACTOR SHALL NOTIFY MARTIN & MARTIN WITHIN 24 HOURS OF OMISSIONS AND ERRORS DISCOVERED ON PLANS. MARTIN & MARTIN WILL REVISE AND RE-ISSUE DRAWINGS AS SOON AS POSSIBLE. MARTIN & MARTIN WILL NOT BE RESPONSIBLE FOR ANY "CORRECTIVE" WORK DONE BY OTHERS.

DEPTARTMENT OF DEVELOPMENT SERVICES CIVIL ENGINEERING DIVISION NOTES

INSPECTIONS ARE REQUIRED. CALL 24 HOURS IN ADVANCE, 455-4610. YOUR PERMIT, APPROVED PLANS, AND BARRICADE PLANS FOR THIS WORK MUST BE ON THE JOB SITE AT ALL TIMES.

EXACT LOCATION OF ALL SAW-CUT LINES SHALL BE DETERMINED IN THE FIELD BY A CLARK COUNTY INSPECTOR.

CURB AND GUTTER WITH A GRADE OF LESS THAN 4/10 OF ONE PERCENT SHALL BE CONSTRUCTED BY FORMING. EACH JOINT SHALL BE CHECKED FOR GRADE PRIOR TO CONSTRUCTION AND WATER TESTED AS SOON AS POSSIBLE AFTER CONSTRUCTION.

FINAL ASPHALTIC CONCRETE (AC) PAVEMENT SURFACES SHALL BE ONE-HALF (1/2") INCH ABOVE THE LIP OF THE GUTTER (INCLUDING OPEN GRADE).

ALL OFF-SITE IMPROVEMENT CONSTRUCTION SHALL CONFORM TO THE UNIFORM STANDARD SPECIFICATIONS AND STANDARD DRAWINGS CLARK COUNTY AREA NEVADA AND CLARK COUNTY SUPPLEMENT TO UNIFORM STANDARD DRAWINGS AND SPECIFICATIONS, LATEST ADDITION.

PRIVATE STREETS, CURB & GUTTER AND VALLEY GUTTERS REFLECTED ON THESE PLANS ARE TO BE INSPECTED BY A CLARK COUNTY INSPECTOR.

WHEEL CHAIR RAMPS SHALL BE CONSTRUCTED IN EACH QUADRANT OF AN INTERSECTION PER STANDARD DRAWING 235. EXACT LOCATION OF RAMPS SHALL BE DETERMINED IN THE FIELD BY A CLARK COUNTY PUBLIC WORKS INSPECTOR.

PROPER SIGNS, BARRIERS, BARRICADES AND LIGHTS SHALL BE PLACED AND MAINTAINED IN ACCORDANCE WITH THE LATEST "MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS". TRAFFIC, SCHOOL, OR STREET SIGNS OF ANY KIND ARE NOT TO BE MOVED FOR ANY REASON WITHOUT FIRST COORDINATING WITH THE DEPARTMENT OF DEVELOPMENT SERVICES, CIVIL ENGINEERING DIVISION INSPECTOR @ 455-4610.

THIS PLAN DOES NOT AUTHORIZE CLOSURE OF ANY ROAD OR STREET.

NO OPEN TRENCH SHALL BE ALLOWED ACROSS ANY STREET OR WITHIN TEN (10') OF ANY TRAVEL-WAY, EXCEPT WHEN WORK IS IN ACTUAL PROGRESS. AREAS COVERED BY ACCEPTABLE STEEL PLATE ARE NOT TO BE CONSTRUED AS A TRENCH. NO OPEN TRENCH IS PERMITTED IN EXCESS OF 500 FEET OR LENGTH NECESSARY TO ACCOMMODATE PIPE INSTALLATION IN A SINGLE DAY, WHICH EVER IS GREATER. ALL TRENCH CROSSINGS AND BACKFILL SHALL MEET THE STANDARD SPECIFICATION UNLESS OTHERWISE STATED.

A TEMPORARY PATCH IS TO BE IN PLACE AT THE END OF EACH WORK DAY WHERE THE BACKFILL IN THE TRENCH HAS BEEN COMPLETED AND PRIOR TO OPENING THE WORK AREA BACK TO TRAFFIC AND IS TO BE MAINTAINED BY THE PERMITEE. A PERMANENT PATCH IS TO BE IN PLACE WITHIN THIRTY (30) DAYS AFTER THE INSTALLATION OF THE TEMPORARY PATCH.

COMPACTION TESTS ARE REQUIRED.

REVISED 11-15-02

L.V.V.W.D. STANDARD NOTES

LVVWD PROJECT # _____

1. NO WORK SHALL BEGIN UNTIL THE WATER PLANS HAVE BEEN RELEASED FOR CONSTRUCTION BY THE LVVWD. FOLLOWING WATER PLAN APPROVAL, 48 HOUR NOTICE SHALL BE GIVEN TO THE LVVWD CUSTOMER SERVICE DEPARTMENT (258-7171) PRIOR TO THE START OF CONSTRUCTION. NOTICE MUST BE GIVEN BY 2:00 P.M. THE BUSINESS DAY PRIOR TO A LVVWD INSPECTION. WHEN REQUESTING INSPECTIONS, PLEASE REFER TO THE PROJECT # IDENTIFIED ABOVE.

2. ALL WORK SHALL CONFORM TO LVVWD'S STANDARD PLATES, DRAWINGS, AND SPECIFICATIONS, AND THE UNIFORM DESIGN AND CONSTRUCTION STANDARDS FOR WATER DISTRIBUTION SYSTEMS (UDACS), LATEST EDITION.

3. ALL WORK, EXCEPT AS MODIFIED BY THESE PLANS OR BY NOTE 2, SHALL BE DONE IN ACCORDANCE WITH THE MOST CURRENT DRAFT OR EDITION OF THE UNIFORM STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION OFFSITE IMPROVEMENT, CLARK COUNTY AREA.

4. A SINGLE PIPE MATERIAL SHALL BE USED THROUGHOUT THE PROJECT UNLESS OTHERWISE APPROVED BY THE LVVWD.

5. ALL SERVICE LATERALS TWO(2) INCHES IN DIAMETER AND SMALLER SHALL BE COPPER TUBING WITH LVVWD APPROVED SERVICE SADDLES.

6. ALL WATER METER BOXES SHALL BE LOCATED OUTSIDE OF DRIVEWAY AREAS.

7. ALL VALVES SHALL BE LOCATED OUTSIDE OF DRIVEWAYS, VALLEY AND CURB GUTTERS.

8. THE FOLLOWING REQUIREMENTS MUST BE MET IN THE EVENT A WATER LINE AND SANITARY SEWER LINE CROSS:

   A MINIMUM EIGHTEEN (18) INCH VERTICAL SEPARATION (OUTSIDE TO OUTSIDE) MUST BE MAINTAINED WHEN THE WATER LINE IS INSTALLED OVER THE SANITARY OR STORM SEWER LINE. IF THE VERTICAL SEPARATION INSTALLED CANNOT BE MAINTAINED OR THE WATER LINE MUST BE PLACED UNDER THE SANITARY OR STORM SEWER LINE MUST BE CONSTRUCTED WITH ONE OF THE FOLLOWING OR, AS SHOWN ON THESE PLANS:

   A. POTABLE WATER SUPPLY QUALITY MATERIAL,
   B. ENCASEMENT, WITH FOUR (4) INCH CONCRETE (MINIMUM)
   C. SLEEVING WITH POTABLE WATER SUPPLY QUALITY PIPE.

   EACH PROVISION MUST EXTEND ALONG THE SANITARY OR STORM SEWER, ON EITHER SIDE OF THE MAIN, A MINIMUM TEN (10) FOOT DISTANCE PERPENDICULAR TO THE WATER MAIN EXTERIOR.

9. WARNING TAPE SHALL BE REQUIRED OVER ALL MAINS, ALL SIX (6) INCH DIAMETER AND LARGER SERVICE LATERALS, AND ANY SERVICE LATERAL NOT INSTALLED PERPENDICULAR TO THE MAIN IN ACCORDANCE WITH STANDARD PLATE NO. 27.

10. ALL WATER FACILITIES SHALL BE FILLED, DISINFECTED, PRESSURE TESTED, FLUSHED, FILLED AND AN ACCEPTABLE WATER SAMPLE OBTAINED, PRIOR TO CONNECTION TO THE LVVWD'S DISTRIBUTION SYSTEM.

11. THE CONTRACTOR MUST OBTAIN ALL METERS TWO (2) INCHES AND SMALLER FROM LVVWD CENTRAL STORES, TELEPHONE 258-3152 FORTY-EIGHT HOURS PRIOR TO PICKUP.

12. CONSTRUCTION MAY INTERRUPT SERVICE, WITH LVVWD APPROVAL AND PROPER NOTIFICATION, BETWEEN THE HOURS OF 10 P.M. AND 6 A.M., SUNDAY THROUGH THURSDAY. CIRCUMSTANCES MAY REQUIRE TEMPORARY SERVICE FEEDS BE INSTALLED WITHOUT LVVWD REIMBURSEMENT. ANY TEMPORARY SERVICE FEED MUST HAVE PRIOR LVVWD APPROVAL.

13. ALL WATER FACILITY CONSTRUCTION MATERIALS USED MUST BE AS LISTED ON THE LVVWD'S PRE-APPROVED MATERIALS AND MANUFACTURERS LISTING FOR NEW FACILITIES, LATEST REVISION, OR SPECIFICALLY APPROVED ON THESE PLANS.

PRIVATE FIRE SERVICE MAIN STANDARD NOTES

1. A PRIVATE FIRE SERVICE MAIN IS THAT PIPE AND IT'S APPURTENANCES ON PRIVATE PROPERTY:

   A. BETWEEN A SOURCE OF WATER AND THE BASE OF THE RISER NOT OVER 6 IN. ABOVE FLOOR). "FOR WATER-BASED FIRE PROTECTION.

   B. BETWEEN A SOURCE OF WATER AND THE BASE ELBOW OF PRIVATE HYDRANTS OR MONITORING NOZZLES.

   C. THE NEVADA STATE FIRE MARSHAL HAS DETERMINED THAT THE UNDERGROUND PORTIONS OF A SPRINKLER SYSTEM ARE DEFINED AS: THAT PORTION OF THE PIPING BETWEEN A SOURCE OF PUBLIC WATER (USUALLY IN A PUBLIC STREET) AND THE BASE OF THE SPRINKLER RISER (NOT OVER 6 IN. ABOVE THE FLOOR).

2. THE UNDERGROUND CONTRACTOR INSTALLING THE PRIVATE FIRE SERVICE MAIN SUPPLYING ANY AUTOMATIC FIRE SPRINKLER SYSTEM MUST BE LICENSED BY THE STATE OF NEVADA, STATE FIRE MARSHAL DIVISION, FOR THE UNDERGROUND INSTALLATION OF SPRINKLER PIPING.

3. THE INSPECTION AND TESTING OF ALL PRIVATE FIRE SERVICE MAINS SHALL BE WITNESSED AND APPROVED BY THE FIRE PREVENTION DIVISION.

4. ALL VALVES CONTROLLING CONNECTIONS TO WATER SUPPLIES AND TO SPRINKLER PIPING SHALL BE LISTED INDICATING VALVES OR AS APPROVED BY THE FIRE PREVENTION DIVISION.

5. ALL VALVES CONTROLLING CONNECTIONS TO WATER SUPPLIES AND TO SPRINKLER PIPING SHALL BE PROTECTED FROM FREEZING WHEN EXPOSED TO TEMPERATURES LESS THAN 40T. FREEZE PROTECTION SHALL BE PROVIDED IN SUCH A MANNER THAT IT WILL LAST THE LIFETIME OF THE VALVE.

6. ALL VALVES CONTROLLING THE FLOW OF WATER THROUGH A PRIVATE FIRE SERVICE MAIN SUPPLYING WATER FOR AUTOMATIC FIRE SPRINKLER SYSTEMS SHALL BE ELECTRICALLY SUPERVISED WHEN REQUIRED BY THE UNIFORM FIRE CODE. WHEN REQUIRED, VALVE SUPERVISION AND TROUBLE SIGNALS SHALL BE CONNECTED TO A FIRE ALARM PANEL FOR RETRANSMISSIONS TO AN APPROVED CENTRAL STATION.

7. ALL FIRE DEPARTMENT CONNECTIONS (FDC) FOR FIRE SPRINKLER SYSTEMS SHALL BE LOCATED WITHIN 100 FEET OF FIRE HYDRANT.

8. ALL WORK SHALL BE IN ACCORDANCE WITH NFPA 24, STANDARD FOR THE INSTALLATION OF PRIVATE FIRE SERVICE MAINS AND THEIR APPURTENANCES.

UPDATED 4-6-94

GENERAL NOTE:

IT IS THE CONTRACTORS RESPONSIBILITY TO FILE A NOTICE OF INTENT/REQUEST TO BE INCLUDED IN THE STORM WATER GENERAL PERMIT, AND SUBMIT THE ASSOCIATED STORM DRAIN WATER POLLUTION PREVENTION PLAN (SPPP) AS REQUIRED BY THE FEDERAL LAW, AND MONITORED BY THE NEVADA DIVISION OF ENVIRONMENTAL PROTECTION.

TRAFFIC NOTES

1. ALL PERMANENT TRAFFIC CONTROL DEVICES CALLED FOR HEREON SHALL BE IN PLACE AND IN FINAL POSITION PRIOR TO ALLOWING ANY PUBLIC TRAFFIC ONTO THE PORTIONS OF THE ROAD(S) BEING IMPROVED HERE UNDER, REGARDLESS OF THE STATUS OF COMPLETION OF PAVING OR OTHER OFF-SITE IMPROVEMENTS CALLED FOR BY THESE PLANS.

2. BEFORE ANY WORK IS STARTED IN THE RIGHT-OF-WAY, THE CONTRACTOR SHALL INSTALL ALL ADVANCE WARNING SIGNS FOR THE CONSTRUCTION ZONE. THE CONTRACTOR SHALL INSTALL TEMPORARY GROUND MOUNTED STOP SIGNS AT ALL NEW STREET ENCROACHMENTS INTO EXISTING COUNTY STREETS IMMEDIATELY AFTER FIRST GRADING WORK IS ACCOMPLISHED, AND SHALL MAINTAIN SAID SIGNS UNTIL PERMANENT SIGNS ARE INSTALLED.

3. ALL CONSTRUCTION SIGNING, BARRICADING AND PAVEMENT MARKINGS SHALL CONFORM TO THE "NEVADA WORK ZONE TRAFFIC CONTROL HANDBOOK - 1986" AND TO THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES", CURRENT EDITION.

4. IF THE IMPROVEMENTS NECESSITATE THE OBLITERATION, TEMPORARY OBSTRUCTION, TEMPORARY REMOVAL, OR RELOCATION OF ANY EXISTING TRAFFIC PAVEMENT MARKING, SUCH PAVEMENT MARKING SHALL BE RESTORED OR REPLACED WITH LIKE MATERIALS TO THE SATISFACTION OF THE COUNTY TRAFFIC MANAGER.

5. THE DEVELOPER SHALL BE RESPONSIBLE TO PROVIDE AND INSTALL ALL PERMANENT SIGNS SHOWN ON THE PLANS. STREET NAME SIGNS SHALL CONFORM IN THEIR ENTIRETY TO CLARK COUNTY AREA STANDARDS. ALL OTHER SIGNS SHALL BE STANDARD SIZE UNLESS OTHERWISE SPECIFIED IN THE PLANS. ALL SIGN POSTS SHALL BE INSTALLED IN ACCORDANCE WITH CLARK COUNTY AREA STANDARDS. ALL SIGNS SHALL USE TYPE III SHEETING.

6. IF A PROPOSED STREET LIGHT STANDARD IS FIELD LOCATED TO WITHIN FIVE (5) FEET OF ANY SIGN SHOWN HEREON TO BE MOUNTED ON A SIGN POST, THEN CHANGE SIGN MOUNTING TO ONE ON THE STREETLIGHT STANDARD.

7. PRIOR TO CONSTRUCTION, THE STREET SIGN CONTRACTOR SHALL OBTAIN STREET NAMES AND BLOCK NUMBERING FROM THE CURRENT PLANNING DIVISION OF THE DEPARTMENT OF COMPREHENSIVE PLANNING.

8. ALL TRAFFIC SIGNAL POLE ASSEMBLIES, STEEL PEDESTALS FOR CABINETS AND STREET LIGHT POLES SHALL BE GALVANIZED PER ASTM A.123.

9. ALL STREET LIGHTING INSTALLATIONS EXCEPT AS NOTED ON THE STREET LIGHTING PLANS SHALL CONFORM TO THE UNIFORM STANDARD DRAWINGS AND THE UNIFORM STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION, OFF-SITE IMPROVEMENTS, CLARK COUNTY AREA, NEVADA, LATEST EDITION OF EACH.

10. THE FOLLOWING CLARK COUNTY UNDERGROUND FACILITIES MAY BE LOCATED IN YOUR PROJECT AREA: STREET LIGHTING, TRAFFIC SIGNALS, LAS VEGAS AREA COMPUTER TRAFFIC SYSTEM (LVACTS) INTERCONNECT CABLE. YOU MUST CONTACT CLARK COUNTY TRAFFIC MANAGEMENT DIVISION, OPERATIONS UNIT AT 455-7511 FOR LOCATIONS AT LEAST 48 HOURS PRIOR TO WORKING IN THE AREA. CLARK COUNTY IS NOT A MEMBER OF CALL BEFORE YOU DIG (UNDERGROUND SERVICE ALERT), AND A CALL TO THAT ORGANIZATION DOES NOT RELIEVE YOU OF LIABILITY FOR CLARK COUNTY FACILITIES.

11. LVACTS INTERCONNECT CABLE POLICY IS IN EFFECT. INTERCONNECT CABLE MUST BE MAINTAINED AT ALL TIMES. DEVELOPER/CONTRACTOR SHALL PROVIDE TEMPORARY OVERHEAD INTERCONNECT CABLE, WHILE PERMANENT CABLE IS BEING RELOCATED. TEMPORARY AERIAL INSTALLATION MUST BE ACCEPTABLE TO THE CLARK COUNTY TRAFFIC MANAGER AND TO LVACTS. ANY DAMAGE TO THIS CABLE IS DEEMED AN EMERGENCY BY LVACTS, CITY OF LAS VEGAS, CLARK COUNTY AND MDOT AND MUST BE REPAIRED IMMEDIATELY BY LVACTS' ACCEPTANCE. $2,500 PER DAY DAMAGES MAY BE ASSESSED AFTER 24 HOURS HAS ELAPSED FROM TIME OF BREAK OR DAMAGE.

12. ALL NEW OR REPLACEMENT TRAFFIC SIGNAL LOOPS SHALL BE INSTALLED USING CABLE-IN-DUCT WIRING. SHALL HAVE INDEPENDENT LEAD-IN WIRES FOR EACH LOOP FROM THE CONTROLLER TO THE PULL-BOX, AND EACH LEAD-IN SHALL BE INDIVIDUALLY TAGGED.

13. TRAFFIC SIGNAL PEDESTRIAN HEADS SHALL BE THE LED TYPE.

14. ELECTRICAL POWER SERVICE POINT LOCATION(S) FOR STREET LIGHTING AND TRAFFIC SIGNALS MUST BE INDICATED ON THE PLANS. IF CONNECTING TO AN EXISTING CIRCUIT, INDICATE LOCATION OF EXISTING SERVICE POINT FOR EACH CIRCUIT.

15. WHEN STREET LIGHTS ARE TO BE CONNECTED TO AN EXISTING CIRCUIT, THE ENGINEER MUST CERTIFY THAT THE EXISTING CIRCUIT IS CAPABLE OF HANDLING THE ADDITIONAL CIRCUIT LOAD.

16. CLARK COUNTY RESERVES THE RIGHT TO REJECT STREET LIGHT AND TRAFFIC SIGNAL POLES AND ASSEMBLIES WHICH HAVE A "STRIPED" APPEARANCE.

17. PRIOR TO BEGINNING OF CONSTRUCTION, MODIFICATION, OR RELOCATION OF ANY TRAFFIC SIGNAL SYSTEM, WRITTEN NOTICE SHALL BE SUBMITTED TO THE CLARK COUNTY TRAFFIC MANAGEMENT DIVISION OF THE DATE THAT WORK WILL BEGIN.

18. THREE (3) NORMAL WORKING DAYS PRIOR TO TURN-ON OR COMPLETION OF MODIFICATION(S) TO A TRAFFIC SIGNAL SYSTEM, WRITTEN NOTICE SHALL BE SUBMITTED TO THE CLARK COUNTY TRAFFIC MANAGEMENT DIVISION THAT WORK IS BEING COMPLETED AND THE PROPOSED DATE OF COMPLETION.

FIRE DEPARTMENT GENERAL NOTES

A. ALL WORK SHALL BE DONE IN STRICT ACCORDANCE WITH THE 1997 EDITION OF THE UNIFORM FIRE CODE, AND THE 1995 EDITION OF NATIONAL FIRE PROTECTION ASSOCIATION PAMPHLET #24.

B. ON ANY BUILDING CONSTRUCTION, ACCESSIBLE FIRE HYDRANTS SHALL BE INSTALLED BEFORE COMBUSTIBLE MATERIALS ARE DELIVERED TO THE SITE AND CONSTRUCTION COMMENCES. SAID FIRE HYDRANTS SHALL BE IN GOOD WORKING ORDER WITH THE REQUIRED WATER SUPPLY.

C. IF DURING CONSTRUCTION IT BECOMES NECESSARY TO CLOSE ANY CONTROL VALVE OR PLACE A HYDRANT OUT OF SERVICE, THE CLARK COUNTY FIRE DEPARTMENT MUST BE CONTACTED.

D. PAINTING OF CURBS AND/OR STRIPING OF ASPHALT AREAS AND PROTECTION OF HYDRANTS FROM PHYSICAL INJURY PER FIRE HYDRANT INSTALLATION SPECIFICATIONS OF THE FIRE PREVENTION BUREAU.

E. NO FIRE HYDRANT SHALL BE LOCATED WITHIN 25 FEET OF ANY STRUCTURE, OR 5 FEET OF A DRIVEWAY, POWER POLE, LIGHT STANDARD, OR ANY OTHER OBSTRUCTION; FOR WALL, FENCE AND PLANTER LOCATIONS, A PERIMETER AROUND THE HYDRANT MEASURING A MINIMUM OF 3 FEET FROM ITS EXTERIOR SHALL BE MAINTAINED CLEAR OF ALL OBSTRUCTION AT ALL TIMES.

F. AT ALL TIMES DURING CONSTRUCTION SUITABLE EMERGENCY VEHICLE ACCESS ROAD MUST BE MAINTAINED. ROADWAYS MUST BE SMOOTH, COMPACTED AND CAPABLE OF SUPPORTING THE IMPOSED LOADS OF ALL EMERGENCY VEHICLES.

G. PRIOR TO ACCEPTANCE OF ANY FIRE SERVICE MAIN, A SATISFACTORY HYDROSTATIC TEST WITH PIPING JOINTS UNCOVERED MUST BE CONDUCTED. APPROVED PLANS AND CONTRACTOR'S MATERIALS AND TEST CERTIFICATE MUST BE PROVIDED AT TIME OF INSPECTION.

H. BLUE REFLECTIVE MARKERS MUST BE INSTALLED BEFORE FINAL HYDRANT ACCEPTANCE CAN BE ATTAINED [97 UFC SEC. 901.4.3]

ABBREVIATIONS

ABAN	- ABANDON	LT	- LEFT
AIP	- ABANDONED IN PLACE	LF	- LINEAR FEET
AGG	- AGGREGATE	LP	- LOW POINT
ALT	- ALTERNATE	LVVWD	- LAS VEGAS VALLEY WATER DISTRICT
A	- ANGLE, GAS	MH	- MANHOLE
ACP	- ASBESTOS CEMENT PIPE	MAX	- MAXIMUM
AC	- ASPHALTIC CONCRETE	MIN	- MINIMUM
AVE	- AVENUE	MON	- MONOLITHIC
BC	- BACK OF CURB	MUE	- MUNICIPAL UTILITY EASEMENT
BCR	- BACK OF CURB RADIUS	NO	- NUMBER
BEG	- BEGIN	N/O	- NORTH OF
BVC	- BEGINNING OF VERTICAL CURVE	NTS	- NOT TO SCALE
BM	- BENCH MARK	OC	- ON CENTER
BDRY LINE	- BOUNDARY LINE	OG	- OPEN-GRADE PAVEMENT, ORIGINAL GROUND
BW	- BACK OF SIDEWALK	OD	- OVERHEAD ELECTRIC
CATV	- CABLE TELEVISION	OHE	- PAVEMENT
C-C	- CENTER TO CENTER	PC	- PAD GRADE
℄	- CENTER LINE	PHP	- PLASTIC HIGH PRESSURE
CBC	- CITY OF BOULDER CITY	PVMT	- PAVEMENT
CLV	- CITY OF LAS VEGAS	PI	- POINT OF INTERSECTION
COH	- CITY OF HENDERSON	PRC	- POINT OF REVERSE CURVE
CM	- CITY OF MESQUITE	PC	- POINT OF CURVE
CNLV	- CITY OF NORTH LAS VEGAS	PT	- POINT OF TANGENCY
CC	- CLARK COUNTY	PCC	- POINT OF COMPOUND CURVE
CCSD	- CLARK COUNTY SANITATION DISTRICT	PCC, CONC	- PORTLAND CEMENT CONCRETE
CO	- CLEAN OUT, SEWER	PP	- POWER POLE
COMM	- COMMERCIAL	P	- POWER
CONC, PCC	- CONCRETE	PL	- PROPERTY LINE
CONST	- CONSTRUCTION OR CONSTRUCT	PROP	- PROPOSED
COR	- CORNER	PL-G	- PLASTIC GAS
CMP	- CORRUGATED METAL PIPE	PRC	- POINT OF REVERSE CURVE
CSAP	- CORRUGATED STEEL ARCH PIPE	PB	- PULL BOX
CSP	- CORRUGATED STEEL PIPE	PVI	- POINT OF VERTICAL INTERSECTION
C&G	- CURB & GUTTER	PVC	- POLYVINYL CHLORIDE PIPE
CIP	- CAST IRON PIPE	Q	- RATE OF FLOW
COL	- COLUMN	RP	- RADIUS POINT
CU YD, CY	- CUBIC YARD	R	- RADIUS
CU FT, CF	- CUBIC FOOT	RR	- RAILROAD
CULV	- CULVERT	REINF	- REINFORCED
CF	- CURB FACE	RC	- REINFORCED CONCRETE
DC	- DEPRESSED CURB	RCB	- REINFORCED CONCRETE BOX
DEPT	- DEPARTMENT	RELOC	- RELOCATE
DIA	- DIAMETER	RCP	- REINFORCED CONCRETE PIPE
DWY	- DRIVEWAY	RT	- RIGHT
DI	- DROP INLET	R/W	- RIGHT-OF-WAY
DIP	- DUCTILE IRON PIPE	RD	- ROAD
DMH	- DROP MANHOLE	S-G	- STEEL GAS
ESMT	- EASEMENT	SS	- SANITARY SEWER
E/O	- EAST OF	SHT	- SHEET
EP	- EDGE OF PAVEMENT	S/O	- SOUTH OF
EO	- EDGE OF OIL	SW	- SIDEWALK
E	- ELECTRIC	SQ FT, SF	- SQUARE FOOT
EM	- ELECTRIC METER	SQ YD, SY	- SQUARE YARD
ELEV	- ELEVATION	STA	- STATION
EMBK	- EMBANKMENT	SHP	- STEEL HIGH-PRESSURE PIPE
ECR	- END OF CURB RETURN	SD	- STORM DRAIN
EC	- END OF CURVE	STD	- STANDARD
EPS	- CATHODIC PROTECTION BOND STATION	STRUCT	- STRUCTURAL OR STRUCTURE
ETS	- CATHODIC PROTECTION TEST STATION	SURV	- SURVEY
EVC	- END OF VERTICAL CURVE	TL	- STREETLIGHT
EXIST, EX	- EXISTING	T	- TELEPHONE
FF	- FINISHED FLOOR	TEMP	- TEMPORARY
FDC	- FIRE DEPARTMENT CONNECTION	TBA	- TO BE ADJUSTED
FT	- FEET OF FOOT	TBR	- TO BE REMOVED
FG	- FINISH GRADE	TC	- TOP OF CURB
FA	- FIRE ALARM	TMH	- TOP OF MANHOLE
FH	- FIRE HYDRANT	TP	- TOP OF PIPE
FL	- FLOW LINE	TS	- TRAFFIC SIGNAL
G	- GAS	TSC	- TRAFFIC SIGNAL CONDUIT
GALV	- GALVANIZED	TSI	- TRAFFIC SIGNAL INTERCONNECT
GM	- GAS METER	TRANS	- TRANSITION
GR	- GAS PRESSURE REGULATOR	TW	- TOP OF WALL
GB	- GRADE BREAK	TYP	- TYPICAL
GUT	- GUTTER	UG	- UNDERGROUND
HDWL	- HEADWALL	UGE	- UNDERGROUND ELECTRICAL
HP	- HIGH POINT	VAR	- VARIABLE
HDWL	- HEADWALL	VERT	- VERTICAL
ID	- INSIDE DIAMETER	VC	- VERTICAL CURVE
IN	- INCH	VG	- VALLEY GUTTER
INT	- INTERSECTION	VCP	- VITRIFIED CLAY PIPE
INV	- INVERT	W	- WATER
ISL	- ISLAND	WM	- WATER METER
JB	- JUNCTION BOX	W/O	- WEST OF
LAT	- LATERAL	YD	- YARD
LOC	- LENGTH OF CURB		
LS	- LANDSCAPE		

CLARK COUNTY WATER RECLAMATION DISTRICT

1. ALL CONSTRUCTION AND MATERIALS SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE DESIGN & CONSTRUCTION STANDARDS FOR WASTEWATER COLLECTION SYSTEMS AND THE UNIFORM STANDARD SPECIFICATIONS FOR PUBLIC WORKS' CONSTRUCTION OFF-SITE IMPROVEMENTS, CLARK COUNTY AREA, NEVADA, AS AMENDED. IN ALL CASES, THESE STANDARDS SHALL SUPERSEDE THE UNIFORM STANDARD SPECIFICATIONS. IT WILL BE THE RESPONSIBILITY OF THE CONTRACTOR TO BE AWARE OF THE CONTENTS OF THE ABOVE SPECIFICATION BOOKS.

2. THESE STANDARDS SHALL APPLY TO ALL CONSTRUCTION.

3. SEWER MAINS ONLY TO BE LAID IN SEWER TRENCHES.

4. ALL LATERALS TO BE LAID AT NOT LESS THAN MINIMUM SLOPES AS SHOWN IN THESE STANDARDS.

5. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO PERFORM CONSTRUCTIONS AS PER PLANS. ANY ADDITIONS, DELETIONS, OR CHANGES SHALL FIRST MEET WITH THE APPROVAL OF THE CONTROLLING AGENCY.

6. SOIL TESTING SHALL BE IN ACCORDANCE WITH SECTION 3.11 OF THESE STANDARDS.

7. ALL EXFILTRATION, INFILTRATION, AIR TESTING AND TELEVISING OF LINES SHALL BE IN ACCORDANCE WITH THESE STANDARDS.

8. CUT SHEETS MUST BE SUBMITTED TO THE AGENCY BEFORE CONSTRUCTION WILL BE PERMITT

C4.01 C4.02 C4.03

C4.04 C4.05 C4.06

C4.07 C4.08 C4.09

PARADISE ROAD

TROPICANA AVENUE

GRAPHIC SCALE

(IN FEET)
1 inch = 80 ft.

BASIS OF BEARING

N 89°36'15" E, BEING THE SOUTH LINE OF THE SOUTHWEST ONE QUARTER (SW1/4) OF SECTION 22, TOWNSHIP 21 SOUTH, RANGE 61 EAST, M.D.M., CLARK COUNTY, NEVADA AS SHOWN ON THAT CERTAIN RECORD OF SURVEY, FILE 67, PAGE 7, RECORDED JUNE 23, 1993 AS DOC. NO. 01360.

BENCHMARK

CLARK COUNTY DATUM 6C11-22SSW6, A RIVET AND SQUARE PLATE IN TOP OF CURB, NORTHEAST CORNER OF TROPICANA AVENUE AND PARADISE ROAD.

ELEVATION 2058.93

PROJECT SITE

VICINITY MAP

AVOID CUTTING UNDERGROUND UTILITY LINES. IT'S COSTLY.
Call before you Dig–
1-800-227-2600
(NEVADA ONE CALL)

AVOID OVERHEAD POWER LINE CONTACT
Call before you
OVERHEAD
1-702-593-6111
(NEVADA POWER ENVIRONMENT AND SAFETY SERVICES DEPARTMENT)

MARTIN & MARTIN ASSUMES NO RESPONSIBILITY FOR EXISTING UTILITY LOCATIONS AND ELEVATIONS. THE UTILITIES SHOWN ON THIS DRAWING HAVE BEEN PLOTTED FROM THE BEST AVAILABLE INFORMATION. IT IS, HOWEVER, THE CONTRACTOR'S RESPONSIBILITY TO FIELD VERIFY THE LOCATION AND ELEVATION OF ALL UTILITIES PRIOR TO THE COMMENCEMENT OF ANY CONSTRUCTION. CONTRACTOR TO FIELD VERIFY ALL EXISTING SITE CONDITIONS PRIOR TO CONSTRUCTION. IF A CONFLICT EXISTS BETWEEN WHAT IS SHOWN ON THESE DRAWINGS AND WHAT EXISTS IN THE FIELD, THE CONTRACTOR IS TO NOTIFY THE ARCHITECT OR ENGINEER IMMEDIATELY.

MARTIN & MARTIN
CIVIL ENGINEERS
2101 SOUTH JONES BLVD.
SUITE 120
LAS VEGAS, NEVADA 89146
PHONE (702) 248-8000
FAX (702) 248-8070
E-MAIL: MARTMART@LVCM.COM

PROFESSIONAL ENGINEER STATE OF NEVADA
JOHN W. WAKENHUT
Exp. 6-30-04
CIVIL
No. 13720

Z-26-03

PREMIERE PARK
GOLF COURSE
OVERALLL SITE PLAN

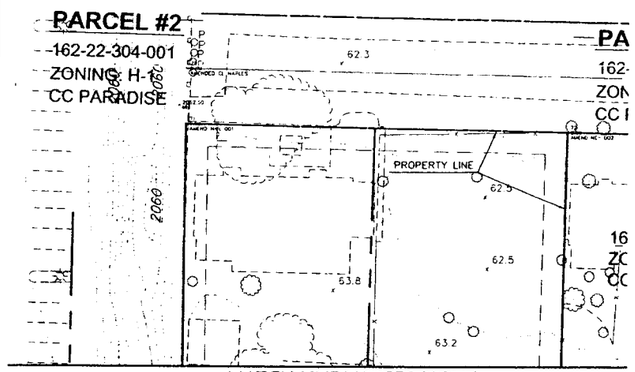
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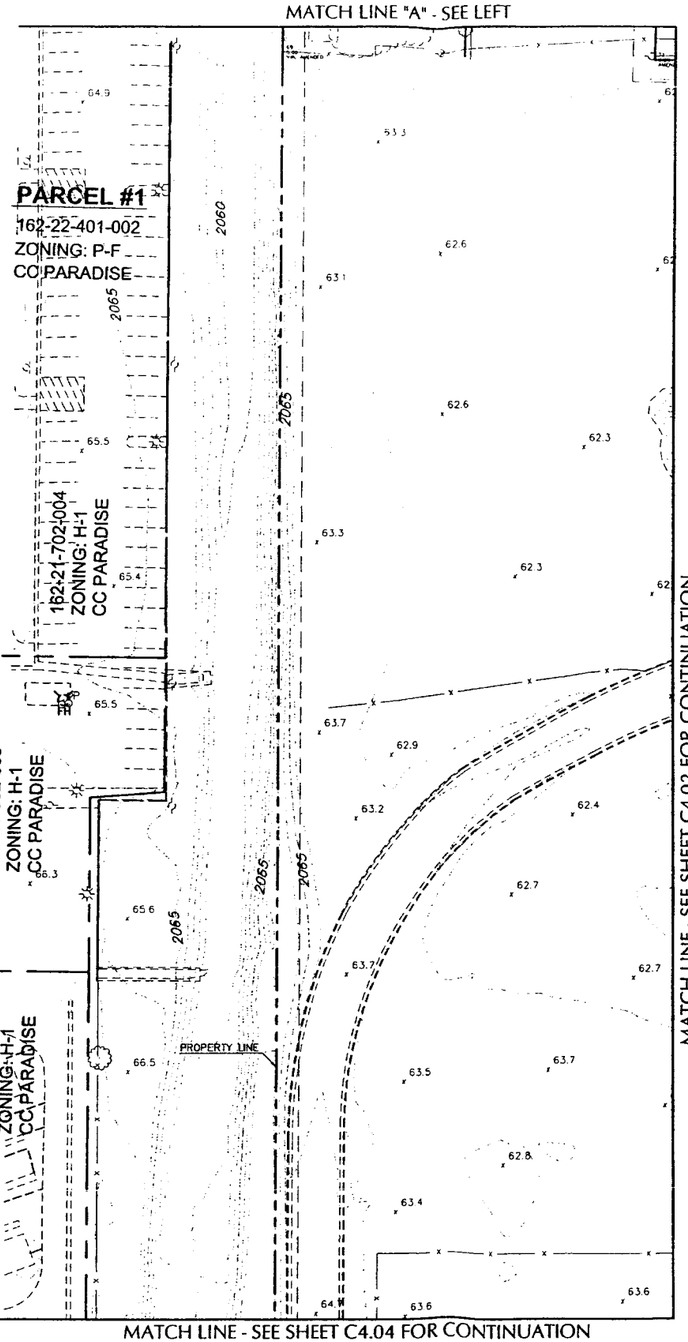
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job number 1903.05
design by J. WAKENHUT, P.E.
drawn by V. WINFORD
checked by J. DAVIS, P.E.

sheet number
C1.03

SHEET 3 OF 13
HTE #03-7719

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ALL GRADING WORK SHALL BE IN STRICT ACCORDANCE WITH THE SOILS REPORT FOR THE SITE ENTITLED "XXXXXXXXXX XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX XXXXXXXXXX, PROJECT NO. XXXXXXXXX,

PROJECT NO.: XXXXXXXXX, DATED XXXXXXXXXX
PREPARED BY:
XXXXXXXXX
XXXXXXXXXX
LAS VEGAS, NV XXXXX
PHONE NO. (702) XXX-XXXX
FAX NO. (702) XXX-XXXX

ALL WORK SHALL BE PERFORMED UNDER THE DIRECTION OF A REGISTERED PROFESSIONAL SOILS ENGINEER.

GRAPHIC SCALE

(IN FEET)
1 inch = 30 ft.

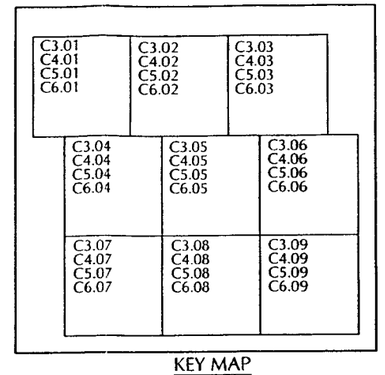
BASIS OF BEARING

N 89°36'15" E, BEING THE SOUTH LINE OF THE SOUTHWEST ONE QUARTER (SW1/4) OF SECTION 22, TOWNSHIP 21 SOUTH, RANGE 61 EAST, M.D.M., CLARK COUNTY, NEVADA AS SHOWN ON THAT CERTAIN RECORD OF SURVEY, FILE 67, PAGE 7, RECORDED JUNE 23, 1993 AS DOC. NO. 01360.

BENCHMARK

CLARK COUNTY DATUM 6C11-22SSW6, A RIVET AND SQUARE PLATE IN TOP OF CURB, NORTHEAST CORNER OF TROPICANA AVENUE AND PARADISE ROAD.

ELEVATION 2058.93



KEY MAP

CONSTRUCTION NOTES

No.	ITEM
1	CONSTRUCT "L" TYPE CURB AND GUTTER PER STD. DWG. NO. 216.
2	CONSTRUCT "A" TYPE CURB ONLY PER STD. DWG. 219.
3	CONSTRUCT SIDEWALK PER STD. DWG. NO. 234.
4	CONSTRUCT SIDEWALK RAMP PER STD. DWG. NO. 235, CASE I.
5	CONSTRUCT 8' CROSS GUTTER PER STD. DWG. NO. 228.
6	CONSTRUCT 2" MIN. AC OVER 6" TYPE II AB (CAR).
7	CONSTRUCT 6" MIN. AC OVER 16" TYPE II AB (TRUCK)
8	CONSTRUCT 3.5" MIN. AC OVER 5" TYPE II AB.- STREET NAME
9	CONSTRUCT 6" MIN. AC OVER 13" TYPE II AB. -STREET NAME
10	CONSTRUCT SIDEWALK DRAIN PER STD. DWG. NO. 236.
11	CONSTRUCT 4' CONCRETE CHANNEL PER DETAIL X ON SHEET XXXX.
12	CONSTRUCT COMMERCIAL DRIVEWAY PER C.C. AREA STD. DWG. NO. 222A, 225, & 228.
13	CONSTRUCT 3' VALLEY GUTTER PER DETAIL X OF SHEET XXX.
14	CONSTRUCT 4' VALLEY GUTTER PER DETAIL X OF SHEET XXX.

LEGEND

FUTURE	EXISTING	PROPOSED	
			RIGHT-OF-WAY
			CENTERLINE
		W	WATER LINE
S	S	S	SANITARY SEWER LINE
G	G	G	GAS LINE
SD	SD	SD	STORM DRAIN
P	P	P	POWER LINE / POWER POLE
T	T	T	TELEPHONE LINE
			FIRE HYDRANT
			WATER VALVE
			METERS / PULL BOXES
			REDUCER
			MANHOLE
			CLEANOUT
			SEWER MANHOLE
			STORM MANHOLE
			SIGN POLE
			UTILITY POLE
			DRAIN INLET
			CONTOUR

FUTURE	EXISTING	PROPOSED	
			SCREEN / RETAINING WALL
			CHAIN LINK FENCE
			GRADE BREAK
			WIRE FENCE
		FF=0.00	FINISH FLOOR
		0.00 C.O. INV.	CLEANOUT INVERT ELEVATION
		0.00	FLOW LINE
		0.00 F.G.	FINISH GRADE
		0.00 B.S.W.	BACK OF SIDEWALK
		0.00 T.C.	TOP OF CURB
		0.00 T.O.W.	TOP OF WALL
			2" A.C. PAVING
			4" A.C. PAVING
			TYPE "L" CURB & GUTTER
			TYPE "A" CURB
			CONCRETE

STREET LIGHTS
100 W H.P.S.
150 W H.P.S.
200 W H.P.S.
250 W H.P.S.

CLARK COUNTY
DEPARTMENT OF PUBLIC WORKS
ENGINEERING DIVISION

ACCEPTANCE OF PLANS FOR FILING
BY: Jack L. Swan 2-27-03
ACCEPTANCE OF THESE PLANS FOR FILING SHALL NOT BE CONSTRUED TO BE A PERMIT FOR OR AN APPROVAL OF ANY VIOLATION OF ANY OF THE PROVISIONS OF THE STATE OR COUNTY LAWS AND/OR SPECIFICATIONS. CLARK COUNTY SHALL BE HELD FREE FROM DAMAGES WHICH MAY RESULT FROM THE CONSTRUCTION OF THE IMPROVEMENTS FROM THE ENGINEERING DESIGN DEPICTED HEREIN.

I CERTIFY THAT THIS GRADING PLAN IS IN CONFORMANCE WITH THE APPROVED DRAINAGE STUDY ON FILE WITH THE CLARK COUNTY FOR THIS PROJECT.

JOHN WAKENHUT, P.E. — 2/26/03 DATE

COMPLETION OF SECTION II OF DRAINAGE COMPLIANCE REPORT REQUIRED.

AVOID CUTTING UNDERGROUND UTILITY LINES. IT'S COSTLY. Call before you Dig-- 1-800-227-2600 UNDERGROUND SERVICE ALERT (U.S.A.)

AVOID OVERHEAD POWER LINE CONTACT Call before you OVERHEAD 1-702-593-6111 NEVADA POWER ENVIRONMENT AND SAFETY SERVICES DEPARTMENT

MARTIN & MARTIN ASSUMES NO RESPONSIBILITY FOR EXISTING UTILITY LOCATIONS AND ELEVATIONS. THE UTILITIES SHOWN ON THIS DRAWING HAVE BEEN PLOTTED FROM THE BEST AVAILABLE INFORMATION. IT IS, HOWEVER, THE CONTRACTOR'S RESPONSIBILITY TO FIELD VERIFY THE LOCATION AND ELEVATION OF ALL UTILITIES PRIOR TO THE COMMENCEMENT OF ANY CONSTRUCTION. CONTRACTOR TO FIELD VERIFY ALL EXISTING SITE CONDITIONS PRIOR TO CONSTRUCTION. IF A CONFLICT EXISTS BETWEEN WHAT IS SHOWN ON THESE DRAWINGS AND WHAT EXISTS IN THE FIELD, THE CONTRACTOR IS TO NOTIFY THE ARCHITECT OR ENGINEER IMMEDIATELY.

NOTE: POWER POLES AND/OR OTHER EXISTING FACILITIES NOT IN PROPER LOCATION BASED ON PROPOSED IMPROVEMENTS SHOWN HEREON WILL BE RELOCATED AT NO EXPENSE TO CLARK COUNTY.

GENERAL NOTE:

IT IS THE CONTRACTORS RESPONSIBILITY TO FILE A NOTICE OF INTENT/REQUEST TO BE INCLUDED IN THE STORM WATER GENERAL PERMIT, AND SUBMIT THE ASSOCIATED STORMWATER POLLUTION PREVENTION PLAN (SPPP) AS REQUIRED BY FEDERAL LAW, AND MONITORED BY THE NEVADA DIVISION OF ENVIRONMENTAL PROTECTION.

MARTIN & MARTIN
CIVIL ENGINEERS
2101 SOUTH JONES BLVD
SUITE 120
LAS VEGAS, NEVADA 89146
PHONE (702) 248-8000
FAX (702) 248-8070
E-MAIL: MARTINAT@LVCM.COM

PROFESSIONAL ENGINEER STATE OF NEVADA JOHN WAKENHUT Exp. 6-30-04 CIVIL No. 15720 2-26-03

PREMIERE PARK
GOLF COURSE
GRADING PLAN

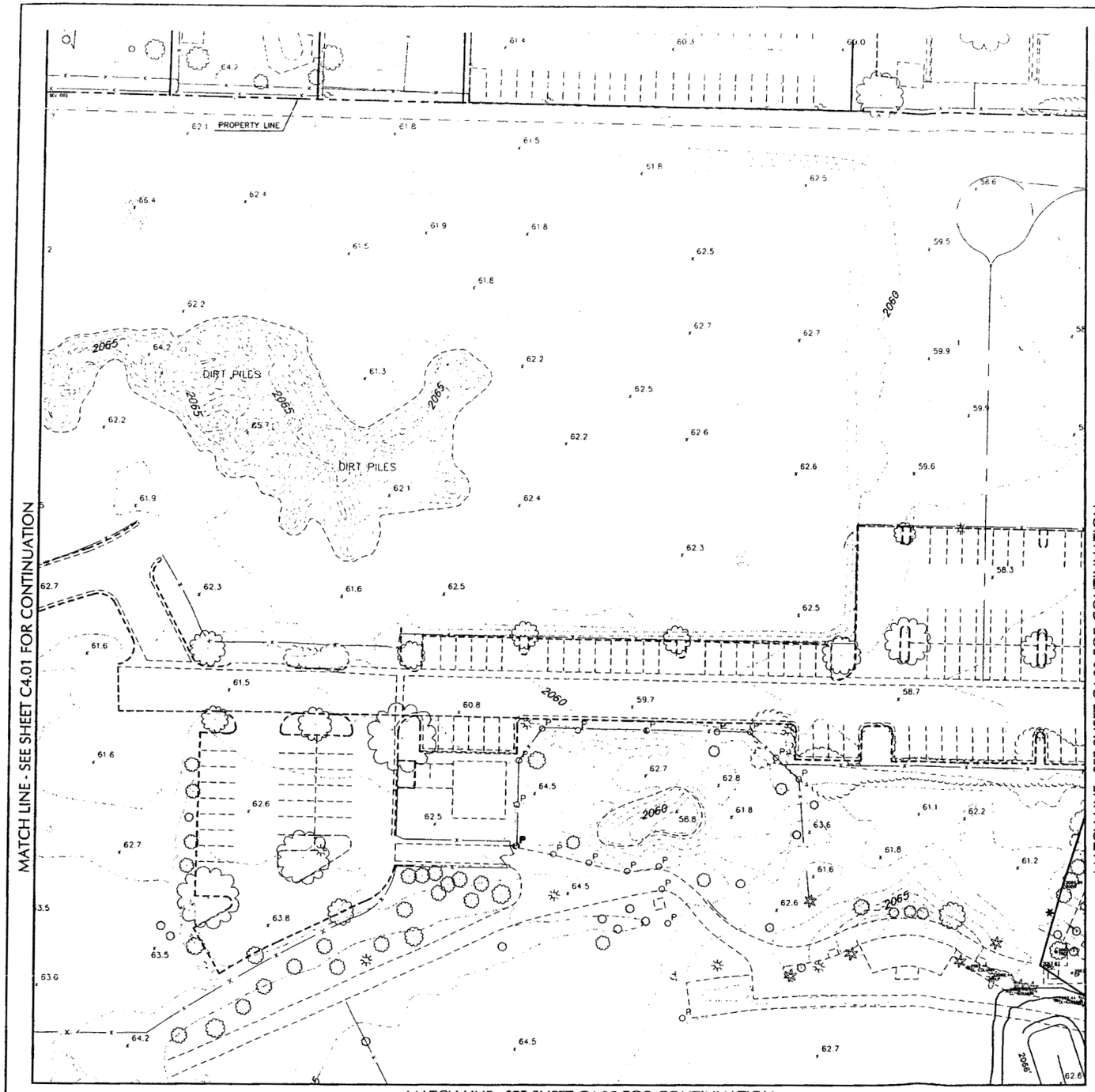
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date 02-14-03
job number 1903.05
design by J. WAKENHUT, P.E.
drawn by V. WINFORD
checked by J. DAVIS, P.E.

sheet number
C4.01
SHEET 4 OF 13

HTE #03-7719

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ALL GRADING WORK SHALL BE IN STRICT ACCORDANCE WITH THE SOILS REPORT FOR THE SITE ENTITLED "XXXXXXXXXX XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX XXXXXXXXX, PROJECT NO. XXXXXXXXX,

PROJECT NO.: XXXXXXXXX, DATED XXXXXXXXXX
PREPARED BY:

XXXXXXXXX
XXXXXXXXX
LAS VEGAS, NV XXXXX
PHONE NO. (702) XXX-XXXX
FAX NO. (702) XXX-XXXX

ALL WORK SHALL BE PERFORMED UNDER THE DIRECTION OF A REGISTERED PROFESSIONAL SOILS ENGINEER.

GRAPHIC SCALE

30 0 15 30 60 120

(IN FEET)
1 inch = 30 ft

BASIS OF BEARING

N 89°36'15" E, BEING THE SOUTH LINE OF THE SOUTHWEST ONE QUARTER (SW1/4) OF SECTION 22, TOWNSHIP 21 SOUTH, RANGE 61 EAST, M.D.M., CLARK COUNTY, NEVADA AS SHOWN ON THAT CERTAIN RECORD OF SURVEY, FILE 67, PAGE 7, RECORDED JUNE 23, 1993 AS DOC. NO. 01360.

BENCHMARK

CLARK COUNTY DATUM 6C11-22SSW6, A RIVET AND SQUARE PLATE IN TOP OF CURB, NORTHEAST CORNER OF TROPICANA AVENUE AND PARADISE ROAD.

ELEVATION 2058.93

C3.01 C4.01 C5.01 C6.01	C3.02 C4.02 C5.02 C6.02	C3.03 C4.03 C5.03 C6.03
C3.04 C4.04 C5.04 C6.04	C3.05 C4.05 C5.05 C6.05	C3.06 C4.06 C5.06 C6.06
C3.07 C4.07 C5.07 C6.07	C3.08 C4.08 C5.08 C6.08	C3.09 C4.09 C5.09 C6.09

KEY MAP

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7	CONSTRUCT 6" MIN. AC OVER 16" TYPE II AB (TRUCK)
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LEGEND

FUTURE	EXISTING	PROPOSED	
			RIGHT-OF-WAY
			CENTERLINE
		W	WATER LINE
S	S	S	SANITARY SEWER LINE
G	G	G	GAS LINE
SD	SD	SD	STORM DRAIN
E	E	E	POWER LINE / POWER POLE
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			FIRE HYDRANT
			WATER VALVE
			METERS / PULL BOXES
			REDUCER
			MANHOLE
			CLEANOUT
		S	SEWER MANHOLE
		S	STORM MANHOLE
			SIGN POLE
			UTILITY POLE
			DRAIN INLET
			CONTOUR

STREET LIGHTS

100 W H.P.S.
150 W H.P.S.
200 W H.P.S.
250 W H.P.S.

FUTURE	EXISTING	PROPOSED	
			SCREEN / RETAINING WALL
			CHAIN LINK FENCE
			GRADE BREAK
			WIRE FENCE
		FF=0.00	FINISH FLOOR
(0.00) C.O. BOX	(0.00) C.O. BOX	0.00 C.O. BOX	CLEANOUT INVERT ELEVATION
(0.00)	(0.00)	0.00	FLOW LINE
(0.00) F.G.	(0.00) F.G.	0.00 F.G.	FINISH GRADE
(0.00) B.S.W.	(0.00) B.S.W.	0.00 B.S.W.	BACK OF SIDEWALK
(0.00) T.C.	(0.00) T.C.	0.00 T.C.	TOP OF CURB
(0.00) T.O.W.	(0.00) T.O.W.	0.00 T.O.W.	TOP OF WALL
			2" A.C. PAVING
			4" A.C. PAVING
			TYPE "L" CURB & GUTTER
			TYPE "A" CURB
			CONCRETE

CLARK COUNTY
DEPARTMENT OF PUBLIC WORKS
ENGINEERING DIVISION

ACCEPTANCE OF PLANS FOR FILING

BY: Jack Lee Simpson 2-27-03

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COMPLETION OF SECTION II OF DRAINAGE COMPLIANCE REPORT REQUIRED.

I CERTIFY THAT THIS GRADING PLAN IS IN CONFORMANCE WITH THE APPROVED DRAINAGE STUDY ON FILE WITH THE CLARK COUNTY FOR THIS PROJECT.

JOHN WAKENHUT, P.E. — 2/26/03 DATE

AVOID CUTTING UNDERGROUND UTILITY LINES. IT'S COSTLY.
Call before you Dig— 1-800-227-2600
UNDERGROUND SERVICE ALERT (U.S.A.)

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NEVADA POWER ENVIRONMENT AND SAFETY SERVICES DEPARTMENT

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NOTE: POWER POLES AND/OR OTHER EXISTING FACILITIES NOT IN PROPER LOCATION BASED ON PROPOSED IMPROVEMENTS SHOWN HEREIN WILL BE RELOCATED AT NO EXPENSE TO CLARK COUNTY.

GENERAL NOTE:

IT IS THE CONTRACTORS RESPONSIBILITY TO FILE A NOTICE OF INTENT/REQUEST TO BE INCLUDED IN THE STORM WATER GENERAL PERMIT, AND SUBMIT THE ASSOCIATED STORMWATER POLLUTION PREVENTION PLAN (SPPP) AS REQUIRED BY FEDERAL LAW, AND MONITORED BY THE NEVADA DIVISION OF ENVIRONMENTAL PROTECTION.

MARTIN & MARTIN
CIVIL ENGINEERS
2101 SOUTH JONES BLVD.
SUITE 120
LAS VEGAS, NEVADA 89146
PHONE (702) 248-8000
FAX (702) 248-8070
E-MAIL: MARTMART@VCM.COM

PROFESSIONAL ENGINEER - STATE OF NEVADA - JOHN WAKENHUT - Exp. 6-30-04 - CIVIL - No. 13770 - 2-26-03

PREMIERE PARK
GOLF COURSE
GRADING PLAN

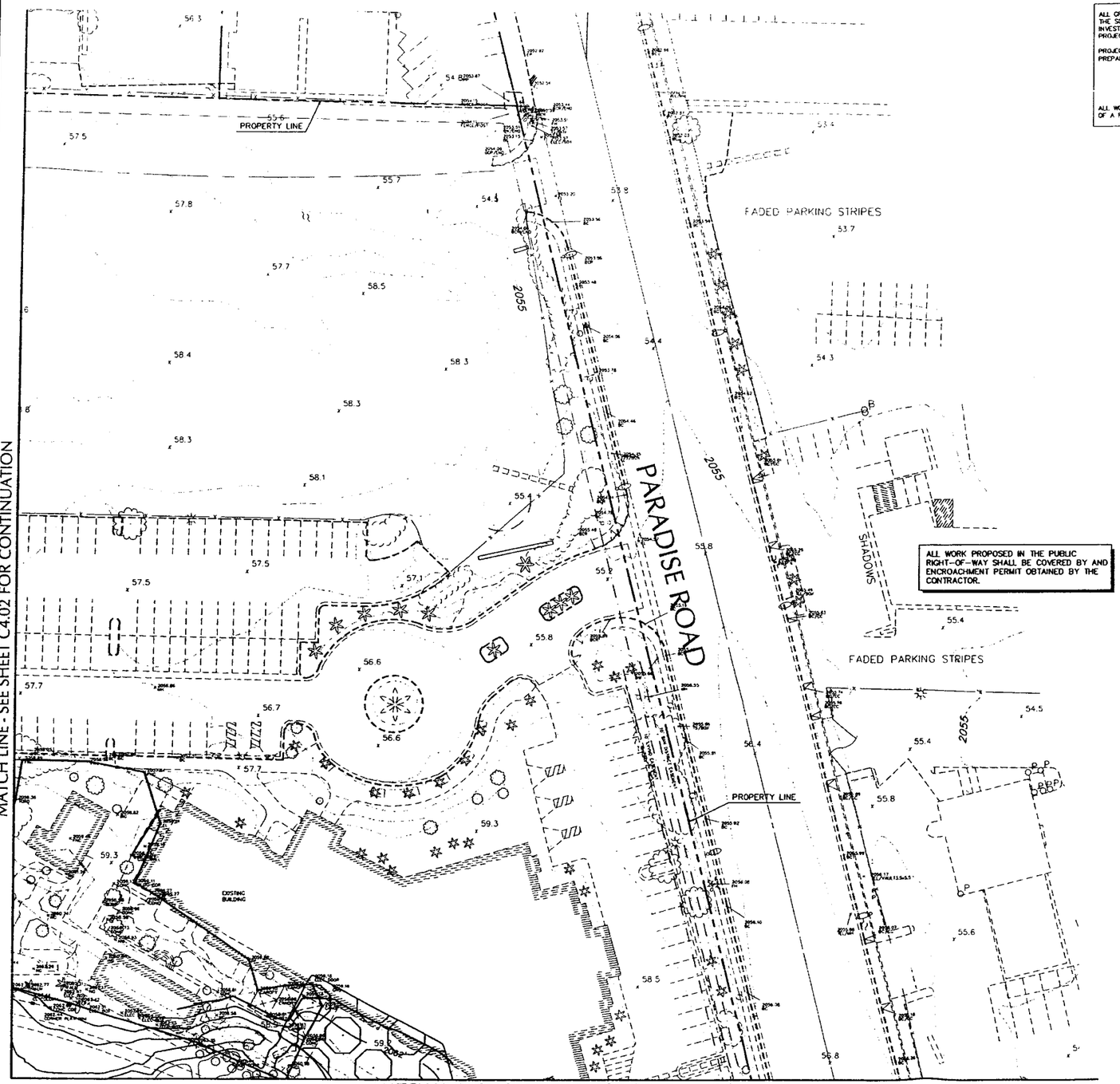
no	description of revisions	date	name

date 02-14-03
job number 1903.05
design by J. WAKENHUT, P.E.
drawn by V. WINFORD
checked by J. DAVIS, P.E.

sheet number
C4.02
SHEET 5 OF 13

HTE #03-7719

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ALL GRADING WORK SHALL BE IN STRICT ACCORDANCE WITH THE SOILS REPORT FOR THE SITE ENTITLED "GEOTECHNICAL INVESTIGATION FOR THE GREENS OF LAS VEGAS"
PROJECT NO. 99-135-1

PROJECT NO.: 99-135-1, DATED 12/04/02
PREPARED BY:

B-SAFE CONSULTANTS
XXXXXXXXX
LAS VEGAS, NV XXXXX
PHONE NO. (702) XXX-YYYY
FAX NO. (702) XXX-XXXX

ALL WORK SHALL BE PERFORMED UNDER THE DIRECTION OF A REGISTERED PROFESSIONAL SOILS ENGINEER.

ALL WORK PROPOSED IN THE PUBLIC RIGHT-OF-WAY SHALL BE COVERED BY AND ENCROACHMENT PERMIT OBTAINED BY THE CONTRACTOR.

GRAPHIC SCALE

30 0 15 30 60 120

(IN FEET)
1 inch = 30 ft.

BASIS OF BEARING

N 89°36'15" E, BEING THE SOUTH LINE OF THE SOUTHWEST ONE QUARTER (SW1/4) OF SECTION 22, TOWNSHIP 21 SOUTH, RANGE 61 EAST, M.D.M., CLARK COUNTY, NEVADA AS SHOWN ON THAT CERTAIN RECORD OF SURVEY, FILE 67, PAGE 7, RECORDED JUNE 23, 1993 AS DOC. NO. 01360.

BENCHMARK

CLARK COUNTY DATUM 6C11-22SSWG, A RIVET AND SQUARE PLATE IN TOP OF CURB, NORTHEAST CORNER OF TROPICANA AVENUE AND PARADISE ROAD.

ELEVATION 2058.93

C3.01 C4.01 C5.01 C6.01	C3.02 C4.02 C5.02 C6.02	C3.03 C4.03 C5.03 C6.03
C3.04 C4.04 C5.04 C6.04	C3.05 C4.05 C5.05 C6.05	C3.06 C4.06 C5.06 C6.06
C3.07 C4.07 C5.07 C6.07	C3.08 C4.08 C5.08 C6.08	C3.09 C4.09 C5.09 C6.09

KEY MAP

CONSTRUCTION NOTES

No.	ITEM
1	CONSTRUCT "L" TYPE CURB AND GUTTER PER STD. DWG. NO. 216.
2	CONSTRUCT "A" TYPE CURB ONLY PER STD. DWG. 219.
3	CONSTRUCT SIDEWALK PER STD. DWG. NO. 234.
4	CONSTRUCT SIDEWALK RAMP PER STD. DWG. NO. 235, CASE I.
5	CONSTRUCT 8' CROSS GUTTER PER STD. DWG. NO. 228.
6	CONSTRUCT 2" MIN. AC OVER 6" TYPE II AB (CAR).
7	CONSTRUCT 6" MIN. AC OVER 16" TYPE II AB (TRUCK)
8	CONSTRUCT 3.5" MIN. AC OVER 5" TYPE II AB.- STREET NAME
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11	CONSTRUCT 4' CONCRETE CHANNEL PER DETAIL X ON SHEET XXXX.
12	CONSTRUCT COMMERCIAL DRIVEWAY PER C.C. AREA STD. DWG. NO. 222A, 225, & 228.
13	CONSTRUCT 3' VALLEY GUTTER PER DETAIL X OF SHEET XXX.
14	CONSTRUCT 4' VALLEY GUTTER PER DETAIL X OF SHEET XXX.

LEGEND

FUTURE	EXISTING	PROPOSED		FUTURE	EXISTING	PROPOSED	
			RIGHT-OF-WAY				SCREEN / RETAINING WALL
			CENTERLINE				CHAIN LINK FENCE
			WATER LINE				GRADE BREAK
			SANITARY SEWER LINE				WIRE FENCE
			GAS LINE			FF=0.00	FINISH FLOOR
			STORM DRAIN	(0.00)	(0.00)	0.00	CLEANOUT INVERT ELEVATION
			POWER LINE / POWER POLE	C.O. INV.	C.O. INV.	C.O. INV.	
			TELEPHONE LINE	(0.00)	(0.00)	0.00	FLOW LINE
			FIRE HYDRANT	(0.00)	(0.00)	0.00	FINISH GRADE
			WATER VALVE	F.C.	F.C.	F.C.	
			METERS / PULL BOXES	(0.00)	(0.00)	0.00	BACK OF SIDEWALK
			REDUCER	S.S.W.	S.S.W.	S.S.W.	
			MANHOLE	(0.00)	(0.00)	0.00	TOP OF CURB
			CLEANOUT	(0.00)	(0.00)	0.00	TOP OF WALL
			SEWER MANHOLE	T.O.W.	T.O.W.	T.O.W.	
			STORM MANHOLE				2" A.C. PAVING
			SIGN POLE				4" A.C. PAVING
			UTILITY POLE				TYPE "L" CURB & GUTTER
			DRAIN INLET				TYPE "A" CURB
			CONTOUR				CONCRETE

STREET LIGHTS

100 W H.P.S.
150 W H.P.S.
200 W H.P.S.
250 W H.P.S.

COMPLETION OF SECTION II OF DRAINAGE COMPLIANCE REPORT REQUIRED.

CLARK COUNTY
DEPARTMENT OF PUBLIC WORKS
ENGINEERING DIVISION

ACCEPTANCE OF PLANS FOR FILING
BY: Jack B. Brown 2-27-03

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I CERTIFY THAT THIS GRADING PLAN IS IN CONFORMANCE WITH THE APPROVED DRAINAGE STUDY ON FILE WITH THE CLARK COUNTY FOR THIS PROJECT.

JOHN WAKENHUT, P.E. — 2/26/03 DATE

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PHONE (702) 248-8000
FAX (702) 248-8070
E-MAIL: MARTMARTIN@VOM.COM

PROFESSIONAL ENGINEER — STATE OF NEVADA — JOHN R. WAKENHUT — Exp. 6-30-04 — CIVIL — No. 13720
2-26-03

PREMIERE PARK
GOLF COURSE
GRADING PLAN

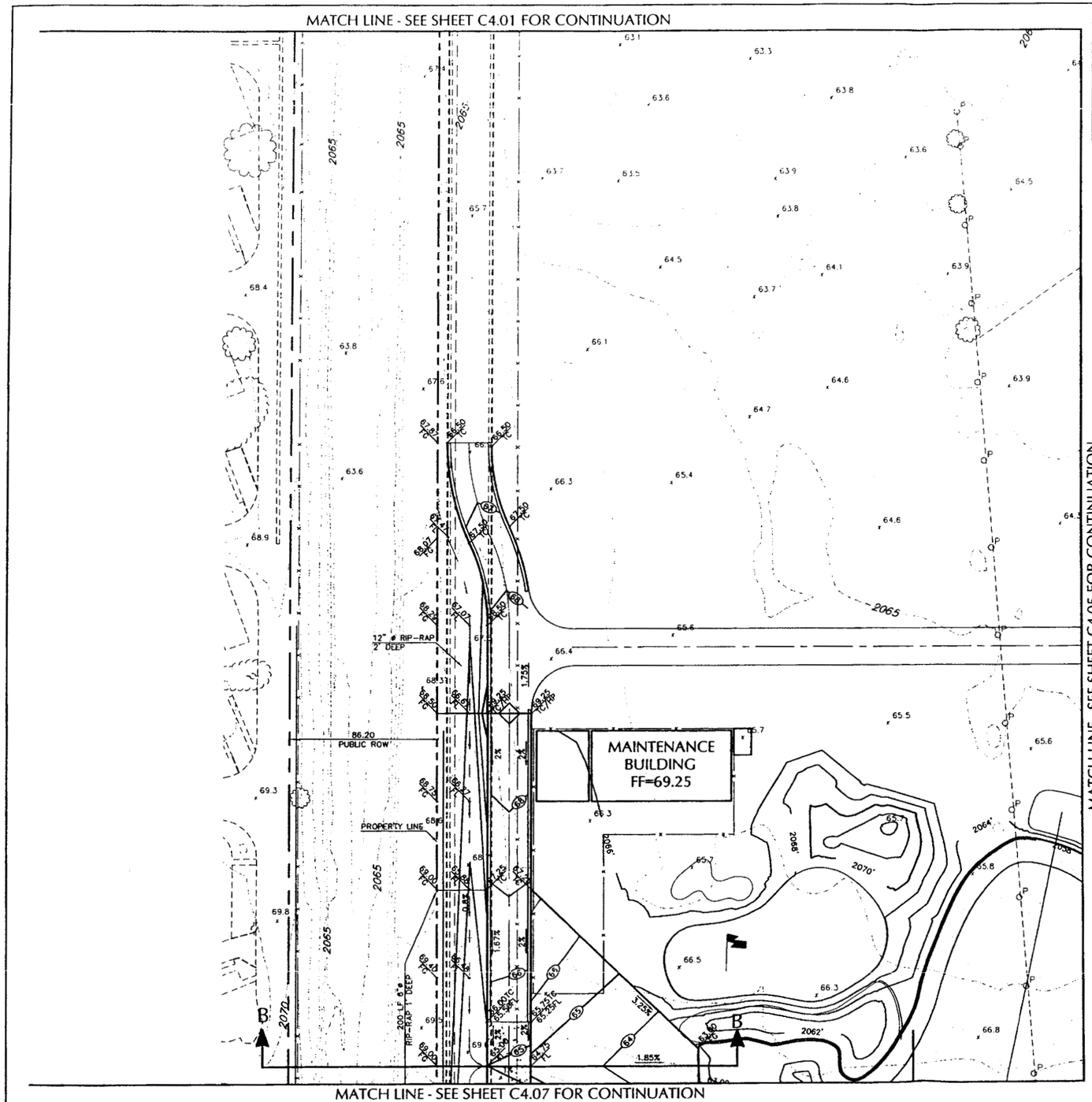
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date 02-14-03
job number 1903.05
design by J. WAKENHUT, P.E.
drawn by V. WINFORD
checked by J. DAVIS, P.E.

sheet number
C4.03

SHEET 6 OF 13
HTF #03-7719

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ALL GRADING WORK SHALL BE IN STRICT ACCORDANCE WITH THE SOILS REPORT FOR THE SITE ENTITLED "GEOTECHNICAL INVESTIGATION FOR THE GREENS OF LAS VEGAS"
PROJECT NO. 99-135-1

PROJECT NO.: 99-135-1, DATED 12/04/02
PREPARED BY:
B-SAFE CONSULTANTS
XXXXXXXXXX
LAS VEGAS, NV XXXXX
PHONE NO. (702) XXX-XXXX
FAX NO. (702) XXX-XXXX

ALL WORK SHALL BE PERFORMED UNDER THE DIRECTION OF A REGISTERED PROFESSIONAL SOILS ENGINEER

GRAPHIC SCALE

30 0 15 30 60 120
(IN FEET)
1 inch = 30 ft

BASIS OF BEARING

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BENCHMARK

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ELEVATION 2058.93

C3.01 C4.01 C5.01 C6.01	C3.02 C4.02 C5.02 C6.02	C3.03 C4.03 C5.03 C6.03
C3.04 C4.04 C5.04 C6.04	C3.05 C4.05 C5.05 C6.05	C3.06 C4.06 C5.06 C6.06
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KEY MAP

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LEGEND

FUTURE	EXISTING	PROPOSED	
			RIGHT-OF-WAY
			CENTERLINE
W	W	W	WATER LINE
S	S	S	SANITARY SEWER LINE
G	G	G	GAS LINE
SD	SD	SD	STORM DRAIN
E-P	E-P	E-P	POWER LINE / POWER POLE
T	T	T	TELEPHONE LINE
		(0.00) F.C.	FINC HYDRANT
			WATER VALVE
		(0.00)	METERS / PULL BOXES
			REDUCER
		(0.00) T.O.	MANHOLE
			CLEANOUT
		S	SEWER MANHOLE
		S	STORM MANHOLE
			SIGN POLE
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			DRAIN INLET
			CONTOUR

FUTURE	EXISTING	PROPOSED	
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			TYPE "A" CURB
			CONCRETE

STREET LIGHTS
100 W H.P.S.
150 W H.P.S.
200 W H.P.S.
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CLARK COUNTY
DEPARTMENT OF PUBLIC WORKS
ENGINEERING DIVISION

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BY: Jack G. Simon 2-27-03
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JOHN WAKENHUT, P.E. 2-26-03 DATE

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PROFESSIONAL ENGINEER STATE OF NEVADA JOHN P. WAKENHUT Exp. 6-30-04 CIVIL No. 13729
2-26-03

PREMIERE PARK
GOLF COURSE
GRADING PLAN

no	description of revisions	date	name

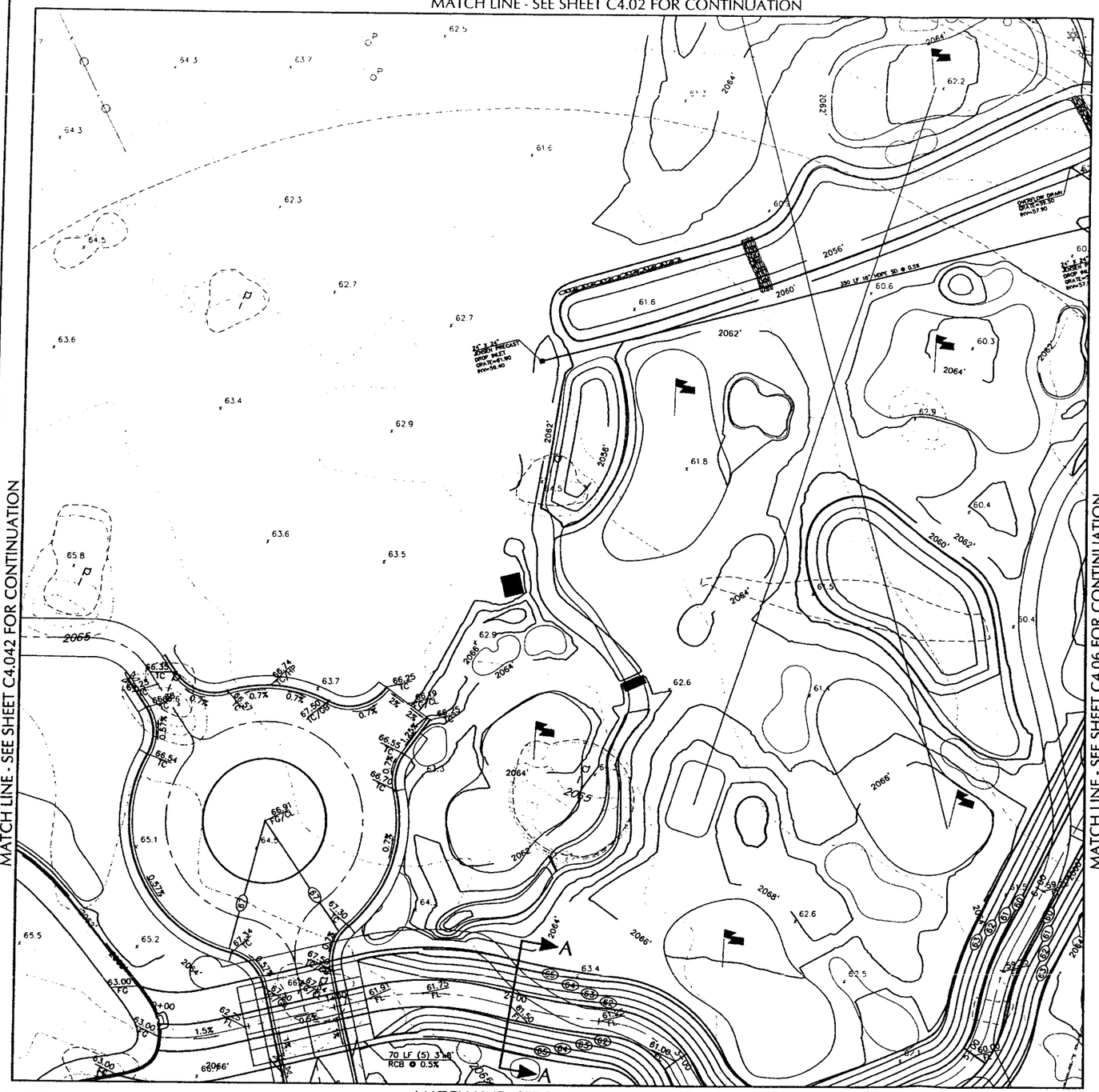
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drawn by V. WINFORD
checked by J. DAVIS, P.E.

sheet number
C4.04

SHEET 7 OF 33
HTF #03-7719

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MATCH LINE - SEE SHEET C4.02 FOR CONTINUATION



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PROJECT NO.: 99-135-1, DATED 12/04/02
PREPARED BY:
B-SAFE CONSULTANTS
XXXXXXXXXX
LAS VEGAS, NV XXXXX
PHONE NO. (702) AAA-AAAA
FAX NO. (702) XXX-XXXX

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C3.07 C4.07 C5.07 C6.07	C3.08 C4.08 C5.08 C6.08	C3.09 C4.09 C5.09 C6.09

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LEGEND

FUTURE	EXISTING	PROPOSED	
			RIGHT-OF-WAY
			CENTERLINE
-W-	-W-	-W-	WATER LINE
-S-	-S-	-S-	SANITARY SEWER LINE
-G-	-G-	-G-	GAS LINE
-SD-	-SD-	-SD-	STORM DRAIN
-E-⊕-	-E-⊕-	-E-⊕-	POWER LINE / POWER POLE
-T-	-T-	-T-	TELEPHONE LINE
			FIRE HYDRANT
⊕	⊕	⊕	WATER VALVE
▫	▫	■	METERS / PULL BOXES
▷	▷	▶	REDUCER
			MANHOLE
●	●	●	CLEANOUT
Ⓢ	Ⓢ	Ⓢ	SEWER MANHOLE
Ⓓ	Ⓓ	Ⓓ	STORM MANHOLE
○	○	○	SIGN POLE
			UTILITY POLE
			DRAIN INLET
00	00	00	-CONTOUR

FUTURE	EXISTING	PROPOSED	
			SCREEN / RETAINING WALL
			CHAIN LINK FENCE
			GRADE BREAK
			WIRE FENCE
		FF=0.00	FINISH FLOOR
		0.00	CLEANOUT INVERT ELEVATION
(0.00) C.O. INV.	(0.00) C.O. INV.	0.00 C.O. INV.	
(0.00)	(0.00)	0.00	FLOW LINE
(0.00) F.G.	(0.00) F.G.	0.00 F.G.	FINISH GRADE
(0.00) B.S.W.	(0.00) B.S.W.	0.00 B.S.W.	BACK OF SIDEWALK
(0.00)	(0.00)	0.00	TOP OF CURB
(0.00) T.O.W.	(0.00) T.O.W.	0.00 T.O.W.	TOP OF WALL
			2" A.C. PAVING
			4" A.C. PAVING
			TYPE "L" CURB & GUTTER
			TYPE "A" CURB
			CONCRETE

STREET LIGHTS

	100 W H.P.S.
	150 W H.P.S.
	200 W H.P.S.
	250 W H.P.S.

CLARK COUNTY
DEPARTMENT OF PUBLIC WORKS
ENGINEERING DIVISION

ACCEPTANCE OF PLANS FOR FILING
BY: _____ 2-27-03
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I CERTIFY THAT THIS GRADING PLAN IS IN CONFORMANCE WITH THE APPROVED DRAINAGE STUDY ON FILE WITH THE CLARK COUNTY FOR THIS PROJECT.

JOHN W. WAKENHUT, P.E. — 2/26/03 DATE

COMPLETION OF SECTION II OF DRAINAGE COMPLIANCE REPORT REQUIRED.

AVOID CUTTING UNDERGROUND UTILITY LINES. IT'S COSTLY.
Call before you Dig– 1-800-227-2600
UNDERGROUND SERVICE ALERT (U.S.A.)

AVOID OVERHEAD POWER LINE CONTACT
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NEVADA POWER ENVIRONMENT AND SAFETY SERVICES DEPARTMENT

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MARTIN & MARTIN
CIVIL ENGINEERS
2101 SOUTH JONES BLVD.
SUITE 120
LAS VEGAS, NEVADA 89146
PHONE (702) 248-8000
FAX (702) 248-8070
E-MAIL MARTMART@LVCM.COM

PROFESSIONAL ENGINEER STATE OF NEVADA
JOHN W. WAKENHUT
Exp. 6-30-04
CIVIL
No. 13720
2-26-03

PREMIERE PARK GOLF COURSE

GRADING PLAN

no	description of revisions	date	name

date 02-14-03
job number 1903.05
design by J. WAKENHUT, P.E.
drawn by V. WINFORD
checked by J. DAVIS, P.E.

sheet number
C4.05

SHEET 8 OF 13

HTF #03-7719

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MATCH LINE - SEE SHEET C4.09 FOR CONTINUATION



MATCH LINE - SEE SHEET C4.05 FOR CONTINUATION

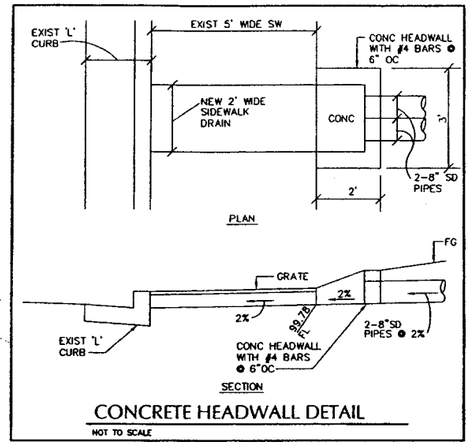
MATCH LINE - SEE SHEET C4.09 FOR CONTINUATION

ALL GRADING WORK SHALL BE IN STRICT ACCORDANCE WITH THE SOILS REPORT FOR THE SITE ENTITLED "GEOTECHNICAL INVESTIGATION FOR THE GREENS OF LAS VEGAS" PROJECT NO 99-135-1

PROJECT NO.: 99-135-1, DATED 12/04/02
PREPARED BY:

G-SAFE CONSULTANTS
XXXXXXXXX
LAS VEGAS, NV XXXXX
PHONE NO. (702) XXX-XXXX
FAX NO. (702) XXX-XXXX

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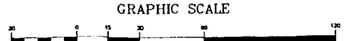


CONCRETE HEADWALL DETAIL

NOT TO SCALE

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GRAPHIC SCALE



(IN FEET)
1 inch = 30 ft.

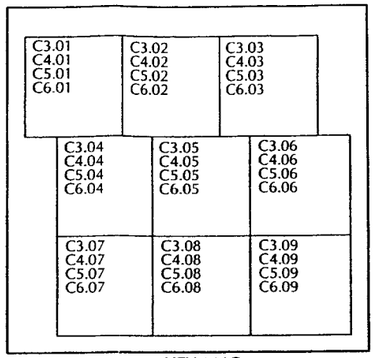
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N 89°36'15" E, BEING THE SOUTH LINE OF THE SOUTHWEST ONE QUARTER (SW1/4) OF SECTION 22, TOWNSHIP 21 SOUTH, RANGE 61 EAST, M.D.M., CLARK COUNTY, NEVADA AS SHOWN ON THAT CERTAIN RECORD OF SURVEY, FILE 67, PAGE 7, RECORDED JUNE 23, 1993 AS DOC. NO. 01360.

BENCHMARK

CLARK COUNTY DATUM GC11-22SSW6, A RIVET AND SQUARE PLATE IN TOP OF CURB, NORTHEAST CORNER OF TROPICANA AVENUE AND PARADISE ROAD.

ELEVATION 2058.93



KEY MAP

CONSTRUCTION NOTES

No.	ITEM
1	CONSTRUCT "L" TYPE CURB AND GUTTER PER STD. DWG. NO. 216.
2	CONSTRUCT "A" TYPE CURB ONLY PER STD. DWG. 219.
3	CONSTRUCT SIDEWALK PER STD. DWG. NO. 234.
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LEGEND

FUTURE	EXISTING	PROPOSED	
			RIGHT-OF-WAY
			CENTERLINE
-W-	-W-	-W-	WATER LINE
-S-	-S-	-S-	SANITARY SEWER LINE
-G-	-G-	-G-	GAS LINE
-SD-	-SD-	-SD-	STORM DRAIN
-P-	-P-	-P-	POWER LINE / POWER POLE
-T-	-T-	-T-	TELEPHONE LINE
			FIRE HYDRANT
			WATER VALVE
			METERS / FULL BOXES
			REDUCER
			MANHOLE
			CLEANOUT
(S)	(S)	(S)	SEWER MANHOLE
(D)	(D)	(D)	STORM MANHOLE
			SIGN POLE
			UTILITY POLE
			DRAIN INLET
			CONTOUR

FUTURE	EXISTING	
(0.00) C.O. INV.	(0.00) C.O. INV.	
(0.00)	(0.00)	
(0.00) F.G.	(0.00) F.G.	
(0.00) B.S.W.	(0.00) B.S.W.	
(0.00) T.C.	(0.00) T.C.	
(0.00) T.O.W.	(0.00) T.O.W.	

PROPOSED	
	SCREEN / RETAINING WALL
	CHAIN LINK FENCE
45555	GRADE BREAK
	WIRE FENCE
FF=0.00	FINISH FLOOR
0.00 C.O. INV.	CLEANOUT INVERT ELEVATION
0.00	FLOW LINE
0.00 F.G.	FINISH GRADE
0.00 B.S.W.	BACK OF SIDEWALK
0.00 T.C.	TOP OF CURB
0.00 T.O.W.	TOP OF WALL
	2" A.C. PAVING
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	TYPE 'L' CURB & GUTTER
	TYPE "A" CURB
	CONCRETE

STREET LIGHTS

100 W H.P.S.
150 W H.P.S.
200 W H.P.S.
250 W H.P.S.

CLARK COUNTY
DEPARTMENT OF PUBLIC WORKS
ENGINEERING DIVISION

ACCEPTANCE OF PLANS FOR FILING
BY: Jack Gilmore 2-27-03
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JOHN WAKENHUT, P.E. — DATE 2-26-03

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PHONE (702) 248-8000
FAX (702) 248-8070
E-MAIL: MARTINMARTIN@VOM.COM

PROFESSIONAL ENGINEER — JOHN WAKENHUT — Exp. 6-30-04 — CIVIL — No. 13720 — STATE OF NEVADA
2-26-03

PREMIERE PARK
GOLF COURSE
GRADING PLAN

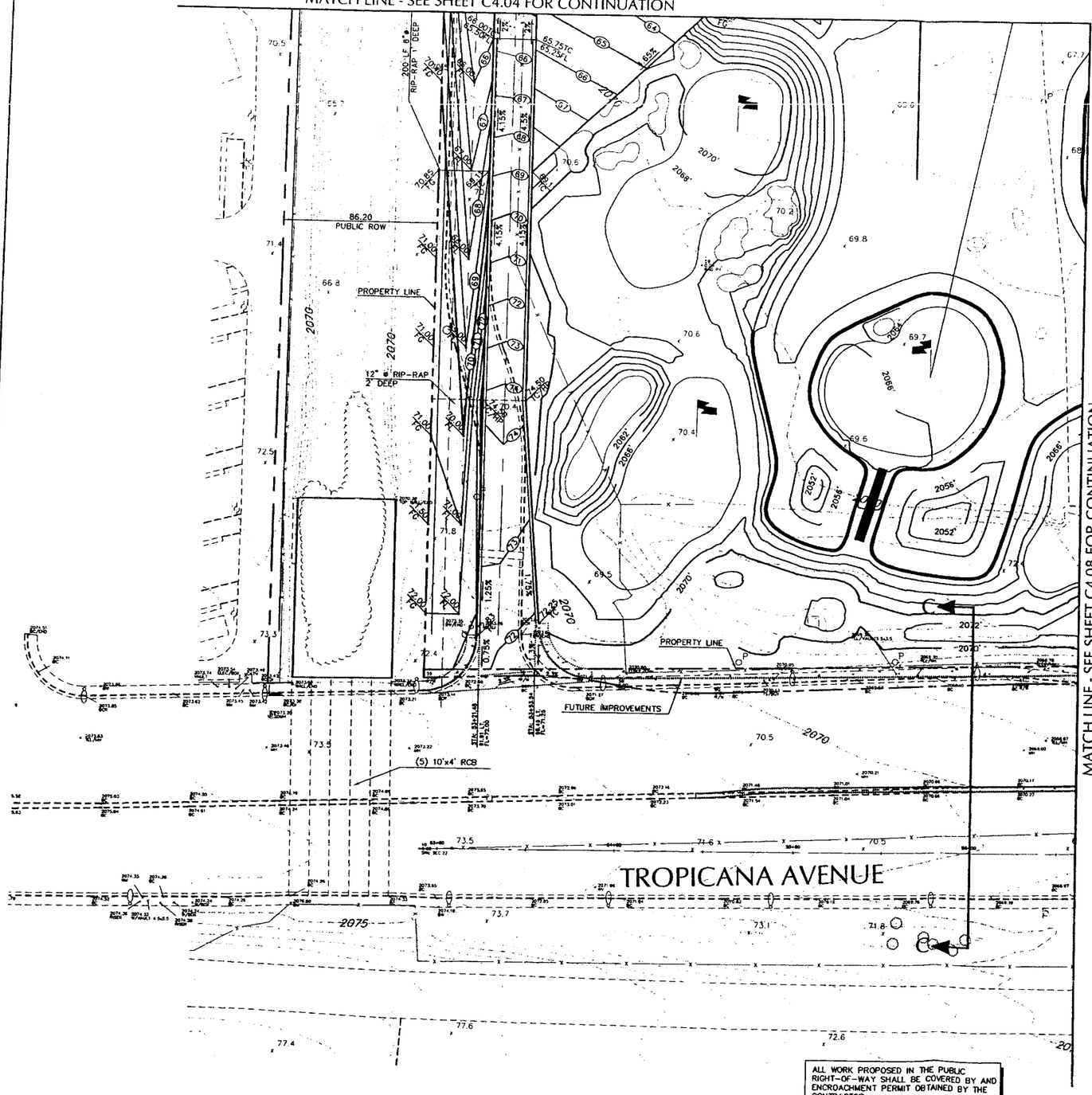
no.	description of revisions	date	name

date 02-14-03
job number 1903.05
design by J. WAKENHUT, P.E.
drawn by V. WINFORD
checked by J. DAVIS, P.E.

sheet number
C4.06

SHEET 9 OF 13
HTF #03-7719

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ALL GRADING WORK SHALL BE IN STRICT ACCORDANCE WITH THE SOILS REPORT FOR THE SITE ENTITLED "GEOTECHNICAL INVESTIGATION FOR THE GREENS OF LAS VEGAS" PROJECT NO. 99-135-1

PROJECT NO.: 99-135-1, DATED 12/04/02
PREPARED BY:

G-SAFE CONSULTANTS
XXXXXXXXXX
LAS VEGAS, NV XXXXX
PHONE NO. (702) XXX-XXXX
FAX NO. (702) XXX-XXXX

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GRAPHIC SCALE

(IN FEET)
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BASIS OF BEARING

N 89°36'15" E, BEING THE SOUTH LINE OF THE SOUTHWEST ONE QUARTER (SW1/4) OF SECTION 22, TOWNSHIP 21 SOUTH, RANGE 61 EAST, M.D.M., CLARK COUNTY, NEVADA AS SHOWN ON THAT CERTAIN RECORD OF SURVEY, FILE 67, PAGE 7, RECORDED JUNE 23, 1993 AS DOC. NO. 01360.

BENCHMARK

CLARK COUNTY DATUM 6C11-22SSW6, A RIVET AND SQUARE PLATE IN TOP OF CURB, NORTHEAST CORNER OF TROPICANA AVENUE AND PARADISE ROAD.

ELEVATION 2058.93

C3.01 C4.01 C5.01 C6.01	C3.02 C4.02 C5.02 C6.02	C3.03 C4.03 C5.03 C6.03
C3.04 C4.04 C5.04 C6.04	C3.05 C4.05 C5.05 C6.05	C3.06 C4.06 C5.06 C6.06
C3.07 C4.07 C5.07 C6.07	C3.08 C4.08 C5.08 C6.08	C3.09 C4.09 C5.09 C6.09

KEY MAP

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LEGEND

FUTURE	EXISTING	PROPOSED	
			RIGHT-OF-WAY
			CENTERLINE
-W-	-W-	-W-	WATER LINE
-S-	-S-	-S-	SANITARY SEWER LINE
-G-	-G-	-G-	GAS LINE
-SD-	-SD-	-SD-	STORM DRAIN
-E-	-E-	-E-	POWER LINE / POWER POLE
-T-	-T-	-T-	TELEPHONE LINE
			FIRE HYDRANT
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			METERS / PULL BOXES
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			MANHOLE
			CLEANOUT
			SEWER MANHOLE
			STORM MANHOLE
			SIGN POST
			UTILITY POLE
			DRAIN INLET
			CONTOUR

STREET LIGHTS

100 W H.P.S.
150 W H.P.S.
200 W H.P.S.
250 W H.P.S.

FUTURE	EXISTING	PROPOSED	
			SCREEN / RETAINING WALL
			CHAIN LINK FENCE
			GRADE BREAK
			WIRE FENCE
		FF=0.00	FINISH FLOOR
		0.00 C.O. INV.	CLEANOUT (INVERT ELEVATION)
		0.00	FLOW LINE
		0.00 F.G.	FINISH GRADE
		0.00 B.S.W.	BACK OF SIDEWALK
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			CONCRETE

CLARK COUNTY
DEPARTMENT OF PUBLIC WORKS
ENGINEERING DIVISION

ACCEPTANCE OF PLANS FOR FILING
BY: [signature] 2-27-03
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JOHN WAKENHUT, P.E. — 2-26-03 DATE

COMPLETION OF SECTION II OF DRAINAGE COMPLIANCE REPORT REQUIRED.

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PROFESSIONAL ENGINEER — JOHN C. WAKENHUT — Exp. 6-30-04 — CIVIL — No. 13770 — STATE OF NEVADA
2-26-03

PREMIERE PARK
GOLF COURSE
GRADING PLAN

no	description of revisions	date	name

date 02-14-03
job number 1903.05
design by J. WAKENHUT, P.E.
drawn by V. WINFORD
checked by J. DAVIS, P.E.

sheet number
C4.07
SHEET 10 OF 13

LITE 803 7710

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MATCH LINE - SEE SHEET C4.05 FOR CONTINUATION

MATCH LINE - SEE SHEET C4.07 FOR CONTINUATION

MATCH LINE - SEE SHEET C4.09 FOR CONTINUATION

PROPERTY LINE

FUTURE IMPROVEMENTS

TROPICANA AVENUE

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PROJECT NO.: 99-135-1, DATED 12/04/02
PREPARED BY:
8-SAFE CONSULTANTS
XXXXXXXXXX
LAS VEGAS, NV XXXXX
PHONE NO. (702) XXX-XXXX
FAX NO. (702) XXX-XXXX

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ELEVATION 2058.93

KEY MAP

C3.01 C4.01 C5.01 C6.01	C3.02 C4.02 C5.02 C6.02	C3.03 C4.03 C5.03 C6.03
C3.04 C4.04 C5.04 C6.04	C3.05 C4.05 C5.05 C6.05	C3.06 C4.06 C5.06 C6.06
C3.07 C4.07 C5.07 C6.07	C3.08 C4.08 C5.08 C6.08	C3.09 C4.09 C5.09 C6.09

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LEGEND

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			CENTERLINE
		W	WATER LINE
		S	SANITARY SEWER LINE
		G	GAS LINE
		SD	STORM DRAIN
		P	POWER LINE / POWER POLE
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			TYPE "A" CURB
			CONCRETE

CLARK COUNTY
DEPARTMENT OF PUBLIC WORKS
ENGINEERING DIVISION

ACCEPTANCE OF PLANS FOR FILING
BY: Jack Johnson 2-27-03
ACCEPTANCE OF THESE PLANS FOR FILING SHALL NOT BE CONSTRUED TO BE A PERMIT FOR OR AN APPROVAL OF ANY VIOLATION OF ANY OF THE PROVISIONS OF THE STATE OR COUNTY LAWS AND/OR SPECIFICATIONS. CLARK COUNTY SHALL BE HELD FREE FROM DAMAGES WHICH MAY RESULT FROM THE CONSTRUCTION OF THE IMPROVEMENTS FROM THE ENGINEERING DESIGN DEPICTED HEREIN.

I CERTIFY THAT THIS GRADING PLAN IS IN CONFORMANCE WITH THE APPROVED DRAINAGE STUDY ON FILE WITH THE CLARK COUNTY FOR THIS PROJECT.

JOHN WAKENHUT, P.E. — 2-26-03 DATE

COMPLETION OF SECTION II OF DRAINAGE COMPLIANCE REPORT REQUIRED.

AVOID CUTTING UNDERGROUND UTILITY LINES. IT'S COSTLY.
Call before you Dig— 1-800-227-2600
UNDERGROUND SERVICE ALERT (U.S.A.)

AVOID OVERHEAD POWER LINE CONTACT
Call before you OVERHEAD 1-702-593-6111
NEVADA POWER ENVIRONMENT AND SAFETY SERVICES DEPARTMENT

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NOTE: POWER POLES AND/OR OTHER EXISTING FACILITIES NOT IN PROPER LOCATION BASED ON PROPOSED IMPROVEMENTS SHOWN HEREIN WILL BE RELOCATED AT NO EXPENSE TO CLARK COUNTY.

GENERAL NOTE:

IT IS THE CONTRACTORS RESPONSIBILITY TO FILE A NOTICE OF INTENT/REQUEST TO BE INCLUDED IN THE STORM WATER GENERAL PERMIT, AND SUBMIT THE ASSOCIATED STORMWATER POLLUTION PREVENTION PLAN (SPPP) AS REQUIRED BY FEDERAL LAW, AND MONITORED BY THE NEVADA DIVISION OF ENVIRONMENTAL; PROTECTION.

MARTIN & MARTIN
CIVIL ENGINEERS
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SUITE 120
LAS VEGAS, NEVADA 89146
PHONE (702) 248-8000
FAX (702) 248-8070
E-MAIL MARTIMART@AOL.COM

PROFESSIONAL ENGINEER JON R. WAKENHUT Exp. 6-30-04 CIVIL No. 13770 STATE OF NEVADA
2-26-03

PREMIERE PARK
GOLF COURSE
GRADING PLAN

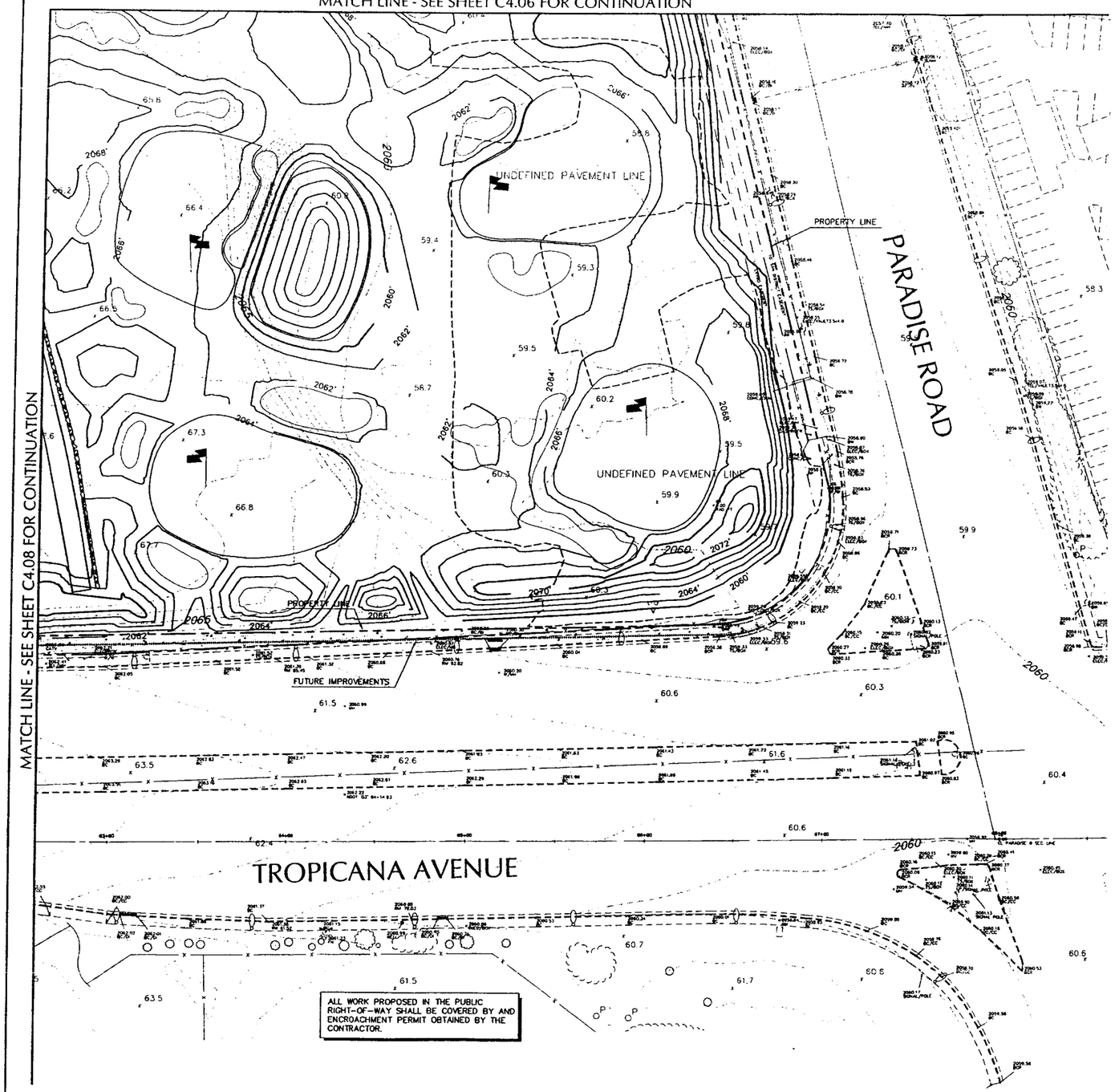
no	description of revisions	date	name

date 02-14-03
job number 1903.05
design by J. WAKENHUT, P.E.
drawn by V. WINFORD
checked by J. DAVIS, P.E.

sheet number
C4.08

SHEET 11 OF 13
HTF #03-7719

H:\JOBS\1903\GPD\dwg\sheets\FINAL DRAINAGE\GDCP\1903GRADE.dwg, 10/24/2003 11:09:39 AM, vince



ALL GRADING WORK SHALL BE IN STRICT ACCORDANCE WITH THE SOILS REPORT FOR THE SITE ENTITLED "GEOTECHNICAL INVESTIGATION FOR THE GREENS OF LAS VEGAS" PROJECT NO. 99-135-1

PROJECT NO.: 99-135-1, DATED 12/04/02
PREPARED BY:
B-SAFE CONSULTANTS
XXXXXXXXXX
LAS VEGAS, NV XXXXX
PHONE NO. (702) XXX-XXXX
FAX NO. (702) XXX-XXXX

ALL WORK SHALL BE PERFORMED UNDER THE DIRECTION OF A REGISTERED PROFESSIONAL SOILS ENGINEER.

GRAPHIC SCALE

30 0 15 30 60 120
(IN FEET)
1 inch = 30 ft.

BASIS OF BEARING

N 89°36'15" E, BEING THE SOUTH LINE OF THE SOUTHWEST ONE QUARTER (SW1/4) OF SECTION 22, TOWNSHIP 21 SOUTH, RANGE 61 EAST, M.D.M., CLARK COUNTY, NEVADA AS SHOWN ON THAT CERTAIN RECORD OF SURVEY, FILE 67, PAGE 7, RECORDED JUNE 23, 1993 AS DOC. NO. 01360.

BENCHMARK

CLARK COUNTY DATUM 6C11-22SSW6, A RIVET AND SQUARE PLATE IN TOP OF CURB, NORTHEAST CORNER OF TROPICANA AVENUE AND PARADISE ROAD.

ELEVATION 2058.93

C3.01 C4.01 C5.01 C6.01	C3.02 C4.02 C5.02 C6.02	C3.03 C4.03 C5.03 C6.03
C3.04 C4.04 C5.04 C6.04	C3.05 C4.05 C5.05 C6.05	C3.06 C4.06 C5.06 C6.06
C3.07 C4.07 C5.07 C6.07	C3.08 C4.08 C5.08 C6.08	C3.09 C4.09 C5.09 C6.09

KEY MAP

CONSTRUCTION NOTES

No.	ITEM
1	CONSTRUCT "L" TYPE CURB AND GUTTER PER STD. DWG. NO. 216.
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13	CONSTRUCT 3' VALLEY GUTTER PER DETAIL X OF SHEET XXX.
14	CONSTRUCT 4' VALLEY GUTTER PER DETAIL X OF SHEET XXX.

LEGEND

FUTURE	EXISTING	PROPOSED	
			RIGHT-OF-WAY
			CENTERLINE
W	W	W	WATER LINE
S	S	S	SANITARY SEWER LINE
G	G	G	GAS LINE
SD	SD	SD	STORM DRAIN
P P	P P	P P	POWER LINE / POWER POLE
T T	T T	T T	TELEPHONE LINE
			FIRE HYDRANT
			WATER VALVE
			METERS / PULL BOXES
			REDUCER
			MANHOLE
			CLEANOUT
S	S	S	SEWER MANHOLE
D	D	D	STORM MANHOLE
			SIGN POLE
			UTILITY POLE
			DRAIN INLET
XXX	XXX	XXX	CONTOUR

FUTURE	EXISTING	PROPOSED	
			SCREEN / RETAINING WALL
			CHAIN LINK FENCE
			GRADE BREAK
			WIRE FENCE
		FF=0.00	FINISH FLOOR
		0.00 C.O. INV.	CLEANOUT INVERT ELEVATION
		0.00 F.L.	FLOW LINE
		0.00 F.G.	FINISH GRADE
		0.00 B.S.W.	BACK OF SIDEWALK
		0.00 T.C.	TOP OF CURB
		0.00 T.W.	TOP OF WALL
			2" A.C. PAVING
			4" A.C. PAVING
			TYPE "L" CURB & GUTTER
			TYPE "A" CURB
			CONCRETE

STREET LIGHTS
100 W H.P.S.
150 W H.P.S.
200 W H.P.S.
250 W H.P.S.

COMPLETION OF SECTION II OF DRAINAGE COMPLIANCE REPORT REQUIRED.

CLARK COUNTY
DEPARTMENT OF PUBLIC WORKS
ENGINEERING DIVISION

ACCEPTANCE OF PLANS FOR FILING
BY: Jack G. Swan 2-27-03
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JOHN WAKENHUT, P.E. — DATE 2-26-03

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E-MAIL: MARTMART@LVCM.COM

PROFESSIONAL ENGINEER STATE OF NEVADA
JOHN B. WAKENHUT
Exp. 6-30-04
CIVIL
No. 13720
2-26-03

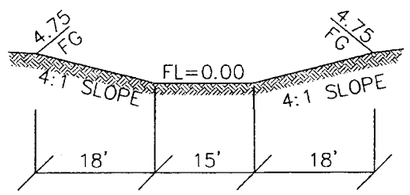
PREMIERE PARK
GOLF COURSE
GRADING PLAN

no	description of revisions	date	name

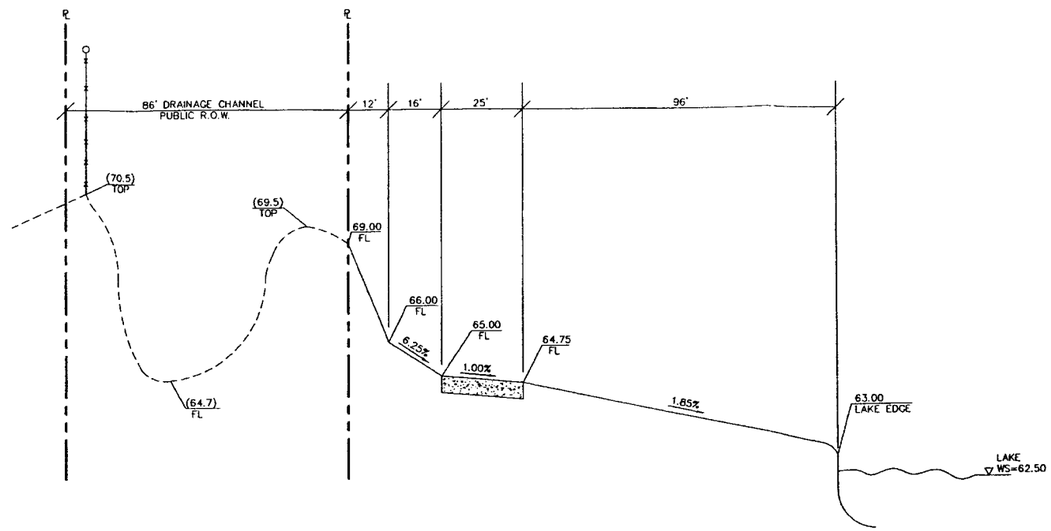
date 02-14-03
job number 1903.05
design by J. WAKENHUT, P.E.
drawn by V. WANFORD
checked by J. DAVIS, P.E.

sheet number
C4.09
SHEET 12 OF 13
HTF #03-7719

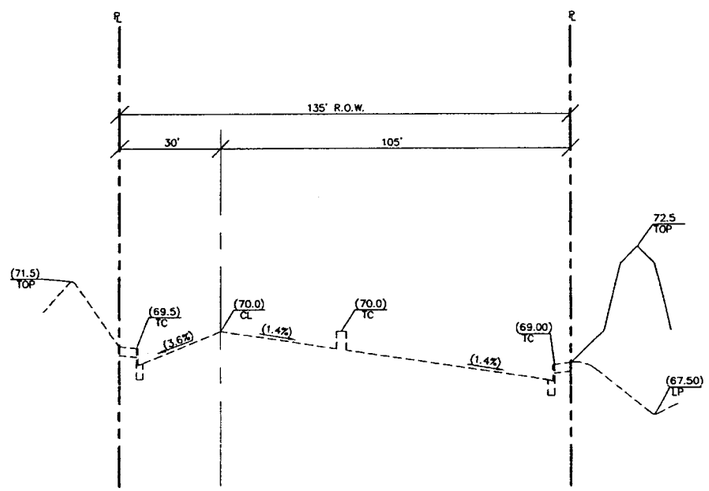
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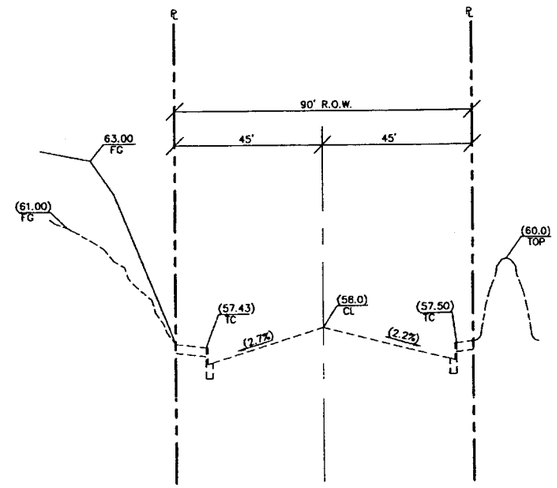
CHANNEL SECTION (AA)
SCALE HORIZONTAL 1"=10'



WEST PROPERTY CROSS-SECTION (BB)
SCALE HORIZONTAL 1"=20'
VERTICAL 1"=2'



TROPICANA AVENUE CROSS-SECTION (CC)
SCALE HORIZONTAL 1"=20'
VERTICAL 1"=2'



PARADISE ROAD CROSS-SECTION (DD)
SCALE HORIZONTAL 1"=20'
VERTICAL 1"=2'

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E-MAIL MARTINMARTIN.COM

GLEN R. WAKENHUT
Exp. 6-30-04
CIVIL
No. 13720
STATE OF NEVADA
2-26-03

PREMIERE PARK
GOLF COURSE
DETAIL SHEET

no.	description of revisions	date	name

date 02-14-03
job number 1903.05
design by J. WAKENHUT, P.E.
drawn by V. WINFORD
checked by J. DAVIS, P.E.

sheet number
C8.01

SHEET 13 OF 13
HTE #03-7719

C4.01 C4.02 C4.03

C4.04 C4.05 C4.06

C4.07 C4.08 C4.09

PARADISE ROAD

TROPICANA AVENUE

GRAPHIC SCALE

0 40 80 160 320

(IN FEET)
1 inch = 80 ft.

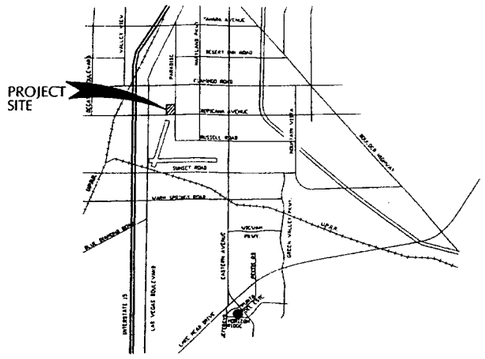
BASIS OF BEARING

N 89°36'15" E, BEING THE SOUTH LINE OF THE SOUTHWEST ONE QUARTER (SW1/4) OF SECTION 22, TOWNSHIP 21 SOUTH, RANGE 61 EAST, M.D.M., CLARK COUNTY, NEVADA AS SHOWN ON THAT CERTAIN RECORD OF SURVEY, FILE 67, PAGE 7, RECORDED JUNE 23, 1993 AS DOC. NO. 01360.

BENCHMARK

CLARK COUNTY DATUM 6C11-22SSW6, A RIVET AND SQUARE PLATE IN TOP OF CURB, NORTHEAST CORNER OF TROPICANA AVENUE AND PARADISE ROAD.

ELEVATION 2058.93



VICINITY MAP

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PROFESSIONAL ENGINEER STATE OF NEVADA
JOHN C. WAKEHAM
Exp. 6-30-04
CIVIL
No. 13720

Z-26-03

PREMIERE PARK
GOLF COURSE
OVERALL SITE PLAN

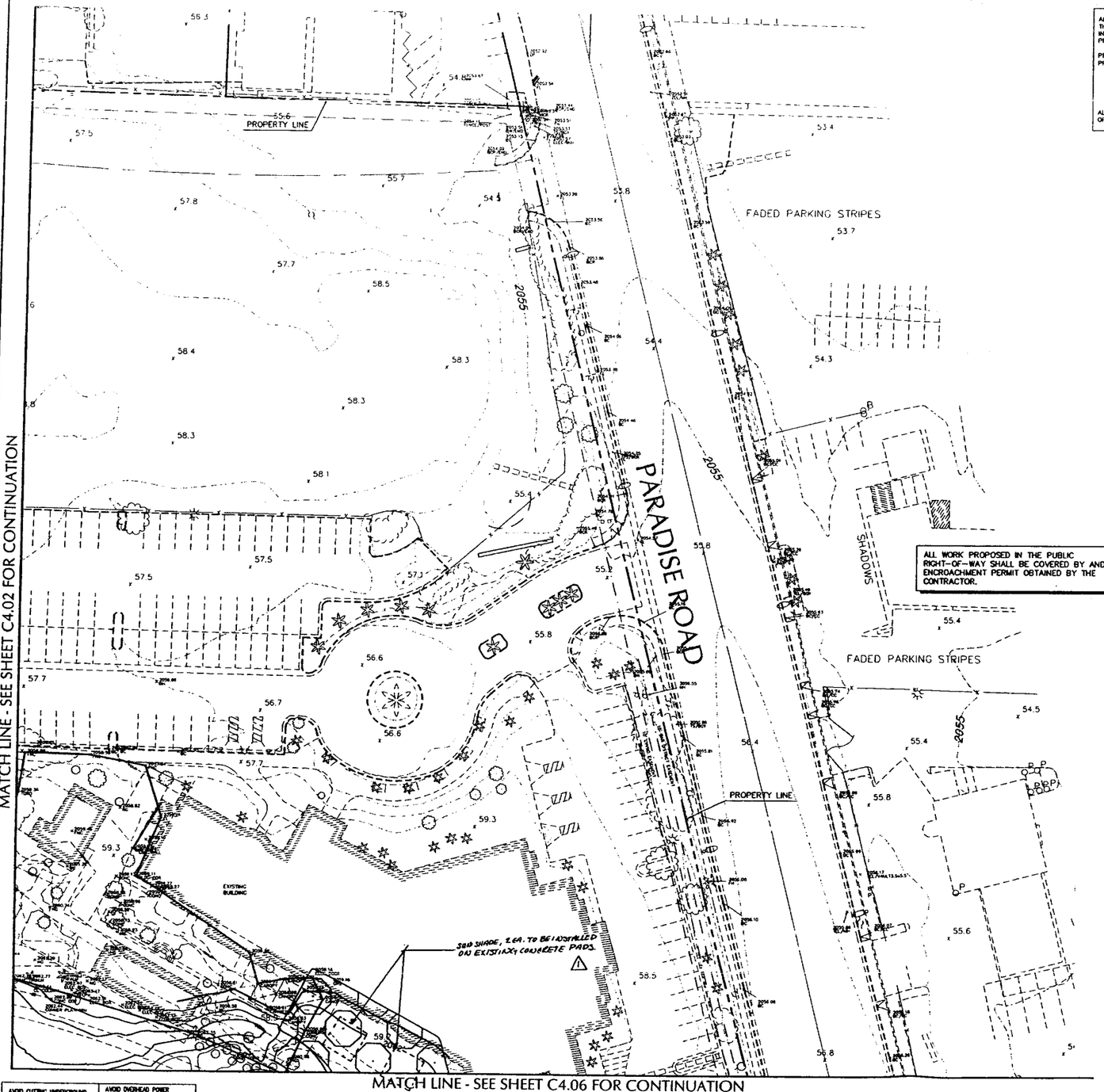
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date 02-14-03
job number 1903.05
design by J. WAKEHAM, P.E.
drawn by V. WINFORD
checked by J. DAVIS, P.E.

sheet number
C1.03

SHEET 3 OF 13
HTE #03-7719

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ALL GRADING WORK SHALL BE IN STRICT ACCORDANCE WITH THE SOILS REPORT FOR THE SITE ENTITLED "GEOTECHNICAL INVESTIGATION FOR THE GREENS OF LAS VEGAS" PROJECT NO. 99-135-1

PROJECT NO.: 99-135-1, DATED 12/04/02
PREPARED BY:
B-SAFE CONSULTANTS
XXXXXXXXXX
LAS VEGAS, NV XXXXX
PHONE NO. (702) XXX-XXXX
FAX NO. (702) XXX-XXXX

ALL WORK SHALL BE PERFORMED UNDER THE DIRECTION OF A REGISTERED PROFESSIONAL SOILS ENGINEER.

ALL WORK PROPOSED IN THE PUBLIC RIGHT-OF-WAY SHALL BE COVERED BY AND ENCROACHMENT PERMIT OBTAINED BY THE CONTRACTOR.

GRAPHIC SCALE

30 0 15 30 60 120

(IN FEET)
1 inch = 30 ft.

BASIS OF BEARING

N 89°36'15" E, BEING THE SOUTH LINE OF THE SOUTHWEST ONE QUARTER (SW1/4) OF SECTION 22, TOWNSHIP 21 SOUTH, RANGE 61 EAST, M.D.M., CLARK COUNTY, NEVADA AS SHOWN ON THAT CERTAIN RECORD OF SURVEY, FILE 67, PAGE 7, RECORDED JUNE 23, 1993 AS DOC. NO. 01360.

BENCHMARK

CLARK COUNTY DATUM 6C11-22SSW6, A RIVET AND SQUARE PLATE IN TOP OF CURB, NORTHEAST CORNER OF TROPICANA AVENUE AND PARADISE ROAD.

ELEVATION 2058.93

C3.01 C4.01 C5.01 C6.01	C3.02 C4.02 C5.02 C6.02	C3.03 C4.03 C5.03 C6.03
C3.04 C4.04 C5.04 C6.04	C3.05 C4.05 C5.05 C6.05	C3.06 C4.06 C5.06 C6.06
C3.07 C4.07 C5.07 C6.07	C3.08 C4.08 C5.08 C6.08	C3.09 C4.09 C5.09 C6.09

KEY MAP

CONSTRUCTION NOTES

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2	CONSTRUCT "A" TYPE CURB ONLY PER STD. DWG. 219.
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14	CONSTRUCT 4' VALLEY GUTTER PER DETAIL X OF SHEET XXX.

CLARK COUNTY
DEPARTMENT OF DEVELOPMENT SERVICES
Acceptance of plans for filing

By: Jack H. Simon Date: 2-26-03

Acceptance of these plans for filing shall not be construed to be a permit for or an approval of any violation of any of the provisions of the state or county laws and/or specifications. Clark County shall be held free from damages which may result from the construction of the improvements from the engineering design depicted herein.

NOTE: Power poles and/or other existing facilities not in proper location based on proposed improvements shown hereon will be relocated at no expense to Clark County.

CLARK COUNTY
DEPARTMENT OF PUBLIC WORKS
ENGINEERING DIVISION

ACCEPTANCE OF PLANS FOR FILING
BY: Jack H. Simon 2-17-03
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LEGEND

FUTURE	EXISTING	PROPOSED	
			RIGHT-OF-WAY
			CENTERLINE
		W	WATER LINE
		S	SANITARY SEWER LINE
		G	GAS LINE
		SD	STORM DRAIN
		P	POWER LINE / POWER POLE
		T	TELEPHONE LINE
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			WATER VALVE
			METERS / FULL BOXES
			REDUCER
			MANHOLE
			CLEANOUT
			SEWER MANHOLE
			STORM MANHOLE
			SIGN POLE
			UTILITY POLE
			DRAIN INLET
			CONTOUR

STREET LIGHTS
100 W H.P.S.
150 W H.P.S.
200 W H.P.S.
250 W H.P.S.

FUTURE	EXISTING	
		SCREEN / RETAINING WALL
		CHAIN LINK FENCE
		GRADE BREAK
		WIRE FENCE
FF=0.00		FINISH FLOOR
0.00 C.O. INV.	(0.00) C.O. INV.	CLEANOUT INVERT ELEVATION
	0.00	FLOW LINE
0.00 F.G.		FINISH GRADE
0.00 B.S.W.		BACK OF SIDEWALK
0.00 T.C.		TOP OF CURB
0.00 T.O.W.		TOP OF WALL
		2" A.C. PAVING
		4" A.C. PAVING
		TYPE "L" CURB & GUTTER
		TYPE "A" CURB
		CONCRETE

I CERTIFY THAT THIS GRADING PLAN IS IN CONFORMANCE WITH THE APPROVED DRAINAGE STUDY ON FILE WITH THE CLARK COUNTY FOR THIS PROJECT.

JOHN WAKENHUT, P.E. — DATE 2-26-03

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E-MAIL: MARTMART@LVCM.COM

PROFESSIONAL ENGINEER — STATE OF NEVADA — JOHN WAKENHUT — Exp. 6-30-04 — CIVIL — No. 13770 — 2-26-03

PREMIERE PARK
GOLF COURSE
GRADING PLAN

no	description of revisions	date	name

date 02-14-03
job number 1903.05
design by J. WAKENHUT, P.E.
drawn by V. WINFORD
checked by J. DAVIS, P.E.

sheet number
C4.03
SHEET 6 OF 13
HTF #03-7719

H:\JOBS\1903\dwgs\pdwgs\FINAL DRAINAGE\GCA1\C4.03-GRAD.dwg, 02/26/2003 11:13:06 AM, vcb

MATCH LINE – SEE DRAWING C-35

E 627200

E 627000

E 626800

E 626600

E 626400

N 492400

N 492200

BEGIN ALIGNMENT
STA. 0+00.00
N 492290
E 626878

℄ RUNWAY 1L/19R EXTENDED

N24°40'10"E
7250.00'

EXTEND BLOW-OFF STRUCTURE ABOVE FINISH GRADE

TROPICANA AVENUE

LIMITS OF GRADING

(E) 5 CELL 40'X 6' CONCRETE BOX CULVERT UNDER TROPICANA AVENUE

REVISE FF = 0+00.00
ELEV. 2071.25
E 626878.21

(N) TRANSITION STRUCTURE SEE DWG. S-1

(N) STORM DRAIN B
66" RCP CLASS V
(STA. 200+00.00 TO 206+94.12)

(Δ = 36°24'40"
R = 200.00'
L = 134.08'

(Δ = 33°45'00"
R = 200.00'
L = 117.81'

20' CONSTRUCTION SAFETY ZONE

SEE STORM DRAIN B PROFILE – DWG. C-41

SEE STORM DRAIN A PROFILE – DWG. C-39

℄ (N) STORM DRAIN A
7'Wx6'H. RCB
(STA. 99+98.50 TO 108+00.00)

(E) FENCE TO BE REMOVED

(N) MH

(N) 8" SEWER

℄ (N) SERVICE ROAD
SEE DWG. C-47

(E) SERVICE ROAD (SEE NOTE 2)

ASPHALT DRAINAGE DITCH (SEE NOTE 1)

(N) FENCE

℄ (N) WESTSIDE CHANNEL
R.O.B., SEE DWG. C-7

MATCH LINE – STA. 7+00
SEE DRAWING C-28

MH A-1 STA. 103+99.52 O/S -0.62'
RIM EL.=2077.04

NOTE:
1. BREAK ASPHALT INTO 6 INCH MINUS PIECES AND LEAVE IN PLACE.
2. SEE DROP INLET TABLE, JUNCTION STRUCTURE TABLE AND MANHOLE TABLE DRAWING S-11.

STORM DRAIN A & B BEGINNING COORDINATES	
STORM DRAIN A STA. 99+98.50	N491,919.24
	E626,757.14
STORM DRAIN B STA. 200+00.00	N491,911.74
	E626,773.84

PLAN
SCALE: 1"=40'-0"

C-27

KEY MAP
N.T.S.

SCALE: 1" = 40'

DESIGNED BY PMY
DRAWN BY MSD
CHECKED BY
APPROVED BY AIRPORT ENGINEER

REV.	DATE	DESCRIPTION
2	5/5/94	REALIGNED SERVICE ROAD
1	5/1/94	ISSUED FOR CONSTRUCTION
Δ	4/26/94	RECORD DRAWING

H:\pmy\dwg\803\engineering\P-27 CD 1-94\C-27.DWG, 5/5/1994 8:13:31 AM, PMY

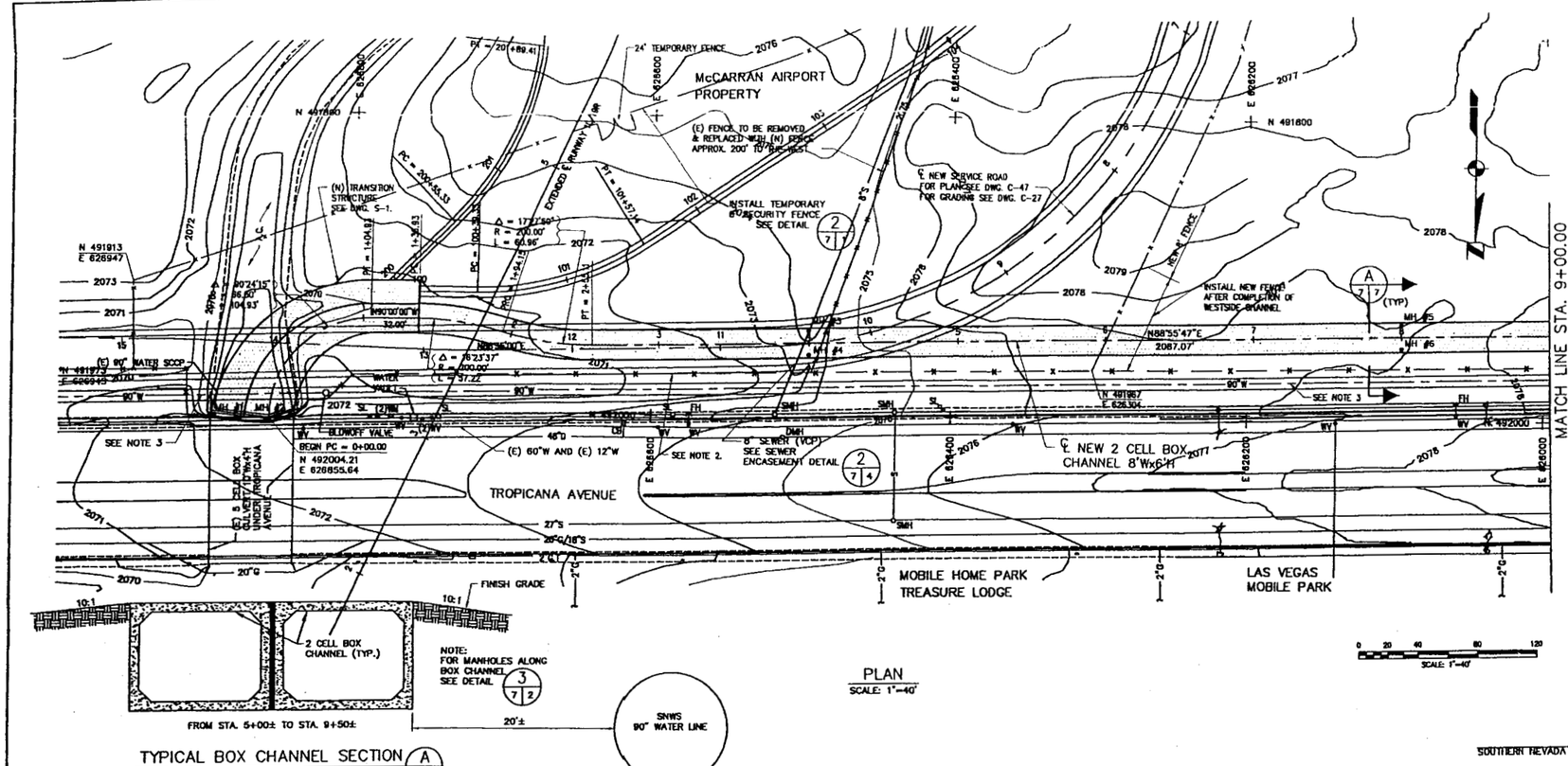
Kennedy/Jenks Consultants
Las Vegas, Nevada 89119

• LAS VEGAS • McCARRAN • NEVADA • INTERNATIONAL • AIRPORT •
CLARK COUNTY

DEPT. OF AVIATION • CLARK COUNTY, NV.
WESTSIDE DRAINAGE IMPROVEMENTS
1L/19R INFIELD PLAN
GRADING & DRAINAGE
STA 0+00 TO STA 7+00

SCALE: HORZ. 1"=40'
VERT. NONE
DATE: 4/94
PROJ. NO. 489911.00
DRAWING NO. C-27
SHT. 35 OF 68

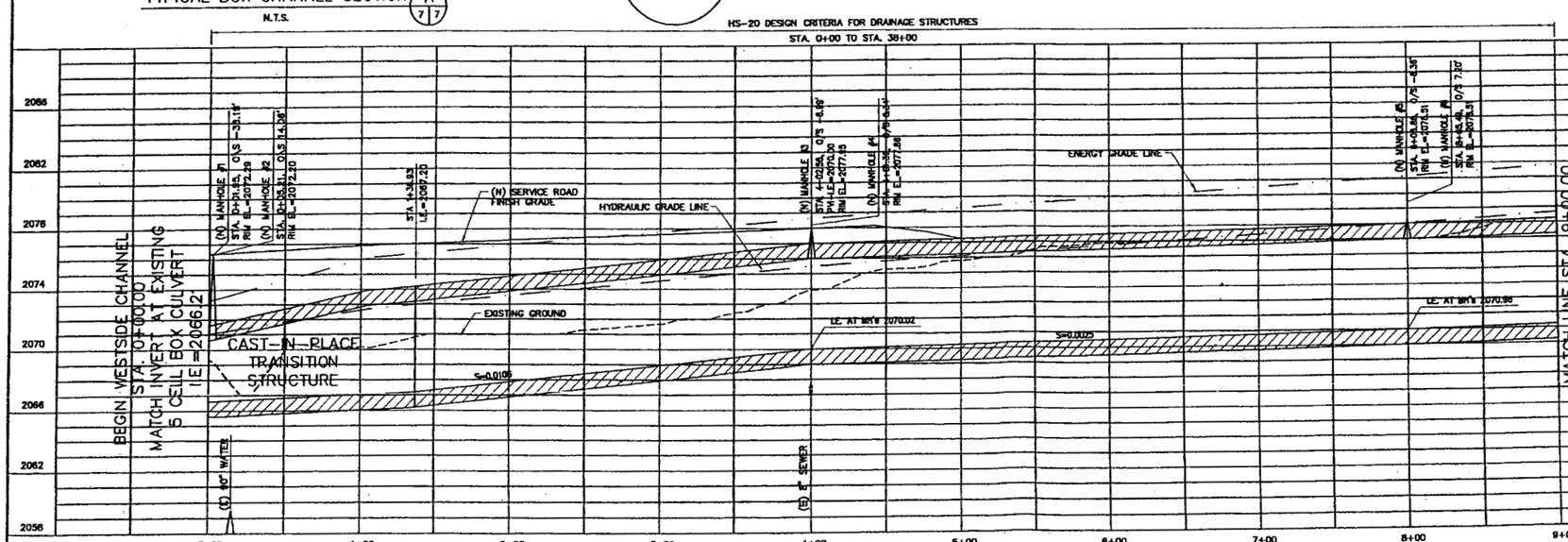
03-7719



PLAN
SCALE: 1"=40'

TYPICAL BOX CHANNEL SECTION
N.T.S.

SOUTHERN NEVADA WATER SYSTEM DATE



Kennedy/Jenks Consultants
Las Vegas, Nevada 89119

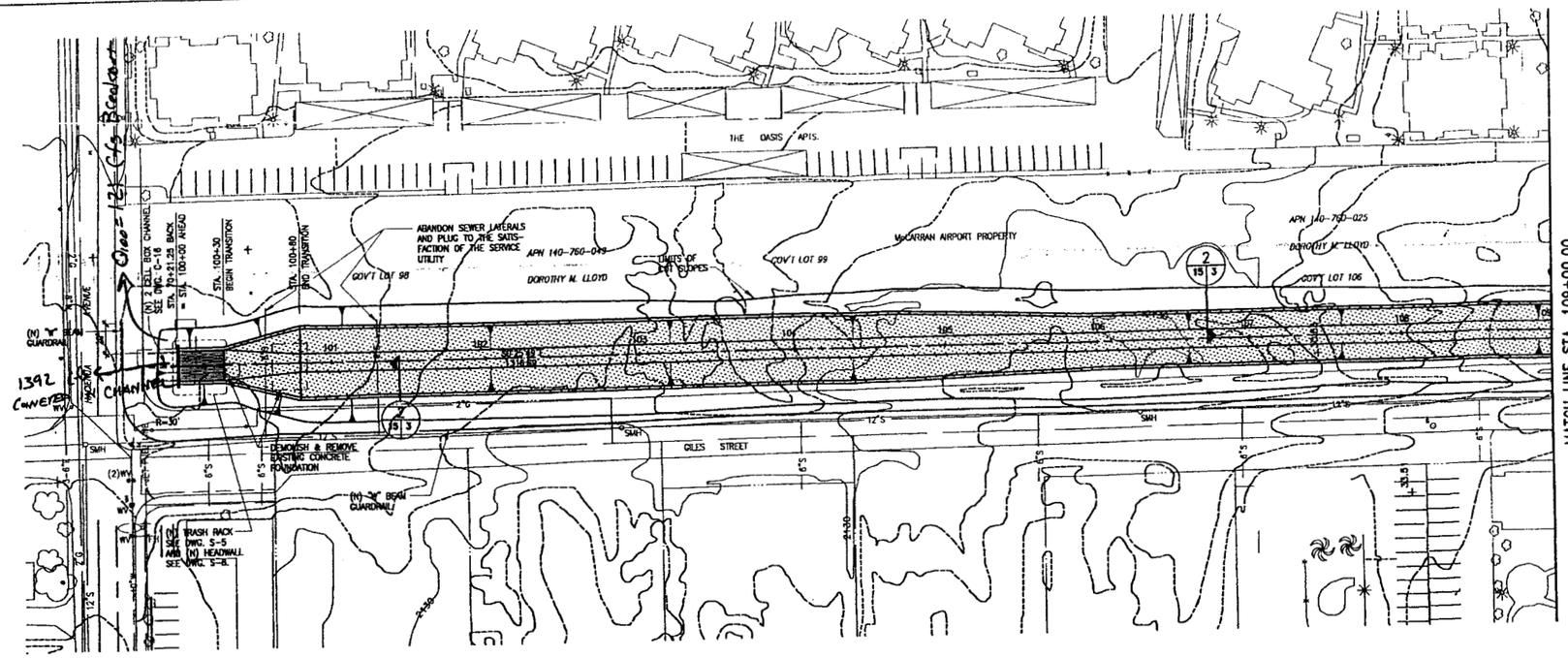
NO.	DATE	DESCRIPTION
1	25 DEC 85	RECORD DRAWING
2	01 AUG 84	REALIGNED SERVICE ROAD
1	06 FEB 84	EXISTING STRUCTURE
0	15 DEC 83	ISSUED FOR BID

DESIGNED ESV CHKD. TJK
DRAWN ____ APPROVED ____
CHECKED ____ AS-BUILT ____

DEPT. OF AVIATION • CLARK COUNTY, NV.
WESTSIDE DRAINAGE IMPROVEMENTS
WESTSIDE CHANNEL
PLAN AND PROFILE
STA. 0+00 TO STA. 9+00

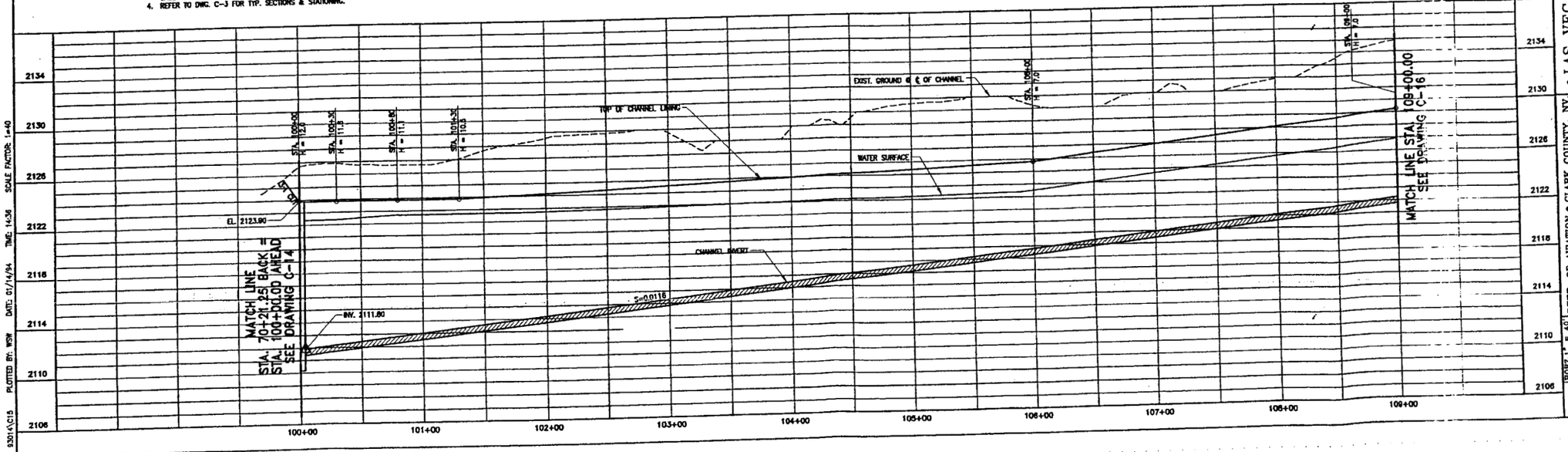
SCALE HORZ. 1"=40' VERT. 1"=4'
DATE 1/15/84
PROJ. NO. 857011.00
DRAWING NO. C-7
SHEET 13 OF 65

• LAS VEGAS • McCARRAN • NEVADA • CLARK COUNTY • INTERNATIONAL • AIRPORT •



PLAN
SCALE : 1" = 40'

NOTES:
1. INSTALL NEW 6' FENCE AROUND THE TRANSITION STRUCTURE AND ALONG THE WEST SIDE OF THE OPEN CHANNEL.
2. INSTALL NEW 6' FENCE ALONG EAST SIDE OF THE OPEN CHANNEL.
3. INSTALL "W" GUARDRAIL STA.100+00 TO STA.109+00 AS SHOWN ON PLAN ALONG HACIENDA AVE. & GILES ST. PER NDOT STD. DWG. R-8.1.4(618) CASE 1.
4. REFER TO DWG. C-3 FOR TYP. SECTIONS & STATIONING.



SCALE FACTOR: 1=40 DATE: 01/14/94 TIME: 14:36 PLOTTED BY: WSW 9301A\C15

DESIGNED BY	MJC
DRAWN BY	WSW
CHECKED BY	
APPROVED BY	AIRPORT ENGINEER

NO.	DATE	DESCRIPTION
2	25 DEC 96	RECORD DRAWING
1	08 FEB 94	ISSUED FOR CONSTRUCTION
BID	10 JAN 94	ISSUED FOR BID

Kennedy/Jenks Consultants
Las Vegas, Nevada 89119

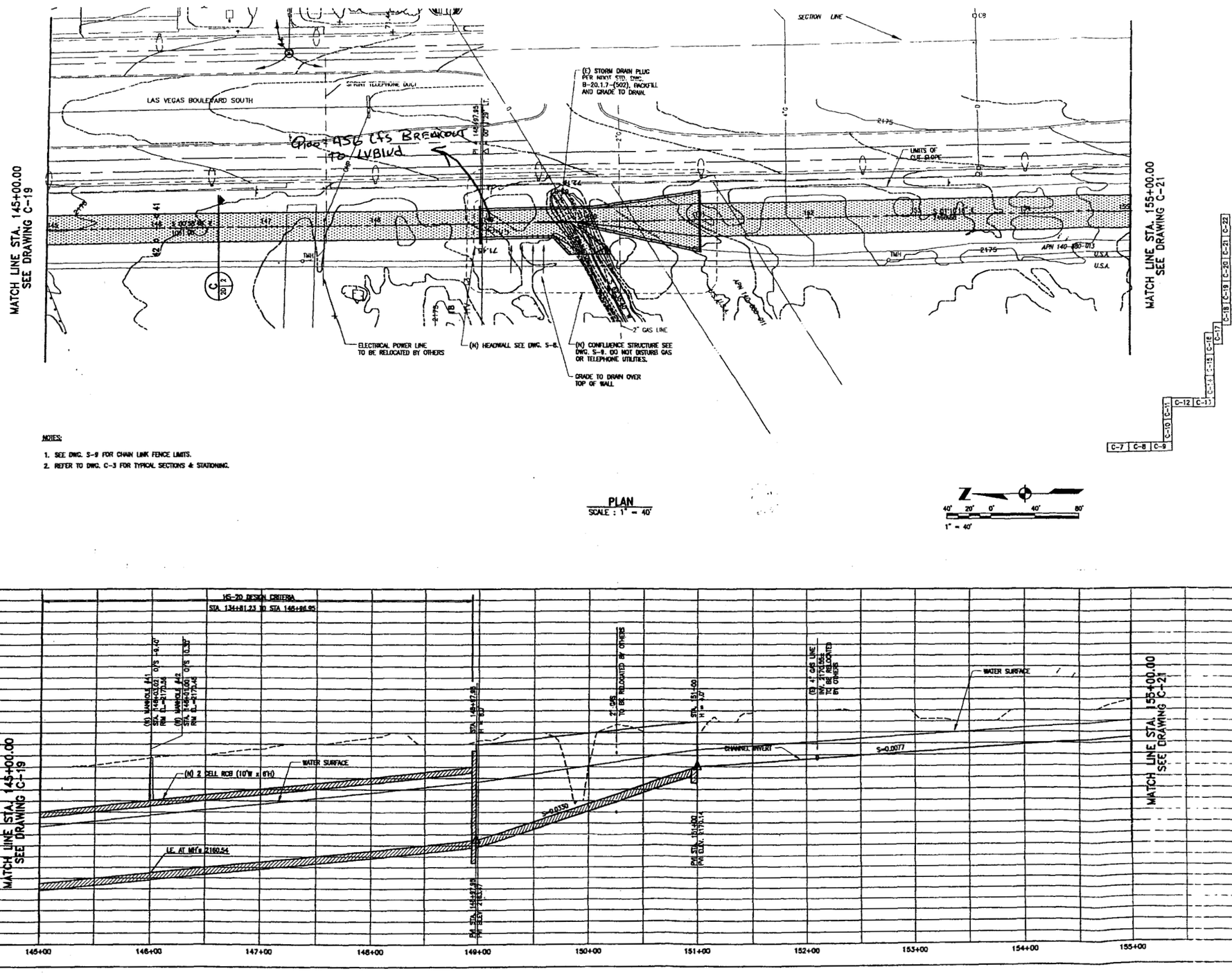
GRBJ CONSULTING ENGINEERS

LAS VEGAS • McCARRAN • NEVADA • INTERNATIONAL • AIRPORT •
CLARK COUNTY
DEPT. OF AVIATION • CLARK COUNTY, NV.

WESTSIDE DRAINAGE IMPROVEMENT

WESTSIDE CHANNEL
PLAN & PROFILE
STA. 100+00 TO 109+00

SCALE	HORZ. 1" = 40' VERT. 1" = 4'
DATE	1/14/94
PROJ. NO.	
DRAWING NO.	C-15
SHT.	23 OF 98



DESIGNED BY MC
DRAWN BY
CHECKED BY
APPROVED BY AIRPORT ENGINEER

MARK	DATE	DESCRIPTION
A	25 DEC 93	RECORD DRAWING
A	05 MAY 94	ISSUED FOR CONSTRUCTION
A	10 FEB 94	ISSUED FOR BID

Kennedy/Jenks Consultants
Las Vegas, Nevada 89119

GBG CONSULTING ENGINEERS

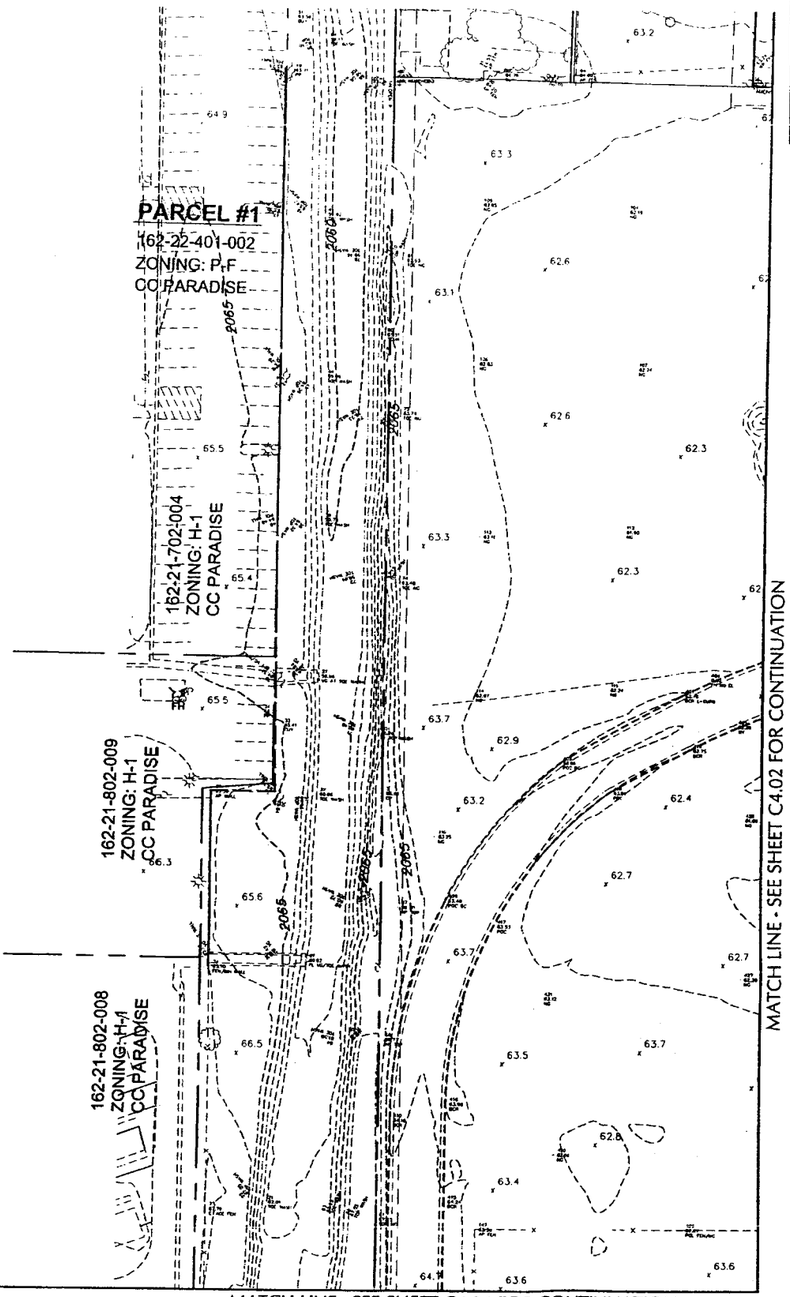
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• INTERNATIONAL • AIRPORT •
CLARK COUNTY

DEPT. OF AVIATION • CLARK COUNTY, NV.
WESTSIDE DRAINAGE IMPROVEMENTS

WESTSIDE CHANNEL
PLAN & PROFILE
STA. 145+00 TO 155+00

SCALE HORIZ. 1" = 40'
VERT. 1" = 4'
DATE 1/14/94
PROJ. NO.
DRAWING NO. C-20
SHT. 28 OF 50

PLOTTED BY: MSW DATE: 01/14/94 TIME: 1500 SCALE FACTOR: 1=40
S:\C1\C20



ALL GRADING WORK SHALL BE IN STRICT ACCORDANCE WITH THE SOILS REPORT FOR THE SITE ENTITLED "XXXXXXXXXX XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX XXXXXXXXXX, PROJECT NO. XXXXXXXXX,

PROJECT NO.: XXXXXXXXX, DATED XXXXXXXXXX
PREPARED BY:
XXXXXXXXX
XXXXXXXXX
LAS VEGAS, NV XXXXX
PHONE NO. (702) XXX-XXXX
FAX NO. (702) XXX-XXXX

ALL WORK SHALL BE PERFORMED UNDER THE DIRECTION OF A REGISTERED PROFESSIONAL SOILS ENGINEER.

GRAPHIC SCALE

(IN FEET)
1 inch = 30 ft.

BASIS OF BEARING

N 89°38'15" E, BEING THE SOUTH LINE OF THE SOUTHWEST ONE QUARTER (SW1/4) OF SECTION 22, TOWNSHIP 21 SOUTH, RANGE 61 EAST, M.D.M., CLARK COUNTY, NEVADA AS SHOWN ON THAT CERTAIN RECORD OF SURVEY, FILE 67, PAGE 7, RECORDED JUNE 23, 1993 AS DOC. NO. 01360.

BENCHMARK

CLARK COUNTY DATUM 6C11-22SSW6, A RIVET AND SQUARE PLATE IN TOP OF CURB, NORTHEAST CORNER OF TROPICANA AVENUE AND PARADISE ROAD.

ELEVATION 2058.93

C3.01 C4.01 C5.01 C6.01	C3.02 C4.02 C5.02 C6.02	C3.03 C4.03 C5.03 C6.03
C3.04 C4.04 C5.04 C6.04	C3.05 C4.05 C5.05 C6.05	C3.06 C4.06 C5.06 C6.06
C3.07 C4.07 C5.07 C6.07	C3.08 C4.08 C5.08 C6.08	C3.09 C4.09 C5.09 C6.09

KEY MAP

CONSTRUCTION NOTES

No.	ITEM
1	CONSTRUCT "L" TYPE CURB AND GUTTER PER STD. DWG. NO. 216.
2	CONSTRUCT "A" TYPE CURB ONLY PER STD. DWG. 219.
3	CONSTRUCT SIDEWALK PER STD. DWG. NO. 234.
4	CONSTRUCT SIDEWALK RAMP PER STD. DWG. NO. 235, CASE I.
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7	CONSTRUCT 6" MIN. AC OVER 16" TYPE II AB (TRUCK)
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9	CONSTRUCT 6" MIN. AC OVER 13" TYPE II AB. –STREET NAME
10	CONSTRUCT SIDEWALK DRAIN PER STD. DWG. NO. 236.
11	CONSTRUCT 4' CONCRETE CHANNEL PER DETAIL X ON SHEET XXXX.
12	CONSTRUCT COMMERCIAL DRIVEWAY PER C.C. AREA STD. DWG. NO. 222A, 225, & 228.
13	CONSTRUCT 3' VALLEY GUTTER PER DETAIL X OF SHEET XXX.
14	CONSTRUCT 4' VALLEY GUTTER PER DETAIL X OF SHEET XXX.

LEGEND

FUTURE	EXISTING	PROPOSED		FUTURE	EXISTING	PROPOSED	
			RIGHT-OF-WAY			SCREEN / RETAINING WALL	
			CENTERLINE			CHAIN LINK FENCE	
		W	WATER LINE			GRADE BREAK	
		S	SANITARY SEWER LINE			WIRE FENCE	
		G	GAS LINE			FF=0.00	FINISH FLOOR
		SD	STORM DRAIN	(0.00)	(0.00)	0.00	
		E-P	POWER LINE / POWER POLE	C.O. INV.	C.O. INV.	C.O. INV.	CLEANOUT INVERT ELEVATION
		T	TELEPHONE LINE	(0.00)	(0.00)	0.00	FLOW LINE
			FIRE HYDRANT	(0.00)	(0.00)	0.00	FINISH GRADE
			WATER VALVE	F.G.	F.G.	F.G.	
			METERS / PULL BOXES	(0.00)	(0.00)	0.00	BACK OF SIDEWALK
			REDUCER	0.5 R	0.5 R	0.5 R	
			MANHOLE	(0.00)	(0.00)	0.00	TOP OF CURB
			CLEANOUT	(0.00)	(0.00)	0.00	TOP OF WALL
			SEWER MANHOLE	T.O.W.	T.O.W.	T.O.W.	
			STORM MANHOLE				3" A.C. PAVING
			SIGN POLE				4" A.C. PAVING
			UTILITY POLE				
			DRAIN INLET				TYPE "L" CURB & GUTTER
			CONTOUR				TYPE "A" CURB
							CONCRETE

STREET LIGHTS

- 100 W H.P.S.
- 150 W H.P.S.
- 200 W H.P.S.
- 250 W H.P.S.

CLARK COUNTY
DEPARTMENT OF PUBLIC WORKS
ENGINEERING DIVISION

ACCEPTANCE OF PLANS FOR FILING

RE:
ACCEPTANCE OF THESE PLANS FOR FILING SHALL NOT BE CONSTRUED TO BE A PERMIT FOR OR AN APPROVAL OF ANY VIOLATION OF ANY OF THE PROVISIONS OF THE STATE OR COUNTY LAWS AND/OR SPECIFICATIONS. CLARK COUNTY SHALL BE HELD FREE FROM DAMAGES WHICH MAY RESULT FROM THE CONSTRUCTION OF THE IMPROVEMENTS FROM THE ENGINEERING DESIGN DEPICTED HEREIN.

I CERTIFY THAT THIS GRADING PLAN IS IN CONFORMANCE WITH THE APPROVED DRAINAGE STUDY ON FILE WITH THE CLARK COUNTY FOR THIS PROJECT

JOHN WAKENHUT, P.E. DATE

PRELIMINARY

AVOID CUTTING UNDERGROUND UTILITY LINES. IT'S COSTLY.
Call before you Dig— 1-800-227-2600
(UNDERGROUND SERVICE ALERT (USA))

AVOID OVERHEAD POWER LINE CONTACT
Call before you OVERHEAD 1-702-593-6111
(CLARK COUNTY ENVIRONMENT AND SAFETY SERVICES DEPARTMENT)

MARTIN & MARTIN ASSUMES NO RESPONSIBILITY FOR EXISTING UTILITY LOCATIONS AND ELEVATIONS. THE UTILITIES SHOWN ON THIS DRAWING HAVE BEEN PLOTTED FROM THE BEST AVAILABLE INFORMATION. IT IS, HOWEVER, THE CONTRACTOR'S RESPONSIBILITY TO FIELD VERIFY THE LOCATION AND ELEVATION OF ALL UTILITIES PRIOR TO THE COMMENCEMENT OF ANY CONSTRUCTION. CONTRACTOR TO FIELD VERIFY ALL EXISTING SITE CONDITIONS PRIOR TO CONSTRUCTION. IF A CONFLICT EXISTS BETWEEN WHAT IS SHOWN ON THESE DRAWINGS AND WHAT EXISTS IN THE FIELD, THE CONTRACTOR IS TO NOTIFY THE ARCHITECT OR ENGINEER IMMEDIATELY.

MARTIN & MARTIN
CIVIL ENGINEERS
2101 SOUTH JONES BLVD.
SUITE 120
LAS VEGAS, NEVADA 89146
PHONE (702) 248-1000
FAX (702) 248-8072
E-MAIL: MARTMART@LVCM.COM

PROFESSIONAL ENGINEER
JOHN C. WAKENHUT
Exp. 6-30-04
CIVIL
No. 13720
STATE OF NEVADA
1-24-03

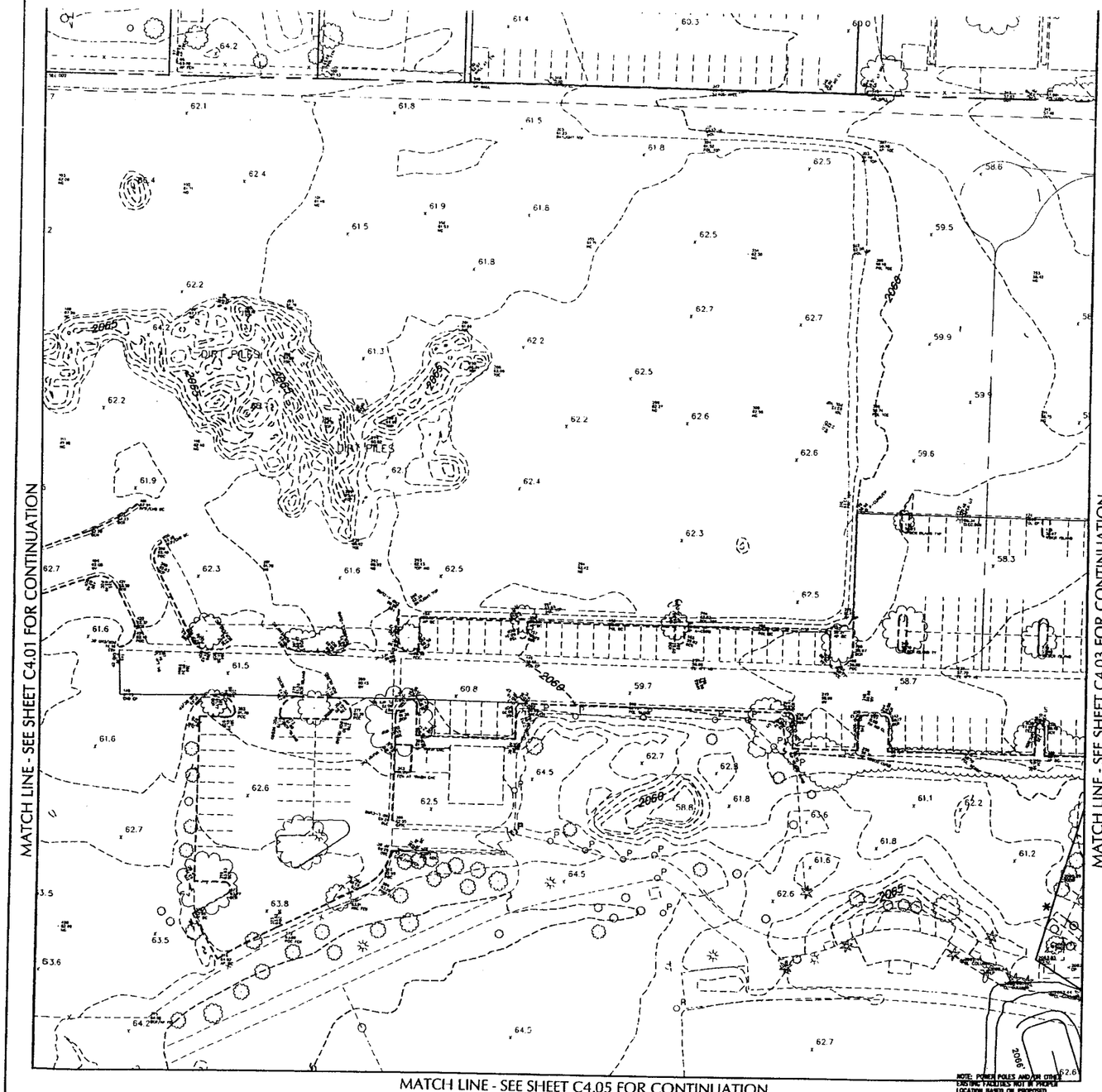
PREMIERE PARK
GOLF COURSE
GRADING PLAN

no.	description of revisions	date	name

date: 1-24-03
job number: 1903.05
design by: J. WAKENHUT, P.E.
drawn by: Y. YINKFORD
checked by: J. DAVIS, P.E.

sheet number
C4.01
SHEET X OF X

03-7719



ALL GRADING WORK SHALL BE IN STRICT ACCORDANCE WITH THE SOILS REPORT FOR THE SITE ENTITLED "XXXXXXXXXXX XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX XXXXXXXXXX, PROJECT NO. XXXXXXXXX,

PROJECT NO.: XXXXXXXXX, DATED XXXXXXXXXXX
PREPARED BY:
XXXXXXXXXX
XXXXXXXXXX
LAS VEGAS, NV XXXXX
PHONE NO. (702) XXX-XXXX
FAX NO. (702) XXX-XXXX

ALL WORK SHALL BE PERFORMED UNDER THE DIRECTION OF A REGISTERED PROFESSIONAL SOILS ENGINEER.

GRAPHIC SCALE

(IN FEET)
1 inch = 80 ft.

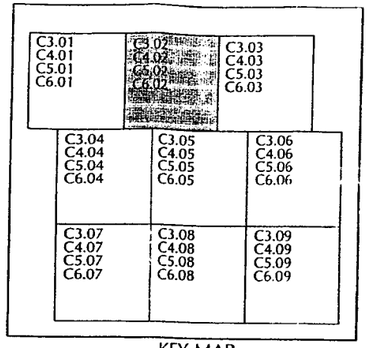
BASIS OF BEARING

N 89°36'15" E, BEING THE SOUTH LINE OF THE SOUTHWEST ONE QUARTER (SW1/4) OF SECTION 22, TOWNSHIP 21 SOUTH, RANGE 61 EAST, M.D.M., CLARK COUNTY, NEVADA AS SHOWN ON THAT CERTAIN RECORD OF SURVEY, FILE 67, PAGE 7, RECORDED JUNE 23, 1993 AS DOC. NO. 013000.

BENCHMARK

CLARK COUNTY DATUM 6C11-22SSW6, A RIVET AND SQUARE PLATE IN TOP OF CURB, NORTHEAST CORNER OF TROPICANA AVENUE AND PARADISE ROAD.

ELEVATION 2058.93



KEY MAP

CONSTRUCTION NOTES

No.	ITEM
1	CONSTRUCT "L" TYPE CURB AND GUTTER PER STD. DWG. NO. 216.
2	CONSTRUCT "A" TYPE CURB ONLY PER STD. DWG. 219.
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LEGEND

FUTURE	EXISTING	PROPOSED		FUTURE	EXISTING	PROPOSED
			RIGHT-OF-WAY			SCREEN / RETAINING WALL
		W	WATER LINE			CHAIN LINK FENCE
		S	SANITARY SEWER LINE			GRADE BREAK
		G	GAS LINE			WIRE FENCE
		SD	STORM DRAIN			FINISH FLOOR
			POWER LINE / POWER POLE			CLEANOUT/INVERT ELEVATION
		T	TELEPHONE LINE			FLOW LINE
			FIRE HYDRANT			FINISH GRADE
			WATER VALVE			RACK OF SIDEWALK
			METERS / PULL BOXES			TOP OF CURB
			REDUCER			TOP OF WALL
			MANHOLE			2" A.C. PAVING
			CLEANOUT /			4" A.C. PAVING
		S	SEWER MANHOLE			TYPE "L" CURB & GUTTER
		SD	STORM MANHOLE			TYPE "A" CURB
			SIGN POLE			CONCRETE
			UTILITY POLE			
			DRAIN INLET			
			CONTOUR			

STREET LIGHTS
100 W H.P.S.
150 W H.P.S.
200 W H.P.S.
250 W H.P.S.

AVOID CUTTING UNDERGROUND UTILITY LINES. IT'S COSTLY. Call before you Dig– 1-800-227-2600 (UNDERGROUND SERVICE ALERT (NSA))

AVOID OVERHEAD POWER LINE CONTACT Call before you OVERHEAD 1-702-593-6111 NEVADA POWER ENVIRONMENT AND SAFETY SERVICES DEPARTMENT

MARTIN & MARTIN ASSUMES NO RESPONSIBILITY FOR EXISTING UTILITY LOCATIONS AND ELEVATIONS. THE UTILITIES SHOWN ON THIS DRAWING HAVE BEEN PLOTTED FROM THE BEST AVAILABLE INFORMATION. IT IS, HOWEVER, THE CONTRACTOR'S RESPONSIBILITY TO FIELD VERIFY THE LOCATION AND ELEVATION OF ALL UTILITIES PRIOR TO THE COMMENCEMENT OF ANY CONSTRUCTION. CONTRACTOR TO FIELD VERIFY ALL EXISTING SITE CONDITIONS PRIOR TO CONSTRUCTION. IF A CONFLICT EXISTS BETWEEN WHAT IS SHOWN ON THESE DRAWINGS AND WHAT EXISTS IN THE FIELD, THE CONTRACTOR IS TO NOTIFY THE ARCHITECT OR ENGINEER IMMEDIATELY.

NOTE: POWER POLES AND/OR OTHER EXISTING FACILITIES NOT IN PROPER LOCATION BASED ON PROPOSED IMPROVEMENTS SHOWN HEREIN WILL BE RELOCATED AT NO EXPENSE TO CLARK COUNTY.

I CERTIFY THAT THIS GRADING PLAN IS IN CONFORMANCE WITH THE APPROVED DRAINAGE STUDY ON FILE WITH THE CLARK COUNTY FOR THIS PROJECT

JOHN WAKENHUT, P.E. DATE

CLARK COUNTY
DEPARTMENT OF PUBLIC WORKS
ENGINEERING DIVISION

ACCEPTANCE OF PLANS FOR FILING

BY:
ACCEPTANCE OF THESE PLANS FOR FILING SHALL NOT BE CONSTRUED TO BE A PERMIT FOR OR AN APPROVAL OF ANY VIOLATION OF ANY OF THE PROVISIONS OF THE STATE OR COUNTY LAWS AND/OR SPECIFICATIONS. CLARK COUNTY SHALL BE HELD FREE FROM DAMAGES WHICH MAY RESULT FROM THE CONSTRUCTION OF THE IMPROVEMENTS FROM THE ENGINEERING DESIGN DEPICTED HEREIN.

PRELIMINARY

MARTIN & MARTIN
CIVIL ENGINEERS
2101 SOUTH JONES BLVD.
SUITE 120
LAS VEGAS, NEVADA 89146
PHONE (702) 248-8000
FAX (702) 248-8070
E-MAIL: MARTMART@LVCOX.COM

JOHN WAKENHUT Exp. 6-30-05 CIVIL No. 13720 STATE OF NEVADA
1-24-03

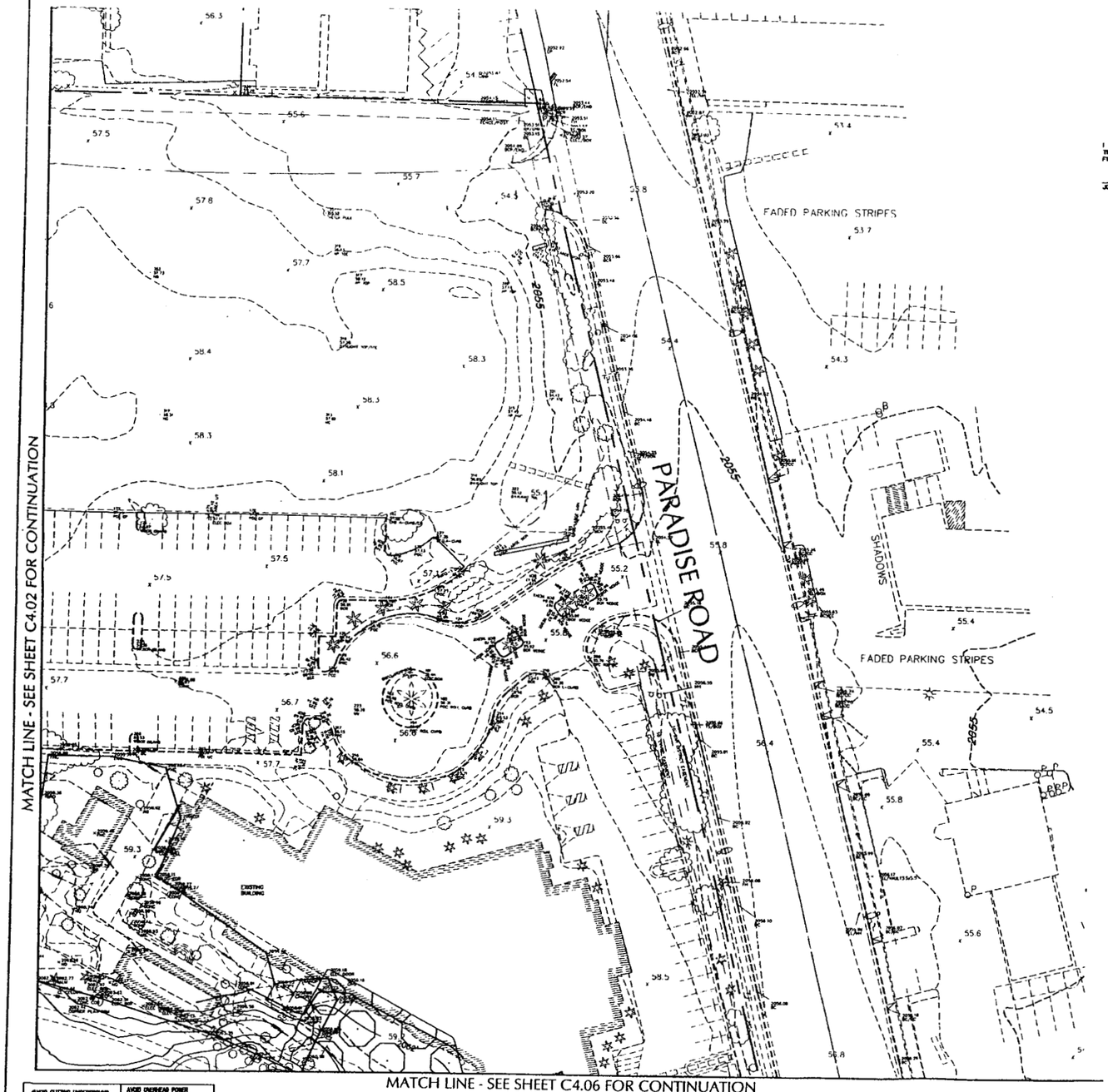
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PREMIERE PARK
GOLF COURSE
GRADING PLAN

no	description of revisions	date	name

date 01-24-03
job number 1903.05
design by J. WAKENHUT, P.E.
drawn by V. WINFORD
checked by J. DAVIS, P.E.

sheet number
C4.02
SHEET X OF X



ALL GRADING WORK SHALL BE IN STRICT ACCORDANCE WITH THE SOILS REPORT FOR THE SITE ENTITLED "GEOTECHNICAL INVESTIGATION FOR THE CREEKS OF LAS VEGAS" PROJECT NO. 99-135-1

PROJECT NO.: 99-135-1, DATED 12/04/02
PREPARED BY:
D-SAFE CONSULTANTS
XXXXXXXXXX
LAS VEGAS, NV XXXXX
PHONE NO. (702) XXX-XXXX
FAX NO. (702) XXX-XXXX

ALL WORK SHALL BE PERFORMED UNDER THE DIRECTION OF A REGISTERED PROFESSIONAL SOILS ENGINEER.

I CERTIFY THAT THIS GRADING PLAN IS IN CONFORMANCE WITH THE APPROVED DRAINAGE STUDY ON FILE WITH THE CLARK COUNTY FOR THIS PROJECT

JOHN WAKENHUT, P.E. DATE

GRAPHIC SCALE

(IN FEET)
1 inch = 30 ft.

BASIS OF BEARING

N 89°36'15" E, BEING THE SOUTH LINE OF THE SOUTHWEST ONE QUARTER (SW1/4) OF SECTION 22, TOWNSHIP 21 SOUTH, RANGE 61 EAST, M.D.M., CLARK COUNTY, NEVADA AS SHOWN ON THAT CERTAIN RECORD OF SURVEY, FILE 67, PAGE 7, RECORDED JUNE 23, 1993 AS DOC NO 01360

BENCHMARK

CLARK COUNTY DATUM 6C11-22SSWB, A RIVET AND SQUARE PLATE IN TOP OF CURB, NORTHEAST CORNER OF TROPICANA AVENUE AND PARADISE ROAD.

ELEVATION 2058.93

C3.01 C4.01 C5.01 C6.01	C3.02 C4.02 C5.02 C6.02	C3.03 C4.03 C5.03 C6.03
C3.04 C4.04 C5.04 C6.04	C3.05 C4.05 C5.05 C6.05	C3.06 C4.06 C5.06 C6.06
C3.07 C4.07 C5.07 C6.07	C3.08 C4.08 C5.08 C6.08	C3.09 C4.09 C5.09 C6.09

KEY MAP

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13	CONSTRUCT 3' VALLEY GUTTER PER DETAIL X OF SHEET XXX
14	CONSTRUCT 4' VALLEY GUTTER PER DETAIL X OF SHEET XXX.

LEGEND

FUTURE	EXISTING	PROPOSED	
			RIGHT-OF-WAY
			CENTERLINE
W	W	W	WATER LINE
S	S	S	SANITARY SEWER LINE
G	G	G	GAS LINE
SD	SD	SD	STORM DRAIN
E	E	E	POWER LINE / POWER POLE
T	T	T	TELEPHONE LINE
			FIRE HYDRANT
			WATER VALVE
			METERS / PULL BOXES
			REDUCER
			MANHOLE
			CLEANOUT
			SEWER MANHOLE
			STORM MANHOLE
			SIGN POLE
			UTILITY POLE
			DRAIN INLET
			CONTOUR

STREET LIGHTS
100 W H.P.S.
150 W H.P.S.
200 W H.P.S.
250 W H.P.S.

FUTURE	EXISTING	PROPOSED	
			SCREEN / RETAINING WALL
			CHAIN LINK FENCE
			GRADE BREAK
			WIRE FENCE
		FF=0.00	FINISH FLOOR
		0.00	
		C.O. INV.	CLEANOUT INVERT ELEVATION
		0.00	FLOW LINE
		0.00	FINISH GRADE
		0.00	BACK OF SIDEWALK
		0.00	TOP OF RETAINING WALL
		0.00	TOP OF WALL
			2" A.C. PAVING
			4" A.C. PAVING
			TYPE "L" CURB & GUTTER
			TYPE "A" CURB
			CONCRETE

CLARK COUNTY
DEPARTMENT OF PUBLIC WORKS
ENGINEERING DIVISION

ACCEPTANCE OF PLANS FOR FILING

BY:
ACCEPTANCE OF THESE PLANS FOR FILING SHALL NOT BE CONSTRUED TO BE A PERMIT FOR OR AN APPROVAL OF ANY VIOLATION OF ANY OF THE PROVISIONS OF THE STATE OR COUNTY LAWS AND/OR SPECIFICATIONS. CLARK COUNTY SHALL BE HELD FREE FROM DAMAGES WHICH MAY RESULT FROM THE CONSTRUCTION OF THE IMPROVEMENTS FROM THE ENGINEERING DESIGN DEPICTED HEREIN.

PRELIMINARY

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Call before you Dig— 1-800-227-2600
(FREE UNDERGROUND SERVICE ALERT (USA))

AVOID OVERHEAD POWER LINE CONTACT
Call before you OVERHEAD 1-702-593-6111
(NEVADA POWER ENVIRONMENT AND SAFETY SERVICES DEPARTMENT)

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GENERAL NOTE:

IT IS THE CONTRACTORS RESPONSIBILITY TO FILE A NOTICE OF INTENT/REQUEST TO BE INCLUDED IN THE STORM WATER GENERAL PERMIT, AND SUBMIT THE ASSOCIATED STORMWATER POLLUTION PREVENTION PLAN (SPPP) AS REQUIRED BY FEDERAL LAW, AND MONITORED BY THE NEVADA DIVISION OF ENVIRONMENTAL PROTECTION.

MARTIN & MARTIN
CIVIL ENGINEERS
2101 SOUTH JONES BLVD
SUITE 120
LAS VEGAS, NEVADA 89146
PHONE (702) 248-0000
FAX (702) 248-8010
E-MAIL: MARTMARTIN@YAHOO.COM

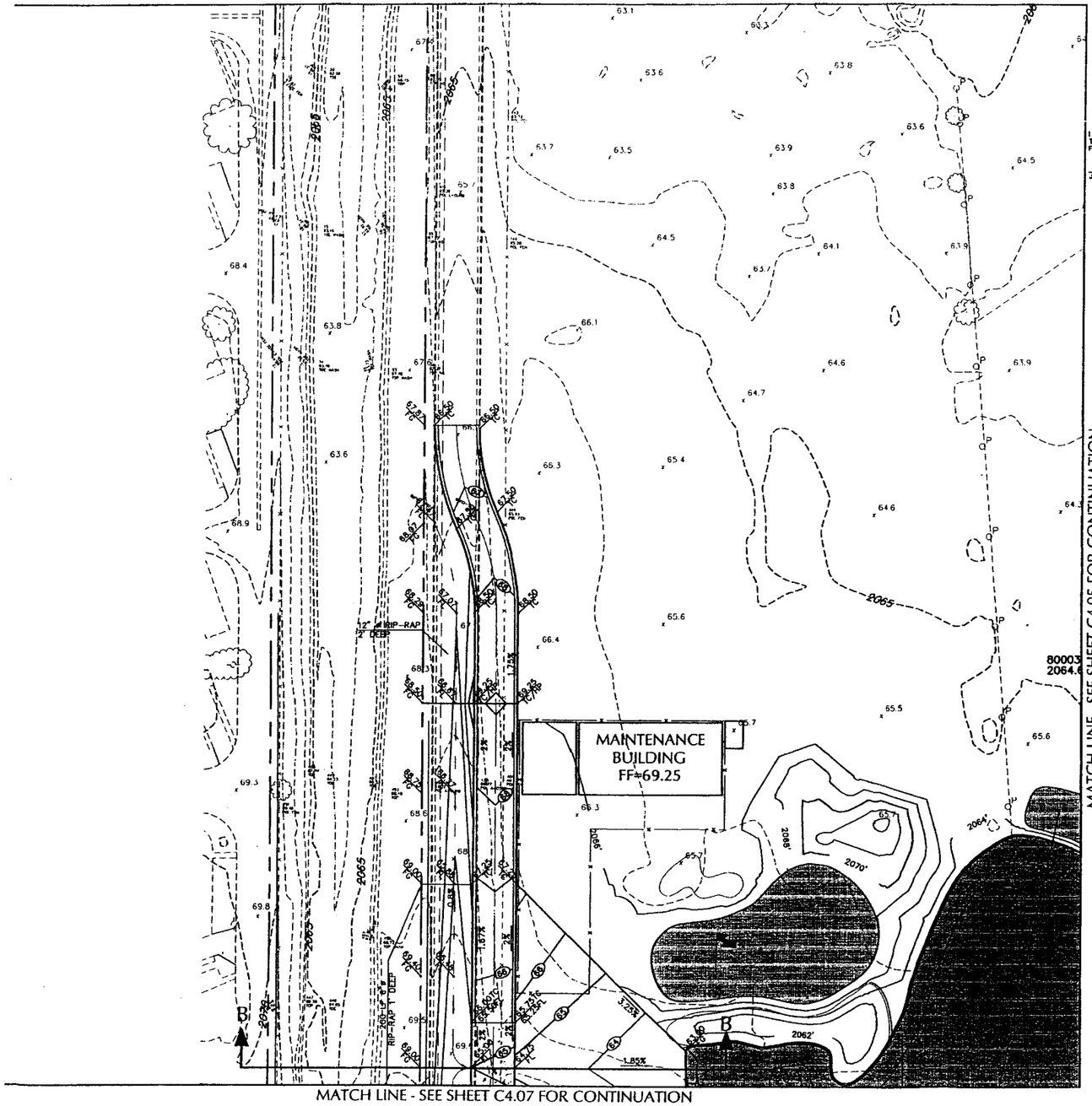
JOHN WAKENHUT Exp. 6-30-04 CIVIL No. 13720 STATE OF NEVADA
1-24-03

PREMIERE PARK
GOLF COURSE
GRADING PLAN

no	description of revisions	date	name

date	01-24-03
job number	1903.05
design by	J. WAKENHUT, P.E.
drawn by	V. WINFORM
checked by	J. DAVIS, P.E.

sheet number
C4.03
SHEET X OF X



ALL GRADING WORK SHALL BE IN STRICT ACCORDANCE WITH THE SOILS REPORT FOR THE SITE ENTITLED "GEOTECHNICAL INVESTIGATION FOR THE GREENS OF LAS VEGAS" PROJECT NO. 98-135-1

PROJECT NO.: 98-135-1, DATED 12/04/02
PREPARED BY:

B-SAFE CONSULTANTS
XXXXXXXXXX
LAS VEGAS, NV XXXXX
PHONE NO. (702) XXX-XXXX
FAX NO. (702) XXX-XXXX

ALL WORK SHALL BE PERFORMED UNDER THE DIRECTION OF A REGISTERED PROFESSIONAL SOILS ENGINEER.

I CERTIFY THAT THIS GRADING PLAN IS IN CONFORMANCE WITH THE APPROVED DRAINAGE STUDY ON FILE WITH THE CLARK COUNTY FOR THIS PROJECT

JOHN WAKENHUT, P.E. DATE

GRAPHIC SCALE

(IN FEET)
1 inch = 30 ft.

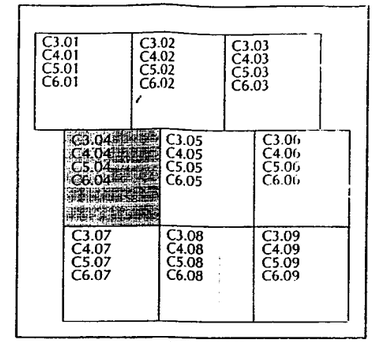
BASIS OF BEARING

N 89°36'15" E, BEING THE SOUTH LINE OF THE SOUTHWEST ONE QUARTER (SW1/4) OF SECTION 22, TOWNSHIP 21 SOUTH, RANGE 61 EAST, M.D.M., CLARK COUNTY, NEVADA AS SHOWN ON THAT CERTAIN RECORD OF SURVEY, FILE 67, PAGE 7, RECORDED JUNE 23, 1993 AS DOC. NO. 01360.

BENCHMARK

CLARK COUNTY DATUM 6C11-22SSW6, A RIVET AND SQUARE PLATE IN TOP OF CURB, NORTHEAST CORNER OF TROPICANA AVENUE AND PARADISE ROAD.

ELEVATION 2058.93



KEY MAP

CONSTRUCTION NOTES

No.	ITEM
1	CONSTRUCT "L" TYPE CURB AND GUTTER PER STD. DWG. NO. 216.
2	CONSTRUCT "A" TYPE CURB ONLY PER STD. DWG. 219.
3	CONSTRUCT SIDEWALK PER STD. DWG. NO. 234.
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LEGEND

FUTURE	EXISTING	PROPOSED		FUTURE	EXISTING	PROPOSED	
			RIGHT-OF-WAY				SCREEN / RETAINING WALL
			CENTERLINE				CHAIN LINK FENCE
		W	WATER LINE				GRADE BREAK
		S	SANITARY SEWER LINE				WIRE FENCE
G	G	G	GAS LINE			FF=0.00	FINISH FLOOR
SD	SD	SD	STORM DRAIN	(0.00)	(0.00)	C.O. INV.	CLEANOUT INVERT ELEVATION
P/T	P/T	P/T	POWER LINE / POWER POLE	C.O. INV. (0.00)	C.O. INV. (0.00)	0.00	FLOW LINE
T	T	T	TELEPHONE LINE			0.00 F.G.	FINISH GRADE
			FIRE HYDRANT	(0.00) F.G.	(0.00) F.G.	0.00 B.S.W.	BACK OF SIDEWALK
			WATER VALVE	(0.00)	(0.00)	0.00 T.O.C.	TOP OF CURB
			METERS / PULL BOXES	B.S.W. (0.00)	B.S.W. (0.00)	0.00 T.O.W.	TOP OF WALL
			REDUCER	T.O.C. (0.00)	T.O.W. (0.00)		2" A.C. PAVING
			MANHOLE				4" A.C. PAVING
			CLEANOUT				TYPE "L" CURB & GUTTER
			SEWER MANHOLE				TYPE "A" CURB
			STORM MANHOLE				CONCRETE
			SIGN POLE				
			UTILITY POLE				
			DRAIN INLET				
			CONTOUR				

STREET LIGHTS

100 W H.P.S.
150 W H.P.S.
200 W H.P.S.
250 W H.P.S.

CLARK COUNTY
DEPARTMENT OF PUBLIC WORKS
ENGINEERING DIVISION

ACCEPTANCE OF PLANS FOR FILING

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(CLARK COUNTY DEPARTMENT OF AVIATION, MCCARRAN INTERNATIONAL AIRPORT, AIRPORT SERVICES DEPARTMENT)

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2101 SOUTH JONES BLVD.
SUITE 120
LAS VEGAS, NEVADA 89146
PHONE (702) 248-8000
FAX (702) 248-8071
E-MAIL: JOHN@MARTINLVC.COM

PROFESSIONAL ENGINEER STATE OF NEVADA JOHN WAKENHUT Exp. 6-30-04 CIVIL No. 13720
1-24-03

PREMIERE PARK
GOLF COURSE
GRADING PLAN

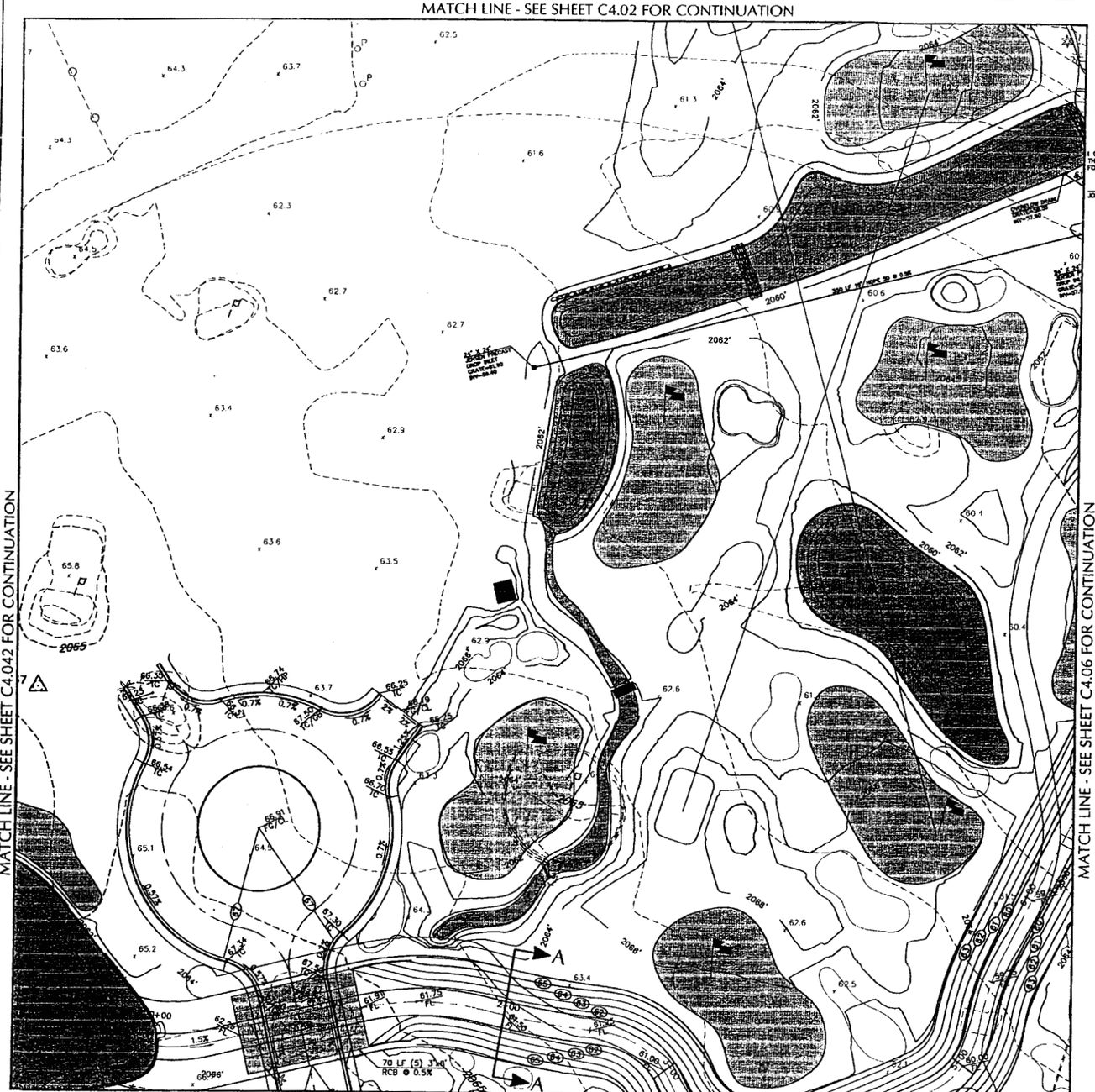
no	description of revisions	date	name

date 01-24-03
job number 1903.05
design by J. WAKENHUT, P.E.
drawn by V. WINFORD
checked by J. DAVIS, P.E.

sheet number
C4.04
SHEET X OF X

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MATCH LINE - SEE SHEET C4.02 FOR CONTINUATION



MATCH LINE - SEE SHEET C4.09 FOR CONTINUATION



MATCH LINE - SEE SHEET C4.05 FOR CONTINUATION

MATCH LINE - SEE SHEET C4.09 FOR CONTINUATION

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PROJECT NO. 99-135-1

PROJECT NO.: 99-135-1, DATED 12/04/02
PREPARED BY:
B-SAFE CONSULTANTS
XXXXXXXXXX
LAS VEGAS, NV XXXXX
PHONE NO. (702) XXX-XXXX
FAX NO. (702) XXX-XXXX

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JOHN WAKENHUT, P.E. DATE

GRAPHIC SCALE

(IN FEET)
1 inch = 30 ft.

BASIS OF BEARING

N 89°36'15" E, BEING THE SOUTH LINE OF THE SOUTHWEST ONE QUARTER (SW1/4) OF SECTION 22, TOWNSHIP 21 SOUTH, RANGE 61 EAST, M.D.M., CLARK COUNTY, NEVADA AS SHOWN ON THAT CERTAIN RECORD OF SURVEY, FILE 67, PAGE 7, RECORDED JUNE 23, 1993 AS DOC. NO. 01360.

BENCHMARK

CLARK COUNTY DATUM 6C11-22SSW6, A RIVET AND SQUARE PLATE IN TOP OF CURB, NORTHEAST CORNER OF TROPICANA AVENUE AND PARADISE ROAD.

ELEVATION 2058.93

C3.01 C4.01 C5.01 C6.01	C3.02 C4.02 C5.02 C6.02	C3.03 C4.03 C5.03 C6.03
C3.04 C4.04 C5.04 C6.04	C3.05 C4.05 C5.05 C6.05	C3.06 C4.06 C5.06 C6.06
C3.07 C4.07 C5.07 C6.07	C3.08 C4.08 C5.08 C6.08	C3.09 C4.09 C5.09 C6.09

KEY MAP

CONSTRUCTION NOTES

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LEGEND

FUTURE	EXISTING	PROPOSED		FUTURE	EXISTING	PROPOSED
			RIGHT-OF-WAY			SCREEN / RETAINING WALL
			CENTERLINE			CHAIN LINK FENCE
		W	WATER LINE			GRAVEL BREAK
		S	SANITARY SEWER LINE			WIRE FENCE
		G	GAS LINE			FF=2058 FINISH FLOOR
		SD	STORM DRAIN	(SD)	(SD)	SD FG CLEANOUT INVERT ELEVATION
		E	POWER LINE / POWER POLE	C.O. INV.	C.O. INV.	
		T	TELEPHONE LINE	(SD)	(SD)	SD FF - FLOW LINE
			FIRE HYDRANT	(SD)	(SD)	SD FG - FINISH GRADE
			WATER VALVE	F.H.	F.H.	FH
			METERS / PULL BOXES	(SD)	(SD)	SD BOS - BACK OF SIDEWALK
			REDUCER	G.V.	G.V.	G.V.
			MANHOLE	(SD)	(SD)	SD TOC - TOP OF CURB
			CLEANOUT	(SD)	(SD)	SD TOW - TOP OF WALL
			SEWER MANHOLE	T.O.W.	T.O.W.	T.O.W.
			STORM MANHOLE			3" A.C. PAVING
			SIGN POLE			4" A.C. PAVING
			UTILITY POLE			
			DRAIN INLET			TYPE "L" CURB & GUTTER
			CONTOUR			TYPE "A" CURB
						CONCRETE

STREET LIGHTS
100 W H.P.S.
150 W H.P.S.
200 W H.P.S.
250 W H.P.S.

CLARK COUNTY
DEPARTMENT OF PUBLIC WORKS
ENGINEERING DIVISION

ACCEPTANCE OF PLANS FOR FILING

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NOTE: POWER POLES AND/OR OTHER EXISTING FACILITIES NOT IN PROPER LOCATION BASED ON PROPOSED IMPROVEMENTS SHOWN HEREON WILL BE RELOCATED AT NO EXPENSE TO CLARK COUNTY.

MARTIN & MARTIN
CIVIL ENGINEERS
2101 SOUTH JONES BLVD.
SUITE 120
LAS VEGAS, NEVADA 89146
PHONE (702) 248-8000
FAX (702) 248-8070
E-MAIL: MARTIN@MJV.COM

PROFESSIONAL ENGINEER — JOHN WAKENHUT — Exp. 6-30-04 — CIVIL — No. 13720 — STATE OF NEVADA
1-24-03

PREMIERE PARK
GOLF COURSE
GRADING PLAN

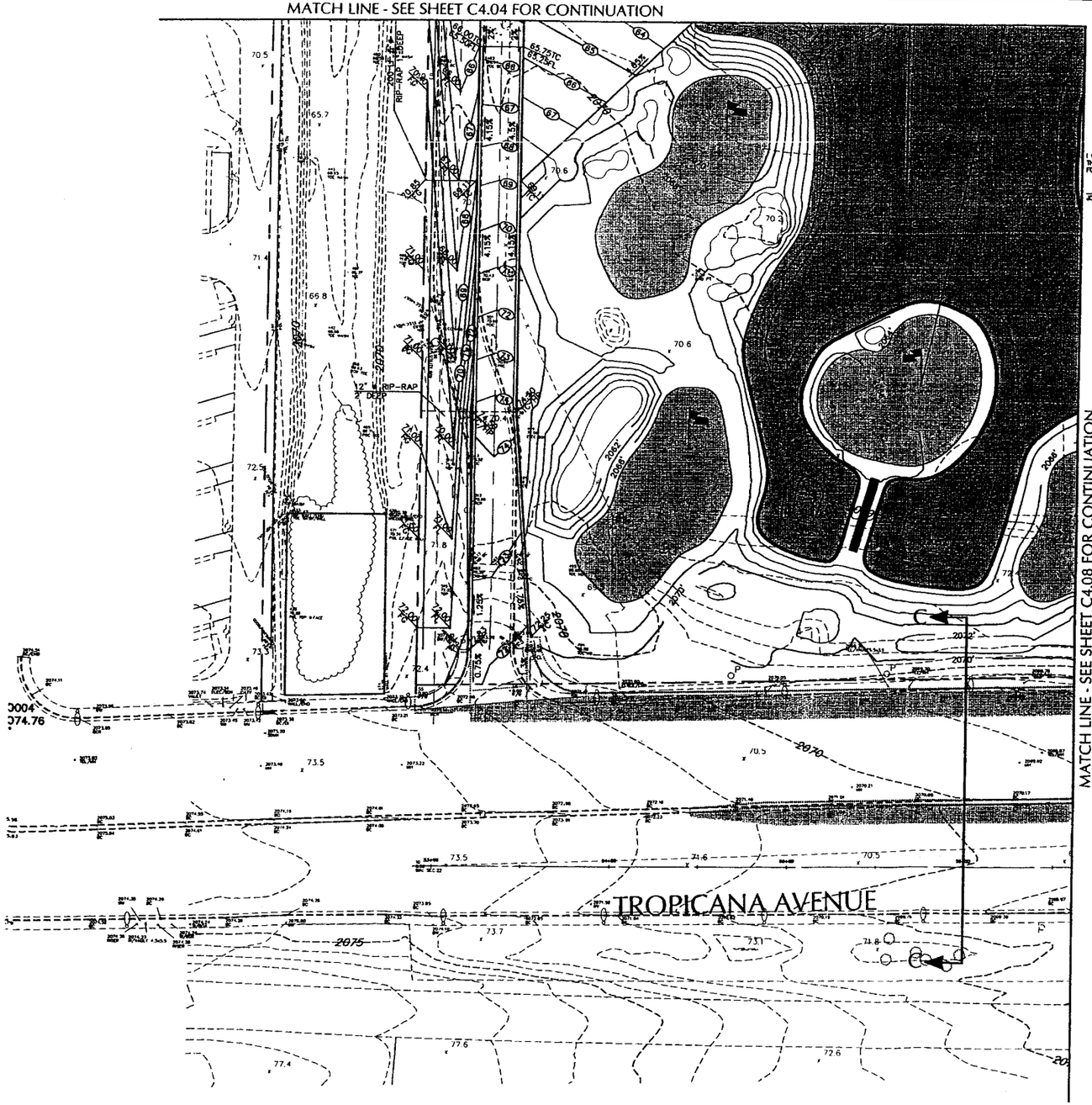
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date 01-24-03
job number 1903.05
design by J. WAKENHUT, P.E.
drawn by V. WANFORD
checked by J. DAVIS, P.E.

sheet number
C4.06
SHEET X OF X

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MATCH LINE - SEE SHEET C4.04 FOR CONTINUATION



MATCH LINE - SEE SHEET C4.08 FOR CONTINUATION

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PROJECT NO.: 99-135-1, DATED 12/04/02
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B-SAFE CONSULTANTS
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LAS VEGAS, NV XXXXX
PHONE NO. (702) XXX-XXXX
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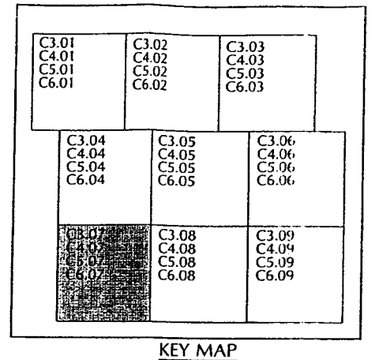
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ELEVATION 2058.93



KEY MAP

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			CENTERLINE				CHAIN LINK FENCE
-W-	-W-	-W-	WATER LINE				GRADE BREAK
-S-	-S-	-S-	SANITARY SEWER LINE				WIRE FENCE
-G-	-G-	-G-	GAS LINE			FF=0.00	FINISH FLOOR
-SD-	-SD-	-SD-	STORM DRAIN	(0.00)	(0.00)	0.00	CLEANOUT INVERT ELEVATION
-P-	-P-	-P-	POWER LINE / POWER POLE	C.O. INV.	C.O. INV.	C.O. INV.	
-T-	-T-	-T-	TELEPHONE LINE	(0.00)	(0.00)	0.00	FLOW LINE
			FIRE HYDRANT	(0.00)	(0.00)	0.00	FINISH GRADE
			WATER VALVE	F.C.	F.C.	F.C.	
			METERS / PULL BOXES	(0.00)	(0.00)	0.00	BACK OF SIDEWALK
			REDUCER	B.S.W.	B.S.W.	B.S.W.	
			MANHOLE	(0.00)	(0.00)	0.00	TOP OF CURB
			CLEANOUT	T.C.R.E.	T.C.R.E.	0.00	TOP OF WALL
			SEWER MANHOLE			T.O.W.	
			STORM MANHOLE				2" A.C. PAVING
			SIGN POLE				4" A.C. PAVING
			UTILITY POLE				
			DRAIN INLET				TYPE "L" CURB & GUTTER
			CONTOUR				TYPE "A" CURB
							CONCRETE

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100 W H.P.S.
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CIVIL ENGINEERS
2101 SOUTH JONES BLVD.
SUITE 120
LAS VEGAS, NEVADA 89146
PHONE (702) 248-8000
FAX (702) 248-8070
E-MAIL: MM@MARTINLV.COM

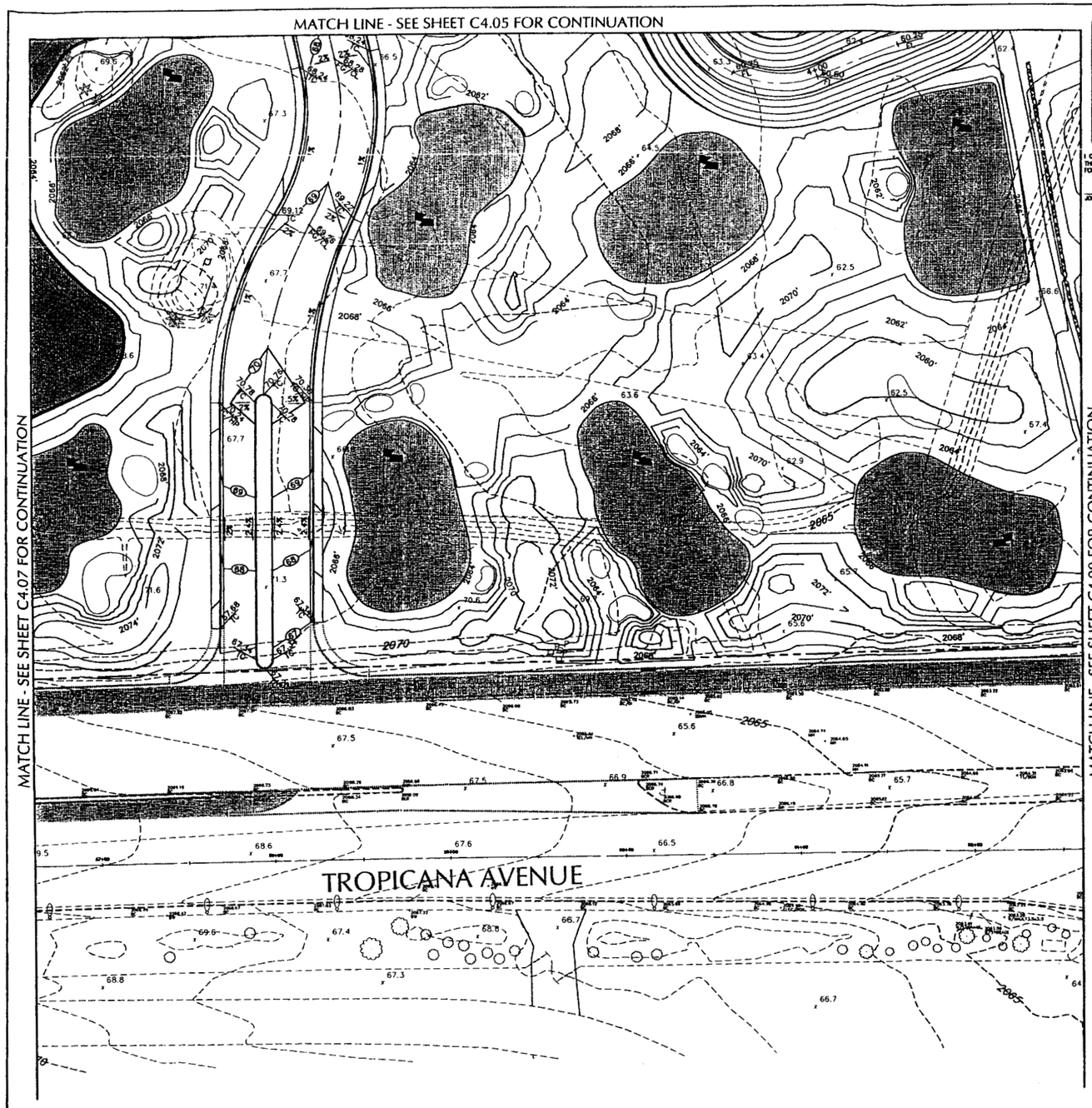
JOHN WAKENHUT Exp. 6-30-04 CIVIL No. 13720 STATE OF NEVADA
1-24-03

PREMIERE PARK
GOLF COURSE
GRADING PLAN

no	description of revisions	date	name

date 01-24-03
job number 1903.05
design by J. WAKENHUT, P.E.
drawn by V. WINFUNU
checked by J. DAVIS

sheet number
C4.07
SHEET X OF X



ALL GRADING WORK SHALL BE IN STRICT ACCORDANCE WITH THE SOILS REPORT FOR THE SITE ENTITLED "GEOTECHNICAL INVESTIGATION FOR THE GREENS OF LAS VEGAS"
PROJECT NO. 99-135-1

PROJECT NO.: 99-135-1, DATED 12/04/02
PREPARED BY:

B-SAFE CONSULTANTS
XXXXXXXXXX
LAS VEGAS, NV XXXXX
PHONE NO. (702) XXX-XXXX
FAX NO. (702) XXX-XXXX

ALL WORK SHALL BE PERFORMED UNDER THE DIRECTION OF A REGISTERED PROFESSIONAL SOILS ENGINEER.

I CERTIFY THAT THIS GRADING PLAN IS IN CONFORMANCE WITH THE APPROVED DRAINAGE STUDY ON FILE WITH THE CLARK COUNTY FOR THIS PROJECT

JOHN WAKENHUT, P.E. DATE

GRAPHIC SCALE

(IN FEET)
1 inch = 50 ft.

BASIS OF BEARING

N 89°38'15" E, BEING THE SOUTH LINE OF THE SOUTHWEST ONE QUARTER (SW1/4) OF SECTION 22, TOWNSHIP 21 SOUTH, RANGE 61 EAST, M.D.M., CLARK COUNTY, NEVADA AS SHOWN ON THAT CERTAIN RECORD OF SURVEY, FILE 87, PAGE 7, RECORDED JUNE 23, 1993 AS DOC. NO. 01360.

BENCHMARK

CLARK COUNTY DATUM BC11-22SSW6, A RIVET AND SQUARE PLATE IN TOP OF CURB, NORTHEAST CORNER OF TROPICANA AVENUE AND PARADISE ROAD.

ELEVATION 2058.93

C3.01 C4.01 C5.01 C6.01	C3.02 C4.02 C5.02 C6.02	C3.03 C4.03 C5.03 C6.03
C3.04 C4.04 C5.04 C6.04	C3.05 C4.05 C5.05 C6.05	C3.06 C4.06 C5.06 C6.06
C3.07 C4.07 C5.07 C6.07	C3.08 C4.08 C5.08 C6.08	C3.09 C4.09 C5.09 C6.0"

KEY MAP

CONSTRUCTION NOTES

No.	ITEM
1	CONSTRUCT "L" TYPE CURB AND GUTTER PER STD. DWG. NO. 216.
2	CONSTRUCT "A" TYPE CURB ONLY PER STD. DWG. 219.
3	CONSTRUCT SIDEWALK PER STD. DWG. NO. 234.
4	CONSTRUCT SIDEWALK RAMP PER STD. DWG. NO. 235, CASE L
5	CONSTRUCT 6" CROSS GUTTER PER STD. DWG. NO. 228.
6	CONSTRUCT 2" MIN. AC OVER 6" TYPE II AB (CAR).
7	CONSTRUCT 6" MIN. AC OVER 16" TYPE II AB (TRUCK)
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9	CONSTRUCT 6" MIN. AC OVER 13" TYPE II AB. –STREET NAME
10	CONSTRUCT SIDEWALK DRAIN PER STD.; DWG. NO. 238.
11	CONSTRUCT 4' CONCRETE CHANNEL PER DETAIL X ON SHEET XXXX.
12	CONSTRUCT COMMERCIAL DRIVEWAY PER C.C. AREA STD. DWG. NO. 222A, 225, & 228.
13	CONSTRUCT 3' VALLEY GUTTER PER DETAIL X OF SHEET XXX.
14	CONSTRUCT 4' VALLEY GUTTER PER DETAIL X OF SHEET XXX.

LEGEND

FUTURE	EXISTING	PROPOSED	
			RIGHT-OF-WAY
			CENTERLINE
W	W	W	WATER LINE
S	S	S	SANITARY SEWER LINE
G	G	G	GAS LINE
SD	SD	SD	STORM DRAIN
E	E	E	POWER LINE / POWER POLE
T	T	T	TELEPHONE LINE
			FIRE HYDRANT
			WATER VALVE
			MOTERS / PULL BOXES
			REDUCER
			MANHOLE
			CLEANOUT
			SEWER MANHOLE
			STORM MANHOLE
			SIGN POLE
			UTILITY POLE
			DRAIN INLET
			CONTOUR

STREET LIGHTS
100 W H.P.S.
150 W H.P.S.
200 W H.P.S.
250 W H.P.S.

FUTURE	EXISTING	PROPOSED	
			SCREEN / RETAINING WALL
			CHAIN LINK FENCE
			GRADE BREAK
			WIRE FENCE
		FF=0.00	FINISH FLOOR
		0.00	CLEANOUT (INVERT ELEVATION
		0.00	FLOW LINE
		0.00 F.G.	FINISH GRADE
		0.00 B.O.W.	BACK OF SIDEWALK
		0.00 T.O.C.	TOP OF CURB
		0.00 T.O.W.	TOP OF WALL
			3" A.C. PAVING
			4" A.C. PAVING
			TYPE "L" CURB & GUTTER
			TYPE "A" CURB
			CONCRETE

CLARK COUNTY
DEPARTMENT OF PUBLIC WORKS
ENGINEERING DIVISION

ACCEPTANCE OF PLANS FOR FILING

BY:

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PRELIMINARY

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PROFESSIONAL ENGINEER JOHN WAKENHUT Exp. 6-30-04 CIVIL No. 13720 STATE OF NEVADA
1-24-03

PREMIERE PARK
GOLF COURSE

GRADING PLAN

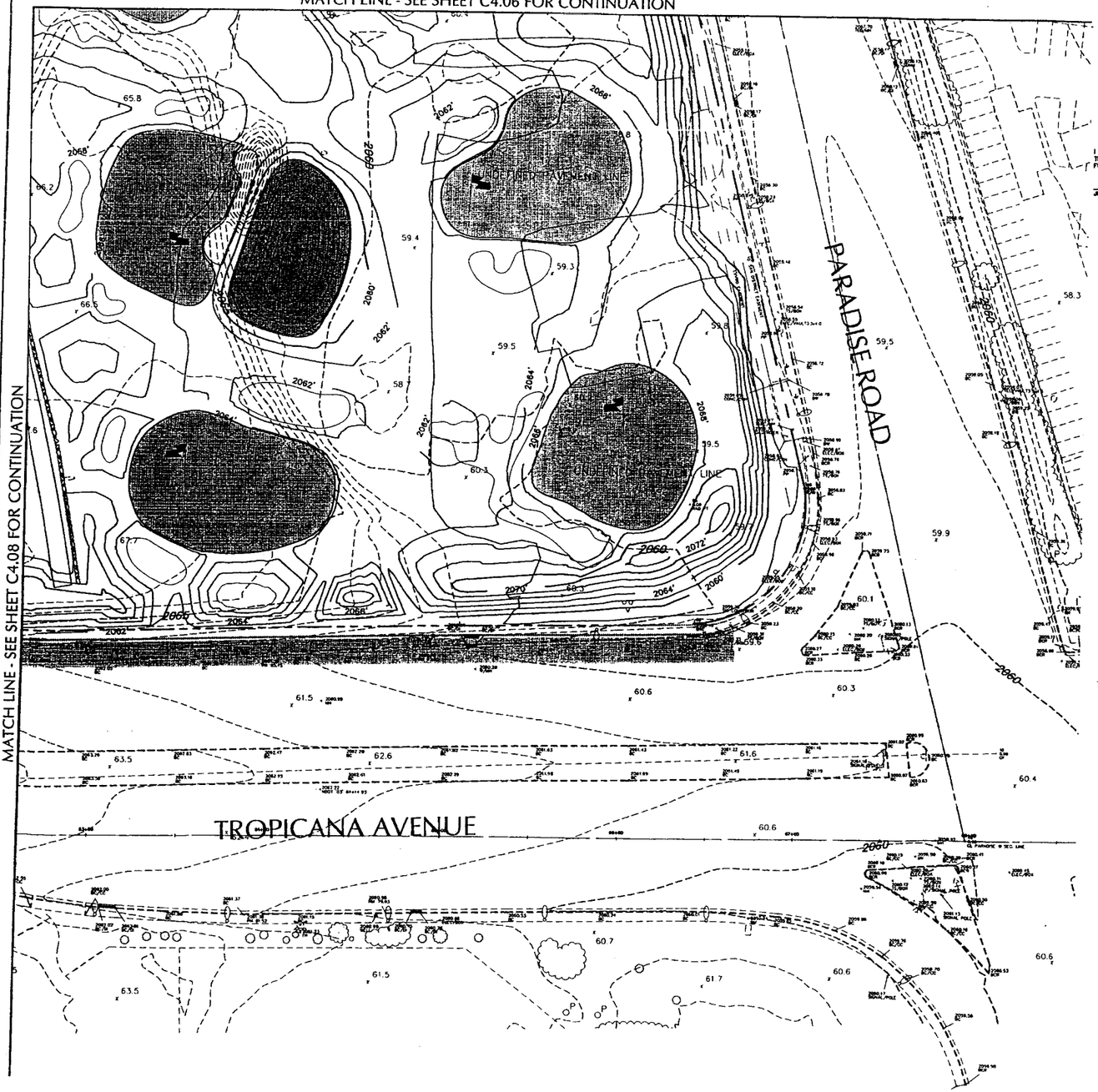
no	description of revisions	date	name

date 01-24-03
job number 1903.05
design by J. WAKENHUT, P.E.
drawn by V. WINFORD
checked by J. DAVIS, P.E.

sheet number
C4.08
SHEET X OF X

MATCH LINE - SEE SHEET C4.06 FOR CONTINUATION

MATCH LINE - SEE SHEET C4.08 FOR CONTINUATION



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PROJECT NO.: 99-135-1, DATED 12/04/02
PREPARED BY:
B-SAFE CONSULTANTS
XXXXXXXXXX
LAS VEGAS, NV XXXXX
PHONE NO. (702) XXX-XXXX
FAX NO. (702) XXX-XXXX

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JOHN WAKENHUT, P.E. DATE

GRAPHIC SCALE

(IN FEET)
1 inch = 30 ft.

BASIS OF BEARING

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ELEVATION 2058.93

KEY MAP

C3.01 C4.01 C5.01 C6.01	C3.02 C4.02 C5.02 C6.02	C3.03 C4.03 C5.03 C6.03
C3.04 C4.04 C5.04 C6.04	C3.05 C4.05 C5.05 C6.05	C3.06 C4.06 C5.06 C6.06
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LEGEND

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			RIGHT-OF-WAY			SCREEN / RETAINING WALL
			CENTERLINE			CHAIN LINK FENCE
W	W	W	WATER LINE			GRADE BREAK
S	S	S	SANITARY SEWER LINE			WIRE FENCE
G	G	G	GAS LINE			FF=0.00 FINISH FLOOR
SD	SD	SD	STORM DRAIN	(0.00)	(0.00)	0.00 C.O. INV. CLEANOUT INVERT ELEVATION
E	E	E	POWER LINE / POWER POLE	C.O. INV. (0.00)	C.O. INV. (0.00)	
T	T	T	TELEPHONE LINE			0.00 FLOW LINE
			FIRE HYDRANT	(0.00) F.C.	(0.00) F.C.	0.00 FINISH GRADE
			WATER VALVE			
			METERS / PULL BOXES	(0.00) B.S.W.	(0.00) B.S.W.	0.00 BACK OF SIDEWALK
			REDUCER	(0.00) T.C.	(0.00) T.C.	0.00 TOP OF CURB
			MANHOLE			
			CLEANOUT	(0.00) T.O.W.	(0.00) T.O.W.	0.00 TOP OF WALL
			SEWER MANHOLE			2" A.C. PAVING
			STORM MANHOLE			4" A.C. PAVING
			SIGN POLE			TYPE "L" CURB & GUTTER
			UTILITY POLE			TYPE "A" CURB
			DRAIN INLET			CONCRETE
			CONTOUR			

STREET LIGHTS

100 W H.P.S.
150 W H.P.S.
200 W H.P.S.
250 W H.P.S.

CLARK COUNTY
DEPARTMENT OF PUBLIC WORKS
ENGINEERING DIVISION

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(NEVADA ONE CALL)

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PHONE (702) 248-9000
FAX (702) 248-9070
E-MAIL: JOHN@MTNMTN.WEST.COM

JOHN WAKENHUT, Exp. 6-30-04, CIVIL, No. 13770, STATE OF NEVADA, PROFESSIONAL ENGINEER
12/03

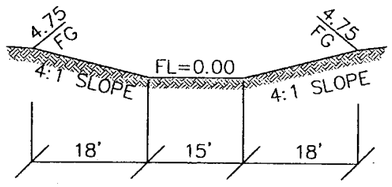
PREMIERE PARK GOLF COURSE

GRADING PLAN

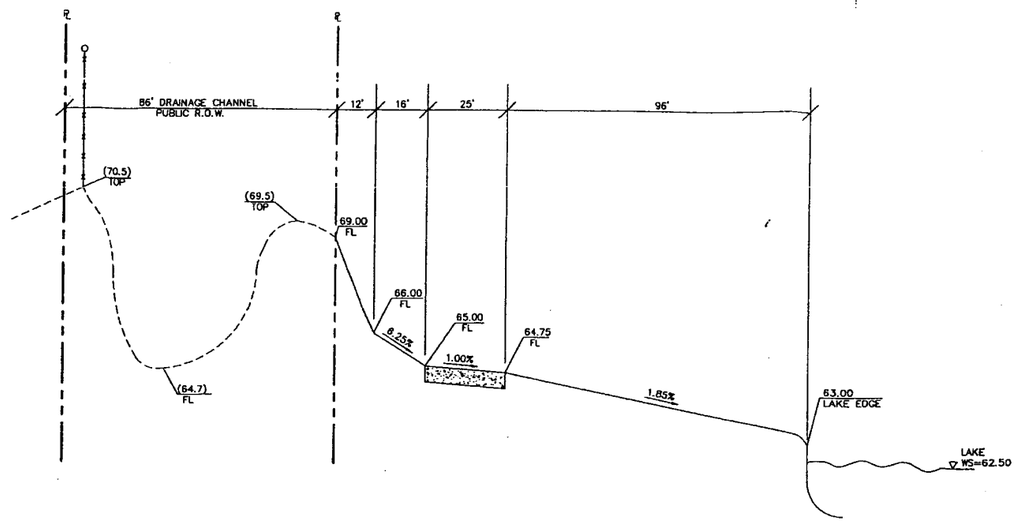
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job number 1903.05
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drawn by V. WINFORD
checked by J. DAVIS, P.E.

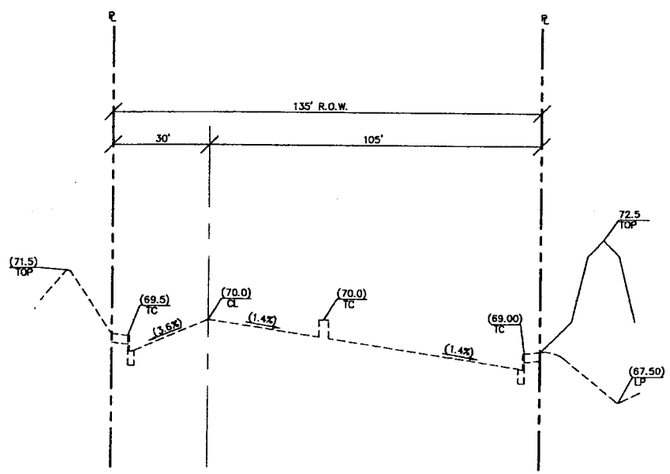
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SHEET X OF X



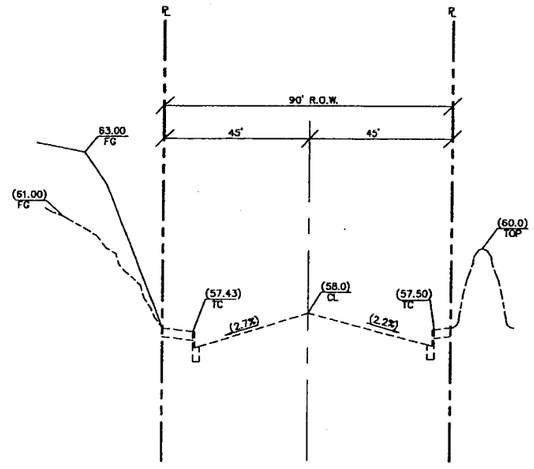
CHANNEL SECTION
SCALE HORIZONTAL 1"=10'
AA



WEST PROPERTY CROSS-SECTION
SCALE HORIZONTAL 1"=20'
VERTICAL 1"=2'
BB



TROPICANA AVENUE CROSS-SECTION
SCALE HORIZONTAL 1"=20'
VERTICAL 1"=2'
CC



PARADISE ROAD CROSS-SECTION
SCALE HORIZONTAL 1"=20'
VERTICAL 1"=2'
DD

PRELIMINARY

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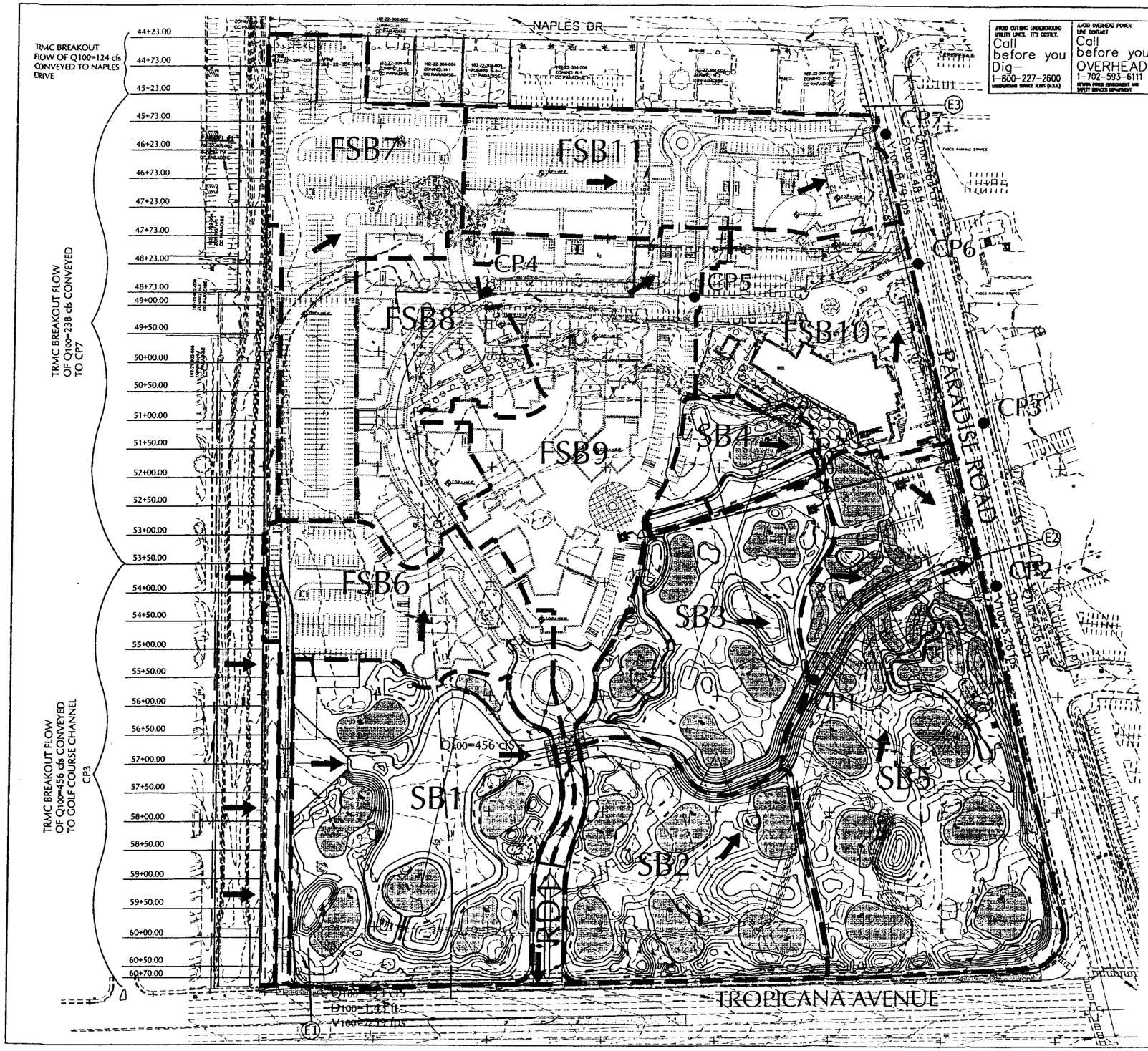
PREMIERE PARK
GOLF COURSE

DETAIL SHEET

no	description of revisions	date	name

date 01-24-03
job number 1903.05
design by J. WAKENHUT, P.E.
drawn by V. WINFORD
checked by J. DAWS, P.E.

sheet number
C8.01
SHEET 17 OF .7



AVOID CUTTING UNDERGROUND UTILITY LINES. IT'S COSTLY. Call before you Dig– 1-800-227-2600 UNDERGROUND SERVICE ALERT (USA)

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GRAPHIC SCALE

(IN FEET)
1 inch = 80 ft.

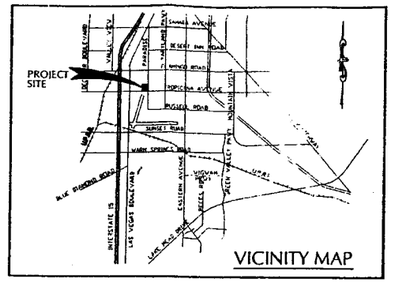
BASIS OF BEARING

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BENCHMARK

BENCHMARK – CLARK COUNTY 6C11–22SSW6, A RIVET AND SQUARE PLATE IN TOP OF CURB, NORTHEAST CORNER OF TROPICANA AVE. AND PARADISE RD.

ELEVATION 2058.93

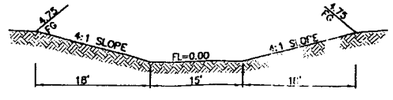


DRAINAGE LEGEND

Q10/100	PEAK 100 YEAR RUNOFF/PEAK 10 YEAR RUNOFF
	BASIN BOUNDARY
	FLOW DIRECTION
E1	LOCATION OF STREET FLOW CALCULATIONS
60+00	HEC-RAS CROSS SECTIONS

BASIN/ LOCATION	Q10	Q100
SB1	<1 cfs	2 cfs
SB2	<1 cfs	1 cfs
SB3	<1 cfs	1 cfs
SB4	<1 cfs	<1cfs
SB5	<1 cfs	2 cfs
RD1	<1 cfs	2 cfs
FSB6	4 cfs	8 cfs
FSB7	3 cfs	7 cfs
FSB8	6 cfs	13 cfs
FSB9	5 cfs	10 cfs
FB10	4 cfs	9 cfs
FB11	4 cfs	9 cfs

	Q10	Q100	Q100 (OFF-SITE)
CP1	<1 cfs	4 cfs	456
CP2	<1 cfs	6 cfs	456
CP3	<1 cfs	6 cfs	456
CP4	10 cfs	21 cfs	–
CP5	16 cfs	35 cfs	–
CP6	19 cfs	44 cfs	–
CP7	26 cfs	60 cfs	694



CHANNEL SECTION A-A

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PREMIERE PARK
DRAINAGE PLAN
FUTURE CONDITIONS

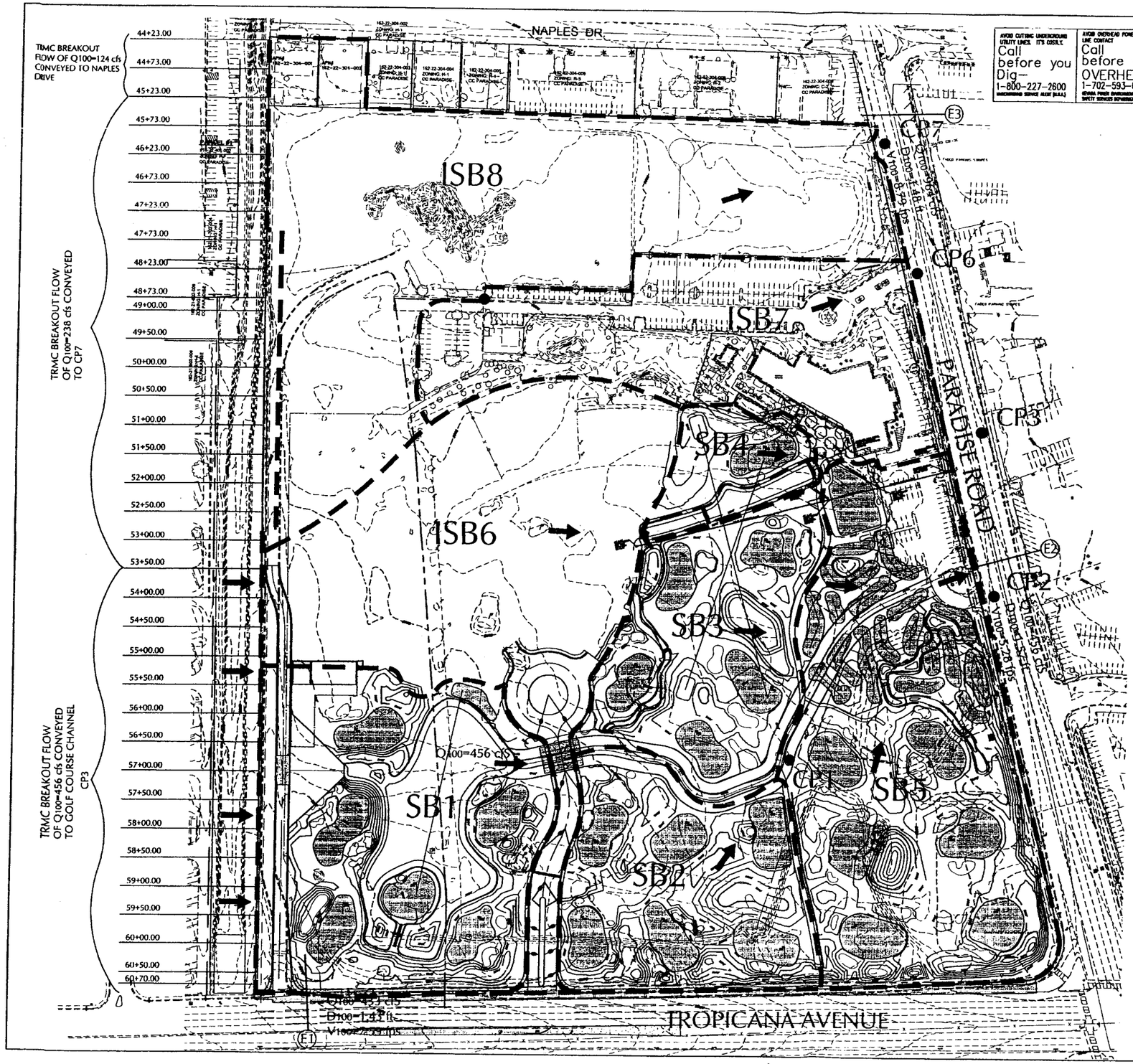
no	description of revisions	date	name

date 01-24-03
job number 1903.05.00
design by T. MYERS, P.E.
drawn by V. WINFORD
checked by T. MYERS, P.E.

sheet number

FIGURE 7

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GRAPHIC SCALE

(IN FEET)
1 inch = 80 ft.

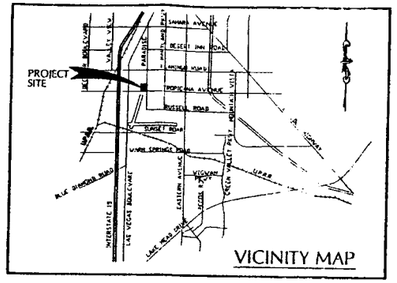
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ELEVATION 2058.93

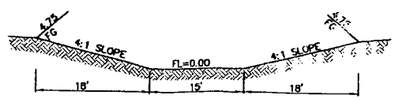


DRAINAGE LEGEND

$Q_{10/100}$	PEAK 100 YEAR RUNOFF/PEAK 10 YEAR RUNOFF
	BASIN BOUNDARY
	FLOW DIRECTION
(E1)	LOCATION OF STREET FLOW CALCULATIONS

BASIN/ LOCATION	Q_{10}	Q_{100}
SB1	<1 cfs	2 cfs
SB2	<1 cfs	1 cfs
SB3	<1 cfs	1 cfs
SB4	4 cfs	8 cfs
SB5	<1 cfs	2 cfs
ISB6	5 cfs	13 cfs
ISB7	6 cfs	14 cfs
ISB8	7 cfs	19 cfs
RD1	<1 cfs	1 cfs

CONCENTRATION POINT	Q_{10}	Q_{100}
CP1	<1 cfs	4 cfs
CP2	<1 cfs	6 cfs
CP3	5 cfs	19 cfs
CP6	11 cfs	31 cfs
CP7	18 cfs	50 cfs



TYPICAL CHANNEL SECTION

NOTE: CPX FLOWS REFLECT ON-SITE RUNOFF ONLY. REFER TO Q 100, D100, V100 FOR OFF-SITE FLOWS.

MARTIN & MARTIN ASSUMES NO RESPONSIBILITY FOR EXISTING UTILITY LOCATIONS AND ELEVATIONS. THE UTILITIES SHOWN ON THIS DRAWING HAVE BEEN PLOTTED FROM THE BEST AVAILABLE INFORMATION. IT IS, HOWEVER, THE CONTRACTOR'S RESPONSIBILITY TO FIELD VERIFY THE LOCATION AND ELEVATION OF ALL UTILITIES PRIOR TO THE COMMENCEMENT OF ANY CONSTRUCTION. CONTRACTOR TO FIELD VERIFY ALL EXISTING SITE CONDITIONS PRIOR TO CONSTRUCTION. IF A CONFLICT EXISTS BETWEEN WHAT IS SHOWN ON THESE DRAWINGS AND WHAT EXISTS IN THE FIELD, THE CONTRACTOR IS TO NOTIFY THE ARCHITECT OR ENGINEER IMMEDIATELY.

MARTIN & MARTIN
CIVIL ENGINEERS
2101 SOUTH JONES BLVD.
SUITE 120
LAS VEGAS, NEVADA 89146
PHONE (702) 248-8000
FAX (702) 248-8070
E-MAIL: MARTMARTRLV@AOL.COM

PREMIERE PARK
DRAINAGE PLAN
INTERIM CONDITIONS

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no	description of revisions	date	name

date 01-24-03
job number 1903.05.00
design by T. MYERS, P.E.
drawn by K. WINFORD
checked by T. MYERS, P.E.

sheet numbe

FIGURE 6