
**CONCEPTUAL MASTER DRAINAGE PLAN
FOR
SUMMERLIN VILLAGE 11/12**

62011.032

February 1996

Prepared for:

**The Howard Hughes Corporation
Summerlin Division
1645 Village Center Circle, Suite 200
Las Vegas, NV 89134**



G. C. WALLACE, PE/SE, PLS
JAMES A. DUDDLESTEN, PE
RONALD R. THOMAS
TERRILL B. ADAMS
MARIE RAINWATER
MICHAEL D. ROSS, PE
CHRISTOPHER W. ANDERSON, PE
CALVIN L. BLACK, PE, PLS
JACK H. MITCHELL, PE
SCOTT R. PLUMMER, PE
BENJAMIN C. SMITH, PE

MICHAEL J. CSIZMADIA, PE
C. RUSSELL DAVIS, PE/SE
JEFFREY J. FREIBERG, PE
DOUGLAS M. HANKEL
DONALD A. HASELHOFF, PE, CEM
BYRON E. JOHNSON, PLS
PAUL H. JUDD, PE, PLS
NOEL C. LAUGHLIN, PE
MARC A. LEMOINE, RA
GREGORY PATCH, PE
JOHN R. TOBIN, PE
HOWARD K. VANDER MEER, PE
EUGENE W. WRIGHT, PE

DOUGLAS F. AHLSTROM
DANA A. AMES, PE/SE
JIM B. BAKKEDAH, PE
DOUGLAS B. BLATCHFORD, PE
JOSEPH A. BODROG, PLS
DENNIS R. BROWN
PAUL BURN, PLS
JOE CANTU
RONALD D. CHAPMAN
RICHARD G. CLARKE
ROY A. DAVIS III, PE
HUBERTO DeLUNA, RA
THOMAS P. DYSON, PE
RANDALL K. GREMLICH, PE
SALLY HENSLEY
ROBERT J. HERMAN
DANNY E. HILL, PLS
DON E. HOLLOWAY, PE
BERT A. HUGHES, PE
DIANE C. HUNT, PE
WILLIAM E. HUNTER, PE
BRIAN L. JENSEN, PE
JERRY D. JOHNSTON
ROBERT D. KINGSTON, PE
KRISTOFER D. KORPI
DON LETEY, PE
MARVIN W. MAIZE
JACK MANDEL
LLOYD B. MATHESON
TIMOTHY A. MCCOY, PE
WILLIAM NEIGHBORS, PE
JOHNNIE R. PATE, JR., PE
ALLEN E. PAVELKA, PE
AL L. ROBINSON, PE
BRIAN L. SCHMIDT, PE
JOHN J. SHIELDS, PE
RICHARD STEUBING, PLS
RICHARD A. E. STRUTZ
SAUNDRA L. VANCE, CCS
G. IRA WALLACE, PE
SCOTT H. WEILER, PE
ROBERT WOODSON, PE

62011.032H

February 23, 1996

Clark County Regional Flood Control District
301 East Clark Avenue, Suite 301
Las Vegas, Nevada 89101

Attention: Kevin L. Eubanks, P.E.
Flood Control

Subject: Conceptual Master Drainage Plan for
Summerlin Village 11/12

Gentlemen:

Please accept one (1) copy of the enclosed Conceptual Master Drainage Plan
for Summerlin Village 11/12 for your review.

If you have any questions, or if I can be of further assistance, please do not
hesitate to contact me.

Very truly yours,

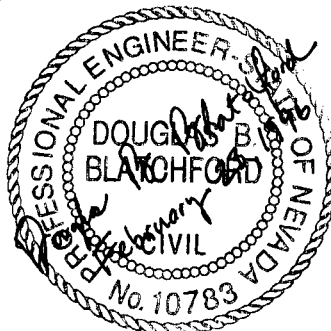
G. C. WALLACE, INC.

Douglas B. Blatchford

Douglas B. Blatchford, P.E.

DBB

Encl.



CITY OF LAS VEGAS		DATE:
INTER-OFFICE MEMORANDUM		February 21, 1996
TO: Barry Thompson, EI Land Development Services Department of Public Works		FROM: Dennis W. Stransky, P.E. Flood Control Project Manager Department of Public Works
SUBJECT: Summerlin Villages 11 and 12 Conceptual Master Drainage Plan		COPIES TO:
FILE NO.	DS1759A.ZNA	G. C. Wallace Howard Hughes Corporation John McNellis, P.E. Robert Thompson, P.E., CCPW

HISTORY	DATE RECEIVED	DATE REVIEWED	COMMENTS	REVIEW FEES
1 st Submittal	02/01/96	02/21/96	See Below	\$250
TOTAL FEES:				\$250

REMARKS:

The Drainage Study for the subject project has been reviewed and:

	is acceptable in concept subject to conformance to all City standards and the following conditions:
	must be resubmitted or supplemented including the following:
	must have Clark County Regional Flood Control concurrence

1. The drainage study is acceptable in concept, however, the City will not formally accept the drainage study until the Clark County Regional Flood Control District (CCRFCDD) has issued a letter of concurrence. The Engineer should call the CCRFCDD to confirm that they have begun their review. The Engineer is to provide addresses for each lot in a FEMA Flood Hazard Zone prior to obtaining a grading permit. This information is necessary to insure that the elevation certificates are provided for each address prior to completion of construction.
2. Detention Basin #5 must be constructed prior to development of Village 11 and 12. The analysis in the conceptual study shows Detention Basin #5 constructed as part of the interim condition.
3. Figure 6 (Composite Drainage Map) indicates that 795 cfs and 1325 cfs flow across Hualpai Way from Basins 13A and 13B respectively. These flows exceed the design capacity of the channels within Peccole Ranch. These flows appear to adversely impact Peccole Ranch and should be reduced.

4. A technical drainage study is required for each development within Villages 11 and 12. Design drawings for all proposed drainage facilities must be provided. All storm drains must include HGL and EGL and all drop inlets must be designed with a 50% clogging factor.
5. HEC-2 analysis showing the velocities of the flows within the channels must be addressed in a separate design documents. Erosion protection must be provided accordingly. The analysis must also address nuisance flow.
6. Public drainage easements with private maintenance is required for all channels. An implementation schedule for all facilities must be provided to CLV Flood Control.
7. It is our understanding that all facilities including channels will be built by Summerlin. If this is not the case please clarify.

NOTE: This site is located in a FEMA Zone A. Clark County Regional Flood Control District (CCRFCDD) review and approval is required prior to recordation of final map or issuance of building/grading permits. The Engineer must send a copy of the report to the CCRFCDD for review. FEMA Elevation Certificates, showing as-built finish floor elevations, must be completed for each building in the FEMA A Zone. The certificate must be submitted to the City of Las Vegas Flood Control Section prior to scheduling a framing inspection. The City recommends that the developer apply for a LOMR (using the drainage study, once approved, as technical support) to remove the site or individual structures from the Zone A.

Any future changes to the proposed design (or design assumptions) as outlined in the approved drainage study and attached preliminary grading plan which affect drainage must be addressed in a Drainage Study Amendment and accepted by the City of Las Vegas Flood Control Section. Additionally, conditional acceptance of a drainage study is valid for a period of one (1) year. If the proposed construction has not been completed in that time period, the City of Las Vegas reserves the right to require additional conditions and/or submission and acceptance of a complete drainage study update prior to further construction.

PLANS SENT TO LAND DEVELOPMENT NO (initial)

END OF REMARKS
dbm

T/R/S 20/58/26
AREA K-28

**CONCEPTUAL MASTER DRAINAGE PLAN
FOR
SUMMERLIN VILLAGE 11/12**

62011.032

February 1996

Prepared for:

**The Howard Hughes Corporation
Summerlin Division
1645 Village Center Circle, Suite 200
Las Vegas, NV 89134**

HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL

DRAINAGE STUDY INFORMATION FORM

Name of Development: Conceptual Master Drainage Plan for Summerlin Villages 11/12 Date: January 1996

Location of Development: a) Descriptive N. of Charleston Blvd. & E. of Town Wide Arterial Alignment

b) Sect. 23-26, Twn. 20S Rng. 59E /Sect. 31 Twn. 20S Rng. 60E
35-36

Name of Owner: The Howard Hughes Corporation Assessors Parcel No: 137-36-101-001

Contact Person-Name: Douglas B. Blatchford, P.E. Telephone No: 363-1200

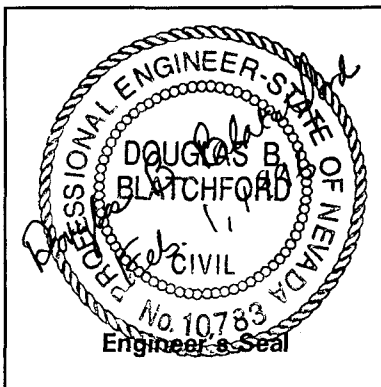
Firm: G. C. Wallace, Inc.

Address: 1555 South Rainbow Boulevard, Las Vegas, NV 89102

Type of Land Development/Land Disturbance Process:

- | | | |
|---|---|--|
| ☐ Rezoning | ☐ Subdivision Map | ☐ Clearing and Grading Only |
| ☐ Parcel Map | ☐ Planned Unit Development | ☒ Other (Please specify below) |
| ☐ Large Parcel Map | ☐ Building Permit | <u>Master Plan</u> |

- Total Owned Land Area: At Site: 1,400 Ac. Being Developed/Disturbed: 1,400 Ac.
- Is a portion or all of the subject property located in a designated FEMA Flood Hazard Area? YES* NO
- Is the property bordered or crossed by an existing or proposed Clark County Regional Flood Control District Master Planned Facility? YES* NO
- Proposed type of development (Residential, Commercial, Etc.)? Multiple Use
- Approximate upstream land area which drains to the subject site? 2,284 Ac.
- Has the site drainage been evaluated in the past? YES NO If yes, please identify documentation: Summerlin TWA Interim Diversion Channel, Phase 2B, GCW; Town Center Dr. Rough Grading & 3090 Inlet/Outlet Rough Grading, GCW; Conceptual Master Drainage Plan for Summerlin Vil. 8, GCW; Town Center Dr., Phase 2 Rough Grading Sta. 417+00 - 4510+00, Alta to Charleston, GCW; 3705 Zone Water Line Rough Grading; Summerlin Village 12 Fill, GCW.
- If known, please briefly identify the proposed discharge point(s) of runoff from the site: Anasazi Drive and Town Center Drive
- Briefly describe your proposed schedule for the subject project: Construction to begin ASAP



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.

Revision	Date

Local Entity File No. _____

REFERENCE:

STANDARD FORM 1

TABLE OF CONTENTS

	<u>Page</u>
I. INTRODUCTION	1
II. LOCATION AND DESCRIPTION	1
A. Existing and Proposed Facilities	2
III. FEMA FLOODPLAIN STATUS	3
IV. CCRFCD FACILITIES	3
V. HYDROLOGY	4
A. Offsite Hydrology	4
B. Onsite Hydrology (Proposed)	8
VI. HYDRAULICS	15
VII. CONCLUSIONS AND RECOMMENDATIONS	19
VIII. REFERENCES	21

LIST OF TABLES

<u>No.</u>	<u>Description</u>	<u>Page</u>
1	Comparison of 100-Year Discharge at Node 12A, North of Charleston Boulevard	7
2	Storm Flow Summary - Village 11/12	11-13
3	Summary of Street and Pipe Flows - Village 11/12 . .	16-18

LIST OF FIGURES

1	Vicinity Map
2	Location Map
3	FEMA Flood Insurance Rate Maps
4	CCRFCD Facilities
5	Soils Map
6	Proposed Offsite Conditions
7	Proposed Village 11/12 (North of Alta)
8	Proposed Village 12/12 (South of Alta)
9	Charleston Boulevard Drainage

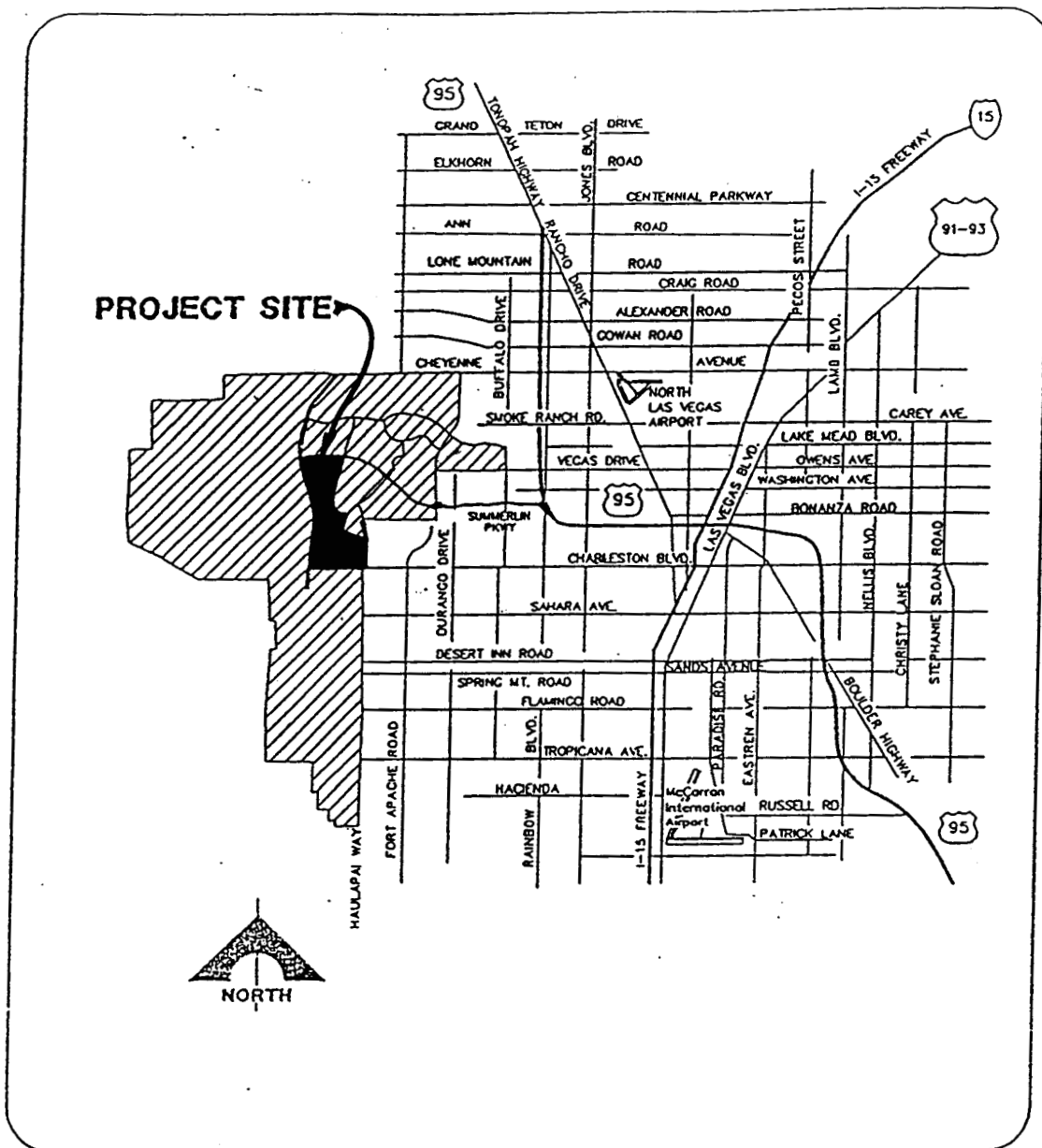
I. INTRODUCTION

The Howard Hughes Corporation is proposing development of the 1,400 (gross) acres within Summerlin in the City of Las Vegas known as Village 11/12. Village 11/12 consists of 61 parcels that will be developed individually. The purpose of this report is to establish a storm drainage network for the village, therefore, setting pipe sizes and general alignments. This study establishes only the village backbone drainage located in collector streets. Technical drainage studies will be required for respective parcels as development occurs. This study is consistent with the currently accepted criteria in the Clark County Regional Flood Control District (CCRFCD) *Hydrologic Criteria and Drainage Design Manual* (Reference 1). The following tasks were performed in the preparation of this report:

- Backbone/collector drainage pipe network established
- Identify FEMA floodplain designation
- Identify existing and proposed CCRFCD drainage facilities that are impacted
- Estimate storm flow runoff for the 10-year and 100-year storms
- Recommend drainage facilities according to local standards

II. LOCATION AND DESCRIPTION

Summerlin Village 11/12 is located in Clark County, Nevada, Section 23-26, and 35-36, T20S, R59E, MDB&M and Section 31, T20S, R60E, MDB&M in the northwestern part of the Las Vegas Valley (see Figures 1 and 2). The existing ground slopes between 2.2 and 4.5 percent from west to east. The drainage includes several large washes described as future CCRFCD facilities.



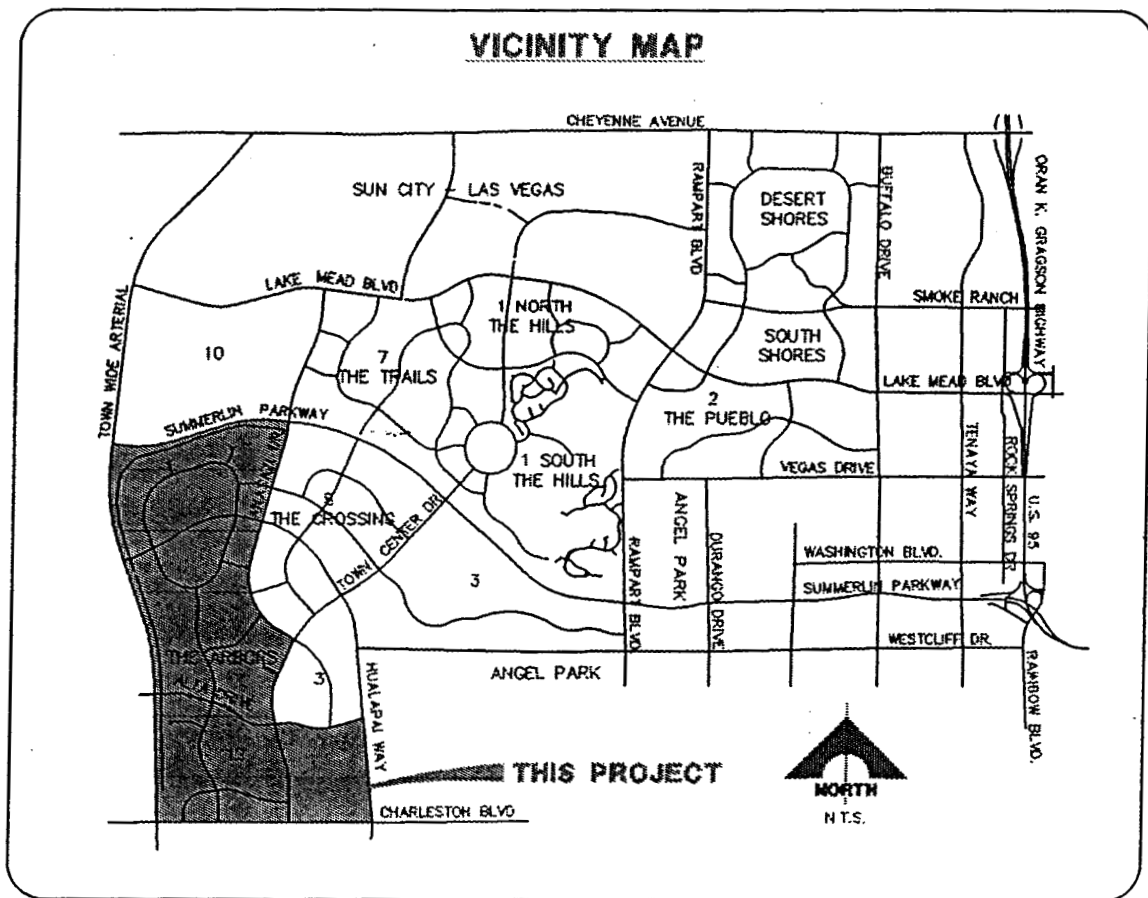
SUMMERLIN VLLAGE 11/12

FIGURE 1 VICINITY MAP



G.C. WALLACE, INC.
Engineering/Architecture

1555 SOUTH RAINBOW BLVD., LAS VEGAS, NEVADA 89102



**SUMMERLIN
VILLAGE 11/12**

**FIGURE 2
LOCATION MAP**

A. Existing and Proposed Facilities

Although most of the area is undeveloped, some drainage facilities are either existing or proposed at the following locations, as shown on Figures 7 and 8.

1. Town Center Drive, Charleston Boulevard to Alta Drive, Station 421 + 10.28 to Station 450 + 80.00-proposed.
2. Town Center Drive, Alta Drive to Anasazi Drive, Station 450 + 80.00 to Station 479 + 45.41-proposed.
3. Town Center Drive, Station 457 + 50.00, 12-foot by 8-foot triple box precast concrete culvert-proposed.
4. Alta Drive Channel, 5.5-foot to 9-foot high by 20-foot wide bottom concrete-lined trapezoidal channel with 2:1 side slopes-proposed.
5. Town Center Drive, Station 432 + 50.00, 8-foot by 8-foot double-box precast concrete culvert-existing.
6. Town Center Drive/Anasazi Drive intersection, storm drain network-existing (see Appendix).
7. Anasazi Drive, Banburry Cross Drive to Summerlin Parkway, concrete-lined channel, 4.7 feet high by 10 feet wide bottom-existing.
8. Summerlin Phase 2B Interim Diversion Channel, existing.
9. Detention Basin No. 5.

III. FEMA FLOODPLAIN STATUS

The Special Flood Hazard Areas for the unincorporated areas of Clark County, Nevada are outlined in the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRMs), dated August 16, 1995 (see Figure 3). After review of FIRM Community Panels 32003C 2145D and 32003C 2150D, the project site was determined to be located outside a FEMA designated Special Flood Hazard Area (Zone A). A small part adjacent APSO 0051-P1 may be located within a Special Flood Hazard Area (Zone A). This will require a Letter of Map Revision (LOMR) to be filed with FEMA. A HEC-2 analysis will be required to analyze the 100-year floodplain.

IV. CCRFCD FACILITIES

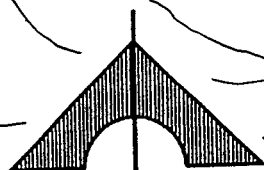
A copy of Figure F-9 and Figure F-13 from the *1991 Flood Control Master Plan Update* (Reference 2) is included as Figure 4. Proposed flood control facilities impacted by the development of Village 11/12 (north of Alta Drive) include:

- A. APNO 0248-P1--Floodway with 3-foot banks, 2,540 cfs
- B. APNO 0358-P1--Floodway with 3-foot banks, 1,840 cfs
- C. APNO 0420-P1--Floodway with 3-foot banks, 1,140 cfs
- D. APMD 0347-P1--Floodway with 3-foot banks, 1,030 cfs
- E. APMD 0205-P1--Floodway with 3-foot banks, 1,840 cfs
- F. APMD 0000-P1--Floodway with 3-foot banks, 2,010 cfs

Proposed flood control facilities impacted by the development of Village 11/12 (south of Alta Drive) include:

- A. APSO 0051-P1--Floodway with 3-foot banks, ,1380 cfs
- B. APSO 0284-P1--Floodway with 3-foot banks, 1,120 cfs

CLARK COUNTY
UNINCORPORATED AREAS
320003



NORTH
SCALE: 1" = 2000'



ZONE X

CORPORATE LIMITS

CITY OF LAS VEGAS
325276

30

PROJECT SITE

VILLAGE 11/12

31

ZONE A

RED ROCK
DETENTION BASIN

WEST

CHARLESTON

BLVD

159

120S

121S

RM

ZONE X

GAS

NATIONAL FLOOD INSURANCE PROGRAM

FIRM

FLOOD INSURANCE RATE MAP

CLARK COUNTY,
NEVADA AND
UNINCORPORATED AREAS

PANEL 2150 OF 4090
(SEE MAP INDEX FOR PANELS NOT PRINTED)

CLARK COUNTY
UNINCORPORATED AREAS
AND LOCAL GOV'T

MAP NUMBER
32003C2150 B

EFFECTIVE DATE:
AUGUST 16, 1995



Federal Emergency Management Agency

MASONRY
DAM
pillway

**SUMMERLIN
VILLAGE 11/12**

**FIGURE 3
F.I.R.M.**



G.C. WALLACE, INC.
Engineering/Architecture

1555 SOUTH RAINBOW BLVD., LAS VEGAS, NEVADA 89102

1991 FLOOD
CONTROL MASTER
PLAN UPDATE
LAS VEGAS VALLEY

LEGEND

STREAM NAME DESIGNATOR AABB
PARENT STREAM NAME
STREAM NAME

ID / RIVER MILE 0000
DISTANCE ABOVE
CONFLUENCE WITH
PARENT STREAM:
MILES
TENTHS OF A MILE

EXISTING FACILITY E
PROPOSED OR MODIFIED FACILITY P
CONTINGENCY LEVEL:
MASTER PLAN PI
FACILITY PLAN P2
PRELIMINARY DESIGN P3
DESIGN P4

BOTTOM WIDTH W

DEPTH D

SIDE SLOPE, H:V SS

CORRUGATED METAL PIPE CMPC
CULVERT

CORRUGATED METAL ARCH CMAPC
PIPE CULVERT

REINFORCED CONCRETE BOX RCB

RCB CULVERT RCBC

REINFORCED CONCRETE PIPE RCP

RCP CULVERT RCPC

REINFORCED CONCRETE RCACP
ARCH PIPE CULVERT

GENERAL COMMENT GI

FACILITY SPECIFIC COMMENT SI

NOTES:
(1) *E* FACILITIES NOT FOLLOWED BY
P FACILITIES ARE ADEQUATE AS IS.
(2) FLOW = NON-DAMAGING Q FOR
EXISTING FACILITY
FLOW = DESIGN Q WITH FREEBOARD
FOR PROPOSED FACILITY

FLOOD CONTROL FACILITIES
INVENTORY

FIGURE F-9

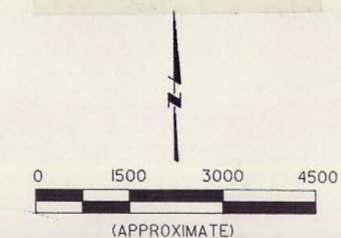
ID / River Mile	E / P	Facility Description	Facility Length (ft)	Flow (cfs)
APMD 0000	P1	ANGEL PARK - MIDDLE BRANCH Floodway - 3' banks	10,800	2,010
0205	P1	Floodway - 3' banks	7,500	1,840
0347	P1	Floodway - 3' banks	3,300	1,030
0409	P1	Floodway - 3' banks	8,000	480
0561	P1	165 ac-ft Detention Basin #4		2,600 / 440
0561	P1	26,000 cfs PMF Spillway		26,000
0561	P1	60" Outlet Pipe	200	440
APNN 0000	P1	ANGEL PARK NORTH - NORTH CHANNEL Rip Rap Chnl 7'D 10"W 2:1 SS	3,500	1,040
0057	P1	Gabion Chnl 5.5'D 8"W 2:1 SS	2,700	680
APNO 0000	E	ANGEL PARK NORTH Angel Park Detention Basin		
0000	P1	Minimal additional excavation		
0000	E	12' X 14' X 380' RCB Culvert		1,560
0000	E	42" RCP Emergency Outlet	200	
0000	E	33" RCP Emergency Outlet	189	
0000	E	33" RCP Emergency Outlet	185	
0001	P1	Floodway - 3' banks	3,600	4,370
0068	P1	Floodway - 3' banks	4,300	3,400
0150	P1	Floodway - 3' banks	5,200	2,750
0248	P1	Floodway - 3' banks	5,800	2,540
0358	P1	Floodway - 3' banks	3,300	1,840
0420	P1	Floodway - 3' banks	3,000	1,150
0477	P1	Floodway - 3' banks	3,200	790
0538	P1	Floodway - 3' banks	7,700	510
0684	P1	300 ac-ft Detention Basin #3		2,780 / 410
0684	P1	28,000 cfs PMF Spillway		28,000
0684	P1	48" Outlet Pipe	200	410
0690	E	Natural Wash		
0812	P1	175 ac-ft Detention Basin #2		2,770 / 520
0812	P1	28,000 cfs PMF Spillway		28,000
0812	P1	60" Outlet Pipe	200	520
APOF 0124	E	ANGEL PARK OUTFALL 54" RCP	1,202	167
0146	E	Earth Chnl 0'W 1'D 10:1SS	277	25
0147	E	Earth Chnl 0'W 1'D 10:1SS	217	24
APSO 0557	P1	ANGEL PARK - SOUTH BRANCH 160 ac-ft Detention Basin #5		1,890 / 590
0557	P1	19,000 cfs PMF Spillway		19,000
0557	P1	60" Outlet Pipe	200	590
G002 0085	E	GOWAN SOUTH FACILITIES (CHEYENNE CHANNEL) Conc. Chnl 25'W 7'D 2:1SS	1,373	9,832
0111	E	Free Span Bridge 25'W 6'D	53	9,660
0112	E	S/B Existing Channel; 7'D 25'W 2:1		
GOLM 0000	P3	GOWAN LONE MOUNTAIN SYSTEM 48" RCP	7,650	210
0145	P3	730 ac-ft Lone Mtn Detention Basin		3,870 / 210
0145	P3	20,000 cfs PMF Spillway		20,000
0145	P3	42" Outlet Pipe	200	210
0166	P3	Conc Chnl 8.5'D 10'W 2:1 SS	6,100	3,870
0166	P3	Sloping Chnl Drop, 128' drop	1,307	3,870
0282	P3	5' Rock Levee	3,500	-
GONO 0046	P3	GOWAN NORTH SYSTEM Conc Chnl 8'D 15'W 2:1 SS	8,200	1,970
0202	P3	2: 12' X 10' RCBC @ Alexander	100	1,730
0204	P3	Conc Chnl 6'D 15'W 2:1 SS	5,600	1,730
GOSM 0000	P1	SUMMERLIN AREA TRIBUTARY TO GOWAN AREA Conc Chnl 6.5'D 10'W 2:1 SS; w/125' in drop structures	7,200	2,300
0000	P1	Sloping Chnl Drop, 125' drop	1,276	2,300
0136	P1	Floodway - 3' banks	5,000	2,250
0231	P1	Floodway - 3' banks	9,000	1,550
LOCH 0582	E	LAS VEGAS CREEK CHANNEL 24" RCP	6,494	30

1991 FLOOD CONTROL MASTER PLAN UPDATE LAS VEGAS VALLEY

LEGEND

- EXISTING MASTER PLAN FACILITIES
- LOCAL OR UNSTUDIED FACILITIES
- PROPOSED MASTER PLAN FACILITIES
- BRIDGE
- CULVERT
- DEBRIS BASIN
- DETENTION BASIN
- DIKE / LEVEE
- PIPELINE
- NATURAL WASH
- FLOODWAY
- UNLINED IMPROVED CHANNEL
- LINED CHANNEL
- DROP STRUCTURE
- SECONDARY FACILITY
- ENVIRONMENTAL AREAS

**FIGURE 4
VILLAGE 11/12**



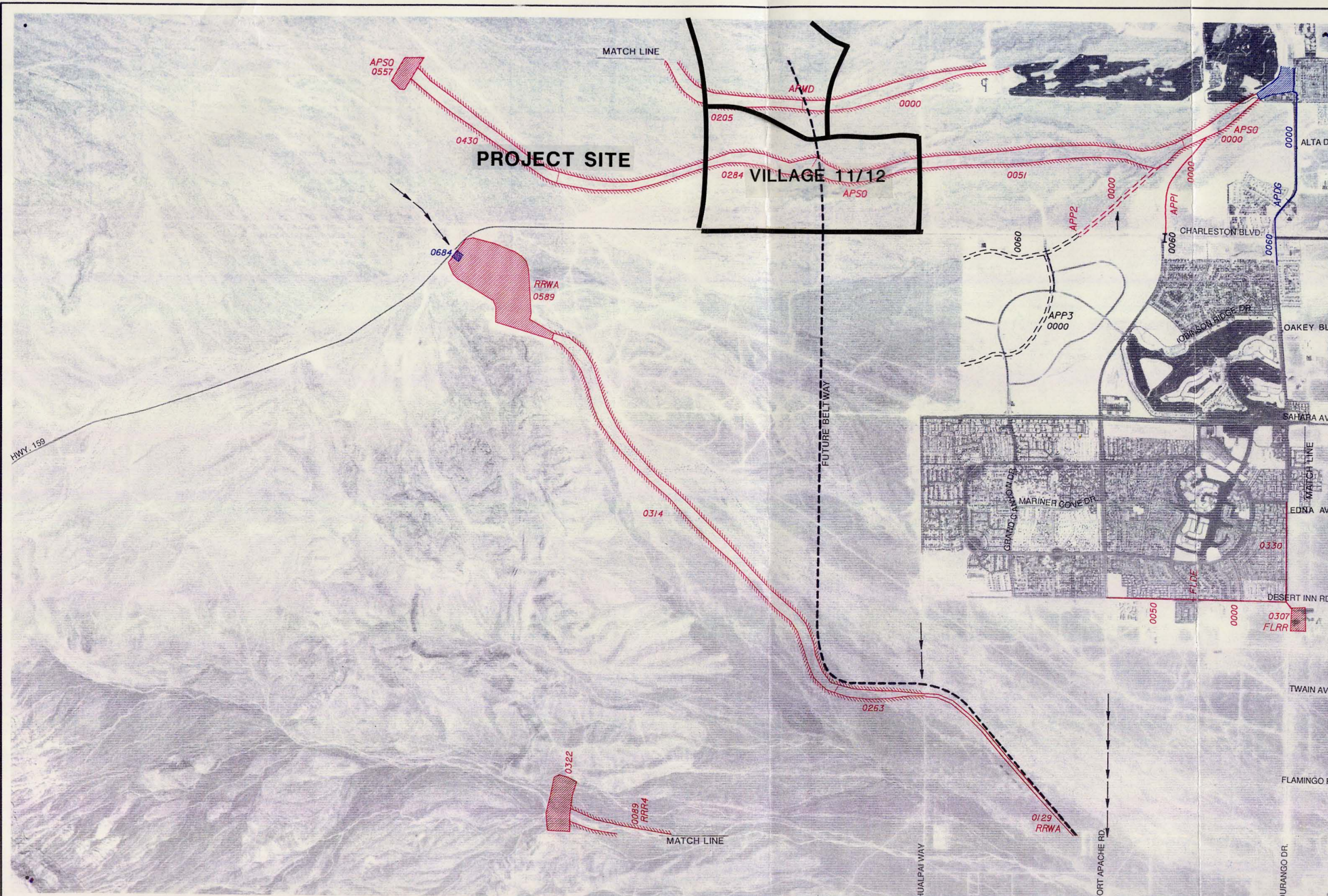
FLOOD CONTROL FACILITIES
AND ENVIRONMENTAL AREAS

FIGURE F-13

JMM James M. Montgomery
Consulting Engineers, Inc.



Las Vegas, Nevada



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		

1991 FLOOD CONTROL MASTER PLAN UPDATE LAS VEGAS VALLEY

LEGEND

STREAM NAME DESIGNATOR AABB
PARENT STREAM NAME
STREAM NAME

ID / RIVER MILE 0000
DISTANCE ABOVE
CONFLUENCE WITH
PARENT STREAM:
MILES
TENTHS OF A MILE

EXISTING FACILITY E

PROPOSED OR MODIFIED
FACILITY P

CONTINGENCY LEVEL:
MASTER PLAN P1
FACILITY PLAN P2
PRELIMINARY DESIGN P3
DESIGN P4

BOTTOM WIDTH W

DEPTH D

SIDE SLOPE, H:V SS

CORRUGATED METAL PIPE
CULVERT CMPC

CORRUGATED METAL ARCH
PIPE CULVERT CMAPC

REINFORCED CONCRETE BOX RCB

RCB CULVERT RCBC

REINFORCED CONCRETE PIPE RCP

RCP CULVERT RCPC

REINFORCED CONCRETE
ARCH PIPE CULVERT RCACP

GENERAL COMMENT GI

FACILITY SPECIFIC COMMENT SI

NOTES:

(1) "E" FACILITIES NOT FOLLOWED BY
"P" FACILITIES ARE ADEQUATE AS IS.

(2) FLOW = NON-DAMAGING Q FOR
EXISTING FACILITY
FLOW = DESIGN Q WITH FREEBOARD
FOR PROPOSED FACILITY

FLOOD CONTROL FACILITIES INVENTORY

FIGURE F-13

ID / River Mile	E / P	Facility Description	Facility Length (ft)	Flow (cfs)
APDG 0000 0060	E E	ANGEL PARK - DURANGO 84" RCP 72" RCP	3,115 1,901	463 359
APMD 0000 0205	P1 P1	ANGEL PARK - MIDDLE BRANCH Floodway - 3' banks Floodway - 3' banks	10,800 7,500	2,010 1,840
APP1 0000 0060	P1 E	ANGEL PARK - PECCOLE 1 2- 60" RCP 2- 60" RCP	3,150 80	460
APP2 0000 0060	P1 E	ANGEL PARK - PECCOLE 2 Grass Chnl - unknown dimensions Grass Chnl - unknown dimensions	3,150 3,750	
APP3 0000	E	ANGEL PARK - PECCOLE 3 Grass Chnl - unknown dimensions	5,100	
APSO 0000 0051 0284 0430 0557 0557 0557	P1 P1 P1 P1 P1 P1 P1	ANGEL PARK - SOUTH BRANCH Floodway - 3' banks Floodway - 3' banks Floodway - 3' banks Floodway - 3' banks 160 ac-ft Detention Basin #5 19,000 cfs PMF Spillway 60" Outlet Pipe	2,700 12,300 7,700 6,700 1,890 / 590 19,000 200	2,370 1,380 1,120 730 1,890 / 590 19,000 590
FLDE 0000 0050	P1 P1	DESERT INN DRAIN 90" RCP 84" RCP	2,640 2,640	1,030 820
FLRR 0307 0307 0307 0330	P1 P1 P1 P1	FLAMINGO WASH - RED ROCK CONVEYANCE Lakes Detention Basin 1,640 cfs Spillway 48" RCP Outlet 57" RCP	 200 2,800	1,640 / 152 1,640 152 200
RRR4 0089 0322 0322 0322	P1 P1 P1 P1	R4 CHANNEL Floodway - 3' banks 380 ac-ft Summerlin DB #6 36,000 cfs PMF Spillway 1:54" Outlet Pipe	12,300 200	420 3,600 / 410 36,000 410
RRWA 0129 0263 0314 0589 0589 0589 0589 0589 0589 0684	P1 P1 P1 E E E P1 P1 P1 E	RED ROCK CHANNEL Conc Chan 7'D 8'W 2:1 SS Floodway - 3' banks Floodway - 3' banks 1673 ac-ft Detention Basin 66,000 cfs PMF Spillway 2- 60" Outlet Pipes Upgrade Red Rock Detention Basin (add 700 ac-ft) 1:2.25' X 2.25' RCBC Outlet Control Spillway: Increase Q by 44,000 cfs Bridge Unknown	7,100 2,700 14,500 1	2,160 1,460 900 11,300 / 5,740 11,300 / 182 182 44,000

Flows from CCRFCD Master Plan Facility APNO (Angel Park North) are routed north and west through Village 11/12, ultimately to the existing Anasazi Channel and a 10-foot wide trapezoidal channel with 2:1 sideslopes, located along the southern alignment of the Summerlin Parkway (see Appendix for plans). Flows from CCRFCD Master Plan Facility APMD are routed on the same general alignment in the Alta Drive channel. This is a concrete-lined channel 20 feet wide, with 2:1 side slopes.

V. HYDROLOGY

Storm runoff for this study is estimated using the SCS Unit Hydrograph method within the HEC-1 computer model (Reference 3). Onsite and offsite precipitation depths were obtained from NOAA Atlas 2, *Precipitation Frequency Atlas of the Western United States, Volume 11-Nevada* (Reference 4). The required Clark County Correction Factors were applied according to the Design Manual to obtain the model precipitation.

Soils analysis is taken from the *Soil Survey of the Las Vegas Valley Area* (Reference 5). Soil group 152, "Cave," and soil group 502, "Canuito-Cave," gravelly, fine sandy loams, underlie Village 11/12 (see Figure 5). Curve number calculations based on the given soil are included in the Appendix.

A. Offsite Hydrology

1. Village 11/12 (North of Alta Drive)

Existing and interim offsite hydrology for this part of Village 11/12, north of Alta Drive, have been determined by Reference 6, *Summerlin Town Wide Arterial (TWA) Interim Diversion Channel, Phase 2B (Extension from Summerlin Parkway to Alta Drive)*. The HEC-1 model for this study is included in the



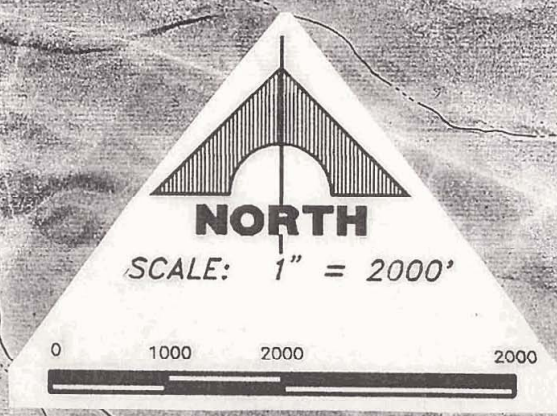
SOIL "B"

SOIL "B"

SOIL "D"

VILLAGE 11/12

SOIL "D"



**SUMMERLIN
VILLAGE 11/12**

**FIGURE 5
SOILS MAP**

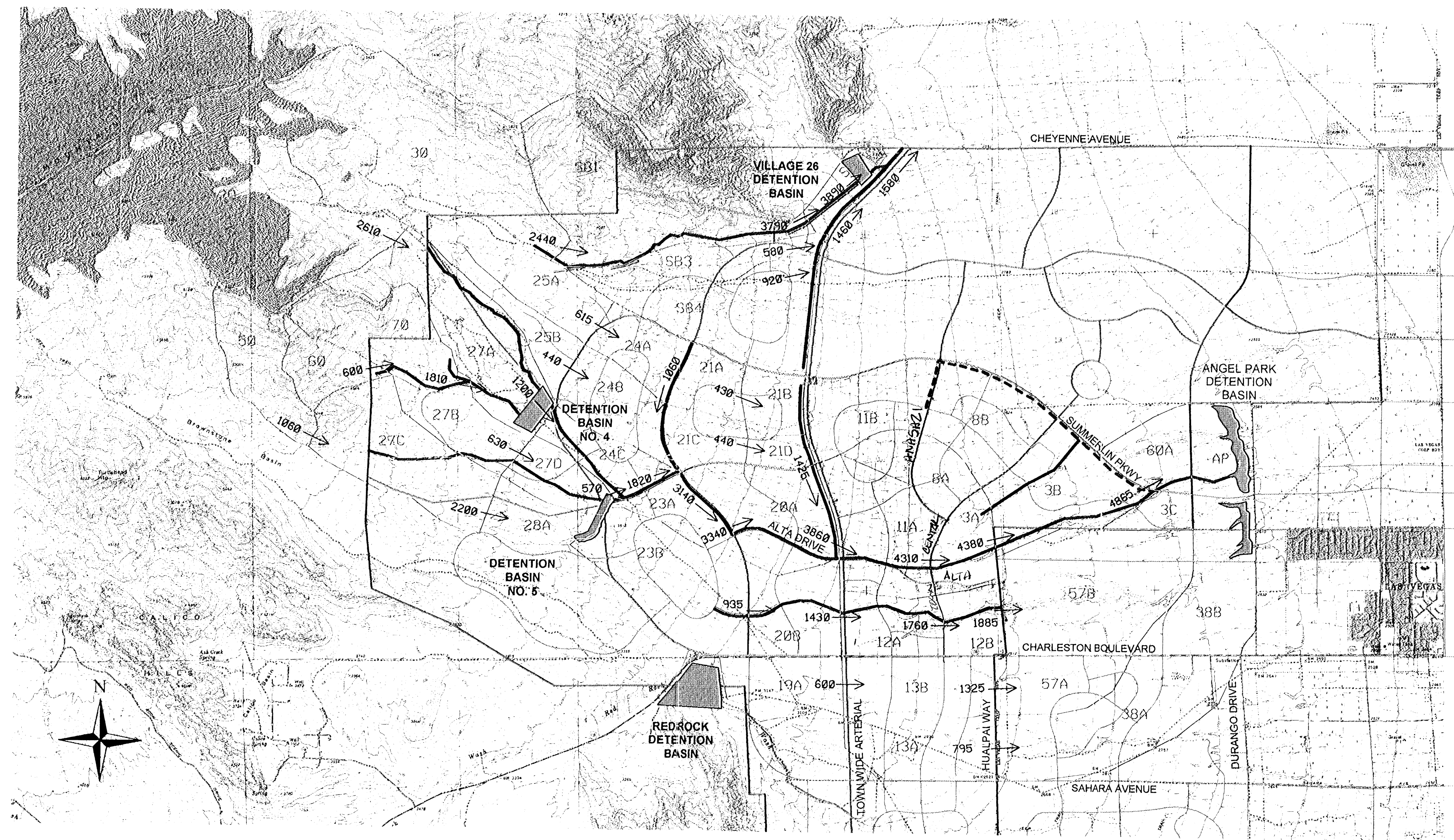
Appendix. Immediately upstream and west of this part, the TWA diversion channel routes existing and interim flow to the Alta Channel, protecting the site from offsite flows as shown on Figure 7.

Ultimate conditions indicate that 1) 3,860 cfs concentrate at the Alta Channel, Town Wide Arterial alignment, and 2) 4,310 cfs concentrate at the Alta Channel, Town Center Drive alignment. These flows were determined by the Summerlin Flood Control Master Plan Update, as shown on Figure 6. A copy of the HEC-1 model for the master plan update is included in the Appendix.

2. Village 11/12 (South of Alta Drive)

a. *Existing Conditions*

The *Summerlin Town Wide Arterial (TWA) Interim Diversion Channel, Phase 2B (Extension from Summerlin Parkway to Alta Drive)*, Reference 6, presents the existing conditions impacting this part of Village 11/12, assuming that Detention Basin 5 is not constructed. Reference 7 modified this study to determine the impact on the Town Center Drive alignment, concluding that 1,738 cfs concentrates at Node C12 (see Figure 6). The existing conditions model assumes that no development is in place in this part of Village 11/12, or upstream to the west.



REVISED 10/13/95

3000 0 3000 6000 Feet

- REGIONAL CHANNEL
- REGIONAL DIKE
- REGIONAL DETENTION BASIN

SUMMERLIN FLOOD CONTROL MASTER PLAN UPDATE

FIGURE 6
COMPOSITE DRAINAGE MAP

G. C. WALLACE, INC.

b. Interim Conditions

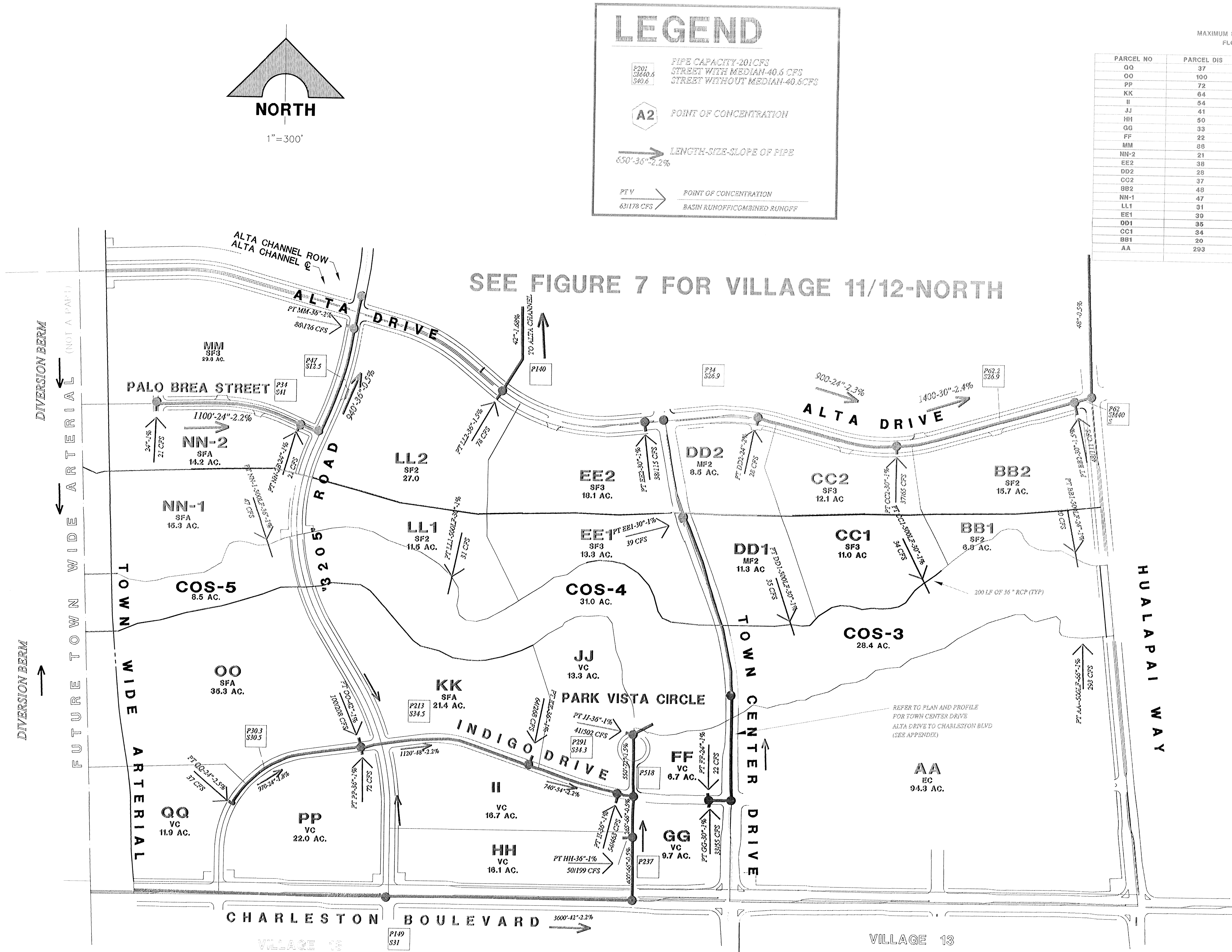
Interim Conditions impacting the development of this part of Village 11/12 at CCRFCD facility APSO 0051-P1 were modeled using the *Summerlin Town Wide Arterial (TWA) Interim Diversion Channel, Phase 2B (Extension from Summerlin Parkway to Alta Drive)* (Reference 6). This model assumes that Detention Basin 5 is in place and that this part of Village 11/12 is developed to the Town Wide Arterial. Reference 7 indicates that a 100-year discharge of 967 cfs reaches the CCRFCD facility APSO 0051-P1 at Node C12. The decrease in discharge from 1,738 cfs (existing) to 967 cfs (interim) is due to the presence of Detention Basin 5 in the upper watershed. Reference 7 indicates that 738 cfs impacts the Town Wide Arterial alignment upstream of this part of Village 11/12.

c. Ultimate Conditions

The Ultimate Condition model includes several assumptions concerning the watershed. Detention Basin 5 is assumed in place. The entire watershed is also assumed fully developed. This model is from the Summerlin Flood Control Master Plan Update (see Figure 6). A copy of the Summerlin Flood Control Master Plan Update HEC-1 Model has been included in the Appendix, indicating that 1,760 cfs reaches Node 12A, at the Town Center Drive alignment and CCRFCD facility APSO 0051-P1.

A comparison of flows from Table 1 indicates that the ultimate conditions model is the most conservative. Therefore, these flows are recommended for determining water surface elevations in the wash at Town Center Drive, and at the storm drain outlet located approximately 600 feet west of Town Center Drive.

TABLE 1 COMPARISON OF 100-YEAR DISCHARGES AT NODE 12A, 1,200 FEET NORTH OF CHARLESTON BOULEVARD		
Model	Watershed Characteristics	100-Year Discharge (cfs)
1. Existing	-Entire watershed existing condition -Detention Basin 5 not in place	1738
2. Interim	-Watershed east of Town Wide Arterial (TWA) Developed (Villages 11 & 12) & watershed west of TWA undeveloped -Detention Basin 5 in place	967
3. Ultimate	-Entire watershed developed -Detention Basin 5 in place	1760



MAXIMUM STREET AND PIPE (CFS)
FLOW PER PARCEL

PARCEL NO	PARCEL DIS	MAX SURFACE DIS	MAX PIPE DIS
QQ	37	6	37
OO	100	6	100
PP	72	6	65
KK	64	6	65
II	54	6	54
JJ	41	6	41
HH	50	6	50
GG	33	6	30
FF	22	6	24
MM	88	6	88
NN-2	21	12.5	21
EE2	38	9	38
DD2	28	9	28
CC2	37	9	37
BB2	48	9	48
NN-1	47	9	47
LL1	31	9	31
EE1	39	9	39
DD1	35	9	35
CC1	34	9	34
BB1	20	9	20
AA	293	9	293

B. Onsite Hydrology (Proposed)

Figure 7 and Figure 8 are conceptual layouts for Village 11/12. These figures indicate the proposed land use and street alignments, along with street and pipe flows for the 100-year storm event. Individual technical drainage studies will be necessary as each parcel develops, as determined by market forces. Points of concentration are indicated with the 100-year basin runoff and the 100-year combined runoff. Points of concentration from the various parcels to the adjacent streets are located approximately and may change as development proceeds.

In general, the northern portion of Village 11/12, north of Alta Drive, drains to the existing Anasazi Drive channel, a 10-foot wide, concrete-lined trapezoidal channel with 2:1 side slopes. The southern portion drains to the proposed Alta Channel, also a 20-foot wide, concrete-lined trapezoidal channel with 2:1 side slopes.

The part of Village 11/12, south of Alta Drive, is bisected by the existing large, natural wash located approximately 1,200 feet north of Charleston Boulevard, future CCRFCD floodways APSO 0051-P1 and APSO 0284-P1. The majority of flow will drain to this wash, with the exception of parcels located along Alta drive. These parcels will drain to the Alta channel.

The following is a detailed discussion of the proposed conditions drainage.

1. Village 11/12 (North of Alta Drive)

Figure 7 is a proposed, conceptual schematic of Village 11/12 drainage north of Alta Drive. This schematic shows drainage basins, general alignment of storm drains, and street and pipe capacities. This part of Village 11/12 is broken into three drainage basins, A, B, and C. Parcel C2 and Parcel B drain directly to the Alta Channel.

Basin A consists of 553 acres that drain north and east towards the Anasazi Drive Channel, as shown on Figure 7. The Town Wide Arterial and Summerlin Parkway right-of-way drain east to the Summerlin Parkway Channel, including Parcels J1 and K1. The majority of flow is routed via interior streets and through storm drains to the intersection of Banburry Cross Drive and Anasazi Drive, Concentration Point A2 (CP A2). Flows at CP A2 are routed through the concrete-lined Anasazi Drive Channel to CP A1. From CP A1 flows are routed through an existing 9-foot by 8-foot RCB east to the Summerlin Parkway Channel (see Appendix for Anasazi Channel plans).

The HEC-1 model for Basin A indicates that 1,073 cfs concentrates at CP A2, and that 1,281 cfs concentration at CP A1. A WSPG model of the Anasazi Drive Channel and 9-foot by 8-foot box culvert indicates these improvements are adequate for the proposed flow (see Appendix).

The remaining part of Village 11/12, northerly of Alta Drive, is divided between Basin B and Basin C. Basin B consists of 133 acres located in the west part of Village 11/12, west of

Road 3205, draining to the Alta Channel. Basin C consists of 147 acres located in the southeast part of Village 11/12, east of Road 3205. Basin C drains to the existing 60-inch RCP at CP C, at the Anasazi Drive, Town Center Drive intersection. Table 2 is a storm flow summary of this part of the Village.

TABLE 2			
STORM FLOW SUMMARY*			
BASIN/PT OF CONC	AREA/TOTAL(AC)	10-YR BASIN/TOTAL	100-YR BASIN/TOTAL
VILLAGE 11/12-NORTH OF ALTA			
BASIN A			
NP-2	8.2/40.1	0/34	4/86
F	40.7	47	108
G	30.2/130.7	36/125	82/307
O	23.6/51.3	29/62	66/142
A3	190	196	463
A2(S)	206	208	498
Q	33.7/63.7	23/59	66/148
R	31.3/95	23/61	66/211
S	25.3/120.3	31/109	72/275
T	23.4	29	67
CH1	4.8	9	18
NP-1	6/229.9	4/190	12/455
L2	9.8/239.7	8/196	21/474
K2	16.6/280.9	13/233	36/567
A2	476.9	440	1048
A1(W)	486.4	435	1050
SUM1	20.7	33	64
A1(S)	53.2	80	175
A1	560	543	1281
BASIN B			
X	37.9	41	99
Z	22.3/82.4	25/88	60/212
HS	40/122.4	43/155	102/307
BASIN C			
ES-2	10	10	28
CH-2	05/15	05/17	13/41
B	37/52	16/45	82/120
RES	11.6/63.6	9/53	25/144
CON	63.6	51	142
* NUMBERS SUCH AS 5/15 INDICATE BASIN AND CUMMULATIVE AREAS OR FLOWS			

BASIN/PT OF CONC	AREA/TOTAL(AC)	10-YR BASIN/TOTAL	100-YR BASIN/TOTAL
VILLAGE 11/12-NORTH OF ALTA			
D1	22.2	14	41
C1	41.7	14	39
D2	9.8/52.5	14/42	39/118
A2	17.5	20	46
A2-1	70	60	160
A1	19.1/89.1	21/78	49/201
C(S)	89.1	78	201
C	152.7	126	334
B&DC1	16.7	23	49
C2	12.2	13	36
* NUMBERS SUCH AS 5/15 INDICATE BASIN AND CUMMULATIVE AREAS OR FLOWS			

TABLE 2			
STORM FLOW SUMMARY* (CON'T)			
BASIN/PT OF CONC	AREA/TOTAL(AC)	10-YR BASIN/TOTAL	100-YR BASIN/TOTAL
VILLAGE 11/12-SOUTH OF ALTA			
BASIN A			
QQ	11.9	18	37
OO	35.3	44	100
PP	21.6/68.8	34/94	72/208
KK	21.5/90.3	28/119	64/268
BB	87.2	91	180
HH	16.1/103.3	24/101	50/199
II	16.5/210.1	25/221	54/463
JJ	13.3/223.4	20/238	41/502
FF	6.7	11	22
GG	6.7/16.4	17/28	33/55
NN2	14.2	18	42
MM	29.8/44	37/54	86/126
LL2	27	34	78
EE2	13.3/40.3	17/50	38/115
DD2	8.5	12	28
CC2	12.1/20.6	16/28	37/65
BB2	15.7/36.3	21/47	48/111
NN1	15.3	21	47
LL1	11.5	12	31
EE1	13.3	17	39
DD1	11.3	15	35
CC1	11	15	34
BB1	6.8	9	20
AA	94.3	150	293
HUAL	10.3	16	31
C	68.9	81	159
D	45.9	63	123
E	21.1	35	68
*NUMBERS SUCH AS 5/15 INDICATE BASIN/CUMMULATIVE AREAS OR FLOWS			

2. Village 11/12 (South of Alta Drive)

Figure 8 is a proposed, conceptual schematic of this part of Village 11/12 drainage. This schematic also shows drainage basins, general alignment of storm drains, and street and pipe capacities. This part of Village 11/12 is bisected by APSO 0051-P1 and APSO 0284-P1, a large natural wash approximately 1,200 feet north of Charleston Boulevard.

The northern half of this part of Village 11/12, north of APSO 0051-P1 and APSO 0284-P1, is split by a drainage divide as shown on Figure 8. Individual parcels adjacent the wash drain directly to the wash, whereas individual parcels adjacent the Alta Drive alignment drain towards either the Alta Channel or Alta Drive.

The southern half of this part of Village 11/12, south of APSO 0051-P1 and APSO 0284-P1, is divided into various basins, as shown in Figure 8. Basin A consists of a 94.3 acre business park that drains towards APSO 0051-P1 via Hualapai Way. Basins FF and GG drain onto Town Center Drive and into APSO 0051-P1. The remaining basins which drain east along Street "C" until being routed north to APSO 0284-P1. Offsite flow from Charleston Boulevard is also routed north which combines with flows from Street "C." An offsite Charleston drainage basin plan is included as to Figure 9. Table 3 is a storm flow summary of Village 11/12.

TABLE 1				
STORM FLOW SUMMARY*				
BASIN	AREA(AC)	10-YR BASIN	25-YR BASIN	100-YR BASIN
BASIN A				
R	13.3	23	34	48
Q	21.6	37	55	77
P/O	36.3/71.2	50/108	78/166	113/236
K	21.5/92.7	37/138	56/213	79/305
F	21.1	38	54	73
D	24.8/45.9	44/70	63/105	85/146
C	23.0/68.9	40/93	58/147	79/209
B	14.3/83.2	26/106	37/167	50/240
H	16.1/99.3	25/119	38/188	53/277
I	16.5/192	27/262	40/413	56/604
J	13.3/205.3	23/281	34/440	48/641
A	205.3	281	440	641

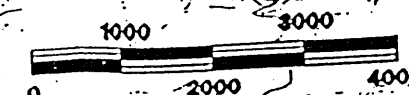


FIGURE 9

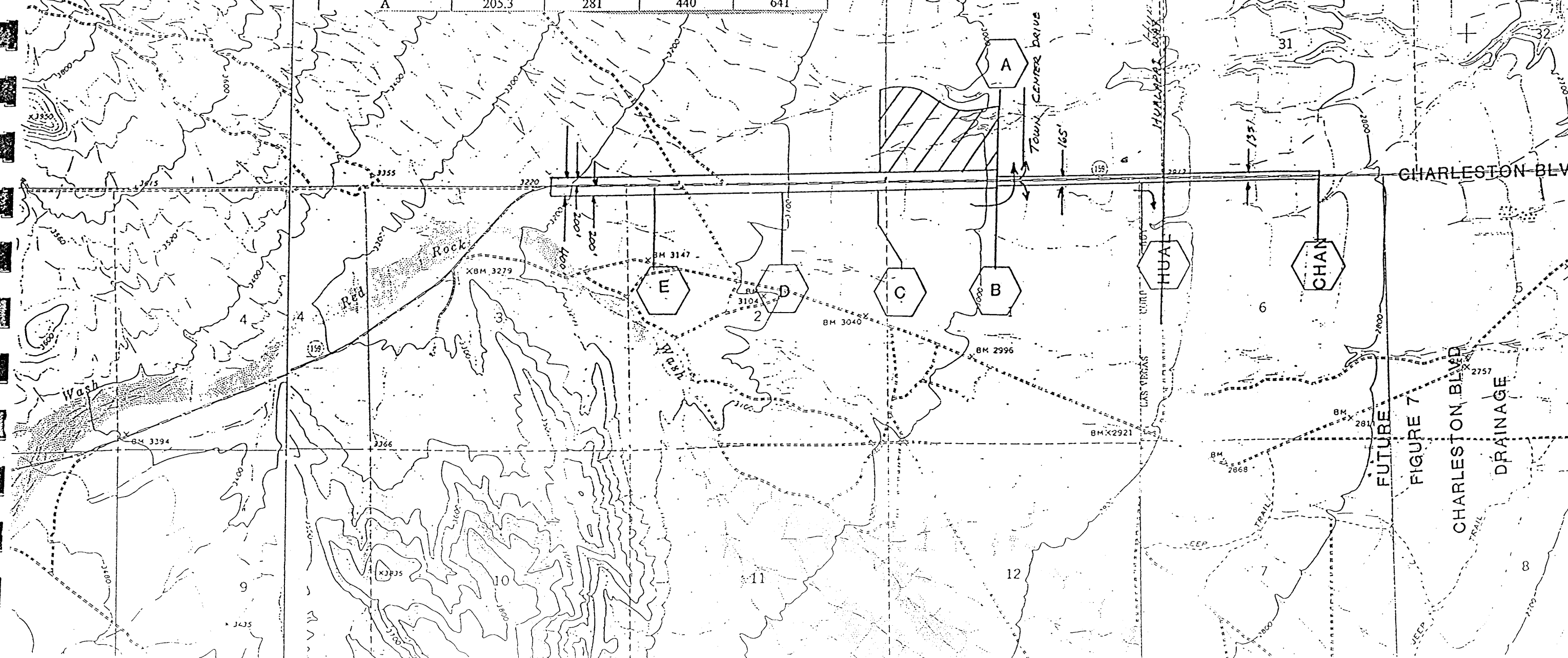


TABLE 1				
STORM FLOW SUMMARY*				
BASIN	AREA(AC)	10-YR BASIN	25-YR BASIN	100-YR BASIN
HUAL	9.1	14	21	28
CHAN	10	14	21	28

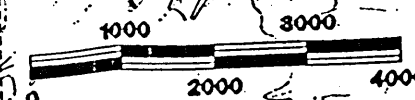
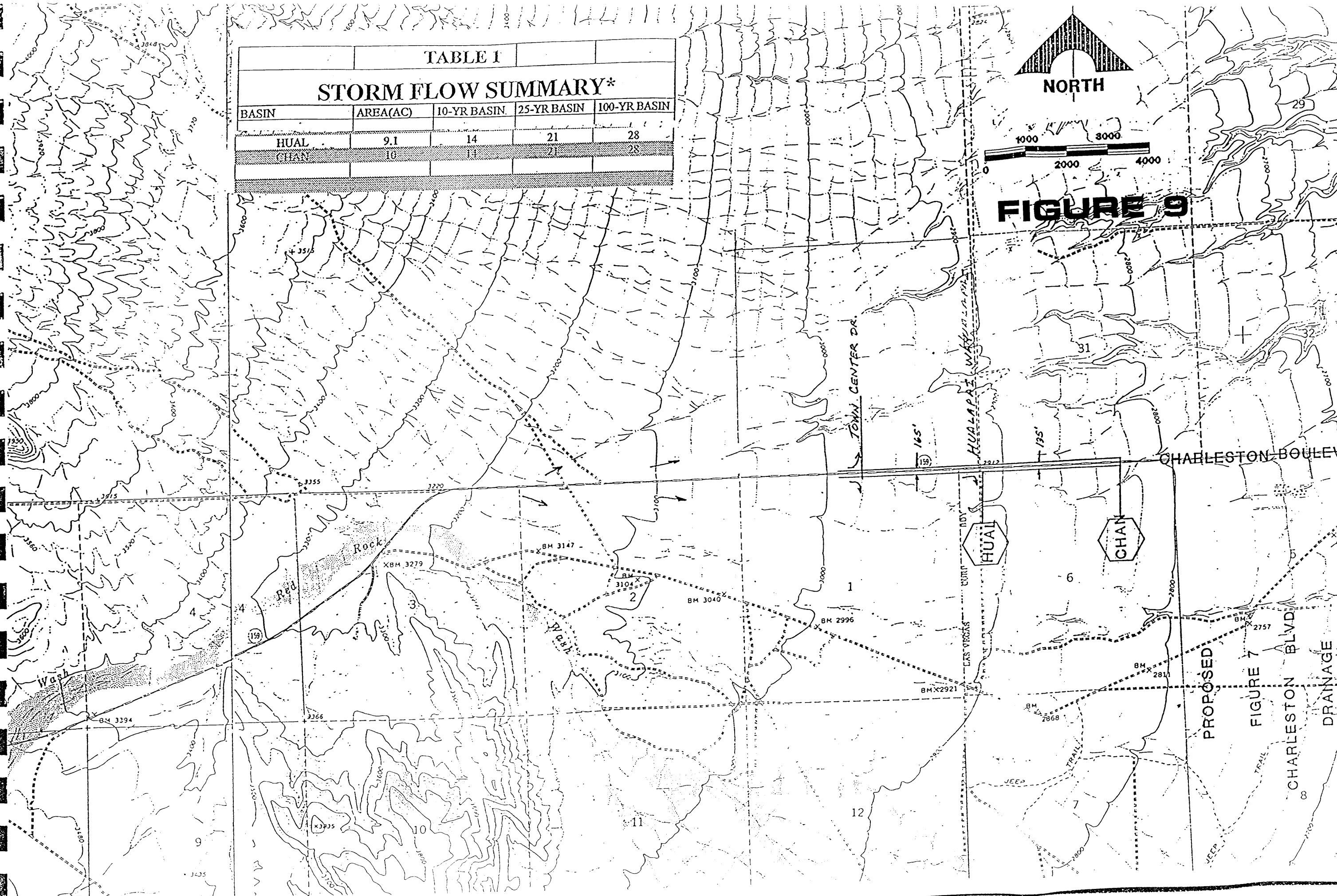


FIGURE 9



PROPOSED

FIGURE 7

CHARLESTON BLVD

DRAINAGE

VI. HYDRAULICS

Street and pipe capacities for the proposed onsite Village 11/12 are shown on Figure 7 and Figure 8, respectively. Street capacities are calculated assuming depth of flow equal to the top of 6-inch curb for the 100-year storm, therefore satisfying both 10-year and 100-year storm flow requirements. Ten-year requirements are satisfied because the depth x velocity factor is below 6 for all street widths, and a 12-foot travel lane in each direction is maintained for right-of-way greater than 80 feet. Although Summerlin standards define the right-of-way as back-of-curb to back-of-curb, the right-of-way for this study is considered to be the back of sidewalk, a conservative approach following Criteria Manual guidelines. A 10-year analysis to determine pipe capacities was not performed, because the top-of-curb criterion for the 100-year storm is the more conservative. This is verified by street calculations included in the Appendix.

This analysis assumes that drop inlets will be constructed with individual development parcels as development progresses. Therefore, calculations for drop inlets have been included only at intersections are required to reduce street flow, as shown in the Appendix. Storm drains are sized by normal depth calculations, without consideration to pressure head. Table 3 is a storm flow summary of Village 11/12.

Approved storm drains along the Town Center Drive and Anasazi Drive alignments have been included in the Appendix. The Town Center Drive storm drain is separated into two parts, Town Center Drive, Anasazi Drive to Alta Drive, and Town Center Drive, Charleston Boulevard to Alta Drive. Plans for other (existing) improvements, such as the Anasazi Drive channel, have been included in the Appendix. Storm flows for approved storm drains vary within 5 percent of the conceptual model, and therefore, have not been changed to accommodate the slight variation in flow.

TABLE 3

STREET AND PIPE CAPACITIES

REFER TO FIGURES 7 & 8

SAGEBERRY DRIVE

					MAX	MAX	
REACH	SLOPE (%)	100YR (CFS)	STREET CAP (CFS)	PIPE CAP (CFS)	PIPE Q (CFS)	SURFACE Q (CFS)	REQ'D DIA (IN)
U TO T	4.6	72	47.1	485	48	24	24
T TO T1	1	67	21.8	67	67	0	36
T1 TO ES-1	4.6	135	47.1	144	111	24	36
ES-1 TO NP-1	4.1	444	44.4	415	408	36	54
NP-1 TO L2	4.1	455	44.4	527	413	42	60
L2 TO M	4.1	474	44.4	527	429.6	44.5	60
L1 TO SUM1	0.5	27	0	420	27	20	36

BANBURY CROSS ROAD

					MAX	MAX	
REACH	SLOPE (%)	100YR (CFS)	STREET CAP (CFS)	PIPE CAP (CFS)	PIPE Q (CFS)	SURFACE Q (CFS)	REQ'D DIA (IN)
M TO K2	4.5	533	45.6	552	487.4	45.6	60
K2 TO A2	4.5	567	45.6	552	521.4	45.6	60

WESTERN HILL AVENUE

					MAX	MAX	
REACH	SLOPE (%)	100YR (CFS)	STREET CAP (CFS)	PIPE CAP (CFS)	PIPE Q (CFS)	SURFACE Q (CFS)	REQ'D DIA (IN)
N/O TO A3	4.5	142	38.4	145	142	0	36
V TO Q	4.5	85	38.4	48	48	37	24

ANASAZI DRIVE

					MAX	MAX	
REACH	SLOPE (%)	100YR (CFS)	STREET CAP (CFS)	PIPE CAP (CFS)	PIPE Q (CFS)	SURFACE Q (CFS)	REQ'D DIA (IN)
A4 TO G	1.4	229	22.1	240	206.9	9	66
G TO A3	1.5	307	22.1	319	289	18	66
A3 TO A2	1	463	18.7	424	445	18	72

LAURELGLEN DRIVE				MAX	MAX		
REACH	SLOPE (%)	100YR (CFS)	STREET CAP (CFS)	PIPE CAP (CFS)	PIPE Q (CFS)	SURFACE Q (CFS)	REQ'D DIA (IN)
W TO NP-2	4.1	84	43.5	45.8	42	42	24
NP-2 TO P	2.3	86	32.6	62.2	40	46	30
GREENMOOR LANE				MAX	MAX		
REACH	SLOPE (%)	100YR (CFS)	STREET CAP (CFS)	PIPE CAP (CFS)	PIPE Q (CFS)	SURFACE Q (CFS)	REQ'D DIA (IN)
CH2 TO E	1.8	41	21.7	30.2	19.3	21.7	24
ES-2 TO CH-2	0.5	28	0	47.1	28	0	36
TRELLIS DRIVE				MAX	MAX		
REACH	SLOPE (%)	100YR (CFS)	STREET CAP (CFS)	PIPE CAP (CFS)	PIPE Q (CFS)	SURFACE Q (CFS)	REQ'D DIA (IN)
P TO A4	4.5	126	46.5	141.5	126	0	36
HUSITE DRIVE				MAX	MAX		
REACH	SLOPE (%)	100YR (CFS)	STREET CAP (CFS)	PIPE CAP (CFS)	PIPE Q (CFS)	SURFACE Q (CFS)	REQ'D DIA (IN)
X TO Y	0.8	99	18	93	93	6	42
Y TO Z	1.7	156	18	175.8	144	12	54
Z TO HS	0.8	212	18	232	194	18	60
NN-2 TO MM	0.5	21	12.5	47	21	0	36
PALO BREA DRIVE				MAX	MAX		
REACH	SLOPE (%)	100YR (CFS)	STREET CAP (CFS)	PIPE CAP (CFS)	PIPE Q (CFS)	SURFACE Q (CFS)	REQ'D DIA (IN)
NN-2A TO NN-2B	2.2	21	41	33.6	8.5	12.5	24
CHARLESTON BOULEVARD				MAX	MAX		
REACH	SLOPE (%)	100YR (CFS)	STREET CAP (CFS)	PIPE CAP (CFS)	PIPE Q (CFS)	SURFACE Q (CFS)	REQ'D DIA (IN)
C TO B	2.2	180	31	149	149	31	42
D TO C	2.2	159	31	128	143	16	42
ALTA DRIVE				MAX	MAX		
REACH	SLOPE (%)	100YR (CFS)	STREET CAP (CFS)	PIPE CAP (CFS)	PIPE Q (CFS)	SURFACE Q (CFS)	REQ'D DIA (IN)
DD2 TO CC2	2.3	28	26.9	34.3	19	9	24
CC2 TO BB2	2.3	65	26.9	62.2	47	18	30

[illegible]

VII. CONCLUSIONS AND RECOMMENDATIONS

1. Methodology used in this report is in compliance with the Clark County Regional Flood Control District (CCRFCD) Hydrologic Criteria and Drainage Design Manual.
2. The proposed development does not alter existing flow patterns. The existing patterns are undisturbed.
3. The proposed development of the part of Village 11/12 is not located within a special flood hazard zone (Zone A). However, a small part of Village 11/12, south of Alta Drive, is located adjacent a special flood hazard zone (Zone A) located along the future APSO 0051 and APSO 0284 alignment. This will require a Letter of Map Revision (LOMR) to be filed with FEMA. A HEC-2 analysis will be required to analyze the 100-year floodplain.
4. The proposed development of Village 11/12 impacts various Flood Control facilities as outlined in Section IV of this report.
5. The Summerlin Town Wide Arterial Interim Diversion Channel, Phase 2B, (extension from Summerlin Parkway to Alta Drive) provides existing and interim offsite protection to the portion of Village 11/12 north of Alta Drive. Interim development of that portion of Village 11/12, south of Alta Drive, will require construction of a protection berm, as shown on Figure 8, and as calculated in the Appendix.
6. The existing Anasazi Channel has been designed with adequate capacity and freeboard as determined by Village 11/12 onsite hydrologic and hydraulic analysis.

7. Existing and proposed facilities in Town Center Drive have been designed with adequate capacity as determined by Village 11/12 hydrologic analysis.
8. This conceptual study does not address development of respective parcels. This study assumes that points of concentration are generally located and that storm flows will be intercepted on the parcel site before reaching village collectors.
9. Future technical drainage studies will be required as Village 11/12 develops. These studies should address individual onsite parcel drainage, including storm drain and street flows, along with drop inlet calculations.

VIII. REFERENCES

1. Clark County Regional Flood Control District, *Hydrologic Criteria and Drainage Design Manual*, October 1990.
2. Clark County Regional Flood Control District, *Master Plan Update of the Las Vegas Valley*, August 1991.
3. U.S. Army Corps of Engineers, *HEC-1 Flood Hydrograph Package*, September 1990, Version 4.0.
4. NOAA, *Precipitation Atlas of the Western United States, Volume VII Nevada*, 1993.
5. U.S. Department of Agriculture, *Soil Conservation Service, Soil Survey of the Las Vegas Valley Area, Nevada*, July 1985.
6. G. C. Wallace, Inc., *Summerlin Town Wide Arterial Interim Diversion Channel, Phase 2B (Extension from Summerlin Parkway to Alta Drive*, April 1994.
7. G. C. Wallace, Inc., *Town Center Drive Phase 2 Rough Grading Station 417+00 to Station 450+00 Alta Drive to Charleston Boulevard*, March 1995.
8. G. C. Wallace, Inc., *Town Center Drive Rough Grading and 3090 Inlet/Outlet Rough Grading*, March 1995.
9. G. C. Wallace, Inc., *Conceptual Master Drainage Plan for Summerlin Village 8*, June 1993.

HYDROLOGY

```

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

*DIAGRAM
1      ID *****
2      ID * ..... *
3      ID * :          SUMMERLIN VILLAGE 11          : *
4      ID * :          PROPOSED CONDITONS            : *
5      ID * :          D. BLATCHFORD                  : *
6      ID * : ..... *
7      ID * :          RETURN PERIOD _ _ _ 10 & 100-YEAR : *
8      ID * :          DISTRIBUTION _ _ _ 6-HOUR SDN3    : *
9      ID * :          PROJECT NO _ _ _ 62011.032H       : *
10     ID * :          FILENAME _ _ _ _ VIL11E.H1        : *
11     ID * :          DATE _ _ _ _ _ 10/95             : *
12     ID * :          MODELED BY _ _ _ _ D. BLATCHFORD  : *
13     ID * : ..... *
14     ID *****
15     IT      5      0      0      300
16     IO      5      0
17     JR      PREC      .56      .97      .973      .976      .98      .986      .988      .992      1.00

18     KK      W
19     KM
20     KM      AREA      31.9      AC
21     KM      LENGTH    1850      FT
22     KM      SLOPE      3.2      %
23     KM      VELOCITY    5.47      FPS
24     KM      Ti      7.03      MIN
25     KM      Tt      5.60      MIN
26     KM      Tc      12.63      MIN
27     KM      CN      88.0
28     BA      .050
29     PB      3.15
30     PC      0.000      .0200      .0570      .0700      .0870      .1080      .1240      .1300      .1300      .1300
31     PC      .1300      .1300      .1300      .1330      .1400      .1420      .1480      .1580      .1720      .1810
32     PC      .1900      .1970      .1990      .2000      .2010      .2040      .2140      .2290      .2410      .2490
33     PC      .2510      .2560      .2700      .2780      .2810      .2830      .2950      .3220      .3520      .4090
34     PC      .4990      .5900      .7100      .7440      .7810      .8120      .8190      .8350      .8510      .8560
35     PC      .8600      .8680      .8760      .8880      .9100      .9260      .9370      .9500      .9700      .9760
36     PC      .9820      .9850      .9870      .9890      .9900      .9930      .9930      .9940      .9950      .9980
37     PC      .9980      .9990      1.000
38     LS      0      88.0
39     UD      .126

40     KK      NP-2
41     KM      ROUTE POINT W TO POINT NP-2
42     RK      900      .041      .016      0      TRAP      72      0

43     KK      NP-2
44     KM
45     KM      AREA      8.2      AC
46     KM      LENGTH    850      FT
47     KM      SLOPE      3.1      %
48     KM      VELOCITY    5.39      FPS
49     KM      Ti      12.2      MIN
50     KM      Tt      2.6      MIN
51     KM      Tc      14.8      MIN

```

LINE	ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10
52	KM CN 60
53	BA .013
54	LS 0 60
55	UD .148
56	KK PTNP2
57	KM COMBINE POINT W AND POINT NP-2
58	HC 2
59	KK P
60	KM ROUTE POINT NP-2 TO POINT P
61	RK 1200 .025 .016 0 TRAP 72 0
62	KK P
63	KM
64	KM AREA 19.7 AC
65	KM LENGTH 1250 FT
66	KM SLOPE 2.0 %
67	KM VELOCITY 4.33 FPS
68	KM Ti 7.03 MIN
69	KM Tt 4.80 MIN
70	KM Tc 11.83 MIN
71	KM CN 83.3
72	BA .030
73	LS 0 83.3
74	UD .118
75	KK PTP
76	KM COMBINE POINT P AND POINT NP-2 AT POINT P
77	HC 2
78	KK 4
79	KM ROUTE POINT P TO POINT A4
80	RK 900 .045 .016 0 TRAP 72 0
81	KK F
82	KM
83	KM AREA 40.7 AC
84	KM LENGTH 2450 FT
85	KM SLOPE 2.3 %
86	KM VELOCITY 4.64 FPS
87	KM Ti 5.55 MIN
88	KM Tt 8.90 MIN
89	KM Tc 15.45 MIN
90	KM CN 89.5
91	BA .064
92	LS 0 89.5
93	UD .155
94	KK PTA4
95	KM COMBINE POINT F AND POINT P AT POINT A4
96	HC 2

LINE	ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10
97	KK G
98	KM ROUTE POINT A4TO POINT G
99	RK 525 .012 .016 0 TRAP 78 0
100	KK G
101	KM
102	KM AREA 30.2 AC
103	KM LENGTH 2000 FT
104	KM SLOPE 2.5 %
105	KM VELOCITY 4.84 FPS
106	KM Ti 5.55 MIN
107	KM Tt 6.90 MIN
108	KM Tc 12.45 MIN
109	KM CN 89.5
110	BA .047
111	LS 0 89.5
112	UD .125
113	KK PTG
114	KM COMBINE POINT A4AND POINT G
115	HC 2
116	KK A3
117	KM ROUTE BASIN G TO BASIN A3
118	RK 525 .012 .016 0 TRAP 78 0
119	KK N
120	KM
121	KM AREA 27.7 AC
122	KM LENGTH 1850 FT
123	KM SLOPE 3.5 %
124	KM VELOCITY 5.70 FPS
125	KM Ti 5.60 MIN
126	KM Tt 5.40 MIN
127	KM Tc 11.00 MIN
128	KM CN 89.5
129	BA .043
130	LS 0 89.5
131	UD .110
132	KK 0
133	KM
134	KM AREA 23.6 AC
135	KM LENGTH 1650 FT
136	KM SLOPE 3.1 %
137	KM VELOCITY 5.39 FPS
138	KM Ti 5.55 MIN
139	KM Tt 5.10 MIN
140	KM Tc 10.65 MIN
141	KM CN 89.5
142	BA .037
143	LS 0 89.5
144	UD .107

LINE	ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10
145	KK PTN
146	KM COMBINE POINT N AND POINT O AT POINT N
147	HC 2
148	KK A3
149	KM ROUTE POINT N TO POINT A3
150	RK 825 .047 .016 0 TRAP 121 0
151	KK H
152	KM
153	KM AREA 8.0 AC
154	KM LENGTH 1050 FT
155	KM SLOPE 1.5 %
156	KM VELOCITY 3.75 FPS
157	KM Ti 4.30 MIN
158	KM Tt 4.60 MIN
159	KM Tc 8.90 MIN
160	KM CN 95.0
161	BA .013
162	LS 0 95.0
163	UD .089
164	KK PTA3
165	KM COMBINE POINTS N, POINT A4, AND POINT H AT POINT A3
166	HC 3
167	KK A2
168	KM ROUTE POINT A3 TO POINT A2
169	RK 1000 .014 .013 0 TRAP 121 0
170	KK I
171	KM
172	KM AREA 16.0 AC
173	KM LENGTH 1300 FT
174	KM SLOPE 3.0 %
175	KM VELOCITY 5.30 FPS
176	KM Ti 5.55 MIN
177	KM Tt 4.10 MIN
178	KM Tc 9.65 MIN
179	KM CN 89.5
180	BA .025
181	LS 0 89.5
182	UD .097
183	KK PT A2
184	KM COMBINE POINT I AND POINT A3 AT POINT A2
185	HC 2
186	KK V
187	KM
188	KM AREA 30.0 AC
189	KM LENGTH 1700 FT
190	KM SLOPE 3.8 %
191	KM VELOCITY 6.00 FPS

LINE	ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10
192	KM Ti 5.60 MIN
193	KM Tt 4.70 MIN
194	KM Tc 10.30 MIN
195	KM CN 89.5
196	BA .047
197	LS 0 89.5
198	UD .103
199	KK Q
200	KM ROUTE POINT V TO POINT Q
201	RK 1300 .044 .016 0 TRAP 95 0
202	KK Q
203	KM
204	KM AREA 33.7 AC
205	KM LENGTH 1950 FT
206	KM SLOPE 1.0 %
207	KM VELOCITY 3.00 FPS
208	KM Ti 7.00 MIN
209	KM Tt 10.80 MIN
210	KM Tc 18.00 MIN
211	KM CN 83.3
212	BA .052
213	LS 0 83.3
214	UD .180
215	KK PTQ
216	KM COMBINE BASINS V AND Q AT POINT Q
217	HC 2
218	KK R
219	KM ROUTE POINT Q TO POINT R
220	RK 450 .0046 .013 0 CIRC 54 0
221	KK R
222	KM
223	KM AREA 31.3 AC
224	KM LENGTH 1500 FT
225	KM SLOPE 3.7 %
226	KM VELOCITY 5.90 FPS
227	KM Ti 7.40 MIN
228	KM Tt 4.20 MIN
229	KM Tc 11.60 MIN
230	KM CN 82.0
231	BA .049
232	LS 0 82.0
233	UD .116
234	KK PTR
235	KM COMBINE POINT Q AND POINT R
236	HC 2

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

237 KK S
 238 KM ROUTE POINT R TO POINT S
 239 RK 900 .0046 .013 0 CIRC 60 0

240 KK S
 241 KM
 242 KM AREA 25.3 AC
 243 KM LENGTH 1700 FT
 244 KM SLOPE 4.4 %
 245 KM VELOCITY 6.4 FPS
 246 KM Ti 5.6 MIN
 247 KM Tt 4.4 MIN
 248 KM Tc 10.0 MIN
 249 KM CN 89.5
 250 BA .039
 251 LS 0 89.5
 252 UD .100

253 KK PTS
 254 KM COMBINE POINT S AND POINT R
 255 HC 2

256 KK ES1
 257 KM ROUTE POINT S TO POINT ES1
 258 RK 600 .046 .013 0 CIRC 72 0

259 KK U
 260 KM
 261 KM AREA 26.0 AC
 262 KM LENGTH 1800 FT
 263 KM SLOPE 1.7 %
 264 KM VELOCITY 4.00 FPS
 265 KM Ti 5.6 MIN
 266 KM Tt 7.5 MIN
 267 KM Tc 13.1 MIN
 268 KM CN 89.5
 269 BA .041
 270 LS 0 89.5
 271 UD .131

272 KK T1
 273 KM ROUTE POINT U TO POINT T1
 274 RK 900 0.050 .016 0 TRAP 60 0

275 KK T
 276 KM
 277 KM AREA 23.4 AC
 278 KM LENGTH 1450 FT
 279 KM SLOPE 4.1 %
 280 KM VELOCITY 6.20 FPS
 281 KM Ti 5.60 MIN
 282 KM Tt 3.90 MIN
 283 KM Tc 10.50 MIN
 284 KM CN 89.5

LINE	ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10
285	BA .037
286	LS 0 89.5
287	UD .105
288	KK T1
289	KM ROUTE POINT T TO POINT T1
290	RK 600 0.005 .014 0 CIRC 36 0
291	KK PT T1
292	KM COMBINE POINT U AND POINT T
293	HC 2
294	KK ES1(S)
295	KM ROUTE POINT T1 TO POINT ES1(S)
296	RK 600 0.050 .016 0 TRAP 60 0
297	KK ES1
298	KM
299	KM AREA 10.5 AC
300	KM LENGTH 1000 FT
301	KM SLOPE 3.0 %
302	KM VELOCITY 5.30 FPS
303	KM T _i 4.70 MIN
304	KM T _t 3.10 MIN
305	KM T _c 7.80 MIN
306	KM CN 93
307	BA .016
308	LS 0 93
309	UD .078
310	KK CH1
311	KM
312	KM AREA 4.8 AC
313	KM LENGTH 400 FT
314	KM SLOPE 3.2 %
315	KM VELOCITY 5.47 FPS
316	KM T _i 4.25 MIN
317	KM T _t 1.84 MIN
318	KM T _c 6.09 MIN
319	KM CN 95
320	BA .0075
321	LS 0 95
322	UD .061
323	KK PTES1
324	KM COMBINED POINT CH1, POINT ES-1, AND POINT T1 AT POINT ES-1(W)
325	HC 3
326	KK PTES1
327	KM COMBINE ES1(S) AND ES1(W) AT POINT ES1
328	HC 2

LINE	ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10
329	KK NP-1
330	KM ROUTE POINT ES1 TO POINT NP-1
331	RK 500 0.050 .016 0 TRAP 60 0
332	KK NP-1
333	KM
334	KM AREA 6.0 AC
335	KM LENGTH 700 FT
336	KM SLOPE 2.9 %
337	KM VELOCITY 5.21 FPS
338	KM Ti 7.70 MIN
339	KM Tt 2.90 MIN
340	KM Tc 10.60 MIN
341	KM CN 80.0
342	BA .0094
343	LS 0 80.0
344	UD .106
345	KK NP-1
346	KM COMBINE POINTS ES1 TO POINT NP-1
347	HC 2
348	KK L2
349	KM ROUTE POINT NP-1 TO POINT L2
350	RK 700 .045 .016 0 TRAP 60
351	KK L2
352	KM
353	KM AREA 9.8 AC
354	KM LENGTH 1100 FT
355	KM SLOPE 2.2 %
356	KM VELOCITY 4.50 FPS
357	KM Ti 7.03 MIN
358	KM Tt 4.10 MIN
359	KM Tc 11.13 MIN
360	KM CN 83.3
361	BA .015
362	LS 0 83.3
363	UD .111
364	KK PTL2
365	KM COMBINE POINT L2 AND POINT NP-1 AT POINT L2
366	HC 2
367	KK M
368	KM ROUTE POINT L2 TO POINT M
369	RK 700 .045 .016 0 TRAP 60
370	KK M
371	KM
372	KM AREA 24.6 AC
373	KM LENGTH 1200 FT
374	KM SLOPE 4.2 %
375	KM VELOCITY 6.27 FPS

LINE	ID	1	2	3	4	5	6	7	8	9	10
376	KM		Ti	5.55	MIN						
377	KM		Tt	3.20	MIN						
378	KM		Tc	8.75	MIN						
379	KM		CN	89.5							
380	BA	.0384									
381	LS	0	89.5								
382	UD	.0875									
383	KK	M									
384	KM	COMBINE POINT L2 AND POINT M									
385	HC	2									
386	KK	K2									
387	KM	ROUTE POINT M TO POINT K2									
388	RK	0500	.041	.016	0	TRAP	60	0			
389	KK	K2									
390	KM										
391	KM	AREA	16.6	AC							
392	KM	LENGTH	1400	FT							
393	KM	SLOPE	1.4	%							
394	KM	VELOCITY	3.60	FPS							
395	KM	Ti	7.03	MIN							
396	KM	Tt	6.50	MIN							
397	KM	Tc	13.53	MIN							
398	KM	CN	83.3								
399	BA	.026									
400	LS	0	83.3								
401	UD	.135									
402	KK	K2									
403	KM	COMBINE POINT K2 TO POINT M									
404	HC	2									
405	KK	A2									
406	KM	ROUTE POINT K2 TO POINT A2									
407	RK	0600	.041	.016	0	TRAP	60	0			
408	KK	PT A2									
409	KM	COMBINE POINT A2(S) AND POINT A2(W) AT POINT A2									
410	HC	2									
411	KK	J2									
412	KM	ROUTE POINT A2 TO POINT J2									
413	RK	1000	.016	.013	0	DEEP	8	0			
414	KK	J2									
415	KM										
416	KM	AREA	9.5	AC							
417	KM	LENGTH	1350	FT							
418	KM	SLOPE	2.2	%							
419	KM	VELOCITY	4.50	FPS							
420	KM	Ti	7.03	MIN							
421	KM	Tt	5.00	MIN							
422	KM	Tc	12.03	MIN							

LINE	ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10
423	KM CN 83.3
424	BA 0.015
425	LS 0 83.3
426	UD .120
427	KK J2
428	KM COMBINE POINT J2 AND POINT A2
429	HC 2
430	KK A1(W)
431	KM ROUTE POINT J2 TO POINT A1(W)
432	RK 1000 .016 .013 0 DEEP 8 0
433	KK TWA1
434	KM
435	KM AREA 17.6 AC
436	KM LENGTH 2300 FT
437	KM SLOPE 2.0 %
438	KM VELOCITY 4.30 FPS
439	KM Ti 4.30 MIN
440	KM Tt 8.90 MIN
441	KM Tc 13.20 MIN
442	KM CN 95
443	BA .027
444	LS 0 95
445	UD .132
446	KK K1
447	KM ROUTE POINT TWA1 TO POINT L1
448	RK 3000 .04 .016 0 TRAP 20 0
449	KK SUM1
450	KM
451	KM AREA 20.7 AC
452	KM LENGTH 3900 FT
453	KM SLOPE 5.1 %
454	KM VELOCITY 6.91 FPS
455	KM Ti 4.25 MIN
456	KM Tt 9.06 MIN
457	KM Tc 14.27 MIN
458	KM CN 95
459	BA .032
460	LS 0 95
461	UD .142
462	KK L1
463	KM
464	KM AREA 11.9 AC
465	KM LENGTH 1700 FT
466	KM SLOPE 3.8 %
467	KM VELOCITY 6.00 FPS
468	KM Ti 7.00 MIN
469	KM Tt 4.70 MIN
470	KM Tc 11.70 MIN
471	KM CN 83.3

LINE	ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10
472	BA .019
473	LS 0 83.3
474	UD .117
475	KK L1
476	KM COMBINE BASINS L1, TWA1, AND SUM1 AT L1
477	HC 3
478	KK K1
479	KM ROUTE POINT L1 TO POINT K1
480	RK 600 .002 .013 0 CIRC 42
481	KK K1
482	KM
483	KM AREA 14.9 AC
484	KM LENGTH 1350 FT
485	KM SLOPE 2.4 %
486	KM VELOCITY 4.70 FPS
487	KM Ti 7.03 MIN
488	KM Tt 4.80 MIN
489	KM Tc 11.83 MIN
490	KM CN 83.3
491	BA .023
492	LS 0 83.3
493	UD .118
494	KK PTK1
495	KM COMBINE POINT K1 AND L1
496	HC 2
497	KK A1(S)
498	KM ROUTE POINT K1 TO POINT A1(S)
499	RK 700 .048 .013 0 CIRC 42 0
500	KK J1
501	KM
502	KM AREA 14.5 AC
503	KM LENGTH 1300 FT
504	KM SLOPE 2.7 %
505	KM VELOCITY 5.00 FPS
506	KM Ti 7.03 MIN
507	KM Tt 5.00 MIN
508	KM Tc 12.03 MIN
509	KM CN 83.3
510	BA .023
511	LS 0 83.3
512	UD .1203
513	KK PTA1(S)
514	KM COMBINE POINT K1 AND POINT J1 AT POINT A1(S)
515	HC 2

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

```

516      KK      SUM2
517      KM
518      KM      AREA      10.4      AC
519      KM      LENGTH    1800      FT
520      KM      SLOPE      4.0      %
521      KM      VELOCITY    6.91     FPS
522      KM      Ti         4.25     MIN
523      KM      Tt         9.06     MIN
524      KM      Tc        13.31     MIN
525      KM      CN         95
526      BA      .016
527      LS      0         95
528      UD      .133

529      KK      PTA1
530      KM      COMBINE POINT SS2, POINT A1(S) AND POINT A1(W) AT POINT A1
531      HC      3

532      KK      X
533      KM
534      KM      AREA      37.9      AC
535      KM      LENGTH    2100      FT
536      KM      SLOPE      3.0      %
537      KM      VELOCITY    5.30     FPS
538      KM      Ti         5.91     MIN
539      KM      Tt         6.60     MIN
540      KM      Tc        12.51     MIN
541      KM      CN         88.0
542      BA      .059
543      LS      0         88.0
544      UD      .125

545      KK      V
546      KM      ROUTE POINT X TO POINT Y
547      RK      600      .010      .016      0      TRAP      78      0

548      KK      Y
549      KM
550      KM      AREA      22.2      AC
551      KM      LENGTH    1700      FT
552      KM      SLOPE      3.0      %
553      KM      VELOCITY    5.30     FPS
554      KM      Ti         5.91     MIN
555      KM      Tt         5.30     MIN
556      KM      Tc        11.21     MIN
557      KM      CN         88.0
558      BA      .035
559      LS      0         88.0
560      UD      .112

```

LINE	ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10
561	KK PT Y
562	KM COMBINE POINT X AND POINT Y AT POINT Y
563	HC 2
564	KK Z
565	KM ROUTE TO POINT Z
566	RK 700 .012 .016 0 TRAP 78 0
567	KK Z
568	KM
569	KM AREA 22.3 AC
570	KM LENGTH 1700 FT
571	KM SLOPE 3.8 %
572	KM VELOCITY 5.97 FPS
573	KM Ti 5.91 MIN
574	KM Tt 4.70 MIN
575	KM Tc 10.61 MIN
576	KM CN 88.0
577	BA .035
578	LS 0 88.0
579	UD .106
580	KK PTZ
581	KM COMBINE POINT Z AND POINT Y
582	HC 2
583	KK HS
584	KM ROUTE POINT Z TO POINT HS
585	RK 1600 .014 .016 0 TRAP 78 0
586	KK HS
587	KM
588	KM AREA 40.0 AC
589	KM LENGTH 2650 FT
590	KM SLOPE 2.6 %
591	KM VELOCITY 4.93 FPS
592	KM Ti 5.91 MIN
593	KM Tt 9.00 MIN
594	KM Tc 14.91 MIN
595	KM CN 88.0
596	BA .063
597	LS 0 88.0
598	UD .149
599	KK PTHS
600	KM COMBINE POINT Z AND POINT HS AT POINT HS
601	HC 2
602	KK ES2
603	KM
604	KM AREA 10.0 AC
605	KM LENGTH 950 FT
606	KM SLOPE 2.1 %
607	KM VELOCITY 4.43 FPS

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	RATIO 2	RATIO 3	RATIO 4	RATIO 5	RATIO 6	RATIO 7	RATIO 8	RATIO 9
				.56	.97	.97	.98	.98	.99	.99	.99	1.00
HYDROGRAPH AT	W	.05	1 FLOW TIME	35. 3.58	80. 3.58	80. 3.58	81. 3.58	81. 3.58	82. 3.58	82. 3.58	83. 3.58	<u>84.</u> 3.58
ROUTED TO	NP-2	.05	1 FLOW TIME	34. 3.58	79. 3.58	80. 3.58	80. 3.58	80. 3.58	81. 3.58	81. 3.58	82. 3.58	<u>83.</u> 3.58
HYDROGRAPH AT	NP-2	.01	1 FLOW TIME	0. 4.92	3. 3.67	3. 3.67	3. 3.67	3. 3.67	3. 3.67	3. 3.67	4. 3.67	<u>4.</u> 3.67
2 COMBINED AT	PTNP2	.06	1 FLOW TIME	34. 3.58	82. 3.58	83. 3.58	83. 3.58	84. 3.58	84. 3.58	85. 3.58	85. 3.58	<u>86.</u> 3.58
ROUTED TO	P	.06	1 FLOW TIME	32. 3.58	80. 3.58	80. 3.58	80. 3.58	81. 3.58	82. 3.58	82. 3.58	82. 3.58	<u>83.</u> 3.58
HYDROGRAPH AT	P	.03	1 FLOW TIME	15. 3.58	40. 3.58	41. 3.58	41. 3.58	41. 3.58	42. 3.58	42. 3.58	42. 3.58	<u>42.</u> 3.58
COMBINED AT	PTP	.09	1 FLOW TIME	47. 3.58	120. 3.58	121. 3.58	121. 3.58	122. 3.58	123. 3.58	123. 3.58	124. 3.58	<u>126.</u> 3.58
ROUTED TO	4	.09	1 FLOW TIME	45. 3.58	117. 3.58	118. 3.58	119. 3.58	119. 3.58	121. 3.58	121. 3.58	122. 3.58	<u>123.</u> 3.58
HYDROGRAPH AT	F	.06	1 FLOW TIME	47. 3.58	104. 3.58	104. 3.58	105. 3.58	105. 3.58	106. 3.58	107. 3.58	107. 3.58	<u>108.</u> 3.58
2 COMBINED AT	PTA4	.16	1 FLOW TIME	92. 3.58	221. 3.58	222. 3.58	223. 3.58	225. 3.58	227. 3.58	227. 3.58	<u>229.</u> 3.58	231. 3.58
ROUTED TO	G	.16	1 FLOW TIME	89. 3.58	218. 3.58	219. 3.58	220. 3.58	221. 3.58	223. 3.58	224. 3.58	<u>225.</u> 3.58	228. 3.58
HYDROGRAPH AT	G	.05	1 FLOW TIME	36. 3.58	79. 3.58	80. 3.58	80. 3.58	80. 3.58	81. 3.58	81. 3.58	82. 3.58	<u>82.</u> 3.58
2 COMBINED AT	PTG	.20	1 FLOW TIME	125. 3.58	297. 3.58	298. 3.58	300. 3.58	301. 3.58	304. 3.58	305. 3.58	<u>307.</u> 3.58	310. 3.58
ROUTED TO	A3	.20	1 FLOW TIME	122. 3.58	293. 3.58	294. 3.58	296. 3.58	297. 3.58	300. 3.58	301. 3.58	<u>303.</u> 3.58	306. 3.58
HYDROGRAPH AT	N	.04	1 FLOW TIME	33. 3.58	73. 3.50	73. 3.50	74. 3.50	74. 3.50	75. 3.50	75. 3.50	75. 3.50	<u>76.</u> 3.50
HYDROGRAPH AT	O	.04	1 FLOW TIME	29. 3.58	64. 3.50	64. 3.50	64. 3.50	64. 3.50	65. 3.50	65. 3.50	66. 3.50	<u>66.</u> 3.50
2 COMBINED AT	PTN	.08	1 FLOW	62.	137.	137.	138.	138.	140.	140.	141.	<u>142.</u>

				TIME	3.58	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50
ROUTED TO	A3	.08	1	FLOW TIME	62. 3.58	135. 3.58	135. 3.58	136. 3.58	136. 3.58	137. 3.58	138. 3.58	139. 3.58	<u>140.</u> 3.58
HYDROGRAPH AT	H	.01	1	FLOW TIME	15. 3.50	28. 3.50	28. 3.50	28. 3.50	28. 3.50	29. 3.50	29. 3.50	29. 3.50	<u>29.</u> 3.50
3 COMBINED AT	PTA3	.30	1	FLOW TIME	196. 3.58	452. 3.58	454. 3.58	455. 3.58	458. 3.58	462. 3.58	<u>463.</u> 3.58	466. 3.58	471. 3.58
ROUTED TO	A2	.30	1	FLOW TIME	189. 3.58	445. 3.58	447. 3.58	448. 3.58	451. 3.58	455. 3.58	<u>456.</u> 3.58	459. 3.58	464. 3.58
HYDROGRAPH AT	I	.03	1	FLOW TIME	20. 3.50	45. 3.50	45. 3.50	45. 3.50	45. 3.50	46. 3.50	46. 3.50	46. 3.50	<u>47.</u> 3.50
2 COMBINED AT	PT A	.32	1	FLOW TIME	208. 3.58	486. 3.58	488. 3.58	490. 3.58	493. 3.58	497. 3.58	<u>498.</u> 3.58	501. 3.58	507. 3.58
HYDROGRAPH AT	V	.05	1	FLOW TIME	37. 3.50	82. 3.50	82. 3.50	83. 3.50	83. 3.50	84. 3.50	84. 3.50	84. 3.50	<u>85.</u> 3.50
ROUTED TO	Q	.05	1	FLOW TIME	36. 3.58	79. 3.58	80. 3.58	80. 3.58	80. 3.58	81. 3.58	81. 3.58	82. 3.58	<u>83.</u> 3.58
HYDROGRAPH AT	Q	.05	1	FLOW TIME	23. 3.58	63. 3.58	63. 3.58	63. 3.58	64. 3.58	64. 3.58	64. 3.58	65. 3.58	<u>66.</u> 3.58
COMBINED AT	PTQ	.10	1	FLOW TIME	59. 3.58	142. 3.58	143. 3.58	143. 3.58	144. 3.58	145. 3.58	146. 3.58	147. 3.58	<u>148.</u> 3.58
ROUTED TO	R	.10	1	FLOW TIME	58. 3.58	141. 3.58	142. 3.58	142. 3.58	143. 3.58	144. 3.58	145. 3.58	146. 3.58	<u>147.</u> 3.58
HYDROGRAPH AT	R	.05	1	FLOW TIME	23. 3.58	63. 3.58	63. 3.58	63. 3.58	64. 3.58	64. 3.58	65. 3.58	65. 3.58	<u>66.</u> 3.58
2 COMBINED AT	PTR	.15	1	FLOW TIME	81. 3.58	204. 3.58	205. 3.58	206. 3.58	207. 3.58	209. 3.58	209. 3.58	<u>211.</u> 3.58	213. 3.58
ROUTED TO	S	.15	1	FLOW TIME	79. 3.58	202. 3.58	203. 3.58	204. 3.58	205. 3.58	207. 3.58	207. 3.58	<u>209.</u> 3.58	211. 3.58
HYDROGRAPH AT	S	.04	1	FLOW TIME	31. 3.50	69. 3.50	69. 3.50	69. 3.50	70. 3.50	70. 3.50	71. 3.50	71. 3.50	<u>72.</u> 3.50
2 COMBINED AT	PTS	.19	1	FLOW TIME	109. 3.58	266. 3.58	267. 3.58	269. 3.58	270. 3.58	273. 3.58	273. 3.58	<u>275.</u> 3.58	278. 3.58
ROUTED TO	ES1	.19	1	FLOW TIME	109. 3.58	265. 3.58	267. 3.58	268. 3.58	270. 3.58	272. 3.58	273. 3.58	<u>274.</u> 3.58	278. 3.58
HYDROGRAPH AT	U	.04	1	FLOW TIME	31. 3.58	69. 3.58	69. 3.58	69. 3.58	70. 3.58	70. 3.58	70. 3.58	71. 3.58	<u>72.</u> 3.58
ROUTED TO	T1	.04	1	FLOW TIME	31. 3.58	68. 3.58	68. 3.58	69. 3.58	69. 3.58	69. 3.58	70. 3.58	70. 3.58	<u>71.</u> 3.58
HYDROGRAPH AT	T	.04	1	FLOW	29.	64.	64.	65.	65.	65.	66.	66.	<u>67.</u>

				TIME	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50
ROUTED TO	T1	.04	1	FLOW TIME	28. 3.58	63. 3.50	63. 3.50	63. 3.50	64. 3.50	64. 3.50	64. 3.50	65. 3.50	<u>65.</u> 3.50
2 COMBINED AT	PT T1	.08	1	FLOW TIME	59. 3.58	130. 3.58	130. 3.58	131. 3.58	132. 3.58	133. 3.58	133. 3.58	134. 3.58	<u>135.</u> 3.58
ROUTED TO	ES1(S)	.08	1	FLOW TIME	58. 3.58	129. 3.58	130. 3.58	130. 3.58	131. 3.58	132. 3.58	132. 3.58	133. 3.58	<u>135.</u> 3.58
HYDROGRAPH AT	ES1	.02	1	FLOW TIME	17. 3.50	34. 3.50	34. 3.50	34. 3.50	34. 3.50	35. 3.50	35. 3.50	35. 3.50	<u>35.</u> 3.50
HYDROGRAPH AT	CH1	.01	1	FLOW TIME	9. 3.50	18. 3.50	18. 3.50	18. 3.50	18. 3.50	18. 3.50	18. 3.50	18. 3.50	<u>18.</u> 3.50
3 COMBINED AT	PTES1	.10	1	FLOW TIME	78. 3.58	173. 3.50	173. 3.50	174. 3.50	175. 3.50	176. 3.50	177. 3.50	178. 3.50	<u>180.</u> 3.50
2 COMBINED AT	PTES1	.29	1	FLOW TIME	187. 3.58	433. 3.58	435. 3.58	437. 3.58	439. 3.58	443. 3.58	<u>444.</u> 3.58	447. 3.58	452. 3.58
ROUTED TO	NP-1	.29	1	FLOW TIME	186. 3.58	432. 3.58	434. 3.58	436. 3.58	439. 3.58	442. 3.58	<u>444.</u> 3.58	446. 3.58	451. 3.58
HYDROGRAPH AT	NP-1	.01	1	FLOW TIME	4. 3.58	11. 3.58	11. 3.58	11. 3.58	11. 3.58	11. 3.58	11. 3.58	11. 3.58	<u>12.</u> 3.58
COMBINED AT	NP-1	.30	1	FLOW TIME	190. 3.58	443. 3.58	446. 3.58	447. 3.58	450. 3.58	453. 3.58	<u>455.</u> 3.58	457. 3.58	463. 3.58
ROUTED TO	L2	.30	1	FLOW TIME	188. 3.58	442. 3.58	444. 3.58	446. 3.58	449. 3.58	452. 3.58	<u>454.</u> 3.58	456. 3.58	461. 3.58
HYDROGRAPH AT	L2	.01	1	FLOW TIME	8. 3.58	20. 3.58	20. 3.58	20. 3.58	21. 3.58	21. 3.58	21. 3.58	21. 3.58	<u>21.</u> 3.58
2 COMBINED AT	PTL2	.31	1	FLOW TIME	196. 3.58	462. 3.58	464. 3.58	466. 3.58	469. 3.58	473. 3.58	<u>474.</u> 3.58	477. 3.58	482. 3.58
ROUTED TO	M	.31	1	FLOW TIME	194. 3.58	460. 3.58	463. 3.58	464. 3.58	467. 3.58	470. 3.58	<u>472.</u> 3.58	475. 3.58	481. 3.58
HYDROGRAPH AT	M	.04	1	FLOW TIME	32. 3.50	71. 3.50	72. 3.50	72. 3.50	72. 3.50	73. 3.50	73. 3.50	73. 3.50	<u>74.</u> 3.50
2 COMBINED AT	M	.35	1	FLOW TIME	222. 3.58	522. 3.58	524. 3.58	526. 3.58	529. 3.58	<u>533.</u> 3.58	535. 3.58	538. 3.58	544. 3.58
ROUTED TO	K2	.35	1	FLOW TIME	221. 3.58	520. 3.58	523. 3.58	525. 3.58	528. 3.58	<u>532.</u> 3.58	534. 3.58	536. 3.58	543. 3.58
HYDROGRAPH AT	K2	.03	1	FLOW TIME	13. 3.58	35. 3.58	35. 3.58	35. 3.58	35. 3.58	35. 3.58	36. 3.58	36. 3.58	<u>36.</u> 3.58
2 COMBINED AT	K2	.38	1	FLOW TIME	233. 3.58	555. 3.58	557. 3.58	560. 3.58	563. 3.58	<u>567.</u> 3.58	569. 3.58	572. 3.58	579. 3.58
ROUTED TO	A2	.38	1	FLOW	231. 3.58	552. 3.58	556. 3.58	558. 3.58	561. 3.58	<u>565.</u> 3.58	568. 3.58	570. 3.58	577. 3.58

				TIME	3.58	3.58	3.58	3.58	3.58	3.58	3.58	3.58	3.58
2 COMBINED AT	PT A	.70	1	FLOW TIME	440. 3.58	1038. 3.58	1043. 3.58	<u>1048.</u> 3.58	1054. 3.58	1062. 3.58	1066. 3.58	1071. 3.58	1084. 3.58
ROUTED TO	J2	.70	1	FLOW TIME	434. 3.58	1032. 3.58	1037. 3.58	<u>1041.</u> 3.58	1047. 3.58	1055. 3.58	1059. 3.58	1065. 3.58	1077. 3.58
HYDROGRAPH AT	J2	.01	1	FLOW TIME	8. 3.58	20. 3.58	20. 3.58	20. 3.58	21. 3.58	21. 3.58	21. 3.58	21. 3.58	<u>21.</u> 3.58
2 COMBINED AT	J2	.71	1	FLOW TIME	442. 3.58	1052. 3.58	<u>1057.</u> 3.58	1061. 3.58	1067. 3.58	1076. 3.58	1080. 3.58	1085. 3.58	1099. 3.58
ROUTED TO	A1(W)	.71	1	FLOW TIME	435. 3.58	1044. 3.58	<u>1050.</u> 3.58	1054. 3.58	1060. 3.58	1069. 3.58	1072. 3.58	1078. 3.58	1091. 3.58
HYDROGRAPH AT	TWA1	.03	1	FLOW TIME	28. 3.58	53. 3.58	53. 3.58	53. 3.58	53. 3.58	54. 3.58	54. 3.58	54. 3.58	<u>54.</u> 3.58
ROUTED TO	K1	.03	1	FLOW TIME	27. 3.58	52. 3.58	52. 3.58	52. 3.58	52. 3.58	52. 3.58	53. 3.58	53. 3.58	<u>53.</u> 3.58
HYDROGRAPH AT	SUM1	.03	1	FLOW TIME	33. 3.58	62. 3.58	62. 3.58	62. 3.58	63. 3.58	63. 3.58	63. 3.58	63. 3.58	<u>64.</u> 3.58
HYDROGRAPH AT	L1	.02	1	FLOW TIME	10. 3.58	26. 3.58	26. 3.58	26. 3.58	26. 3.58	26. 3.58	26. 3.58	27. 3.58	<u>27.</u> 3.58
COMBINED AT	L1	.08	1	FLOW TIME	69. 3.58	139. 3.58	140. 3.58	140. 3.58	141. 3.58	142. 3.58	142. 3.58	143. 3.58	<u>144.</u> 3.58
ROUTED TO	K1	.08	1	FLOW TIME	68. 3.58	138. 3.58	138. 3.58	139. 3.58	139. 3.58	140. 3.58	141. 3.58	141. 3.58	<u>143.</u> 3.58
HYDROGRAPH AT	K1	.02	1	FLOW TIME	12. 3.58	31. 3.58	31. 3.58	31. 3.58	32. 3.58	32. 3.58	32. 3.58	32. 3.58	<u>33.</u> 3.58
2 COMBINED AT	PTK1	.10	1	FLOW TIME	80. 3.58	169. 3.58	169. 3.58	170. 3.58	171. 3.58	172. 3.58	173. 3.58	174. 3.58	<u>175.</u> 3.58
ROUTED TO	A1(S)	.10	1	FLOW TIME	80. 3.58	168. 3.58	169. 3.58	169. 3.58	170. 3.58	172. 3.58	172. 3.58	173. 3.58	<u>175.</u> 3.58
HYDROGRAPH AT	J1	.02	1	FLOW TIME	12. 3.58	31. 3.58	31. 3.58	31. 3.58	32. 3.58	32. 3.58	32. 3.58	32. 3.58	<u>33.</u> 3.58
2 COMBINED AT	PTA1	.12	1	FLOW TIME	91. 3.58	199. 3.58	200. 3.58	201. 3.58	202. 3.58	203. 3.58	204. 3.58	205. 3.58	<u>207.</u> 3.58
HYDROGRAPH AT	SUM2	.02	1	FLOW TIME	17. 3.58	31. 3.58	31. 3.58	31. 3.58	32. 3.58	32. 3.58	32. 3.58	32. 3.58	<u>32.</u> 3.58
3 COMBINED AT	PTA1	.85	1	FLOW TIME	543. 3.58	1275. 3.58	<u>1281.</u> 3.58	1286. 3.58	1294. 3.58	1304. 3.58	1308. 3.58	1315. 3.58	1330. 3.58
HYDROGRAPH AT	X	.06	1	FLOW TIME	41. 3.58	95. 3.58	95. 3.58	95. 3.58	96. 3.58	97. 3.58	97. 3.58	98. 3.58	<u>99.</u> 3.58
ROUTED TO	V	.06	1	FLOW	40.	94.	94.	94.	95.	96.	96.	97.	<u>98.</u>

				TIME	3.58	3.58	3.58	3.58	3.58	3.58	3.58	3.58	3.58
HYDROGRAPH AT	Y	.04	1	FLOW TIME	25. 3.58	56. 3.58	56. 3.58	57. 3.58	57. 3.58	57. 3.58	57. 3.58	58. 3.58	<u>58.</u> 3.58
2 COMBINED AT	PT Y	.09	1	FLOW TIME	65. 3.58	150. 3.58	150. 3.58	151. 3.58	152. 3.58	153. 3.58	153. 3.58	154. 3.58	<u>156.</u> 3.58
ROUTED TO	Z	.09	1	FLOW TIME	63. 3.58	148. 3.58	149. 3.58	149. 3.58	150. 3.58	151. 3.58	152. 3.58	153. 3.58	<u>154.</u> 3.58
HYDROGRAPH AT	Z	.04	1	FLOW TIME	25. 3.58	57. 3.50	57. 3.50	58. 3.50	58. 3.50	59. 3.50	59. 3.50	59. 3.50	<u>60.</u> 3.50
2 COMBINED AT	PTZ	.13	1	FLOW TIME	88. 3.58	204. 3.58	205. 3.58	206. 3.58	207. 3.58	208. 3.58	209. 3.58	210. 3.58	<u>212.</u> 3.58
ROUTED TO	HS	.13	1	FLOW TIME	83. 3.58	199. 3.58	200. 3.58	201. 3.58	202. 3.58	204. 3.58	204. 3.58	206. 3.58	<u>208.</u> 3.58
HYDROGRAPH AT	HS	.06	1	FLOW TIME	43. 3.58	98. 3.58	99. 3.58	99. 3.58	100. 3.58	100. 3.58	101. 3.58	101. 3.58	<u>102.</u> 3.58
2 COMBINED AT	PTHS	.19	1	FLOW TIME	125. 3.58	298. 3.58	299. 3.58	300. 3.58	302. 3.58	304. 3.58	305. 3.58	<u>307.</u> 3.58	310. 3.58
HYDROGRAPH AT	ES2	.02	1	FLOW TIME	12. 3.50	27. 3.50	27. 3.50	28. 3.50	28. 3.50	28. 3.50	28. 3.50	28. 3.50	<u>28.</u> 3.50
ROUTED TO	CH2	.02	1	FLOW TIME	11. 3.50	27. 3.50	27. 3.50	27. 3.50	27. 3.50	27. 3.50	27. 3.50	27. 3.50	<u>28.</u> 3.50
HYDROGRAPH AT	CH2	.01	1	FLOW TIME	5. 3.50	12. 3.50	13. 3.50	13. 3.50	13. 3.50	13. 3.50	13. 3.50	13. 3.50	<u>13.</u> 3.50
2 COMBINED AT	PTCH2	.02	1	FLOW TIME	17. 3.50	39. 3.50	39. 3.50	39. 3.50	40. 3.50	40. 3.50	40. 3.50	40. 3.50	<u>41.</u> 3.50
ROUTED TO	E	.02	1	FLOW TIME	16. 3.58	37. 3.58	37. 3.58	37. 3.58	37. 3.58	38. 3.58	38. 3.58	38. 3.58	<u>38.</u> 3.58
HYDROGRAPH AT	E	.06	1	FLOW TIME	29. 3.58	78. 3.58	78. 3.58	79. 3.58	79. 3.58	80. 3.58	80. 3.58	81. 3.58	<u>82.</u> 3.58
2 COMBINED AT	PTE	.08	1	FLOW TIME	45. 3.58	115. 3.58	115. 3.58	116. 3.58	116. 3.58	118. 3.58	118. 3.58	119. 3.58	<u>120.</u> 3.58
ROUTED TO	RES	.08	1	FLOW TIME	44. 3.58	113. 3.58	114. 3.58	114. 3.58	115. 3.58	116. 3.58	117. 3.58	117. 3.58	<u>119.</u> 3.58
HYDROGRAPH AT	RES	.02	1	FLOW TIME	9. 3.58	24. 3.58	24. 3.58	25. 3.58	25. 3.58	25. 3.58	25. 3.58	25. 3.58	<u>25.</u> 3.58
2 COMBINED AT	PTRES	.10	1	FLOW TIME	53. 3.58	138. 3.58	138. 3.58	139. 3.58	140. 3.58	141. 3.58	142. 3.58	142. 3.58	<u>144.</u> 3.58
ROUTED TO	C(N)	.10	1	FLOW TIME	51. 3.58	136. 3.58	137. 3.58	137. 3.58	138. 3.58	139. 3.58	140. 3.58	141. 3.58	<u>142.</u> 3.58
HYDROGRAPH AT	D1	.04	1	FLOW	14.	39.	39.	39.	40.	40.	40.	40.	<u>41.</u>

				TIME	3.67	3.67	3.67	3.67	3.67	3.67	3.67	3.67	3.67
ROUTED TO	D2	.04	1	FLOW TIME	14. 3.67	39. 3.67	39. 3.67	39. 3.67	39. 3.67	40. 3.67	40. 3.67	40. 3.67	<u>41.</u> 3.67
HYDROGRAPH AT	C1	.03	1	FLOW TIME	14. 3.67	37. 3.67	37. 3.67	37. 3.67	38. 3.67	38. 3.67	38. 3.67	38. 3.67	<u>39.</u> 3.67
ROUTED TO	D2	.03	1	FLOW TIME	14. 3.67	37. 3.67	37. 3.67	37. 3.67	38. 3.67	38. 3.67	38. 3.67	38. 3.67	<u>39.</u> 3.67
HYDROGRAPH AT	D2	.03	1	FLOW TIME	14. 3.67	37. 3.67	37. 3.67	37. 3.67	38. 3.67	38. 3.67	38. 3.67	38. 3.67	<u>39.</u> 3.67
3 COMBINED AT	PT D2	.10	1	FLOW TIME	42. 3.67	113. 3.67	113. 3.67	114. 3.67	115. 3.67	116. 3.67	116. 3.67	117. 3.67	<u>118.</u> 3.67
ROUTED TO	A2-1	.10	1	FLOW TIME	41. 3.67	113. 3.67	113. 3.67	114. 3.67	115. 3.67	116. 3.67	116. 3.67	117. 3.67	<u>118.</u> 3.67
HYDROGRAPH AT	A2	.03	1	FLOW TIME	20. 3.58	44. 3.58	44. 3.58	45. 3.58	45. 3.58	45. 3.58	45. 3.58	46. 3.58	<u>46.</u> 3.58
ROUTED TO	A2-1	.03	1	FLOW TIME	20. 3.58	44. 3.58	44. 3.58	44. 3.58	45. 3.58	45. 3.58	45. 3.58	45. 3.58	<u>46.</u> 3.58
2 COMBINED AT	PT A2	.13	1	FLOW TIME	60. 3.67	152. 3.67	153. 3.67	154. 3.67	155. 3.67	156. 3.67	157. 3.67	158. 3.67	<u>160.</u> 3.67
ROUTED TO	A1	.13	1	FLOW TIME	59. 3.67	152. 3.67	153. 3.67	154. 3.67	155. 3.67	156. 3.67	156. 3.67	157. 3.67	<u>159.</u> 3.67
HYDROGRAPH AT	A1	.03	1	FLOW TIME	21. 3.58	47. 3.58	48. 3.58	48. 3.58	48. 3.58	48. 3.58	49. 3.58	49. 3.58	<u>49.</u> 3.58
2 COMBINED AT	PT A	.16	1	FLOW TIME	78. 3.67	195. 3.67	196. 3.67	196. 3.67	198. 3.67	199. 3.67	200. 3.67	<u>201.</u> 3.67	204. 3.67
ROUTED TO	C(S)	.16	1	FLOW TIME	78. 3.67	194. 3.67	195. 3.67	196. 3.67	197. 3.67	199. 3.67	200. 3.67	<u>201.</u> 3.67	203. 3.67
2 COMBINED AT	PT C	.26	1	FLOW TIME	126. 3.67	325. 3.58	326. 3.58	328. 3.58	330. 3.58	333. 3.58	<u>334.</u> 3.58	336. 3.58	340. 3.58
HYDROGRAPH AT	B&	.03	1	FLOW TIME	23. 3.58	47. 3.58	47. 3.58	47. 3.58	48. 3.58	48. 3.58	48. 3.58	48. 3.58	<u>49.</u> 3.58
HYDROGRAPH AT	C2	.03	1	FLOW TIME	13. 3.58	35. 3.58	35. 3.58	35. 3.58	35. 3.58	36. 3.58	36. 3.58	36. 3.58	<u>36.</u> 3.58

LINE	ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10
608	KM Ti 5.91 MIN
609	KM Tt 3.60 MIN
610	KM Tc 9.51 MIN
611	KM CN 88.0
612	BA .016
613	LS 0 88.0
614	UD .095
615	KK CH2
616	KM ROUTE POINT ES2 TO POINT CH2
617	RK 500 .005 .016 0 CIRC 24 0
618	KK CH2
619	KM
620	KM AREA 5.0 AC
621	KM LENGTH 750 FT
622	KM SLOPE 2.7 %
623	KM VELOCITY 5.03 FPS
624	KM Ti 5.91 MIN
625	KM Tt 2.50 MIN
626	KM Tc 8.41 MIN
627	KM CN 88.0
628	BA .0078
629	LS 0 88.0
630	UD .084
631	KK PTCH2
632	KM COMBINE POINT CH2 AND POINT ES2
633	HC 2
634	KK E
635	KM ROUTE POINT CH2 TO POINT E
636	RK 1050 .032 .016 0 TRAP 50 0
637	KK E
638	KM
639	KM AREA 37.0 AC
640	KM LENGTH 1600 FT
641	KM SLOPE 3.3 %
642	KM VELOCITY 5.56 FPS
643	KM Ti 7.03 MIN
644	KM Tt 5.57 MIN
645	KM Tc 12.60 MIN
646	KM CN 83.3
647	BA .058
648	LS 0 83.3
649	UD .126
650	KK PTE
651	KM COMBINE POINT E AND POINT CH2 AT POINT E
652	HC 2

LINE	ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10
653	KK RES
654	KM ROUTE POINT E TO POINT RES
655	RK 670 .022 .016 0 TRAP 126 0
656	KK RES
657	KM
658	KM AREA 11.6 AC
659	KM LENGTH 1050 FT
660	KM SLOPE 2.9 %
661	KM VELOCITY 5.21 FPS
662	KM Ti 7.03 MIN
663	KM Tt 4.18 MIN
664	KM Tc 11.21 MIN
665	KM CN 83.3
666	BA .018
667	LS 0 83.3
668	UD .112
669	KK PTRES
670	KM COMBINE POINTS RES AND POINT E
671	HC 2
672	KK C(N)
673	KM ROUTE POINT RES TO POINT C(N)
674	RK 650 .04 .016 0 TRAP 126 0
675	KK D1
676	KM
677	KM AREA 22.2 AC
678	KM LENGTH 2000 FT
679	KM SLOPE 2.8 %
680	KM VELOCITY 5.81 FPS
681	KM Ti 16.1 MIN
682	KM Tt 5.7 MIN
683	KM Tc 22 MIN
684	KM CN 83.3
685	BA .035
686	LS 0 83.3
687	UD .22
688	KK D2
689	KM ROUTE POINT D1 TO POINT D2
690	RK 535 .005 .014 0 CIRC 36 0
691	KK C1
692	KM
693	KM AREA 19.5 AC
694	KM LENGTH 1550 FT
695	KM SLOPE 2.5 %
696	KM VELOCITY 4.84 FPS
697	KM Ti 16.1 MIN
698	KM Tt 5.4 MIN
699	KM Tc 21 MIN
700	KM CN 83.3

LINE	ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10
745	KK A1
746	KM ROUTE POINT A2-1 TO POINT A1
747	RK 825 .022 .016 0 TRAP 95 0
748	KK A1
749	KM
750	KM AREA 19.1 AC
751	KM LENGTH 1450 FT
752	KM SLOPE 2.3 %
753	KM VELOCITY 4.64 FPS
754	KM Ti 12.1 MIN
755	KM Tt 5.3 MIN
756	KM Tc 17 MIN
757	KM CN 89.5
758	BA .030
759	LS 0 89.5
760	UD .17
761	KK PT A1
762	KM COMBINE POINTS A1 AND A2 AT POINT A1
763	HC 2
764	KK C(S)
765	KM ROUTE PT(A1 TO POINT C(S)
766	RK 350 .022 .016 0 TRAP 95 0
767	KK PT C
768	KM COMBINE POINT C(S) AND POINT C(N)
769	HC 2
770	KK B&DC1
771	KM
772	KM AREA 16.7 AC
773	KM LENGTH 1000 FT
774	KM SLOPE 1.2 %
775	KM VELOCITY 3.30 FPS
776	KM Ti 8.0 MIN
777	KM Tt 5.1 MIN
778	KM Tc 13.10 MIN
779	KM CN 92.0
780	BA .026
781	LS 0 92.0
782	UD .13
783	KK C2
784	KM
785	KM AREA 12.2 AC
786	KM LENGTH 1550 FT
787	KM SLOPE 2.5 %
788	KM VELOCITY 4.80 FPS
789	KM Ti 16.1 MIN
790	KM Tt 5.4 MIN
791	KM Tc 21.50 MIN
792	KM CN 83.3

LINE	ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10
793	BA .026
794	LS 0 83.3
795	UD .13
796	ZZ

SCHEMATIC DIAGRAM OF STREAM NETWORK

INPUT
TIME

(V) ROUTING

(--->) DIVERSION OR PUMP FLOW

NO.

(.) CONNECTOR

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

18	W		
	V		
	V		
40	NP-2		
	.		
	.		
43	.	NP-2	
	.	.	
	.	.	
56	PTNP2.....		
	V		
	V		
59	P		
	.		
	.		
62	.	P	
	.	.	
	.	.	
75	PTP.....		
	V		
	V		
78	4		
	.		
	.		
81	.	F	
	.	.	
	.	.	
94	PTA4.....		
	V		
	V		
97	G		
	.		
	.		
100	.	G	
	.	.	
	.	.	
113	PTG.....		
	V		
	V		
116	A3		
	.		
	.		
119	.	N	
	.	.	
	.	.	
132	.	.	0
	.	.	.
	.	.	.
145	.	PTN.....	
	.	V	
	.	V	
148	.	A3	
	.	.	

151	.	.		H
	.	.		.
	.	.		.
164	PTA3.....			
	V			
	V			
167	A2			
	.			
	.			
170	.	I		
	.	.		
	.	.		
183	PT A.....			
	.			
	.			
186	.	V		
	.	V		
	.	V		
199	.	Q		
	.	.		
	.	.		
202	.	.	Q	
	.	.	.	
	.	.	.	
215	.	PTQ.....		
	.	V		
	.	V		
218	.	R		
	.	.		
	.	.		
221	.	.	R	
	.	.	.	
	.	.	.	
234	.	PTR.....		
	.	V		
	.	V		
237	.	S		
	.	.		
	.	.		
240	.	.	S	
	.	.	.	
	.	.	.	
253	.	PTS.....		
	.	V		
	.	V		
256	.	ES1		
	.	.		
	.	.		
259	.	.	U	
	.	.	V	
	.	.	V	
272	.	.	T1	
	.	.	.	
	.	.	.	
275	.	.	.	T
	.	.	.	V
	.	.	.	V
288	.	.	.	T1
	.	.	.	.

291	.	.	PT T1.....	.
	.	.	V	
	.	.	V	
04	.	.	ES1(S)	
	.	.	.	
297	.	.	ES1	
	.	.	.	
310	.	.	.	CH1
	.	.	.	.
323	.	.	PTES1.....	
	.	.	.	
326	.	.	PTES1.....	
	.	.	V	
	.	.	V	
329	.	.	NP-1	
	.	.	.	
332	.	.	NP-1	
	.	.	.	
345	.	.	NP-1.....	
	.	.	V	
	.	.	V	
348	.	.	L2	
	.	.	.	
351	.	.	L2	
	.	.	.	
364	.	.	PTL2.....	
	.	.	V	
	.	.	V	
367	.	.	M	
	.	.	.	
370	.	.	M	
	.	.	.	
383	.	.	M.....	
	.	.	V	
	.	.	V	
386	.	.	K2	
	.	.	.	
389	.	.	K2	
	.	.	.	
402	.	.	K2.....	
	.	.	V	
	.	.	V	
05	.	.	A2	
	.	.	.	
408	.	.	PT A.....	
	.	.	V	

411	V			
	J2			
	.			
	.			
414	.	J2		
	.	.		
	.	.		
427	J2.....			
	V			
	V			
430	A1(W)			
	.			
	.			
433	.	TWA1		
	.	V		
	.	V		
446	.	K1		
	.	.		
	.	.		
449	.	.	SUM1	
	.	.	.	
	.	.	.	
462	.	.	.	L1
	.	.	.	.
	.	.	.	.
475	.	L1.....		
	.	V		
	.	V		
478	.	K1		
	.	.		
	.	.		
481	.	.	K1	
	.	.	.	
	.	.	.	
494	.	PTK1.....		
	.	V		
	.	V		
497	.	A1(S)		
	.	.		
	.	.		
500	.	.	J1	
	.	.	.	
	.	.	.	
513	.	PTA1.....		
	.	.		
	.	.		
516	.	.	SUM2	
	.	.	.	
	.	.	.	
529	PTA1.....			
	.			
	.			
532	.	X		
	.	V		
	.	V		
545	.	V		
	.	.		
	.	.		
548	.	.	Y	
	.	.	.	

561	.	.	.
	.	PT V.....	
	.	V	
	.	V	
564	.	Z	
	.	.	
	.	.	
567	.	.	Z
	.	.	.
	.	.	.
580	.	PTZ.....	
	.	V	
	.	V	
583	.	HS	
	.	.	
	.	.	
586	.	.	HS
	.	.	.
	.	.	.
599	.	PTHS.....	
	.	.	
	.	.	
602	.	.	ES2
	.	.	V
	.	.	V
615	.	.	CH2
	.	.	.
	.	.	.
618	.	.	CH2
	.	.	.
	.	.	.
631	.	.	PTCH2.....
	.	.	V
	.	.	V
634	.	.	E
	.	.	.
	.	.	.
637	.	.	E
	.	.	.
	.	.	.
650	.	.	PTE.....
	.	.	V
	.	.	V
653	.	.	RES
	.	.	.
	.	.	.
656	.	.	RES
	.	.	.
	.	.	.
669	.	.	PTRES.....
	.	.	V
	.	.	V
672	.	.	C(N)
	.	.	.
	.	.	.
575	.	.	D1
	.	.	V
	.	.	V
688	.	.	D2
	.	.	.

691	.	.	.	.	C1	
	.	.	.	.	V	
	.	.	.	.	V	
4	.	.	.	.	D2	
	.	.	.	.	.	
707	.	.	.	.	.	D2
	.	.	.	.	.	.
	.	.	.	.	.	.
720	.	.	.	PT D2.....		
	.	.	.	V		
	.	.	.	V		
723	.	.	.	A2-1		
	.	.	.	.		
	.	.	.	.		
726	.	.	.	.	A2	
	.	.	.	.	V	
	.	.	.	.	V	
739	.	.	.	.	A2-1	
	.	.	.	.	.	
	.	.	.	.	.	
742	.	.	.	PT A2.....		
	.	.	.	V		
	.	.	.	V		
745	.	.	.	A1		
	.	.	.	.		
	.	.	.	.		
748	.	.	.	.	A1	
	.	.	.	.	.	
	.	.	.	.	.	
761	.	.	.	PT A.....		
	.	.	.	V		
	.	.	.	V		
764	.	.	.	C(S)		
	.	.	.	.		
	.	.	.	.		
767	.	.	PT C.....			
	.	.	.	.		
	.	.	.	.		
770	.	.	.	B&		
	.	.	.	.		
	.	.	.	.		
783	.	.	.	.	C2	

(***) RUNOFF ALSO COMPUTED AT THIS LOCATION

```

*****
*                               *
* FLOOD HYDROGRAPH PACKAGE (HEC-1) *
*   SEPTEMBER 1990             *
*   VERSION 4.0                *
*                               *
* RUN DATE 01/18/1996 TIME 04:51:40 *
*                               *
*****

```

```

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

```

```

*****
* .....*
* : SUMMERLIN VILLAGE 11 : *
* : PROPOSED CONDITONS : *
* : D. BLATCHFORD : *
* .....*
* : RETURN PERIOD _ _ _ 10 & 100-YEAR : *
* : DISTRIBUTION _ _ _ 6-HOUR SDN3 : *
* : PROJECT NO _ _ _ _ 62011.032H : *
* : FILENAME _ _ _ _ _ VIL11E.H1 : *
* : DATE _ _ _ _ _ 10/95 : *
* : MODELED BY _ _ _ _ D. BLATCHFORD : *
* .....*
*****

```

```

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

```

```

IT HYDROGRAPH TIME DATA
      NMIN      5 MINUTES IN COMPUTATION INTERVAL
      IDATE     1 0 STARTING DATE
      ITIME     0000 STARTING TIME
      NQ        300 NUMBER OF HYDROGRAPH ORDINATES
      NDDATE    2 0 ENDING DATE
      NDTIME    0055 ENDING TIME
      ICENT     19 CENTURY MARK

```

```

      COMPUTATION INTERVAL .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

```

```

JP MULTI-PLAN OPTION
      NPLAN      1 NUMBER OF PLANS

```

```

JR MULTI-RATIO OPTION
      RATIOS OF PRECIPITATION

```

.56 .97 .97 .98 .98 .99 .99 .99 1.00

*** FDKRUT WARNING TIME STEP CALCULATION FAILED TO CONVERGE. STABILITY PROBLEMS MAY RESULT

*** FDKRUT WARNING TIME STEP CALCULATION FAILED TO CONVERGE. STABILITY PROBLEMS MAY RESULT

*** FDKRUT WARNING TIME STEP CALCULATION FAILED TO CONVERGE. STABILITY PROBLEMS MAY RESULT

*** FDKRUT WARNING TIME STEP CALCULATION FAILED TO CONVERGE. STABILITY PROBLEMS MAY RESULT

*** FDKRUT WARNING TIME STEP CALCULATION FAILED TO CONVERGE. STABILITY PROBLEMS MAY RESULT

*** FDKRUT WARNING TIME STEP CALCULATION FAILED TO CONVERGE. STABILITY PROBLEMS MAY RESULT

*** FDKRUT WARNING TIME STEP CALCULATION FAILED TO CONVERGE. STABILITY PROBLEMS MAY RESULT

*** FDKRUT WARNING TIME STEP CALCULATION FAILED TO CONVERGE. STABILITY PROBLEMS MAY RESULT

*** FDKRUT WARNING TIME STEP CALCULATION FAILED TO CONVERGE. STABILITY PROBLEMS MAY RESULT

*** FDKRUT WARNING TIME STEP CALCULATION FAILED TO CONVERGE. STABILITY PROBLEMS MAY RESULT

*** FDKRUT WARNING TIME STEP CALCULATION FAILED TO CONVERGE. STABILITY PROBLEMS MAY RESULT

*** FDKRUT WARNING TIME STEP CALCULATION FAILED TO CONVERGE. STABILITY PROBLEMS MAY RESULT

*** FDKRUT WARNING TIME STEP CALCULATION FAILED TO CONVERGE. STABILITY PROBLEMS MAY RESULT

*** FDKRUT WARNING TIME STEP CALCULATION FAILED TO CONVERGE. STABILITY PROBLEMS MAY RESULT

*** FDKRUT WARNING TIME STEP CALCULATION FAILED TO CONVERGE. STABILITY PROBLEMS MAY RESULT

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

OPERATION	STATION	AREA	PLAN	RATIOS APPLIED TO PRECIPITATION								
				RATIO 1	RATIO 2	RATIO 3	RATIO 4	RATIO 5	RATIO 6	RATIO 7	RATIO 8	RATIO 9
				.56	.97	.97	.98	.98	.99	.99	.99	1.00
HYDROGRAPH AT	W	.05	1 FLOW TIME	35. 3.58	80. 3.58	80. 3.58	81. 3.58	81. 3.58	82. 3.58	82. 3.58	83. 3.58	<u>84.</u> 3.58
ROUTED TO	NP-2	.05	1 FLOW TIME	34. 3.58	79. 3.58	80. 3.58	80. 3.58	80. 3.58	81. 3.58	81. 3.58	82. 3.58	<u>83.</u> 3.58
HYDROGRAPH AT	NP-2	.01	1 FLOW TIME	0. 4.92	3. 3.67	3. 3.67	3. 3.67	3. 3.67	3. 3.67	3. 3.67	4. 3.67	<u>4.</u> 3.67
2 COMBINED AT	PTNP2	.06	1 FLOW TIME	34. 3.58	82. 3.58	83. 3.58	83. 3.58	84. 3.58	84. 3.58	85. 3.58	85. 3.58	<u>86.</u> 3.58
ROUTED TO	P	.06	1 FLOW TIME	32. 3.58	80. 3.58	80. 3.58	80. 3.58	81. 3.58	82. 3.58	82. 3.58	82. 3.58	<u>83.</u> 3.58
HYDROGRAPH AT	P	.03	1 FLOW TIME	15. 3.58	40. 3.58	41. 3.58	41. 3.58	41. 3.58	42. 3.58	42. 3.58	42. 3.58	<u>42.</u> 3.58
COMBINED AT	PTP	.09	1 FLOW TIME	47. 3.58	120. 3.58	121. 3.58	121. 3.58	122. 3.58	123. 3.58	123. 3.58	124. 3.58	<u>126.</u> 3.58
ROUTED TO	4	.09	1 FLOW TIME	45. 3.58	117. 3.58	118. 3.58	119. 3.58	119. 3.58	121. 3.58	121. 3.58	122. 3.58	<u>123.</u> 3.58
HYDROGRAPH AT	F	.06	1 FLOW TIME	47. 3.58	104. 3.58	104. 3.58	105. 3.58	105. 3.58	106. 3.58	107. 3.58	107. 3.58	<u>108.</u> 3.58
2 COMBINED AT	PTA4	.16	1 FLOW TIME	92. 3.58	221. 3.58	222. 3.58	223. 3.58	225. 3.58	227. 3.58	227. 3.58	<u>229.</u> 3.58	231. 3.58
ROUTED TO	G	.16	1 FLOW TIME	89. 3.58	218. 3.58	219. 3.58	220. 3.58	221. 3.58	223. 3.58	224. 3.58	<u>225.</u> 3.58	228. 3.58
HYDROGRAPH AT	G	.05	1 FLOW TIME	36. 3.58	79. 3.58	80. 3.58	80. 3.58	80. 3.58	81. 3.58	81. 3.58	82. 3.58	<u>82.</u> 3.58
2 COMBINED AT	PTG	.20	1 FLOW TIME	125. 3.58	297. 3.58	298. 3.58	300. 3.58	301. 3.58	304. 3.58	305. 3.58	<u>307.</u> 3.58	310. 3.58
ROUTED TO	A3	.20	1 FLOW TIME	122. 3.58	293. 3.58	294. 3.58	296. 3.58	297. 3.58	300. 3.58	301. 3.58	<u>303.</u> 3.58	306. 3.58
HYDROGRAPH AT	N	.04	1 FLOW TIME	33. 3.58	73. 3.50	73. 3.50	74. 3.50	74. 3.50	75. 3.50	75. 3.50	75. 3.50	<u>76.</u> 3.50
HYDROGRAPH AT	O	.04	1 FLOW TIME	29. 3.58	64. 3.50	64. 3.50	64. 3.50	64. 3.50	65. 3.50	65. 3.50	66. 3.50	<u>66.</u> 3.50
2 COMBINED AT	PTN	.08	1 FLOW	62.	137.	137.	138.	138.	140.	140.	141.	<u>142.</u>

				TIME	3.58	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50
ROUTED TO	A3	.08	1	FLOW TIME	62. 3.58	135. 3.58	135. 3.58	136. 3.58	136. 3.58	137. 3.58	138. 3.58	139. 3.58	<u>140.</u> 3.58
HYDROGRAPH AT	H	.01	1	FLOW TIME	15. 3.50	28. 3.50	28. 3.50	28. 3.50	28. 3.50	29. 3.50	29. 3.50	29. 3.50	<u>29.</u> 3.50
3 COMBINED AT	PTA3	.30	1	FLOW TIME	196. 3.58	452. 3.58	454. 3.58	455. 3.58	458. 3.58	462. 3.58	<u>463.</u> 3.58	466. 3.58	471. 3.58
ROUTED TO	A2	.30	1	FLOW TIME	189. 3.58	445. 3.58	447. 3.58	448. 3.58	451. 3.58	455. 3.58	<u>456.</u> 3.58	459. 3.58	464. 3.58
HYDROGRAPH AT	I	.03	1	FLOW TIME	20. 3.50	45. 3.50	45. 3.50	45. 3.50	45. 3.50	46. 3.50	46. 3.50	46. 3.50	<u>47.</u> 3.50
2 COMBINED AT	PT A	.32	1	FLOW TIME	208. 3.58	486. 3.58	488. 3.58	490. 3.58	493. 3.58	497. 3.58	<u>498.</u> 3.58	501. 3.58	507. 3.58
HYDROGRAPH AT	V	.05	1	FLOW TIME	37. 3.50	82. 3.50	82. 3.50	83. 3.50	83. 3.50	84. 3.50	84. 3.50	84. 3.50	<u>85.</u> 3.50
ROUTED TO	Q	.05	1	FLOW TIME	36. 3.58	79. 3.58	80. 3.58	80. 3.58	80. 3.58	81. 3.58	81. 3.58	82. 3.58	<u>83.</u> 3.58
HYDROGRAPH AT	Q	.05	1	FLOW TIME	23. 3.58	63. 3.58	63. 3.58	63. 3.58	64. 3.58	64. 3.58	64. 3.58	65. 3.58	<u>66.</u> 3.58
COMBINED AT	PTQ	.10	1	FLOW TIME	59. 3.58	142. 3.58	143. 3.58	143. 3.58	144. 3.58	145. 3.58	146. 3.58	147. 3.58	<u>148.</u> 3.58
ROUTED TO	R	.10	1	FLOW TIME	58. 3.58	141. 3.58	142. 3.58	142. 3.58	143. 3.58	144. 3.58	145. 3.58	146. 3.58	<u>147.</u> 3.58
HYDROGRAPH AT	R	.05	1	FLOW TIME	23. 3.58	63. 3.58	63. 3.58	63. 3.58	64. 3.58	64. 3.58	65. 3.58	65. 3.58	<u>66.</u> 3.58
2 COMBINED AT	PTR	.15	1	FLOW TIME	81. 3.58	204. 3.58	205. 3.58	206. 3.58	207. 3.58	209. 3.58	209. 3.58	<u>211.</u> 3.58	213. 3.58
ROUTED TO	S	.15	1	FLOW TIME	79. 3.58	202. 3.58	203. 3.58	204. 3.58	205. 3.58	207. 3.58	207. 3.58	<u>209.</u> 3.58	211. 3.58
HYDROGRAPH AT	S	.04	1	FLOW TIME	31. 3.50	69. 3.50	69. 3.50	69. 3.50	70. 3.50	70. 3.50	71. 3.50	71. 3.50	<u>72.</u> 3.50
2 COMBINED AT	PTS	.19	1	FLOW TIME	109. 3.58	266. 3.58	267. 3.58	269. 3.58	270. 3.58	273. 3.58	273. 3.58	<u>275.</u> 3.58	278. 3.58
ROUTED TO	ES1	.19	1	FLOW TIME	109. 3.58	265. 3.58	267. 3.58	268. 3.58	270. 3.58	272. 3.58	273. 3.58	<u>274.</u> 3.58	278. 3.58
HYDROGRAPH AT	U	.04	1	FLOW TIME	31. 3.58	69. 3.58	69. 3.58	69. 3.58	70. 3.58	70. 3.58	70. 3.58	71. 3.58	<u>72.</u> 3.58
ROUTED TO	T1	.04	1	FLOW TIME	31. 3.58	68. 3.58	68. 3.58	69. 3.58	69. 3.58	69. 3.58	70. 3.58	70. 3.58	<u>71.</u> 3.58
HYDROGRAPH AT	T	.04	1	FLOW	29.	64.	64.	65.	65.	65.	66.	66.	<u>67.</u>

				TIME	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50
ROUTED TO	T1	.04	1	FLOW TIME	28. 3.58	63. 3.50	63. 3.50	63. 3.50	64. 3.50	64. 3.50	64. 3.50	65. 3.50	<u>65.</u> 3.50
2 COMBINED AT	PT T1	.08	1	FLOW TIME	59. 3.58	130. 3.58	130. 3.58	131. 3.58	132. 3.58	133. 3.58	133. 3.58	134. 3.58	<u>135.</u> 3.58
ROUTED TO	ES1(S)	.08	1	FLOW TIME	58. 3.58	129. 3.58	130. 3.58	130. 3.58	131. 3.58	132. 3.58	132. 3.58	133. 3.58	<u>135.</u> 3.58
HYDROGRAPH AT	ES1	.02	1	FLOW TIME	17. 3.50	34. 3.50	34. 3.50	34. 3.50	34. 3.50	35. 3.50	35. 3.50	35. 3.50	<u>35.</u> 3.50
HYDROGRAPH AT	CH1	.01	1	FLOW TIME	9. 3.50	18. 3.50	18. 3.50	18. 3.50	18. 3.50	18. 3.50	18. 3.50	18. 3.50	<u>18.</u> 3.50
3 COMBINED AT	PTES1	.10	1	FLOW TIME	78. 3.58	173. 3.50	173. 3.50	174. 3.50	175. 3.50	176. 3.50	177. 3.50	178. 3.50	<u>180.</u> 3.50
2 COMBINED AT	PTES1	.29	1	FLOW TIME	187. 3.58	433. 3.58	435. 3.58	437. 3.58	439. 3.58	443. 3.58	<u>444.</u> 3.58	447. 3.58	452. 3.58
ROUTED TO	NP-1	.29	1	FLOW TIME	186. 3.58	432. 3.58	434. 3.58	436. 3.58	439. 3.58	442. 3.58	<u>444.</u> 3.58	446. 3.58	451. 3.58
HYDROGRAPH AT	NP-1	.01	1	FLOW TIME	4. 3.58	11. 3.58	11. 3.58	11. 3.58	11. 3.58	11. 3.58	11. 3.58	11. 3.58	<u>12.</u> 3.58
COMBINED AT	NP-1	.30	1	FLOW TIME	190. 3.58	443. 3.58	446. 3.58	447. 3.58	450. 3.58	453. 3.58	<u>455.</u> 3.58	457. 3.58	463. 3.58
ROUTED TO	L2	.30	1	FLOW TIME	188. 3.58	442. 3.58	444. 3.58	446. 3.58	449. 3.58	452. 3.58	<u>454.</u> 3.58	456. 3.58	461. 3.58
HYDROGRAPH AT	L2	.01	1	FLOW TIME	8. 3.58	20. 3.58	20. 3.58	20. 3.58	21. 3.58	21. 3.58	21. 3.58	21. 3.58	<u>21.</u> 3.58
2 COMBINED AT	PTL2	.31	1	FLOW TIME	196. 3.58	462. 3.58	464. 3.58	466. 3.58	469. 3.58	473. 3.58	<u>474.</u> 3.58	477. 3.58	482. 3.58
ROUTED TO	M	.31	1	FLOW TIME	194. 3.58	460. 3.58	463. 3.58	464. 3.58	467. 3.58	470. 3.58	<u>472.</u> 3.58	475. 3.58	481. 3.58
HYDROGRAPH AT	M	.04	1	FLOW TIME	32. 3.50	71. 3.50	72. 3.50	72. 3.50	72. 3.50	73. 3.50	73. 3.50	73. 3.50	<u>74.</u> 3.50
2 COMBINED AT	M	.35	1	FLOW TIME	222. 3.58	522. 3.58	524. 3.58	526. 3.58	529. 3.58	<u>533.</u> 3.58	535. 3.58	538. 3.58	544. 3.58
ROUTED TO	K2	.35	1	FLOW TIME	221. 3.58	520. 3.58	523. 3.58	525. 3.58	528. 3.58	<u>532.</u> 3.58	534. 3.58	536. 3.58	543. 3.58
HYDROGRAPH AT	K2	.03	1	FLOW TIME	13. 3.58	35. 3.58	35. 3.58	35. 3.58	35. 3.58	35. 3.58	36. 3.58	36. 3.58	<u>36.</u> 3.58
2 COMBINED AT	K2	.38	1	FLOW TIME	233. 3.58	555. 3.58	557. 3.58	560. 3.58	563. 3.58	<u>567.</u> 3.58	569. 3.58	572. 3.58	579. 3.58
ROUTED TO	A2	.38	1	FLOW	231. 3.58	552. 3.58	556. 3.58	558. 3.58	561. 3.58	<u>565.</u> 3.58	568. 3.58	570. 3.58	577. 3.58

				TIME	3.58	3.58	3.58	3.58	3.58	3.58	3.58	3.58	3.58
2 COMBINED AT	PT A	.70	1	FLOW TIME	440. 3.58	1038. 3.58	1043. 3.58	<u>1048.</u> 3.58	1054. 3.58	1062. 3.58	1066. 3.58	1071. 3.58	1084. 3.58
ROUTED TO	J2	.70	1	FLOW TIME	434. 3.58	1032. 3.58	1037. 3.58	<u>1041.</u> 3.58	1047. 3.58	1055. 3.58	1059. 3.58	1065. 3.58	1077. 3.58
HYDROGRAPH AT	J2	.01	1	FLOW TIME	8. 3.58	20. 3.58	20. 3.58	20. 3.58	21. 3.58	21. 3.58	21. 3.58	21. 3.58	<u>21.</u> 3.58
2 COMBINED AT	J2	.71	1	FLOW TIME	442. 3.58	1052. 3.58	<u>1057.</u> 3.58	1061. 3.58	1067. 3.58	1076. 3.58	1080. 3.58	1085. 3.58	1099. 3.58
ROUTED TO	A1(W)	.71	1	FLOW TIME	435. 3.58	1044. 3.58	<u>1050.</u> 3.58	1054. 3.58	1060. 3.58	1069. 3.58	1072. 3.58	1078. 3.58	1091. 3.58
HYDROGRAPH AT	TWA1	.03	1	FLOW TIME	28. 3.58	53. 3.58	53. 3.58	53. 3.58	53. 3.58	54. 3.58	54. 3.58	54. 3.58	<u>54.</u> 3.58
ROUTED TO	K1	.03	1	FLOW TIME	27. 3.58	52. 3.58	52. 3.58	52. 3.58	52. 3.58	52. 3.58	53. 3.58	53. 3.58	<u>53.</u> 3.58
HYDROGRAPH AT	SUM1	.03	1	FLOW TIME	33. 3.58	62. 3.58	62. 3.58	62. 3.58	63. 3.58	63. 3.58	63. 3.58	63. 3.58	<u>64.</u> 3.58
HYDROGRAPH AT	L1	.02	1	FLOW TIME	10. 3.58	26. 3.58	26. 3.58	26. 3.58	26. 3.58	26. 3.58	26. 3.58	27. 3.58	<u>27.</u> 3.58
COMBINED AT	L1	.08	1	FLOW TIME	69. 3.58	139. 3.58	140. 3.58	140. 3.58	141. 3.58	142. 3.58	142. 3.58	143. 3.58	<u>144.</u> 3.58
ROUTED TO	K1	.08	1	FLOW TIME	68. 3.58	138. 3.58	138. 3.58	139. 3.58	139. 3.58	140. 3.58	141. 3.58	141. 3.58	<u>143.</u> 3.58
HYDROGRAPH AT	K1	.02	1	FLOW TIME	12. 3.58	31. 3.58	31. 3.58	31. 3.58	32. 3.58	32. 3.58	32. 3.58	32. 3.58	<u>33.</u> 3.58
2 COMBINED AT	PTK1	.10	1	FLOW TIME	80. 3.58	169. 3.58	169. 3.58	170. 3.58	171. 3.58	172. 3.58	173. 3.58	174. 3.58	<u>175.</u> 3.58
ROUTED TO	A1(S)	.10	1	FLOW TIME	80. 3.58	168. 3.58	169. 3.58	169. 3.58	170. 3.58	172. 3.58	172. 3.58	173. 3.58	<u>175.</u> 3.58
HYDROGRAPH AT	J1	.02	1	FLOW TIME	12. 3.58	31. 3.58	31. 3.58	31. 3.58	32. 3.58	32. 3.58	32. 3.58	32. 3.58	<u>33.</u> 3.58
2 COMBINED AT	PTA1	.12	1	FLOW TIME	91. 3.58	199. 3.58	200. 3.58	201. 3.58	202. 3.58	203. 3.58	204. 3.58	205. 3.58	<u>207.</u> 3.58
HYDROGRAPH AT	SUM2	.02	1	FLOW TIME	17. 3.58	31. 3.58	31. 3.58	31. 3.58	32. 3.58	32. 3.58	32. 3.58	32. 3.58	<u>32.</u> 3.58
3 COMBINED AT	PTA1	.85	1	FLOW TIME	543. 3.58	1275. 3.58	<u>1281.</u> 3.58	1286. 3.58	1294. 3.58	1304. 3.58	1308. 3.58	1315. 3.58	1330. 3.58
HYDROGRAPH AT	X	.06	1	FLOW TIME	41. 3.58	95. 3.58	95. 3.58	95. 3.58	96. 3.58	97. 3.58	97. 3.58	98. 3.58	<u>99.</u> 3.58
ROUTED TO	V	.06	1	FLOW	40.	94.	94.	94.	95.	96.	96.	97.	<u>98.</u>

				TIME	3.58	3.58	3.58	3.58	3.58	3.58	3.58	3.58	3.58
HYDROGRAPH AT	Y	.04	1	FLOW TIME	25. 3.58	56. 3.58	56. 3.58	57. 3.58	57. 3.58	57. 3.58	57. 3.58	58. 3.58	<u>58.</u> 3.58
2 COMBINED AT	PT Y	.09	1	FLOW TIME	65. 3.58	150. 3.58	150. 3.58	151. 3.58	152. 3.58	153. 3.58	153. 3.58	154. 3.58	<u>156.</u> 3.58
ROUTED TO	Z	.09	1	FLOW TIME	63. 3.58	148. 3.58	149. 3.58	149. 3.58	150. 3.58	151. 3.58	152. 3.58	153. 3.58	<u>154.</u> 3.58
HYDROGRAPH AT	Z	.04	1	FLOW TIME	25. 3.58	57. 3.50	57. 3.50	58. 3.50	58. 3.50	59. 3.50	59. 3.50	59. 3.50	<u>60.</u> 3.50
2 COMBINED AT	PTZ	.13	1	FLOW TIME	88. 3.58	204. 3.58	205. 3.58	206. 3.58	207. 3.58	208. 3.58	209. 3.58	210. 3.58	<u>212.</u> 3.58
ROUTED TO	HS	.13	1	FLOW TIME	83. 3.58	199. 3.58	200. 3.58	201. 3.58	202. 3.58	204. 3.58	204. 3.58	206. 3.58	<u>208.</u> 3.58
HYDROGRAPH AT	HS	.06	1	FLOW TIME	43. 3.58	98. 3.58	99. 3.58	99. 3.58	100. 3.58	100. 3.58	101. 3.58	101. 3.58	<u>102.</u> 3.58
2 COMBINED AT	PTHS	.19	1	FLOW TIME	125. 3.58	298. 3.58	299. 3.58	300. 3.58	302. 3.58	304. 3.58	305. 3.58	<u>307.</u> 3.58	310. 3.58
HYDROGRAPH AT	ES2	.02	1	FLOW TIME	12. 3.50	27. 3.50	27. 3.50	28. 3.50	28. 3.50	28. 3.50	28. 3.50	28. 3.50	<u>28.</u> 3.50
ROUTED TO	CH2	.02	1	FLOW TIME	11. 3.50	27. 3.50	27. 3.50	27. 3.50	27. 3.50	27. 3.50	27. 3.50	27. 3.50	<u>28.</u> 3.50
HYDROGRAPH AT	CH2	.01	1	FLOW TIME	5. 3.50	12. 3.50	13. 3.50	13. 3.50	13. 3.50	13. 3.50	13. 3.50	13. 3.50	<u>13.</u> 3.50
2 COMBINED AT	PTCH2	.02	1	FLOW TIME	17. 3.50	39. 3.50	39. 3.50	39. 3.50	40. 3.50	40. 3.50	40. 3.50	40. 3.50	<u>41.</u> 3.50
ROUTED TO	E	.02	1	FLOW TIME	16. 3.58	37. 3.58	37. 3.58	37. 3.58	37. 3.58	38. 3.58	38. 3.58	38. 3.58	<u>38.</u> 3.58
HYDROGRAPH AT	E	.06	1	FLOW TIME	29. 3.58	78. 3.58	78. 3.58	79. 3.58	79. 3.58	80. 3.58	80. 3.58	81. 3.58	<u>82.</u> 3.58
2 COMBINED AT	PTE	.08	1	FLOW TIME	45. 3.58	115. 3.58	115. 3.58	116. 3.58	116. 3.58	118. 3.58	118. 3.58	119. 3.58	<u>120.</u> 3.58
ROUTED TO	RES	.08	1	FLOW TIME	44. 3.58	113. 3.58	114. 3.58	114. 3.58	115. 3.58	116. 3.58	117. 3.58	117. 3.58	<u>119.</u> 3.58
HYDROGRAPH AT	RES	.02	1	FLOW TIME	9. 3.58	24. 3.58	24. 3.58	25. 3.58	25. 3.58	25. 3.58	25. 3.58	25. 3.58	<u>25.</u> 3.58
2 COMBINED AT	PTRES	.10	1	FLOW TIME	53. 3.58	138. 3.58	138. 3.58	139. 3.58	140. 3.58	141. 3.58	142. 3.58	142. 3.58	<u>144.</u> 3.58
ROUTED TO	C(N)	.10	1	FLOW TIME	51. 3.58	136. 3.58	137. 3.58	137. 3.58	138. 3.58	139. 3.58	140. 3.58	141. 3.58	<u>142.</u> 3.58
HYDROGRAPH AT	D1	.04	1	FLOW	14.	39.	39.	39.	40.	40.	40.	40.	<u>41.</u>

				TIME	3.67	3.67	3.67	3.67	3.67	3.67	3.67	3.67	3.67
ROUTED TO	D2	.04	1	FLOW TIME	14. 3.67	39. 3.67	39. 3.67	39. 3.67	39. 3.67	40. 3.67	40. 3.67	40. 3.67	<u>41.</u> 3.67
HYDROGRAPH AT	C1	.03	1	FLOW TIME	14. 3.67	37. 3.67	37. 3.67	37. 3.67	38. 3.67	38. 3.67	38. 3.67	38. 3.67	<u>39.</u> 3.67
ROUTED TO	D2	.03	1	FLOW TIME	14. 3.67	37. 3.67	37. 3.67	37. 3.67	38. 3.67	38. 3.67	38. 3.67	38. 3.67	<u>39.</u> 3.67
HYDROGRAPH AT	D2	.03	1	FLOW TIME	14. 3.67	37. 3.67	37. 3.67	37. 3.67	38. 3.67	38. 3.67	38. 3.67	38. 3.67	<u>39.</u> 3.67
3 COMBINED AT	PT D2	.10	1	FLOW TIME	42. 3.67	113. 3.67	113. 3.67	114. 3.67	115. 3.67	116. 3.67	116. 3.67	117. 3.67	<u>118.</u> 3.67
ROUTED TO	A2-1	.10	1	FLOW TIME	41. 3.67	113. 3.67	113. 3.67	114. 3.67	115. 3.67	116. 3.67	116. 3.67	117. 3.67	<u>118.</u> 3.67
HYDROGRAPH AT	A2	.03	1	FLOW TIME	20. 3.58	44. 3.58	44. 3.58	45. 3.58	45. 3.58	45. 3.58	45. 3.58	46. 3.58	<u>46.</u> 3.58
ROUTED TO	A2-1	.03	1	FLOW TIME	20. 3.58	44. 3.58	44. 3.58	44. 3.58	45. 3.58	45. 3.58	45. 3.58	45. 3.58	<u>46.</u> 3.58
2 COMBINED AT	PT A2	.13	1	FLOW TIME	60. 3.67	152. 3.67	153. 3.67	154. 3.67	155. 3.67	156. 3.67	157. 3.67	158. 3.67	<u>160.</u> 3.67
ROUTED TO	A1	.13	1	FLOW TIME	59. 3.67	152. 3.67	153. 3.67	154. 3.67	155. 3.67	156. 3.67	156. 3.67	157. 3.67	<u>159.</u> 3.67
HYDROGRAPH AT	A1	.03	1	FLOW TIME	21. 3.58	47. 3.58	48. 3.58	48. 3.58	48. 3.58	48. 3.58	49. 3.58	49. 3.58	<u>49.</u> 3.58
2 COMBINED AT	PT A	.16	1	FLOW TIME	78. 3.67	195. 3.67	196. 3.67	196. 3.67	198. 3.67	199. 3.67	200. 3.67	<u>201.</u> 3.67	204. 3.67
ROUTED TO	C(S)	.16	1	FLOW TIME	78. 3.67	194. 3.67	195. 3.67	196. 3.67	197. 3.67	199. 3.67	200. 3.67	<u>201.</u> 3.67	203. 3.67
2 COMBINED AT	PT C	.26	1	FLOW TIME	126. 3.67	325. 3.58	326. 3.58	328. 3.58	330. 3.58	333. 3.58	<u>334.</u> 3.58	336. 3.58	340. 3.58
HYDROGRAPH AT	B&	.03	1	FLOW TIME	23. 3.58	47. 3.58	47. 3.58	47. 3.58	48. 3.58	48. 3.58	48. 3.58	48. 3.58	<u>49.</u> 3.58
HYDROGRAPH AT	C2	.03	1	FLOW TIME	13. 3.58	35. 3.58	35. 3.58	35. 3.58	35. 3.58	36. 3.58	36. 3.58	36. 3.58	<u>36.</u> 3.58

TIME OF CONCENTRATION

DEVELOPMENT SUMMERLIN VILLAGES 11

CALCULATED BY DBB DATE 10/18/95

EXISTING AND PROPOSED CONDITIONS

SUB-BASIN DATA			INITIAL/OVERLAND TIME (Ti)			TRAVEL TIME (Tt)				Tc CHECK (URBANIZED BASINS)		FINAL Tc	REMARKS
DESIG	K	AREA AC	LENGTH FT	SLOPE %	Ti MIN	LENGTH FT	SLOPE %	VEL. FPS	Tt MIN	TOTAL LENGTH	Tc=(L/180)+10 MIN	MIN	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	
A-1	0.80	19.0	500	1.0	12.1	1450	2.3	4.6	5.3	1950	21	17	PROPOSED
A-2	0.80	17.5	500	1.0	12.1	1300	21.9	4.0	5.4	1800	20	17	PROPOSED
B&DC1	0.90	16.7	500	1.0	8.0	1000	1.2	3.3	5.1	1500	18	13	PROPOSED
C1	0.70	19.5	500	1.0	16.1	1550	2.5	4.8	5.4	2050	21	21	PROPOSED
C2	0.70	12.2	500	1.0	16.1	1550	2.2	4.8	5.4	2050	21	21	PROPOSED
CH-1	0.86	4.8	100	1.0	4.3	400	3.2	5.5	1.2	500	13	6	PROPOSED
CH-2	0.77	5.0	100	1.0	4.7	750	2.7	5.0	2.5	850	15	8	PROPOSED
COS-1	0.40	4.6	100	1.0	12.6	1800	0.6	2.4	12.7	1900	21	25	NONURB
D1	0.70	22.2	500	1.0	16.1	2000	2.8	5.8	5.7	2500	24	22	PROPOSED
D2	0.70	9.8	500	1.0	16.1	1800	2.8	5.8	5.2	2300	23	21	PROPOSED
DC-3	0.90	7.6	100	1.0	3.6	1800	0.5	5.6	5.4	1900	21	9	PROPOSED
E	0.71	37.0	100	1.0	7.0	1600	3.3	5.6	4.8	1700	19	12	PROPOSED
ES-1	0.84	10.5	100	1.0	4.7	1000	3.0	5.3	3.1	1100	16	8	PROPOSED
ES-2	0.77	10.0	100	1.0	5.9	950	2.1	4.4	3.6	1050	16	10	PROPOSED

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

$$Tc = Ti + Tt$$

$$K = .0132CN - 0.39$$

TIME OF CONCENTRATION

DEVELOPMENT SUMMERLIN VILLAGE 11

CALCULATED BY DBB DATE 10/18/95

EXISTING AND PROPOSED CONDITIONS

SUB-BASIN DATA			INITIAL/OVERLAND TIME (Ti)			TRAVEL TIME (Tt)				Tc CHECK (URBANIZED BASINS)		FINAL Tc	REMARKS
DESIG	K	AREA AC	LENGTH FT	SLOPE %	Ti MIN	LENGTH FT	SLOPE %	VEL. FPS	Tt MIN	TOTAL LENGTH	Tc=(L/180)+10 MIN	MIN	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	
F	0.79	40.7	100	1.0	5.6	2450	2.3	4.6	8.9	2550	24	14	PROPOSED
G	0.79	30.2	100	1.0	5.6	2000	2.5	4.8	6.9	2100	22	13	PROPOSED
H	0.86	8.0	100	1.0	4.3	1050	1.5	3.8	4.6	1150	16	9	PROPOSED
HS	0.77	40.0	100	1.0	5.9	2650	2.6	4.9	9.0	2750	25	15	PROPOSED
I	0.79	16.0	100	1.0	5.6	1300	3.0	5.3	4.1	1400	18	10	PROPOSED
J1	0.71	14.5	100	1.0	7.0	1300	2.7	5.0	4.3	1400	18	11	PROPOSED
J2	0.71	9.5	100	1.0	7.0	1350	2.2	4.5	5.0	1450	18	12	PROPOSED
K1	0.71	14.9	100	1.0	7.0	1350	2.4	4.7	4.8	1450	18	12	PROPOSED
K2	0.71	16.6	100	1.0	7.0	1400	1.4	3.6	6.5	1500	18	14	PROPOSED
L1	0.71	11.9	100	1.0	7.0	1700	3.8	6.0	4.7	1800	20	12	PROPOSED
L2	0.71	9.8	100	1.0	7.0	1100	2.2	4.5	4.1	1200	17	11	PROPOSED
M	0.79	24.6	100	1.0	5.6	1200	4.2	6.2	3.2	1300	17	9	PROPOSED
N	0.79	27.7	100	1.0	5.6	1850	3.5	5.7	5.4	1950	21	11	PROPOSED
NP-1	0.67	6.0	100	1.0	7.7	700	2.9	5.2	2.2	800	14	10	PROPOSED

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

$$T_c = T_i + T_t$$

$$K = .0132CN - 0.39$$

TIME OF CONCENTRATION

DEVELOPMENT SUMMERLIN VILLAGE 11

CALCULATED BY DBB DATE 10/18/95

EXISTING AND PROPOSED CONDITIONS

SUB-BASIN DATA			INITIAL/OVERLAND TIME (Ti)			TRAVEL TIME (Tt)				Tc CHECK (URBANIZED BASINS)		FINAL Tc	REMARKS
DESIG	K	AREA AC	LENGTH FT	SLOPE %	Ti MIN	LENGTH FT	SLOPE %	VEL. FPS	Tt MIN	TOTAL LENGTH	Tc=(L/180)+10 MIN	MIN	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	
NP-2	0.42	8.2	100	1.0	12.2	850	3.1	5.4	2.6	950	15	15	PROPOSED
O	0.79	23.6	100	1.0	5.6	1650	3.1	5.4	5.1	1750	20	11	PROPOSED
P	0.71	19.7	100	1.0	7.0	1250	2.0	4.3	4.8	1350	18	12	PROPOSED
Q	0.71	33.7	100	1.0	7.0	1950	1.0	3.0	10.8	2050	21	18	PROPOSED
R	0.69	31.3	100	1.0	7.4	1500	3.7	5.9	4.2	1600	19	12	PROPOSED
ROW-1	0.86	31.5	100	1.0	4.3	3800	5.0	5.0	12.7	3900	32	17	PROPOSED
S	0.79	25.3	100	1.0	5.6	1700	4.4	6.4	4.4	1800	20	10	PROPOSED
T	0.79	23.4	100	1.0	5.6	1450	4.1	6.2	3.9	1550	19	9	PROPOSED
TWA1	0.86	17.6	100	1.0	4.3	2300	2.0	4.3	8.9	2400	23	13	PROPOSED
U	0.79	26.0	100	1.0	5.6	1800	1.7	4.0	7.5	1900	21	13	PROPOSED
V	0.79	30.0	100	1.0	5.6	1700	3.8	6.0	4.7	1800	20	10	PROPOSED
W	0.71	31.9	100	1.0	7.0	1850	3.2	5.5	5.6	1950	21	13	PROPOSED
X	0.77	37.9	100	1.0	5.9	2100	3.0	5.3	6.6	2200	22	13	PROPOSED
Y	0.77	22.2	100	1.0	5.9	1700	3.0	5.3	5.3	1800	20	11	PROPOSED
Z	0.77	22.3	100	1.0	5.9	1700	3.8	6.0	4.7	1800	20	11	PROPOSED

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

$$T_c = T_i + T_t$$

$$K = .0132CN - 0.39$$

CALCULATED BY	DBB	DATE	11/09/95
---------------	-----	------	----------

[illegible]

$$K = .0132CN - 0.39$$

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

*DIAGRAM

```

1 ID *****
2 ID * ..... *
3 ID * : SUMMERLIN VILLAGE 12 : *
4 ID * : PROPOSED CONDITONS : *
5 ID * : D. BLATCHFORD : *
6 ID * : ..... : *
7 ID * : RETURN PERIOD _ _ _ 10 & 100-YEAR : *
8 ID * : DISTRIBUTION _ _ _ 6-HOUR SDN3 : *
9 ID * : PROJECT NO _ _ _ G2012.032H : *
10 ID * : FILENAME _ _ _ VIL12.H1 : *
11 ID * : DATE _ _ _ 6/13/95 : *
12 ID * : MODELED BY _ _ _ D. BLATCHFORD : *
13 ID * : ..... : *
14 ID *****
15 IT 3 0 0 300
16 IO 5 0
17 IN 5 0 0
18 JR PREC .56 0.74 .973 .976 .98 .986 .988 .992 1.00

19 KK QQ
20 KM
21 KM AREA 11.9 AC
22 KM LENGTH 1700 FT
23 KM SLOPE 2.1 %
24 KM VELOCITY 4.43 FPS
25 KM Ti 4.50 MIN
26 KM Tt 6.40 MIN
27 KM Tc 10.90 MIN
28 KM CN 92
29 BA .018
30 PB 3.15
31 PC 0.000 .0200 .0570 .0700 .0870 .1080 .1240 .1300 .1300 .1300
32 PC .1300 .1300 .1300 .1330 .1400 .1420 .1480 .1580 .1720 .1810
33 PC .1900 .1970 .1990 .2000 .2010 .2040 .2140 .2290 .2410 .2490
34 PC .2510 .2560 .2700 .2780 .2810 .2830 .2950 .3220 .3520 .4090
35 PC .4990 .5900 .7100 .7440 .7810 .8120 .8190 .8350 .8510 .8560
36 PC .8600 .8680 .8760 .8880 .9100 .9260 .9370 .9500 .9700 .9760
37 PC .9820 .9850 .9870 .9890 .9900 .9930 .9930 .9940 .9950 .9980
38 PC .9980 .9990 1.000
39 LS 0 92
40 UD .109

41 KK PP/00
42 KM ROUTE POINT QQ TO POINT PP/00
43 RK 975 .018 .016 0 TRAP 40 0

44 KK 00
45 KM
46 KM AREA 35.3 AC
47 KM LENGTH 2400 FT
48 KM SLOPE 3.0 %
49 KM VELOCITY 5.30 FPS
50 KM Ti 5.60 MIN
51 KM Tt 7.50 MIN

```

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

52	KM	Tc	13.10	MIN					
53	KM	CN	89.5						
54	BA	.055							
55	LS	0	89.5						
56	UD	.131							
57	KK	PP							
58	KM								
59	KM	AREA	21.6	AC					
60	KM	LENGTH	1400	FT					
61	KM	SLOPE	3.3	%					
62	KM	VELOCITY	5.56	FPS					
63	KM	Ti	4.50	MIN					
64	KM	Tt	4.20	MIN					
65	KM	Tc	8.70	MIN					
66	KM	CN	92						
67	BA	.034							
68	LS	0	92						
69	UD	.087							
70	KK	PP/00							
71	KM	COMBINE POINT RR, PP, AND QQ AT POINT PP\00							
72	HC	3							
73	KK	KK							
74	KM	ROUTE POINT PP/00 TO POINT KK							
75	RK	1125	.022	.016	0	TRAP	60	0	
76	KK	KK							
77	KM								
78	KM	AREA	21.5	AC					
79	KM	LENGTH	2100	FT					
80	KM	SLOPE	3.6	%					
81	KM	VELOCITY	5.81	FPS					
82	KM	Ti	5.60	MIN					
83	KM	Tt	6.00	MIN					
84	KM	Tc	11.60	MIN					
85	KM	CN	89.5						
86	BA	.034							
87	LS	0	89.5						
88	UD	.116							
89	KK	KK							
90	KM	COMBINE POINT KK AND POINT PP/00 AT POINT KK							
91	HC	2							
92	KK	II							
93	KM	ROUTE POINT KK TO POINT II							
94	RK	600	.022	.016	0	TRAP	60	0	

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

95	KK	BB						
96	KM							
97	KM				AREA	87.2	AC	
98	KM				LENGTH	2400	FT	
99	KM				SLOPE	2.0	%	
100	KM				VELOCITY	4.33	FPS	
101	KM				Ti	4.25	MIN	
102	KM				Tt	37.58	MIN	
103	KM				Tc	41.8	MIN	
104	KM				CN	95		
105	BA	0.136						
106	LS	0	95					
107	UD	0.418						
108	KK	HH						
109	KM	ROUTE POINT BB TO POINT HH						
110	RK	200	.01	.016	0	CIRC	72	0
111	KK	HH						
112	KM							
113	KM	AREA	16.1	AC				
114	KM	LENGTH	1700	FT				
115	KM	SLOPE	1.7	%				
116	KM	VELOCITY	3.99	FPS				
117	KM	Ti	4.96	MIN				
118	KM	Tt	7.10	MIN				
119	KM	Tc	12.06	MIN				
120	KM	CN	92					
121	BA	.025						
122	LS	0	92					
123	UD	.120						
124	KK	HH						
125	KM	COMBINE POINTS HH AND BB						
126	HC	2						
127	KK	II						
128	KM	ROUTE POINT HH TO POINT II						
129	RK	300	.01	.016	0	TRAP	40	0
130	KK	II						
131	KM							
132	KM	AREA	16.5	AC				
133	KM	LENGTH	1600	FT				
134	KM	SLOPE	1.9	%				
135	KM	VELOCITY	4.22	FPS				
136	KM	Ti	4.50	MIN				
137	KM	Tt	6.30	MIN				
138	KM	Tc	10.80	MIN				
139	KM	CN	92					
140	BA	.026						
141	LS	0	92					
142	UD	.108						

LINE	ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10
143	KK II
144	KM COMBINE POINT II, POINT KK, AND POINT HH AT POINT II
145	HC 3
146	KK JJ
147	KM ROUTE POINT II TO POINT JJ
148	RK 200 .005 .016 0 CIRC 72 0
149	KK JJ
150	KM
151	KM AREA 13.3 AC
152	KM LENGTH 800 FT
153	KM SLOPE 3.1 %
154	KM VELOCITY 5.39 FPS
155	KM Ti 4.50 MIN
156	KM Tt 6.30 MIN
157	KM Tc 10.80 MIN
158	KM CN 92
159	BA .020
160	LS 0 92
161	UD .108
162	KK JJ
163	KM COMBINE POINT JJ AND POINT II AT POINT JJ
164	HC 2
165	KK JJ
166	KM ROUTE POINT JJ TO POINT A
167	RK 200 .005 .016 0 CIRC 72 0
168	KK FF
169	KM
170	KM AREA 6.7 AC
171	KM LENGTH 870 FT
172	KM SLOPE 1.4 %
173	KM VELOCITY 3.62 FPS
174	KM Ti 6.15 MIN
175	KM Tt 5.19 MIN
176	KM Tc 11.73 MIN
177	KM CN 95
178	BA .01
179	LS 0 95
180	UD .117
181	KK GG
182	KM
183	KM AREA 9.7 AC
184	KM LENGTH 900 FT
185	KM SLOPE 1.3 %
186	KM VELOCITY 3.49 FPS
187	KM Ti 5.67 MIN
188	KM Tt 5.53 MIN
189	KM Tc 11.20 MIN
190	KM CN 95

LINE	ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10
191	BA .015
192	LS 0 95
193	UD .112
194	KK FF/GG
195	KM COMBINE POINT FF AND POINT GG
196	HC 2
197	KK BB
198	KM ROUTE POINT FF/GG TO POINT BB
199	RK 525 .015 .016 0 TRAP 95 0
200	KK NN2
201	KM
202	KM AREA 14.2 AC
203	KM LENGTH 1300 FT
204	KM SLOPE 1.5 %
205	KM VELOCITY 3.8 FPS
206	KM Ti 5.6 MIN
207	KM Tt 5.7 MIN
208	KM Tc 11.1 MIN
209	KM CN 89.5
210	BA .022
211	LS 0 89.5
212	UD .111
213	KK MM
214	KM ROUTE POINT NN2 TO POINT MM
215	RK 750 .005 .016 0 TRAP 78 0
216	KK MM
217	KM
218	KM AREA 29.8 AC
219	KM LENGTH 2150 FT
220	KM SLOPE 2.5 %
221	KM VELOCITY 4.84 FPS
222	KM Ti 5.60 MIN
223	KM Tt 7.50 MIN
224	KM Tc 13.10 MIN
225	KM CN 89.5
226	BA .047
227	LS 0 89.5
228	UD .131
229	KK MM
230	KM COMBINE POINT MM AND POINT NN2
231	HC 2
232	KK LL2
233	KM
234	KM AREA 27.0 AC
235	KM LENGTH 1600 FT
236	KM SLOPE 1.6 %
237	KM VELOCITY 4.00 FPS
238	KM Ti 5.60 MIN

LINE	ID	1	2	3	4	5	6	7	8	9	10
239	KM		Tt	6.70	MIN						
240	KM		Tc	12.30	MIN						
241	KM		CN	89.5							
242	BA	.042									
243	LS	0	89.5								
244	UD	.123									
245	KK	EE2									
246	KM	ROUTE POINT LL2 TO POINT EE2									
247	RK	525	.025	.016	0	TRAP	78	0			
248	KK	EE2									
249	KM										
250	KM	AREA	13.3	AC							
251	KM	LENGTH	1300	FT							
252	KM	SLOPE	1.9	%							
253	KM	VELOCITY	4.20	FPS							
254	KM	Ti	5.60	MIN							
255	KM	Tt	5.20	MIN							
256	KM	Tc	10.80	MIN							
257	KM	CN	89.5								
258	BA	.020									
259	LS	0	89.5								
260	UD	.108									
261	KK	EE2									
262	KM	COMBINE POINT LL2 AND POINT EE2 AT POINT EE2									
263	HC	2									
264	KK	DD2									
265	KM										
266	KM	AREA	8.5	AC							
267	KM	LENGTH	900	FT							
268	KM	SLOPE	1.6	%							
269	KM	VELOCITY	3.90	FPS							
270	KM	Ti	4.96	MIN							
271	KM	Tt	3.80	MIN							
272	KM	Tc	8.76	MIN							
273	KM	CN	89.5								
274	BA	.014									
275	LS	0	89.5								
276	UD	.088									
277	KK	CC2									
278	KM	ROUTE POINT DD2 TO POINT CC2									
279	RK	865	.024	.016	0	TRAP	78	0			
280	KK	CC2									
281	KM										
282	KM	AREA	12.1	AC							
283	KM	LENGTH	1300	FT							
284	KM	SLOPE	2.3	%							
285	KM	VELOCITY	4.61	FPS							
286	KM	Ti	5.60	MIN							
287	KM	Tt	4.70	MIN							

LINE	ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10
288	KM Tc 10.30 MIN
289	KM CN 89.5
290	BA .019
291	LS 0 89.5
292	UD .103
293	KK CC2
294	KM COMBINE POINT DD2 AND POINT CC2 AT POINT CC2
295	HC 2
296	KK BB2
297	KM ROUTE POINT CC2 TO POINT BB2
298	RK 1275 .023 .016 0 TRAP 78 0
299	KK BB2
300	KM
301	KM AREA 15.7 AC
302	KM LENGTH 1300 FT
303	KM SLOPE 2.3 %
304	KM VELOCITY 4.60 FPS
305	KM Ti 5.60 MIN
306	KM Tt 4.70 MIN
307	KM Tc 10.33 MIN
308	KM CN 89.5
309	BA .025
310	LS 0 89.5
311	UD .103
312	KK BB2
313	KM COMBINE POINT BB2 AND POINT CC2 AT POINT BB2
314	HC 2
315	KK NN1
316	KM
317	KM AREA 15.3 AC
318	KM LENGTH 1200 FT
319	KM SLOPE 2.0 %
320	KM VELOCITY 4.30 FPS
321	KM Ti 5.60 MIN
322	KM Tt 4.70 MIN
323	KM Tc 10.30 MIN
324	KM CN 89.5
325	BA .024
326	LS 0 89.5
327	UD .103
328	KK LL1
329	KM
330	KM AREA 11.5 AC
331	KM LENGTH 1300 FT
332	KM SLOPE 2.7 %
333	KM VELOCITY 4.93 FPS
334	KM Ti 5.60 MIN
335	KM Tt 4.30 MIN
336	KM Tc 9.90 MIN

LINE	ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10
337	KM CN 86
338	BA .018
339	LS 0 86
340	UD .099
341	KK LL1 COMBINE TO SATISFY HEC-1 MODEL REQ
342	HC 3
343	KK EE1
344	KM
345	KM AREA 13.3 AC
346	KM LENGTH 1300 FT
347	KM SLOPE 2.3 %
348	KM VELOCITY 4.60 FPS
349	KM Ti 5.60 MIN
350	KM Tt 4.67 MIN
351	KM Tc 10.27 MIN
352	KM CN 89.5
353	BA .020
354	LS 0 89.5
355	UD .103
356	KK COMBINE TO SATISFY HEC-1 MODEL REQ
357	HC 2
358	KK DD1
359	KM
360	KM AREA 11.3 AC
361	KM LENGTH 1150 FT
362	KM SLOPE 1.3 %
363	KM VELOCITY 3.5 FPS
364	KM Ti 4.96 MIN
365	KM Tt 5.50 MIN
366	KM Tc 10.46 MIN
367	KM CN 89.5
368	BA .018
369	LS 0 89.5
370	UD .105
371	KK DD1 COMBINE TO SATISFY HEC-1 MODEL REQ
372	HC 2
373	KK CC1
374	KM
375	KM AREA 11 AC
376	KM LENGTH 900 FT
377	KM SLOPE 3.3 %
378	KM VELOCITY 5.6 FPS
379	KM Ti 5.6 MIN
380	KM Tt 2.7 MIN
381	KM Tc 8.30 MIN
382	KM CN 89.5
383	BA .017
384	LS 0 89.5
385	UD .083

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

386 KK COMBINE TO SATISFY HEC-1 MODEL REQ
387 HC 2

388 KK BB1
389 KM
390 KM AREA 6.8 AC
391 KM LENGTH 1000 FT
392 KM SLOPE 3.0 %
393 KM VELOCITY 5.3 FPS
394 KM Ti 5.6 MIN
395 KM Tt 3.1 MIN
396 KM Tc 8.7 MIN
397 KM CN 89.5
398 BA .010
399 LS 0 89.5
400 UD .087

401 KK COMBINE TO SATISFY HEC-1 MODEL REQ
402 HC 2

403 KK AA
404 KM
405 KM AREA 94.3 AC
406 KM LENGTH 3000 FT
407 KM SLOPE 2.3 %
408 KM VELOCITY 4.64 FPS
409 KM Ti 4.30 MIN
410 KM Tt 10.90 MIN
411 KM Tc 15.20 MIN
412 KM CN 95
413 BA .147
414 LS 0 95
415 UD .152

416 KK COMBINE TO SATISFY HEC-1 MODEL REQ
417 HC 2

418 KK HUAL
419 KM
420 KM AREA 10.30 AC
421 KM LENGTH 3200 FT
422 KM SLOPE 2.0 %
423 KM VELOCITY 3.5 FPS
424 KM Ti 3.2 MIN
425 KM Tt 15.20 MIN
426 KM Tc 18.40 MIN
427 KM CN 95.
428 BA 0.016
429 LS 0 95
430 UD 0.184

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

431	KK	COMBINE TO SATSIFY HEC-1 MODEL REQ							
432	HC	2							
433	KK	C							
434	KM								
435	KM		AREA	68.9	AC				
436	KM		LENGTH	7500	FT				
437	KM		SLOPE	2.0	%				
438	KM		VELOCITY	4.33	FPS				
439	KM		Ti	4.25	MIN				
440	KM		Tt	29.88	MIN				
441	KM		Tc	34.1	MIN				
442	KM		CN	95					
443	BA	0.108							
444	LS	0	95						
445	UD	0.341							
446	KK	OMBINE TO SATSIFY HEC-1 REQ							
447	HC	2							
448	KK	D							
449	KM								
450	KM		AREA	45.9	AC				
451	KM		LENGTH	5000	FT				
452	KM		SLOPE	2.0	%				
453	KM		VELOCITY	4.33	FPS				
454	KM		Ti	4.25	MIN				
455	KM		Tt	20.25	MIN				
456	KM		Tc	24.50	MIN				
457	KM		CN	95					
458	BA	0.072							
459	LS	0	95						
460	UD	0.245							
461	KK	COMBINE TO SATISFY HEC-1 REQ							
462	HC	2							
463	KK	E							
464	KM								
465	KM		AREA	21.1	AC				
466	KM		LENGTH	2300	FT				
467	KM		SLOPE	2.0	%				
468	KM		VELOCITY	4.33	FPS				
469	KM		Ti	4.25	MIN				
470	KM		Tt	9.85	MIN				
471	KM		Tc	14.10	MIN				
472	KM		CN	95					
473	BA	0.033							
474	LS	0	95						
475	UD	0.141							

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

476 . KK COMBINE TO SATSIFY HEC-1 REQ
477 : HC 2
478 : ZZ

SCHEMATIC DIAGRAM OF STREAM NETWORK

INPUT		
WE	(V) ROUTING	(-->) DIVERSION OR PUMP FLOW
NO.	(.) CONNECTOR	(<---) RETURN OF DIVERTED OR PUMPED FLOW
19	QQ	
	V	
	V	
41	PP/00	
	.	
44	.	00
	.	.
57	.	.
	.	PP
	.	.
	.	.
70	PP/00.....	
	V	
	V	
73	KK	
	.	
	.	
76	.	KK
	.	.
	.	.
89	KK.....	
	V	
	V	
92	II	
	.	
	.	
95	.	BB
	.	V
	.	V
108	.	HH
	.	.
	.	.
111	.	.
	.	HH
	.	.
	.	.
124	.	HH.....
	.	V
	.	V
127	.	II
	.	.
	.	.
130	.	.
	.	II
	.	.
	.	.
143	II.....	
	V	
	V	
146	JJ	
	.	
	.	
149	.	JJ
	.	.

162	.	.				
	JJ.....					
	V					
	V					
165	JJ					
	.					
	.					
168	.	FF				
	.	.				
	.	.				
181	.	.	GG			
	.	.	.			
	.	.	.			
194	.	FF/GG.....				
	.	V				
	.	V				
197	.	BB				
	.	.				
	.	.				
200	.	.	NN2			
	.	.	V			
	.	.	V			
213	.	.	MM			
	.	.	.			
	.	.	.			
216	.	.	.	MM		
	.	.	.	.		
	.	.	.	.		
229	.	.	MM.....			
	.	.	.			
	.	.	.			
232	.	.	.	LL2		
	.	.	.	V		
	.	.	.	V		
245	.	.	.	EE2		
	.	.	.	.		
	.	.	.	.		
248	.	.	.	.	EE2	
	.	.	.	.	.	
	.	.	.	.	.	
261	.	.	.	EE2.....		
	.	.	.	.		
	.	.	.	.		
264	.	.	.	.	DD2	
	.	.	.	.	V	
	.	.	.	.	V	
277	.	.	.	.	CC2	
	.	.	.	.	.	
	.	.	.	.	.	
280	.	.	.	.	.	CC2
	.	.	.	.	.	.
	.	.	.	.	.	.
293	.	.	.	.	CC2.....	
	.	.	.	.	V	
	.	.	.	.	V	
296	.	.	.	.	BB2	
	.	.	.	.	.	
	.	.	.	.	.	
299	.	.	.	.	.	BB2
	.	.	.	.	.	.

312	.	.	.	.	BB2.....
	.	.	.	.	.
5	.	.	.	.	NN1
	.	.	.	.	.
328	.	.	.	.	LL1
	.	.	.	.	.
341	.	.	.	.	LL1.....
	.	.	.	.	.
343	.	.	.	.	EE1
	.	.	.	.	.
356	.	.	.	.	
	.	.	.	.	.
358	.	.	.	.	DD1
	.	.	.	.	.
371	.	.	.	.	DD1.....
	.	.	.	.	.
373	.	.	.	.	CC1
	.	.	.	.	.
386	.	.	.	.	
	.	.	.	.	.
388	.	.	.	.	BB1
	.	.	.	.	.
401	.	.	.	.	
	.	.	.	.	.
403	.	.	.	.	AA
	.	.	.	.	.
416	.	.	.	.	
	.	.	.	.	.
418	.	.	.	.	HUAL
	.	.	.	.	.
431	.	.	.	.	
	.	.	.	.	.
433	.	.	.	.	C
	.	.	.	.	.
446	.	.	.	.	
	.	.	.	.	.
8	.	.	.	.	D
	.	.	.	.	.
461	.	.	.	.	
	.	.	.	.	.

463	.	.	.	.	.	E
	.	.	.	.	.	.
	.	.	.	.	.	.
.76	.	.	.	.	.	.
	.	.	.	.		.

(***) RUNOFF ALSO COMPUTED AT THIS LOCATION

```

*****
*
* FLOOD HYDROGRAPH PACKAGE (HEC-1)
*   SEPTEMBER 1990
*   VERSION 4.0
*
* RUN DATE 10/25/1995 TIME 10:52:37
*
*****

```

```

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

```

```

*****
* .....*
* : SUMMERLIN VILLAGE 12 : *
* : PROPOSED CONDITONS : *
* : D. BLATCHFORD : *
* : .....*
* : RETURN PERIOD _ _ _ 10 & 100-YEAR : *
* : DISTRIBUTION _ _ _ 6-HOUR SDN3 : *
* : PROJECT NO _ _ _ G2012.032H : *
* : FILENAME _ _ _ _ VIL12.H1 : *
* : DATE _ _ _ _ 6/13/95 : *
* : MODELED BY _ _ _ _ D. BLATCHFORD : *
* : .....*
*****

```

```

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

```

```

IT        HYDROGRAPH TIME DATA
          NMIN      3 MINUTES IN COMPUTATION INTERVAL
          IDATE     1 0 STARTING DATE
          ITIME     0000 STARTING TIME
          NQ        300 NUMBER OF HYDROGRAPH ORDINATES
          NDDATE    1 0 ENDING DATE
          NDTIME    1457 ENDING TIME
          ICENT     19 CENTURY MARK

```

```

          COMPUTATION INTERVAL .05 HOURS
          TOTAL TIME BASE 14.95 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

```


.56 .74 .97 .98 .98 .99 .99 .99 1.00

*** FDKRUT WARNING TIME STEP CALCULATION FAILED TO CONVERGE. STABILITY PROBLEMS MAY RESULT

*** FDKRUT WARNING TIME STEP CALCULATION FAILED TO CONVERGE. STABILITY PROBLEMS MAY RESULT

*** FDKRUT WARNING TIME STEP CALCULATION FAILED TO CONVERGE. STABILITY PROBLEMS MAY RESULT

*** FDKRUT WARNING TIME STEP CALCULATION FAILED TO CONVERGE. STABILITY PROBLEMS MAY RESULT

*** FDKRUT WARNING TIME STEP CALCULATION FAILED TO CONVERGE. STABILITY PROBLEMS MAY RESULT

*** FDKRUT WARNING TIME STEP CALCULATION FAILED TO CONVERGE. STABILITY PROBLEMS MAY RESULT

*** FDKRUT WARNING TIME STEP CALCULATION FAILED TO CONVERGE. STABILITY PROBLEMS MAY RESULT

*** FDKRUT WARNING TIME STEP CALCULATION FAILED TO CONVERGE. STABILITY PROBLEMS MAY RESULT

*** FDKRUT WARNING TIME STEP CALCULATION FAILED TO CONVERGE. STABILITY PROBLEMS MAY RESULT

*** FDKRUT WARNING TIME STEP CALCULATION FAILED TO CONVERGE. STABILITY PROBLEMS MAY RESULT

*** FDKRUT WARNING TIME STEP CALCULATION FAILED TO CONVERGE. STABILITY PROBLEMS MAY RESULT

*** FDKRUT WARNING TIME STEP CALCULATION FAILED TO CONVERGE. STABILITY PROBLEMS MAY RESULT

*** FDKRUT WARNING TIME STEP CALCULATION FAILED TO CONVERGE. STABILITY PROBLEMS MAY RESULT

*** FDKRUT WARNING TIME STEP CALCULATION FAILED TO CONVERGE. STABILITY PROBLEMS MAY RESULT

*** FDKRUT WARNING TIME STEP CALCULATION FAILED TO CONVERGE. STABILITY PROBLEMS MAY RESULT

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

OPERATION	STATION	AREA	PLAN	RATIOS APPLIED TO PRECIPITATION									
				RATIO 1	RATIO 2	RATIO 3	RATIO 4	RATIO 5	RATIO 6	RATIO 7	RATIO 8	RATIO 9	
				.56	.74	.97	.98	.98	.99	.99	.99	1.00	
HYDROGRAPH AT	QQ	.02	1	FLOW TIME	18. 3.55	26. 3.55	36. 3.55	36. 3.55	36. 3.55	36. 3.55	37. 3.55	37. 3.55	<u>37.</u> 3.55
ROUTED TO	PP/OO	.02	1	FLOW TIME	17. 3.60	25. 3.55	35. 3.55	35. 3.55	35. 3.55	35. 3.55	36. 3.55	36. 3.55	<u>36.</u> 3.55
HYDROGRAPH AT	OO	.05	1	FLOW TIME	44. 3.55	66. 3.55	97. 3.55	97. 3.55	98. 3.55	98. 3.55	99. 3.55	99. 3.55	<u>100.</u> 3.55
HYDROGRAPH AT	PP	.03	1	FLOW TIME	34. 3.55	50. 3.55	69. 3.55	70. 3.55	70. 3.55	71. 3.55	71. 3.55	71. 3.55	<u>72.</u> 3.55
3 COMBINED AT	PP/OO	.11	1	FLOW TIME	94. 3.55	141. 3.55	201. 3.55	202. 3.55	203. 3.55	204. 3.55	205. 3.55	206. 3.55	<u>208.</u> 3.55
ROUTED TO	KK	.11	1	FLOW TIME	91. 3.55	137. 3.55	197. 3.55	198. 3.55	199. 3.55	200. 3.55	201. 3.55	202. 3.55	<u>204.</u> 3.55
ROGRAPH AT	KK	.03	1	FLOW TIME	28. 3.55	43. 3.55	62. 3.55	62. 3.55	63. 3.55	63. 3.55	63. 3.55	64. 3.55	<u>64.</u> 3.55
2 COMBINED AT	KK	.14	1	FLOW TIME	119. 3.55	180. 3.55	259. 3.55	260. 3.55	261. 3.55	264. 3.55	264. 3.55	266. 3.55	<u>268.</u> 3.55
ROUTED TO	II	.14	1	FLOW TIME	116. 3.55	176. 3.55	256. 3.55	257. 3.55	258. 3.55	260. 3.55	261. 3.55	262. 3.55	<u>265.</u> 3.55
HYDROGRAPH AT	BB	.14	1	FLOW TIME	91. 3.85	128. 3.85	175. 3.85	175. 3.85	176. 3.85	177. 3.85	178. 3.85	178. 3.85	<u>180.</u> 3.85
ROUTED TO	HH	.14	1	FLOW TIME	91. 3.85	128. 3.85	175. 3.85	175. 3.85	176. 3.85	177. 3.85	178. 3.85	178. 3.85	<u>180.</u> 3.85
HYDROGRAPH AT	HH	.03	1	FLOW TIME	24. 3.55	35. 3.55	49. 3.55	49. 3.55	49. 3.55	50. 3.55	50. 3.55	50. 3.55	<u>50.</u> 3.55
2 COMBINED AT	HH	.16	1	FLOW TIME	101. 3.80	142. 3.80	195. 3.80	195. 3.80	196. 3.80	198. 3.80	198. 3.80	<u>199.</u> 3.80	201. 3.80
ROUTED TO	II	.16	1	FLOW TIME	101. 3.80	142. 3.80	194. 3.80	195. 3.80	196. 3.80	197. 3.80	198. 3.80	<u>199.</u> 3.80	200. 3.80
HYDROGRAPH AT	II	.03	1	FLOW TIME	25. 3.55	37. 3.55	52. 3.55	52. 3.55	52. 3.55	53. 3.55	53. 3.55	53. 3.55	<u>54.</u> 3.55
3 COMBINED AT	II	.33	1	FLOW TIME	221. 3.60	322. 3.60	456. 3.55	457. 3.55	460. 3.55	<u>463.</u> 3.55	465. 3.55	467. 3.55	472. 3.55
ROUTED TO	JJ	.33	1	FLOW	220.	322.	454.	456.	458.	<u>462.</u>	463.	465.	470.

				TIME	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60
HYDROGRAPH AT	JJ	.02	1	FLOW	20.	28.	40.	40.	40.	41.	41.	41.	<u>41.</u>
				TIME	3.55	3.55	3.55	3.55	3.55	3.55	3.55	3.55	3.55
2 COMBINED AT	JJ	.35	1	FLOW	238.	347.	494.	496.	498.	<u>502.</u>	503.	506.	511.
				TIME	3.60	3.60	3.55	3.55	3.55	<u>3.55</u>	3.55	3.55	3.55
ROUTED TO	JJ	.35	1	FLOW	237.	347.	492.	494.	496.	<u>500.</u>	502.	504.	509.
				TIME	3.60	3.60	3.55	3.55	3.55	<u>3.55</u>	3.55	3.55	3.55
HYDROGRAPH AT	FF	.01	1	FLOW	11.	16.	21.	21.	21.	21.	22.	22.	<u>22.</u>
				TIME	3.55	3.55	3.55	3.55	3.55	3.55	3.55	3.55	3.55
HYDROGRAPH AT	GG	.01	1	FLOW	17.	24.	32.	32.	32.	32.	33.	33.	<u>33.</u>
				TIME	3.55	3.55	3.55	3.55	3.55	3.55	3.55	3.55	3.55
2 COMBINED AT	FF/GG	.02	1	FLOW	28.	39.	53.	53.	54.	54.	54.	54.	<u>55.</u>
				TIME	3.55	3.55	3.55	3.55	3.55	3.55	3.55	3.55	3.55
ROUTED TO	BB	.02	1	FLOW	27.	38.	52.	52.	53.	53.	53.	53.	<u>54.</u>
				TIME	3.55	3.55	3.55	3.55	3.55	3.55	3.55	3.55	3.55
HYDROGRAPH AT	NN2	.02	1	FLOW	18.	28.	41.	41.	41.	41.	41.	42.	<u>42.</u>
				TIME	3.55	3.55	3.55	3.55	3.55	3.55	3.55	3.55	3.55
ROUTED TO	MM	.02	1	FLOW	18.	27.	39.	39.	39.	40.	40.	40.	<u>41.</u>
				TIME	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60
HYDROGRAPH AT	MM	.05	1	FLOW	37.	57.	83.	83.	83.	84.	84.	85.	<u>86.</u>
				TIME	3.55	3.55	3.55	3.55	3.55	3.55	3.55	3.55	3.55
2 COMBINED AT	MM	.07	1	FLOW	54.	83.	121.	122.	122.	123.	124.	124.	<u>126.</u>
				TIME	3.60	3.55	3.55	3.55	3.55	3.55	3.55	3.55	3.55
HYDROGRAPH AT	LL2	.04	1	FLOW	34.	52.	75.	76.	76.	77.	77.	77.	<u>78.</u>
				TIME	3.55	3.55	3.55	3.55	3.55	3.55	3.55	3.55	3.55
ROUTED TO	EE2	.04	1	FLOW	33.	51.	74.	74.	75.	75.	75.	76.	<u>77.</u>
				TIME	3.55	3.55	3.55	3.55	3.55	3.55	3.55	3.55	3.55
HYDROGRAPH AT	EE2	.02	1	FLOW	17.	26.	37.	37.	37.	38.	38.	38.	<u>38.</u>
				TIME	3.55	3.55	3.55	3.55	3.55	3.55	3.55	3.55	3.55
2 COMBINED AT	EE2	.06	1	FLOW	50.	76.	111.	112.	112.	113.	113.	114.	<u>115.</u>
				TIME	3.55	3.55	3.55	3.55	3.55	3.55	3.55	3.55	3.55
HYDROGRAPH AT	DD2	.01	1	FLOW	12.	19.	27.	27.	27.	27.	27.	28.	<u>28.</u>
				TIME	3.55	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50
ROUTED TO	CC2	.01	1	FLOW	12.	19.	27.	27.	27.	27.	27.	27.	<u>28.</u>
				TIME	3.55	3.55	3.55	3.55	3.55	3.55	3.55	3.55	3.55
HYDROGRAPH AT	CC2	.02	1	FLOW	16.	25.	36.	36.	36.	36.	36.	36.	<u>37.</u>
				TIME	3.55	3.55	3.55	3.55	3.55	3.55	3.55	3.55	3.55
2 COMBINED AT	CC2	.03	1	FLOW	28.	43.	62.	63.	63.	63.	64.	64.	<u>65.</u>
				TIME	3.55	3.55	3.55	3.55	3.55	3.55	3.55	3.55	3.55
ROUTED TO	BB2	.03	1	FLOW	28.	42.	60.	60.	60.	61.	61.	61.	<u>62.</u>

				TIME	3.60	3.60	3.55	3.55	3.55	3.55	3.55	3.55	3.55
HYDROGRAPH AT	BB2	.03	1	FLOW TIME	21. 3.55	32. 3.55	47. 3.55	47. 3.55	47. 3.55	48. 3.55	48. 3.55	48. 3.55	<u>48.</u> 3.55
2 COMBINED AT	BB2	.06	1	FLOW TIME	47. 3.55	73. 3.55	107. 3.55	107. 3.55	108. 3.55	108. 3.55	109. 3.55	109. 3.55	<u>111.</u> 3.55
HYDROGRAPH AT	NN1	.02	1	FLOW TIME	21. 3.55	31. 3.55	45. 3.55	45. 3.55	45. 3.55	46. 3.55	46. 3.55	46. 3.55	<u>47.</u> 3.55
HYDROGRAPH AT	LL1	.02	1	FLOW TIME	12. 3.55	20. 3.55	30. 3.55	30. 3.55	30. 3.55	31. 3.55	31. 3.55	31. 3.55	<u>31.</u> 3.55
3 COMBINED AT	LL1	.10	1	FLOW TIME	80. 3.55	124. 3.55	182. 3.55	182. 3.55	183. 3.55	185. 3.55	185. 3.55	186. 3.55	<u>188.</u> 3.55
HYDROGRAPH AT	EE1	.02	1	FLOW TIME	17. 3.55	26. 3.55	37. 3.55	38. 3.55	38. 3.55	38. 3.55	38. 3.55	38. 3.55	<u>39.</u> 3.55
2 COMBINED AT		.12	1	FLOW TIME	97. 3.55	150. 3.55	219. 3.55	220. 3.55	221. 3.55	223. 3.55	224. 3.55	225. 3.55	<u>227.</u> 3.55
HYDROGRAPH AT	DD1	.02	1	FLOW TIME	15. 3.55	23. 3.55	34. 3.55	34. 3.55	34. 3.55	34. 3.55	34. 3.55	34. 3.55	<u>35.</u> 3.55
2 COMBINED AT	DD1	.14	1	FLOW TIME	113. 3.55	173. 3.55	253. 3.55	254. 3.55	255. 3.55	257. 3.55	258. 3.55	259. 3.55	<u>262.</u> 3.55
HYDROGRAPH AT	CC1	.02	1	FLOW TIME	15. 3.55	22. 3.55	32. 3.50	33. 3.50	33. 3.50	33. 3.50	33. 3.50	33. 3.50	<u>34.</u> 3.50
2 COMBINED AT		.15	1	FLOW TIME	127. 3.55	195. 3.55	285. 3.55	286. 3.55	288. 3.55	290. 3.55	291. 3.55	<u>292.</u> 3.55	295. 3.55
HYDROGRAPH AT	BB1	.01	1	FLOW TIME	9. 3.55	13. 3.55	19. 3.55	19. 3.55	19. 3.55	19. 3.55	19. 3.55	20. 3.55	<u>20.</u> 3.55
2 COMBINED AT		.16	1	FLOW TIME	136. 3.55	209. 3.55	304. 3.55	305. 3.55	307. 3.55	309. 3.55	310. 3.55	<u>312.</u> 3.55	315. 3.55
HYDROGRAPH AT	AA	.15	1	FLOW TIME	150. 3.55	210. 3.55	287. 3.55	288. 3.55	289. 3.55	291. 3.55	291. 3.55	<u>293.</u> 3.55	295. 3.55
2 COMBINED AT		.31	1	FLOW TIME	286. 3.55	418. 3.55	591. 3.55	593. 3.55	596. 3.55	600. 3.55	<u>602.</u> 3.55	605. 3.55	611. 3.55
HYDROGRAPH AT	HUAL	.02	1	FLOW TIME	16. 3.60	22. 3.60	30. 3.60	30. 3.60	30. 3.60	30. 3.60	30. 3.60	30. 3.60	<u>31.</u> 3.60
2 COMBINED AT		.33	1	FLOW TIME	301. 3.55	439. 3.55	619. 3.55	621. 3.55	624. 3.55	629. 3.55	631. 3.55	634. 3.55	640. 3.55
HYDROGRAPH AT	C	.11	1	FLOW TIME	81. 3.75	113. 3.75	154. 3.75	155. 3.75	156. 3.75	157. 3.75	157. 3.75	158. 3.75	<u>159.</u> 3.75
2 COMBINED AT		.44	1	FLOW TIME	356. 3.55	517. 3.55	727. 3.55	730. 3.55	733. 3.55	739. 3.55	741. 3.55	744. 3.55	751. 3.55
HYDROGRAPH AT	D	.07	1	FLOW	63.	88.	120.	120.	121.	121.	122.	122.	<u>123.</u>

			TIME	3.65	3.65	3.65	3.65	3.65	3.65	3.65	3.65	3.65
2 COMBINED AT	.51	1	FLOW	411.	593.	831.	834.	838.	844.	846.	850.	858.
			TIME	3.60	3.55	3.55	3.55	3.55	3.55	3.55	3.55	3.55
HYDROGRAPH AT	E	.03	1 FLOW	35.	49.	66.	66.	67.	67.	67.	68.	68.
			TIME	3.55	3.55	3.55	3.55	3.55	3.55	3.55	3.55	3.55
2 COMBINED AT	.54	1	FLOW	445.	641.	897.	900.	905.	911.	913.	918.	927.
			TIME	3.60	3.55	3.55	3.55	3.55	3.55	3.55	3.55	3.55

TIME OF CONCENTRATION

DEVELOPMENT SUMMERLIN VILLAGE 12CALCULATED BY DBB DATE 10/18/95

EXISTING AND PROPOSED CONDITIONS

SUB-BASIN DATA			INITIAL/OVERLAND TIME (Ti)			TRAVEL TIME (Tt)				Tc CHECK (URBANIZED BASINS)		FINAL Tc	REMARKS
DESIG	K	AREA AC	LENGTH FT	SLOPE %	Ti MIN	LENGTH FT	SLOPE %	VEL. FPS	Tt MIN	TOTAL LENGTH	Tc=(L/180)+10 MIN	MIN	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	
AA	0.86	94.3	100	1.0	4.3	3000	2.3	4.6	10.9	3100	27	15	PROPOSED
BB1	0.79	6.8	100	1.0	5.6	1000	3.0	5.3	3.1	1100	16	9	PROPOSED
BB2	0.79	15.7	100	1.0	5.6	1300	2.3	4.6	4.7	1400	18	10	PROPOSED
CC1	0.79	11.0	100	1.0	5.6	900	3.3	5.6	2.7	1000	16	8	PROPOSED
CC2	0.79	12.1	100	1.0	5.6	1300	2.3	4.6	4.7	1400	18	10	PROPOSED
DD1	0.82	11.3	100	1.0	5.0	1150	1.3	3.5	5.5	1250	17	11	PROPOSED
DD2	0.82	8.5	100	1.0	5.0	900	1.6	3.9	3.8	1000	16	9	PROPOSED
EE1	0.79	13.3	100	1.0	5.6	1300	2.3	4.6	4.7	1400	18	10	PROPOSED
EE2	0.79	18.1	100	1.0	5.6	1300	1.9	4.2	5.2	1400	18	11	PROPOSED
FF	0.82	6.7	100	1.0	5.0	870	1.4	3.6	4.0	970	15	9	PROPOSED
GG	0.82	9.7	100	1.0	5.0	900	1.3	3.5	4.3	1000	16	9	PROPOSED
HH	0.82	16.1	100	1.0	5.0	1700	1.7	4.0	7.1	1800	20	12	PROPOSED
II	0.82	16.5	100	1.0	5.0	1600	1.9	4.2	6.3	1700	19	11	PROPOSED
JJ	0.82	13.3	100	1.0	5.0	800	3.1	5.4	2.5	900	15	8	PROPOSED
KK	0.79	21.5	100	1.0	5.6	2100	3.6	5.8	6.0	2200	22	12	PROPOSED

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

$$T_c = T_i + T_t$$

$$K = .0132CN - 0.39$$

TIME OF CONCENTRATION

DEVELOPMENT SUMMERLIN VILLAGE 12CALCULATED BY DBB DATE 10/18/95

EXISTING AND PROPOSED CONDITIONS

SUB-BASIN DATA			INITIAL/OVERLAND TIME (Ti)			TRAVEL TIME (Tt)				Tc CHECK (URBANIZED BASINS)		FINAL Tc	REMARKS
DESIG	K	AREA AC	LENGTH FT	SLOPE %	Ti MIN	LENGTH FT	SLOPE %	VEL. FPS	Tt MIN	TOTAL LENGTH	Tc=(L/180)+10 MIN	MIN	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	
LL1	0.79	11.5	100	1.0	5.6	1300	2.7	5.0	4.3	1400	18	10	PROPOSED
LL2	0.79	27.0	100	1.0	5.6	1600	1.6	4.0	6.7	1700	19	12	PROPOSED
MM	0.79	29.8	100	1.0	5.6	2150	2.5	4.8	7.5	2250	23	13	PROPOSED
NN-1	0.79	15.3	100	1.0	5.6	1200	2.0	4.3	4.7	1300	17	10	PROPOSED
NN-2	0.79	14.2	100	1.0	5.6	1300	1.5	3.8	5.7	1400	18	11	PROPOSED
PP	0.82	22.0	100	1.0	5.0	1400	3.3	5.6	4.2	1500	18	9	PROPOSED
OO	0.79	35.3	100	1.0	5.6	2400	3.0	5.3	7.5	2500	24	13	PROPOSED
QQ	0.82	11.9	100	1.0	5.0	1700	2.1	4.4	6.4	1800	20	11	PROPOSED

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

$$T_c = T_i + T_t$$

$$K = .0132CN - 0.39$$

HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL

RUNOFF CURVE NUMBERS (SEMIARID RANGELANDS¹)

Cover description		Curve numbers for hydrologic soil group—			
Cover type	Hydrologic condition ²	A ³	B	C	D
Herbaceous—mixture of grass, weeds, and low-growing brush, with brush the minor element.	Poor		80	87	93
	Fair		71	81	89
	Good		62	74	85
Oak-aspen—mountain brush mixture of oak brush, aspen, mountain mahogany, bitter brush, maple, and other brush.	Poor		66	74	79
	Fair		48	57	63
	Good		30	41	48
Pinyon-juniper—pinyon, juniper, or both; grass understory.	Poor		75	85	89
	Fair		58	73	80
	Good		41	61	71
Sagebrush with grass understory.	Poor		67	80	85
	Fair		51	63	70
	Good		35	47	55
Desert shrub—major plants include saltbush, greasewood, creosotebush, blackbrush, bursage, palo verde, mesquite, and cactus.	Poor	63	77	85	88
	Fair	55	72	81	86
	Good	49	68	79	84

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

²Poor: < 30% ground cover (litter, grass, and brush overstory).

Fair: 30 to 70% ground cover.

Good: > 70% ground cover.

³Curve numbers for group A have been developed only for desert shrub.

Revision	Date

WRC
ENGINEERING

REFERENCE:

SCS TR-55, USDA, June 1986.

TABLE 602
4 of 4

HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL

RUNOFF CURVE NUMBERS (URBAN AREAS¹)

Cover description		Curve numbers for hydrologic soil group—			
Cover type and hydrologic condition	Average percent impervious area ²	A	B	C	D
<i>Fully developed urban areas (vegetation established)</i>					
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:					
1/8 acre or less (town houses)	65	77	85	90	92
1/4 acre	38	61	75	83	87
1/3 acre	30	57	72	81	86
1/2 acre	25	54	70	80	85
1 acre	20	51	68	79	84
2 acres	12	46	65	77	82
<i>Developing urban areas</i>					
Newly graded areas (pervious areas only, no vegetation) ⁵		77	86	91	94

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

²The 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.

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

⁴Composite 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.

⁵Composite 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



G.C. WALLACE, INC.

DATE November, 1995

SUBJECT

BY _____

SHEET NO. 1 OF 1

JOB NO. 62011.032

SOIL TYPE 502 - COMPOSITE

55%	CANUITO	- B -	80
40%	CAVE	- D -	89.5
5%	ARIZO	- A -	69
			<u>83.3</u>

ASSUMES SINGLE FAMILY
DEVELOPMENT, 1/6 ACRE

SOIL TYPE 152 - 100% "D"

DATE NOVEMBER, 1995 SUBJECT _____
BY _____SHEET NO. 1 OF 2
JOB NO. 62011.032

VILLAGE 11/12 - NORTH OF ALTA
CURVE NUMBER CALCULATIONS

<u>BASIN</u>	<u>CN</u>	<u>SOIL</u>
W	88	D
NP-2	60	COMPOSITE
P	83.3	D
F	89.5	COMPOSITE
G	89.5	D
N	89.5	"
O	89.5	"
H	95.0	"
I	89.5	"
V	89.5	"
Q	83.3	"
R	82.0	"
S	89.5	"
U	89.5	"
T	89.5	"
ES-1	93	"
CH-1	95	"
NP-1	80	COMPOSITE
L1	83.3	"
L2	83.3	"
M	89.5	D
K2	83.3	COMPOSITE
J2	83.3	"
TWA-1	95	"
SUM-1	95	"
K1	83.3	"
J1	83.3	"
SUM2	95	"



G.C. WALLACE, INC.

DATE NOVEMBER, 1995

SUBJECT

SHEET NO. 2 OF 2

BY _____

JOB NO. 62611.032

VILLAGE 11/12 - NORTH OF ALTA
CURVE NUMBER CALCULATIONS

<u>BASIN</u>	<u>CN</u>	<u>SOIL</u>
X	88	COMPOSITE
Y	88	COMPOSITE
Z	88	COMPOSITE
HS	88	COMPOSITE
CH-2	88	COMPOSITE
ES-2	88	COMPOSITE
E	83.3	"
RES	83.3	"
D1	83.3	"
C1	83.3	"
D2	83.3	"
A2	89.5	"
A1	89.5	"
B+DC-1	92	"
C2	83.3	"



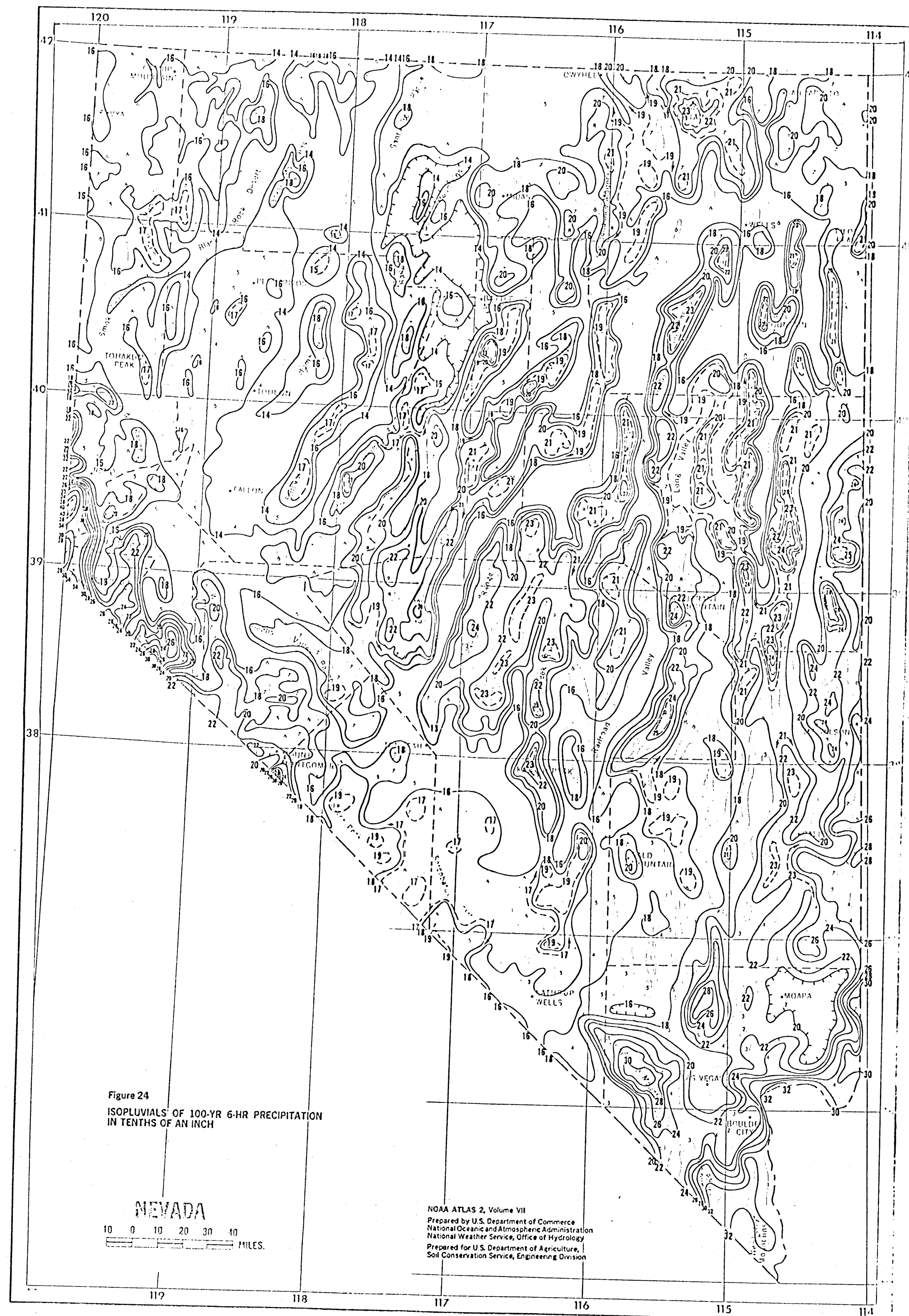
G.C. WALLACE, INC.

DATE NOVEMBER, 1995 SUBJECT
BY _____

SHEET NO. 1 OF 1
JOB NO. 62011.032

VILLAGE 11/12- SOUTH OF ALTA

<u>BASIN</u>	<u>CN</u>	<u>SOIL</u>
QQ	92	D
OO	89.5	D
PP	92	D
KK	89.5	"
BB	95	"
HH	92	"
II	92	"
JJ	92	"
FF	95	"
GG	95	"
NN2	89.5	B COMPOSITE
MM	89.5	B COMPOSITE
LL2	89.5	B COMPOSITE
EE2	89.5	"
DD2	89.5	"
CC2	89.5	"
BB2	89.5	"
NN1	89.5	"
LL1	86	"
EE1	89.5	"
DD1	89.5	"
CC1	89.5	"
BB1	89.5	"
AA	95	"
HUAL	95	"
C	95	"
D	95	"
E	95	"



HYDRAULICS

DATE: 11/ 2/1995
TIME: 21:18

F0515P
WATER SURFACE PROFILE - CHANNEL DEFINITION LISTING

PAGE 1

CARD CODE	SECT NO	CHN TYPE	NO OF PIERS	AVE PIER WIDTH	HEIGHT 1 DIAMETER	BASE WIDTH	ZL	ZR	INV DROP	Y(1)	Y(2)	Y(3)	Y(4)	Y(5)	Y(6)	Y(7)	Y(8)	Y(9)	Y(10)
CD	1	1	0	0.00	6.50	10.00	2.00	2.00	0.00										
CD	2	3	0	0.00	8.00	9.00	0.00	0.00	0.00										
CD	3	4			4.00														
CD	4	1	0	0.00	6.50	10.00	2.00	2.00	0.00										
CD	5	1	0	0.00	6.50	10.00	2.00	2.00	0.00										
CD	6	1	0	0.00	6.50	10.00	2.00	2.00	0.00										
CD	7	1	0	0.00	6.50	10.00	2.00	2.00	0.00										

REFER TO: "VILLAGE 8

SUMMERLIN PARKWAY AND

ANASAZI DRIVE DIVERSION

CHANNEL, PHASE 1" -

(SEE APPENDIX)

WATER SURFACE PROFILE - TITLE CARD LISTING

JING LINE NO 1 IS -

ANASAZI DR CHAN STA 79+00 TO 58+08

HEADING LINE NO 2 IS -

MODELED BY D. BLATCHFORD-NOVEMBER, 1995

HEADING LINE NO 3 IS -

REVISED Q's FROM VILLAGE 11 MASTER PLAN

MENT NO 1 IS A SYSTEM OUTLET * * *

U/S DATA	STATION	INVERT	SECT
	0.00	5.49	1

W S ELEV
11.50

ELEMENT NO 2 IS A REACH * * *

U/S DATA	STATION	INVERT	SECT
	212.17	14.00	1

N
0.013

RADIUS	ANGLE	ANG PT	MAN H
0.00	0.00	0.00	0

ELEMENT NO 3 IS A TRANSITION * * *

U/S DATA	STATION	INVERT	SECT
	262.17	16.00	2

N
0.013

ELEMENT NO 4 IS A REACH * * *

U/S DATA	STATION	INVERT	SECT
	532.55	17.68	2

N
0.013

RADIUS	ANGLE	ANG PT	MAN H
0.00	0.00	0.00	0

ELEMENT NO 5 IS A JUNCTION * * *

U/S DATA	STATION	INVERT	SECT
	536.55	17.70	2

N
0.013

* Q3	* Q4	* INVERT-3	INVERT-4	PHI 3	PHI 4
202.0	0.0	26.37	0.00	90.00	0.00

ELEMENT NO 6 IS A REACH * * *

U/S DATA	STATION	INVERT	SECT
	585.51	27.04	2

N
0.013

RADIUS	ANGLE	ANG PT	MAN H
400.00	46.32	0.00	0

EMENT NO 7 IS A TRANSITION * * *

U/S DATA	STATION	INVERT	SECT
	636.57	28.70	4

N
0.013

ELEMENT NO 8 IS A REACH * * *

U/S DATA	STATION	INVERT	SECT
	713.07	30.28	4

N
0.013

RADIUS	ANGLE	ANG PT	MAN H
150.00	31.58	0.00	0

ELEMENT NO 9 IS A REACH * * *

U/S DATA	STATION	INVERT	SECT
	880.87	31.34	4

N
0.013

RADIUS	ANGLE	ANG PT	MAN H
0.00	0.00	0.00	0

ELEMENT NO 10 IS A REACH * * *

U/S DATA	STATION	INVERT	SECT
	918.86	31.60	4

N
0.013

RADIUS	ANGLE	ANG PT	MAN H
150.00	14.50	0.00	0

ELEMENT NO 11 IS A REACH * * *

M/S DATA	STATION	INVERT	SECT
	946.50	31.76	4

N
0.013

RADIUS	ANGLE	ANG PT	MAN H
0.00	0.00	0.00	0

ELEMENT NO 12 IS A TRANSITION * * *

1/S DATA	STATION	INVERT	SECT
	996.50	32.56	5

N
.013

WATER SURFACE PROFILE - ELEMENT CARD LISTING

ELEMENT NO 13 IS A REACH										*	*	*
U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H				
	1535.70	41.05	5	0.013	0.00	0.00	0.00	0				
ELEMENT NO 14 IS A TRANSITION										*	*	*
U/S DATA	STATION	INVERT	SECT	N								
	1585.69	41.86	6	0.013								
ELEMENT NO 15 IS A REACH										*	*	*
U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H				
	1935.62	45.47	6	0.013	0.00	0.00	0.00	0				
ELEMENT NO 16 IS A TRANSITION										*	*	*
U/S DATA	STATION	INVERT	SECT	N								
	1985.62	45.72	7	0.013								
ELEMENT NO 17 IS A REACH										*	*	*
U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H				
	2091.93	46.25	7	0.013	0.00	0.00	0.00	0				
ELEMENT NO 18 IS A SYSTEM HEADWORKS										*		*
U/S DATA	STATION	INVERT	SECT		W S ELEV							
	2091.93	46.25	7		50.25							

NO EDIT ERRORS ENCOUNTERED-COMPUTATION IS NOW BEGINNING

WATER SURFACE PROFILE LISTING

ANASAZI DR CHAN STA 79+00 TO 58+08

MODELED BY D. BLATCHFORD-NOVEMBER, 1995

REVISED Q's FROM VILLAGE 11 MASTER PLAN

REFER TO: VILLAGE 8, SUMMERLIN PARKWAY;
AND ANASAZI DRIVE DIVERSION
CHANNEL, PHASE I
(SEE APPENDIX)

STATION	INVERT ELEV	DEPTH OF FLOW	W.S. ELEV	Q	VEL	VEL HEAD	ENERGY GRD.EL.	SUPER ELEV	CRITICAL DEPTH	HGT/ DIA	BASE/ ID NO.	ZL PIER	NO AVBPR		
L/ELEM	SO					SF AVE	HF		NORM DEPTH			ZR		CHANNEL STATIONING	

0.00	5.49	2.704	8.194	1281.0	30.75	14.682	22.876	0.00	5.582	6.50	10.00	2.00	0	0.00	<u>79+00</u>
48.14	0.04011					.030322	1.46		2.526			2.00			
48.14	7.42	2.739	10.160	1281.0	30.22	14.178	24.338	0.00	5.582	6.50	10.00	2.00	0	0.00	<u>78+51.86</u>
96.31	0.04011					.027742	2.67		2.526			2.00			
144.45	11.28	2.837	14.121	1281.0	28.81	12.889	27.010	0.00	5.582	6.50	10.00	2.00	0	0.00	<u>77+55.55</u>
67.72	0.04011					.024293	1.65		2.526			2.00			
212.17	14.00	2.937	16.937	1281.0	27.47	11.717	28.654	0.00	5.582	6.50	10.00	2.00	0	0.00	<u>76+87.83</u>
TRANS STR	0.04000					.016258	0.81					2.00			
262.17	16.00	6.533	22.533	1281.0	21.79	7.370	29.903	0.00	8.000	8.00	9.00	0.00	0	0.00	<u>76+37.83</u>
89.92	0.00621					.010386	0.93		7.841			0.00			
352.09	16.56	6.266	22.825	1281.0	22.72	8.013	30.838	0.00	8.000	8.00	9.00	0.00	0	0.00	<u>75+47.91</u>
93.74	0.00621					.011650	1.09		7.841			0.00			
445.83	17.14	5.974	23.115	1281.0	23.82	8.814	31.929	0.00	8.000	8.00	9.00	0.00	0	0.00	<u>74+54.17</u>
86.72	0.00621					.013170	1.14		7.841			0.00			
532.55	17.68	5.696	23.376	1281.0	24.99	9.695	33.071	0.00	8.000	8.00	9.00	0.00	0	0.00	<u>73+67.45</u>
JUNCT STR	0.00500					.022421	0.09					0.00			
536.55	17.70	3.717	21.417	1079.0	32.25	16.154	37.571	0.00	7.645	8.00	9.00	0.00	0	0.00	<u>73+63.45</u>
1.10	0.19077					.030605	0.03		1.954			0.00			
537.65	17.91	3.740	21.649	1079.0	32.06	15.956	37.605	0.00	7.645	8.00	9.00	0.00	0	0.00	<u>73+62.35</u>
7.81	0.19077					.028502	0.22		1.954			0.00			
545.46	19.40	3.923	23.323	1079.0	30.56	14.506	37.829	0.00	7.645	8.00	9.00	0.00	0	0.00	<u>73+54.54</u>
6.80	0.19077					.025045	0.17		1.954			0.00			

WATER SURFACE PROFILE LISTING

ANASAZI DR CHAN STA 79+00 TO 58+08

MODELED BY D. BLATCHFORD-NOVEMBER, 1995

REVISED Q's FROM VILLAGE 11 MASTER PLAN

STATION	INVERT ELEV	DEPTH OF FLOW	W.S. ELEV	Q	VEL	VEL HEAD	ENERGY GRD.EL.	SUPER ELEV	CRITICAL DEPTH	HGT/ DIA	BASE/ ID NO.	ZL	NO PIER	AVBPR	
L/ELEM	SO					SF AVE	HF		NORM DEPTH			ZR			CHANNEL STATIONING

552.26	20.70	4.114	24.811	1079.0	29.14	13.187	37.998	0.00	7.645	8.00	9.00	0.00	0	0.00	<u>73+47.74</u>
5.92	0.19077					.022025	0.13		1.954			0.00			
558.18	21.83	4.315	26.141	1079.0	27.78	11.988	38.129	0.00	7.645	8.00	9.00	0.00	0	0.00	<u>73+41.82</u>
5.13	0.19077					.019383	0.10		1.954			0.00			
563.31	22.80	4.525	27.329	1079.0	26.49	10.898	38.227	0.00	7.645	8.00	9.00	0.00	0	0.00	<u>73+36.69</u>
4.43	0.19077					.017071	0.08		1.954			0.00			
567.74	23.65	4.746	28.396	1079.0	25.26	9.907	38.303	0.00	7.645	8.00	9.00	0.00	0	0.00	<u>73+32.26</u>
3.81	0.19077					.015046	0.06		1.954			0.00			
571.55	24.38	4.978	29.354	1079.0	24.08	9.007	38.361	0.00	7.645	8.00	9.00	0.00	0	0.00	<u>73+28.45</u>
3.24	0.19077					.013271	0.04		1.954			0.00			
574.79	25.00	5.221	30.216	1079.0	22.96	8.188	38.404	0.00	7.645	8.00	9.00	0.00	0	0.00	<u>73+25.21</u>
2.73	0.19077					.011714	0.03		1.954			0.00			
577.52	25.52	5.476	30.993	1079.0	21.89	7.444	38.437	0.00	7.645	8.00	9.00	0.00	0	0.00	<u>73+22.48</u>
2.27	0.19077					.010349	0.02		1.954			0.00			
579.79	25.95	5.743	31.692	1079.0	20.88	6.767	38.459	0.00	7.645	8.00	9.00	0.00	0	0.00	<u>73+20.21</u>
1.85	0.19077					.009149	0.02		1.954			0.00			
581.64	26.30	6.023	32.324	1079.0	19.90	6.152	38.476	0.00	7.645	8.00	9.00	0.00	0	0.00	<u>73+18.36</u>
1.45	0.19077					.008093	0.01		1.954			0.00			
583.09	26.58	6.317	32.895	1079.0	18.98	5.592	38.487	0.00	7.645	8.00	9.00	0.00	0	0.00	<u>73+16.91</u>
1.09	0.19077					.007166	0.01		1.954			0.00			
584.18	26.79	6.626	33.412	1079.0	18.09	5.084	38.496	0.00	7.645	8.00	9.00	0.00	0	0.00	<u>73+15.82</u>
0.75	0.19077					.006350	0.00		1.954			0.00			

WATER SURFACE PROFILE LISTING

ANASAZI DR CHAN STA 79+00 TO 58+08

MODELED BY D. BLATCHFORD-NOVEMBER, 1995

REVISED Q's FROM VILLAGE 11 MASTER PLAN

STATION	INVERT ELEV	DEPTH OF FLOW	W.S. ELEV	Q	VEL	VEL HEAD	ENERGY GRD. EL.	SUPER ELEV	CRITICAL DEPTH	HGT/ DIA	BASE/ ID NO.	ZL	NO PIER	AVBPR
L/ELEM	SO					SF AVE	HF		NORM DEPTH			ZR		

584.93	26.93	6.949	33.879	1079.0	17.25	4.622	38.501	0.00	7.645	8.00	9.00	0.00	0	0.00
														<u>73+15.07</u>
0.44	0.19077					.005629	0.00		1.954			0.00		
585.37	27.01	7.288	34.301	1079.0	16.45	4.202	38.503	0.00	7.645	8.00	9.00	0.00	0	0.00
														<u>73+14.63</u>
0.14	0.19077					.004994	0.00		1.954			0.00		
585.51	27.04	7.645	34.685	1079.0	15.68	3.819	38.504	0.00	7.645	8.00	9.00	0.00	0	0.00
														<u>73+14.49</u>
TRANS STR	0.03251					.002397	0.12					0.00		
636.57	28.70	10.094	38.794	1079.0	3.54	0.195	38.989	0.17	5.108	6.50	10.00	2.00	0	0.00
														<u>72+63.43</u>
12.91	0.02065					.000105	0.00		2.751			2.00		
649.48	28.97	9.809	38.776	1079.0	3.71	0.214	38.990	0.18	5.108	6.50	10.00	2.00	0	0.00
														<u>72+50.52</u>
12.48	0.02065					.000120	0.00		2.751			2.00		
661.96	29.22	9.532	38.756	1079.0	3.90	0.236	38.992	0.20	5.108	6.50	10.00	2.00	0	0.00
														<u>72+38.04</u>
12.06	0.02065					.000135	0.00		2.751			2.00		
674.02	29.47	9.261	38.734	1079.0	4.09	0.259	38.993	0.21	5.108	6.50	10.00	2.00	0	0.00
														<u>72+25.98</u>
11.62	0.02065					.000154	0.00		2.751			2.00		
685.64	29.71	8.996	38.710	1079.0	4.28	0.285	38.995	0.23	5.108	6.50	10.00	2.00	0	0.00
														<u>72+14.36</u>
11.20	0.02065					.000175	0.00		2.751			2.00		
696.84	29.95	8.739	38.684	1079.0	4.49	0.314	38.998	0.24	5.108	6.50	10.00	2.00	0	0.00
														<u>72+03.46</u>
10.75	0.02065					.000198	0.00		2.751			2.00		
707.59	30.17	8.487	38.654	1079.0	4.71	0.345	38.999	0.26	5.108	6.50	10.00	2.00	0	0.00
														<u>71+92.41</u>
5.48	0.02065					.000218	0.00		2.751			2.00		
713.07	30.28	8.358	38.638	1079.0	4.83	0.363	39.001	0.00	5.108	6.50	10.00	2.00	0	0.00
														<u>71+86.93</u>
33.86	0.00632					.000242	0.01		3.741			2.00		

WATER SURFACE PROFILE LISTING

ANASAZI DR CHAN STA 79+00 TO 58+08

MODELED BY D. BLATCHFORD-NOVEMBER, 1995

REVISED Q's FROM VILLAGE 11 MASTER PLAN

STATION	INVERT ELEV	DEPTH OF FLOW	W.S. ELEV	Q	VEL	VEL HEAD	ENERGY GRD.EL.	SUPER ELEV	CRITICAL DEPTH	HGT/ DIA	BASE/ ID NO.	ZL	NO	AVBPR	
L/ELEM	SO														

746.93	30.49	8.116	38.610	1079.0	5.07	0.399	39.009	0.00	5.108	6.50	10.00	2.00	0	0.00	<u>7453.07</u>
32.44	0.00632					.000275	0.01		3.741			2.00			
779.37	30.70	7.880	38.579	1079.0	5.32	0.439	39.018	0.00	5.108	6.50	10.00	2.00	0	0.00	<u>71+20.63</u>
31.01	0.00632					.000312	0.01		3.741			2.00			
810.38	30.89	7.650	38.545	1079.0	5.58	0.483	39.028	0.00	5.108	6.50	10.00	2.00	0	0.00	<u>70+89.62</u>
7.15	0.00632					.000337	0.00		3.741			2.00			
817.53	30.94	7.596	38.536	1079.0	5.64	0.494	39.030	0.00	5.108	6.50	10.00	2.00	0	0.00	<u>70+82.47</u>
HYDRAULIC JUMP												2.00			
817.53	30.94	3.169	34.109	1079.0	20.84	6.746	40.855	0.00	5.108	6.50	10.00	2.00	0	0.00	<u>70+82.47</u>
63.34	0.00632					.012622	0.80		3.741			2.00			
880.87	31.34	3.094	34.434	1079.0	21.54	7.207	41.641	2.80	5.108	6.50	10.00	2.00	0	0.00	<u>70+19.63</u>
37.99	0.00684					.013586	0.52		3.666			2.00			
918.86	31.60	3.048	34.648	1079.0	21.99	7.509	42.157	0.00	5.108	6.50	10.00	2.00	0	0.00	<u>69+81.14</u>
27.64	0.00579					.014335	0.40		3.825			2.00			
946.50	31.76	3.008	34.768	1079.0	22.39	7.788	42.556	0.00	5.108	6.50	10.00	2.00	0	0.00	<u>69+53.50</u>
TRANS STR												2.00			
996.50	32.56	3.018	35.578	1079.0	22.29	7.717	43.295	0.00	5.108	6.50	10.00	2.00	0	0.00	<u>69+03.50</u>
132.45	0.01575					.014202	1.88		2.954			2.00			
1128.95	34.65	3.053	37.698	1079.0	21.95	7.478	45.176	0.00	5.108	6.50	10.00	2.00	0	0.00	<u>67+71.05</u>
211.11	0.01575					.013033	2.75		2.954			2.00			
1340.06	37.97	3.160	41.130	1079.0	20.92	6.798	47.928	0.00	5.108	6.50	10.00	2.00	0	0.00	<u>65+59.94</u>
117.43	0.01575					.011421	1.34		2.954			2.00			

WATER SURFACE PROFILE LISTING

ANASAZI DR CHAN STA 79+00 TO 58+08

MODELED BY D. BLATCHFORD-NOVEMBER, 1995

REVISED Q's FROM VILLAGE 11 MASTER PLAN

STATION	INVERT ELEV	DEPTH OF FLOW	W.S. ELEV	Q	VEL	VEL HEAD	ENERGY GRD.EL.	SUPER ELEV	CRITICAL DEPTH	HGT/ DIA	BASE/ ID NO.	ZL PIER	NO PIER	AVBPR	
L/ELEM	SO														

1457.49	39.82	3.270	43.089	1079.0	19.95	6.180	49.269	0.00	5.108	6.50	10.00	2.00	0	0.00	<u>64+42.51</u>
78.21	0.01575					.010010	0.78		2.954			2.00			
1535.70	41.05	3.383	44.433	1079.0	19.02	5.618	50.051	0.00	5.108	6.50	10.00	2.00	0	0.00	<u>63+64.36</u>
TRANS STR	0.01620					.008882	0.44					2.00			
1585.69	41.86	3.477	45.337	1079.0	18.31	5.203	50.540	0.00	5.108	6.50	10.00	2.00	0	0.00	<u>63+14.34</u>
23.78	0.01032					.008344	0.20		3.299			2.00			
1609.47	42.10	3.491	45.596	1079.0	18.20	5.142	50.738	0.00	5.108	6.50	10.00	2.00	0	0.00	<u>62+90.53</u>
136.47	0.01032					.007767	1.06		3.299			2.00			
1745.94	43.51	3.611	47.124	1079.0	17.35	4.674	51.798	0.00	5.108	6.50	10.00	2.00	0	0.00	<u>61+54.06</u>
86.18	0.01032					.006812	0.59		3.299			2.00			
1832.12	44.40	3.734	48.136	1079.0	16.54	4.250	52.386	0.00	5.108	6.50	10.00	2.00	0	0.00	<u>60+67.88</u>
59.88	0.01032					.005975	0.36		3.299			2.00			
1892.00	45.02	3.860	48.880	1079.0	15.77	3.863	52.743	0.00	5.108	6.50	10.00	2.00	0	0.00	<u>60+08.00</u>
43.62	0.01032					.005242	0.23		3.299			2.00			
1935.62	45.47	3.990	49.460	1079.0	15.04	3.512	52.972	0.00	5.108	6.50	10.00	2.00	0	0.00	<u>59+64.38</u>
TRANS STR	0.00500					.004896	0.24					2.00			
1985.62	45.72	3.992	49.712	1079.0	15.03	3.507	53.219	0.00	5.108	6.50	10.00	2.00	0	0.00	<u>59+14.38</u>
106.31	0.00498					.004872	0.52		3.973			2.00			
2091.93	46.25	4.000	50.250	1079.0	14.99	3.487	53.737	0.00	5.108	6.50	10.00	2.00	0	0.00	<u>58+08.07</u>

CHANNEL
STATIONING

!

Altitude (ft)	I	W	CH	E		
0.00						R
19.55						
39.10						
58.65		I	W	CH	E	R
78.20						
97.75						
117.30						
136.86						
156.41		I	W	CH	E	R
175.96						
195.51						
215.06		I	W	CH	E	TX
234.61						
254.16						
273.71		I		W X	E	R
293.26						
312.81						
332.36						
351.91						
371.46		I		W X	E	R
391.01						
410.57						
430.12						
449.67		I		W X	E	R
469.22						
488.77						
508.32						
527.87						
547.42		I		W X	E	JX
566.97		I		W X	E	R
586.52		I		W CH	E	R
606.07		I		W CH	E	R
625.62		I		W CH	E	R
645.17		I		W CH	E	R
664.73		I		W CH	E	R
684.28		I		W CH	E	R
703.83		I		W CH	E	R
723.38		I		W CH	E	R
742.93		I		W CH	E	R
762.48		I		W X	E	R
782.03		I		W CH	E	R
801.58		I		W CH	E	R
821.13		I		W CH	E	R
840.68		I		W CH	E	R
860.23		I		WCH	E	R
879.78		I		XH	E	TX
899.33			I	C H	X	R
918.89			I	C H	WE	R
938.44			I	C H	WE	R
957.99			I	C H	WE	R
977.54			I	C H	WE	R
997.09			I	C H	WE	R
1016.64			I	C H	WE	R

1036.19	.	I	C	H	WE	.	R
1055.74	.	I	C	H	WE	.	R
1075.29	.	I	C	H	WE	.	R
1094.84	.	I	C	H	WE	.	R
1114.39	.	I	C	H	WE	.	R
1133.94	.	I	W	C	H	E	R
1153.49	.	I	W	C	H	E	R
1173.04	.	I	W	C	H	E	R
1192.60	.	I	W	C	H	E	TX
1212.15	.	I	W	C	H	E	R
1231.70	.	I	W	C	H	E	R
1251.25	.						
1270.80	.						
1290.35	.						
1309.90	.						
1329.45	.						
1349.00	.		I	W	C	H	E
1368.55	.						
1388.10	.						
1407.65	.						
1427.20	.						
1446.76	.						
1466.31	.		I	W	C	H	E
1485.86	.						
1505.41	.						
1524.96	.						
1544.51	.		I	W	C	H	E
1564.06	.						
1583.61	.						
1603.16	.		I	W	C	H	E
1622.71	.		I	W	C	H	E
1642.26	.						
1661.81	.						
1681.36	.						
1700.92	.						
1720.47	.						
1740.02	.						
1759.57	.		I	W	C	H	E
1779.12	.						
1798.67	.						
1818.22	.						
1837.77	.		I	W	C	H	E
1857.32	.						
1876.87	.						
1896.42	.		I	W	C	H	E
1915.97	.						
1935.52	.						
1955.07	.		I	W	C	H	E
1974.63	.						
1994.18	.		I	W	C	H	E
2013.73	.						
2033.28	.						
2052.83	.						
2072.38	.						
2091.93	.			I	W	C	H

5.49	10.31	15.14	19.96	24.79	29.61	34.44	39.26	44.09	48.91	53.74
------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------

NOTES

1. GLOSSARY

I = INVERT ELEVATION
C = CRITICAL DEPTH
S = WATER SURFACE ELEVATION
H = HEIGHT OF CHANNEL
E = ENERGY GRADE LINE
X = CURVES CROSSING OVER
B = BRIDGE ENTRANCE OR EXIT
Y = WALL ENTRANCE OR EXIT

2. STATIONS FOR POINTS AT A JUMP MAY NOT BE PLOTTED EXACTLY

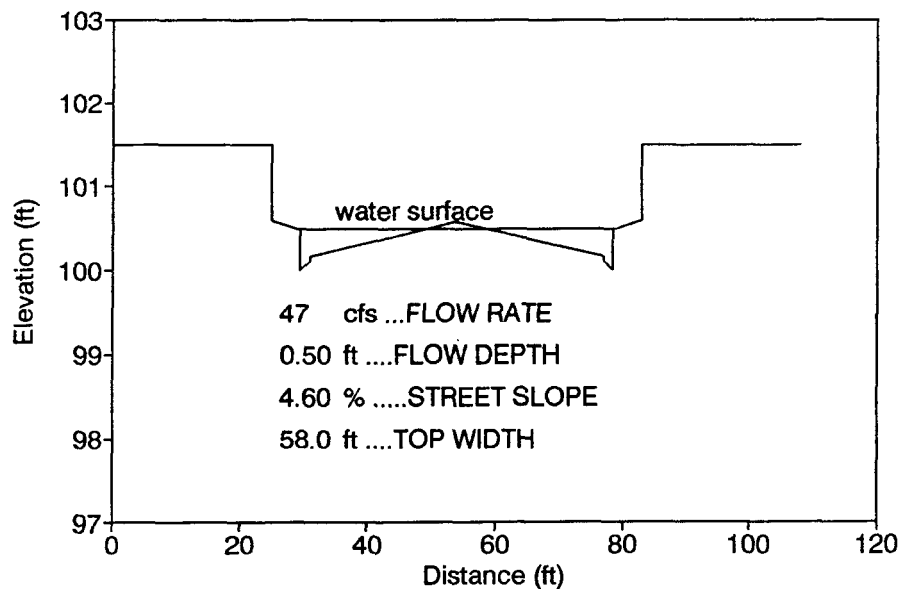
STREET FLOWS

V11-NORTH LOOP ROAD-U TO T

Input variables:		Output variables:	
Flow depth, d	0.50 ft	Capacity at d	47.1 cfs
Road width	50.0 ft	Velocity	6.4 fps
Crown height	0.59 ft	Top width	58.0 ft
Street slope	4.60 %	SECTION:	
Sidewalk width	4.0 ft		
Curb height	6 in		
Median width	0.0 ft		
Rt back of walk	100.0 %		
Lt back of walk	100.0 %		
		Cross Slope	2.0 %
		Gutter Depression	2.0 in
		Depth - Velocity Product	3.20
		Manning's n	0.016

Note: Input 100% slope at back of walk for vertical walls.

V11-NORTH LOOP ROAD-U TO T



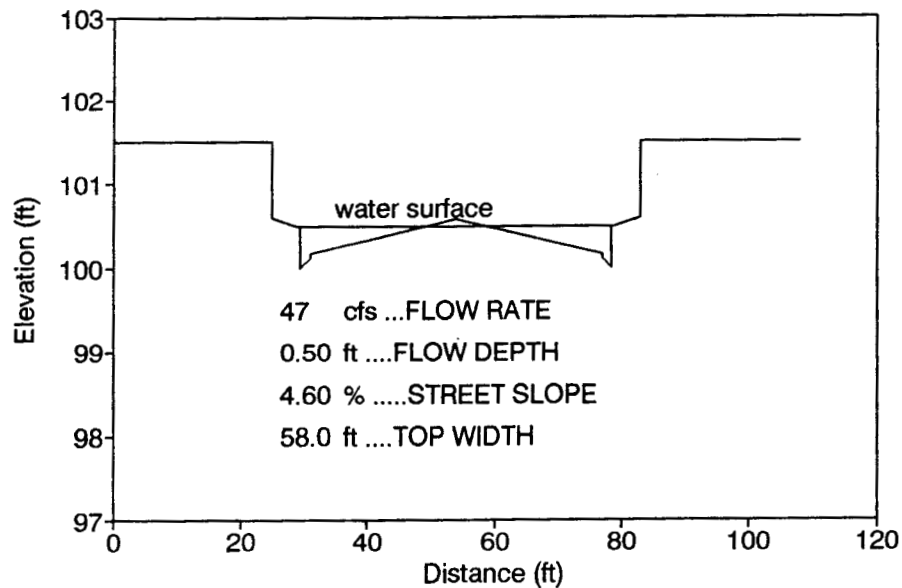
STREET FLOWS

V11-NORTH LOOP ROAD-T TO ES-1

Input variables:		Output variables:	
Flow depth, d	0.50 ft	Capacity at d	47.1 cfs
Road width	50.0 ft	Velocity	6.4 fps
Crown height	0.59 ft	Top width	58.0 ft
Street slope	4.60 %	SECTION:	
Sidewalk width	4.0 ft		
Curb height	6 in		
Median width	0.0 ft		
Rt back of walk	100.0 %		
Lt back of walk	100.0 %		
		Cross Slope	2.0 %
		Gutter Depression	2.0 in
		Depth - Velocity Product	3.20
		Manning's n	0.016

Note: Input 100% slope at back of walk for vertical walls.

V11-NORTH LOOP ROAD-T TO ES-1



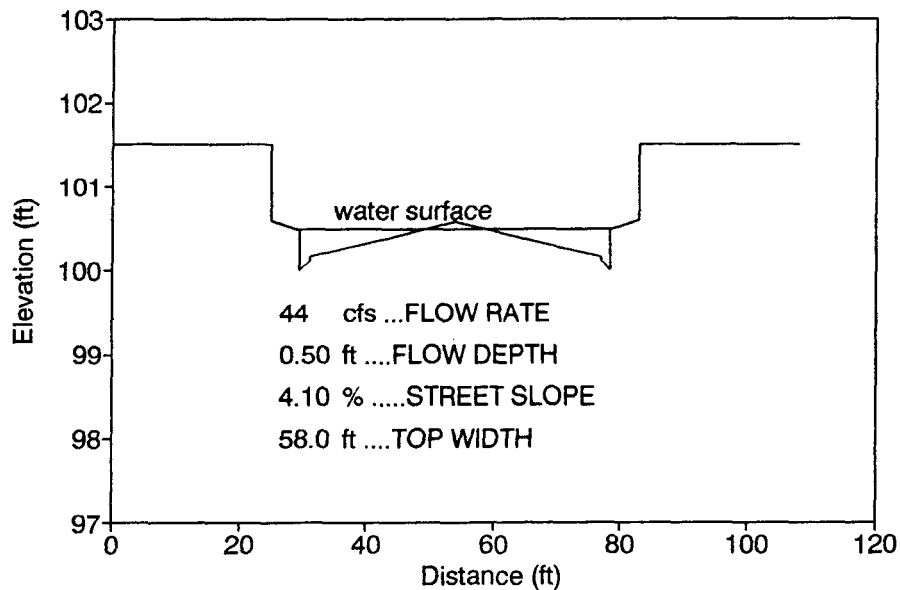
STREET FLOWS

V11-NORTH LOOP ROAD-ES-1 TO NP-1

Input variables:		Output variables:	
Flow depth, d	0.50 ft	Capacity at d	44.4 cfs
Road width	50.0 ft	Velocity	6.0 fps
Crown height	0.59 ft	Top width	58.0 ft
Street slope	4.10 %	SECTION:	
Sidewalk width	4.0 ft		
Curb height	6 in		
Median width	0.0 ft		
Rt back of walk	100.0 %		
Lt back of walk	100.0 %	Cross Slope	2.0 %
		Gutter Depression	2.0 in
		Depth - Velocity Product	3.02
		Manning's n	0.016

Note: Input 100% slope at back of walk for vertical walls.

V11-NORTH LOOP ROAD-ES-1 TO NP-1



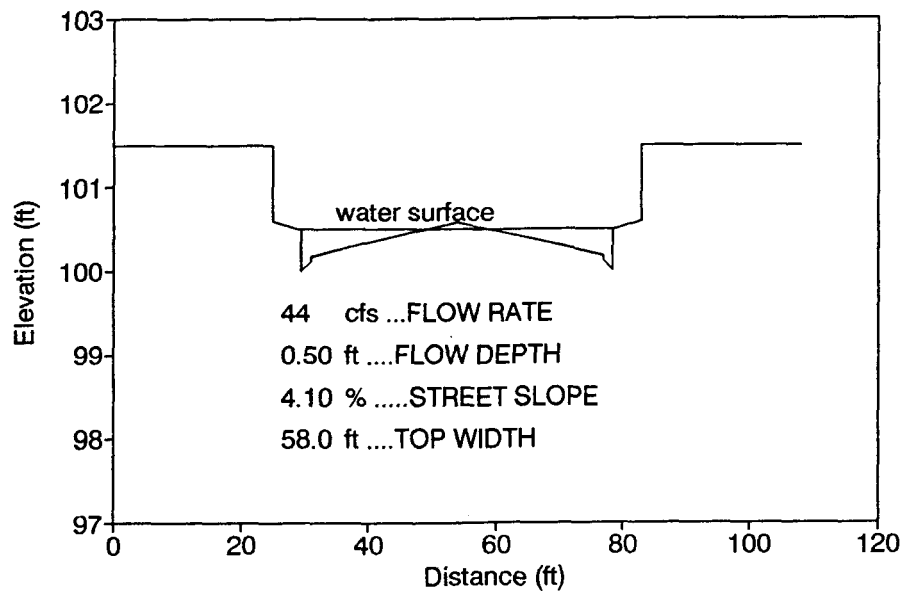
STREET FLOWS

V11-NORTH LOOP ROAD-NP-1 TO L2

Input variables:		Output variables:	
Flow depth, d	0.50 ft	Capacity at d	44.4 cfs
Road width	50.0 ft	Velocity	6.0 fps
Crown height	0.59 ft	Top width	58.0 ft
Street slope	4.10 %	SECTION:	
Sidewalk width	4.0 ft		
Curb height	6 in		
Median width	0.0 ft		
Rt back of walk	100.0 %		
Lt back of walk	100.0 %	Cross Slope	2.0 %
		Gutter Depression	2.0 in
		Depth - Velocity Product	3.02
		Manning's n	0.016

Note: Input 100% slope at back of walk for vertical walls.

V11-NORTH LOOP ROAD-NP-1 TO L2



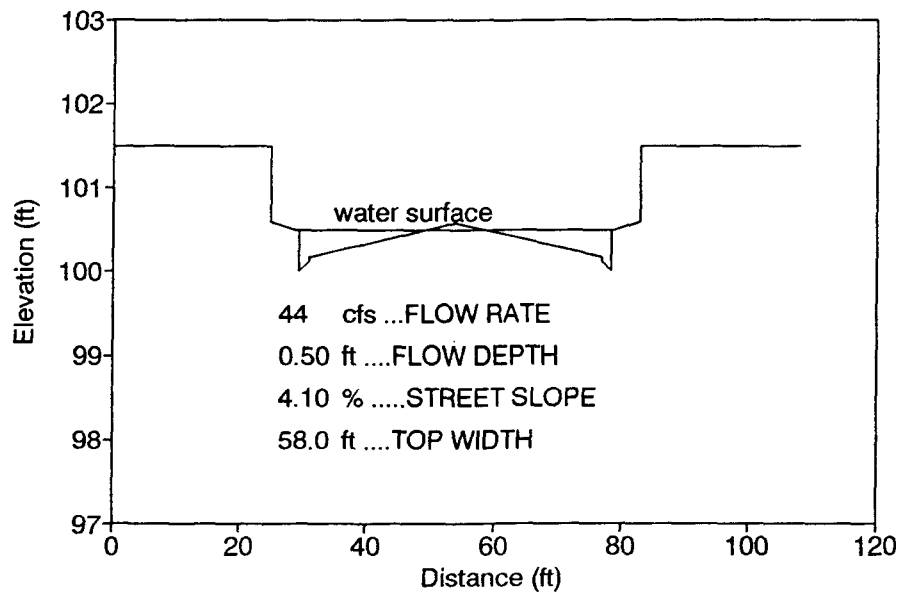
STREET FLOWS

V11-NORTH LOOP ROAD-L2 TO M

Input variables:		Output variables:	
Flow depth, d	0.50 ft	Capacity at d	44.4 cfs
Road width	50.0 ft	Velocity	6.0 fps
Crown height	0.59 ft	Top width	58.0 ft
Street slope	4.10 %	SECTION:	
Sidewalk width	4.0 ft		
Curb height	6 in		
Median width	0.0 ft		
Rt back of walk	100.0 %		
Lt back of walk	100.0 %	Cross Slope	2.0 %
		Gutter Depression	2.0 in
		Depth - Velocity Product	3.02
		Manning's n	0.016

Note: Input 100% slope at back of walk for vertical walls.

V11-NORTH LOOP ROAD-L2 TO M



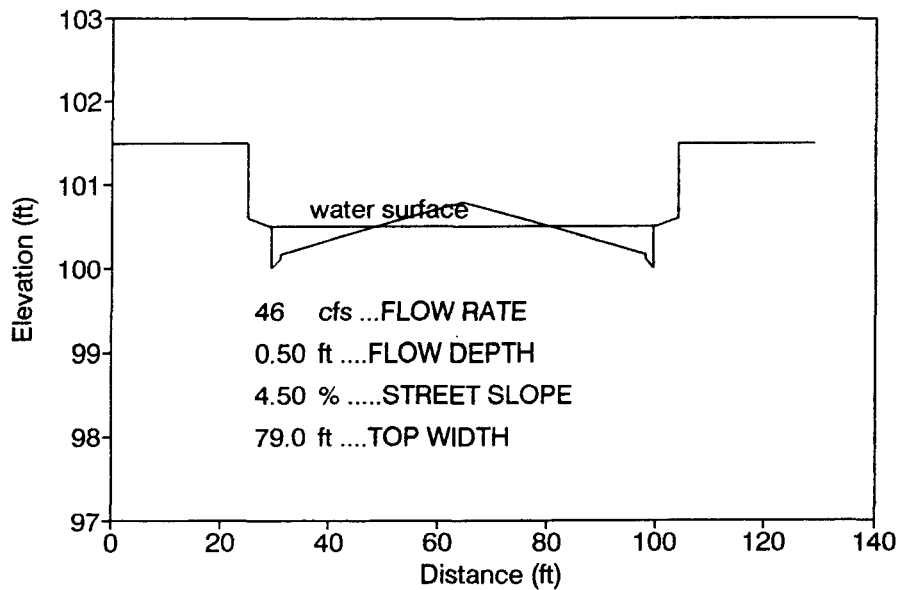
STREET FLOWS

V11-BANBURRY CROSS ROAD-M TO K2

Input variables:		Output variables:	
Flow depth, d	0.50 ft	Capacity at d	45.6 cfs
Road width	71.0 ft	Velocity	6.3 fps
Crown height	0.80 ft	Top width	79.0 ft
Street slope	4.50 %	SECTION:	
Sidewalk width	4.0 ft		
Curb height	6 in		
Median width	0.0 ft		
Rt back of walk	100.0 %		
Lt back of walk	100.0 %	Cross Slope	2.0 %
		Gutter Depression	2.0 in
		Depth - Velocity Product	3.17
		Manning's n	0.016

Note: Input 100% slope at back of walk for vertical walls.

V11-BANBURRY CROSS ROAD-M TO K2



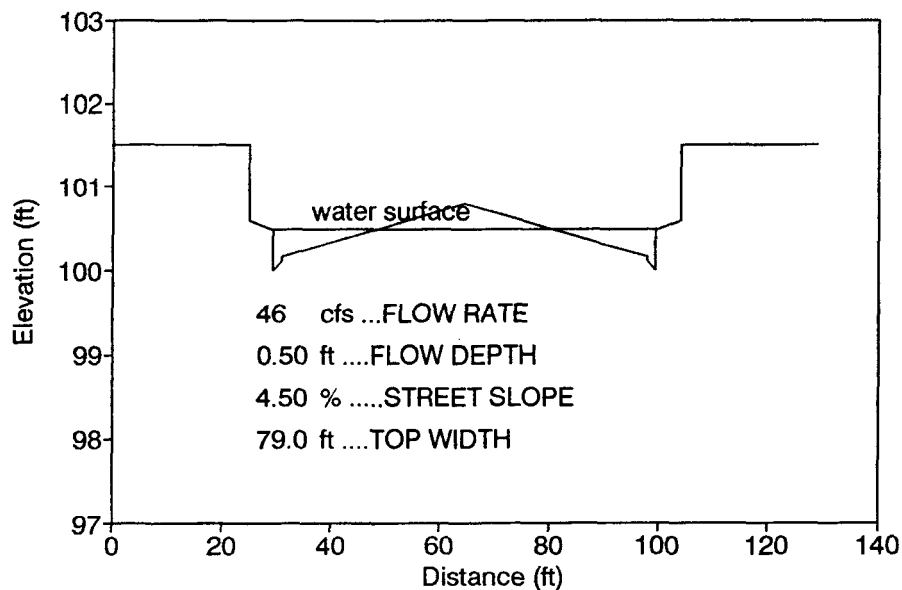
STREET FLOWS

V11-BANBURY CROSS ROAD-K2 TO A2

Input variables:		Output variables:	
Flow depth, d	0.50 ft	Capacity at d	45.6 cfs
Road width	71.0 ft	Velocity	6.3 fps
Crown height	0.80 ft	Top width	79.0 ft
Street slope	4.50 %	SECTION:	
Sidewalk width	4.0 ft		
Curb height	6 in		
Median width	0.0 ft		
Rt back of walk	100.0 %		
Lt back of walk	100.0 %	Cross Slope	2.0 %
		Gutter Depression	2.0 in
		Depth - Velocity Product	3.17
		Manning's n	0.016

Note: Input 100% slope at back of walk for vertical walls.

V11-BANBURY CROSS ROAD-K2 TO A2



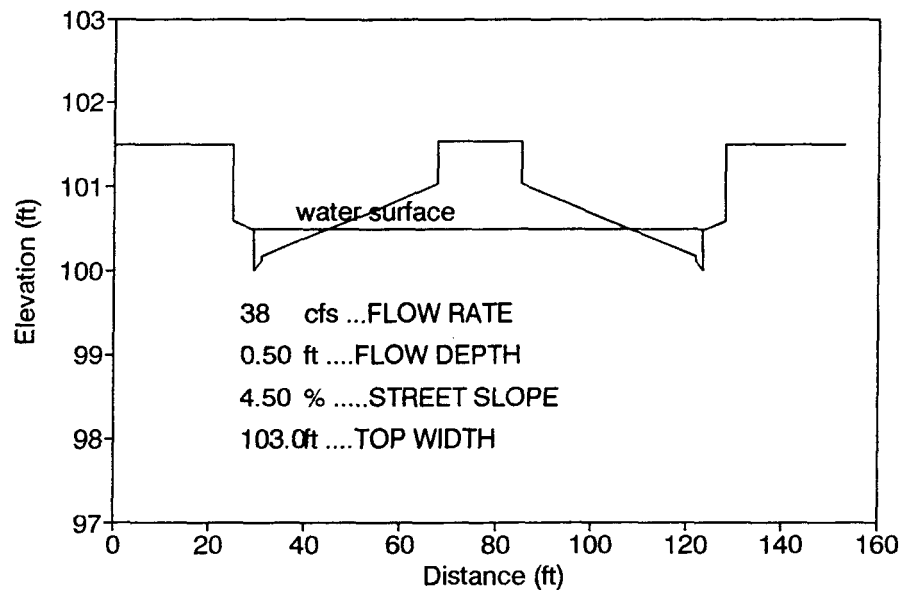
STREET FLOWS

V11-HUALAPAI WAY-N/O TO A3

Input variables:		Output variables:	
Flow depth, d	0.50 ft	Capacity at d	38.4 cfs
Road width	95.0 ft	Velocity	6.4 fps
Crown height	1.04 ft	Top width	103.0 ft
Street slope	4.50 %	SECTION:	
Sidewalk width	4.0 ft		
Curb height	6 in		
Median width	17.7 ft		
Rt back of walk	100.0 %		
Lt back of walk	100.0 %	Cross Slope	2.0 %
		Gutter Depression	2.0 in
		Depth - Velocity Product	3.21
		Manning's n	0.016

Note: Input 100% slope at back of walk for vertical walls.

V11-HUALAPAI WAY-N/O TO A3



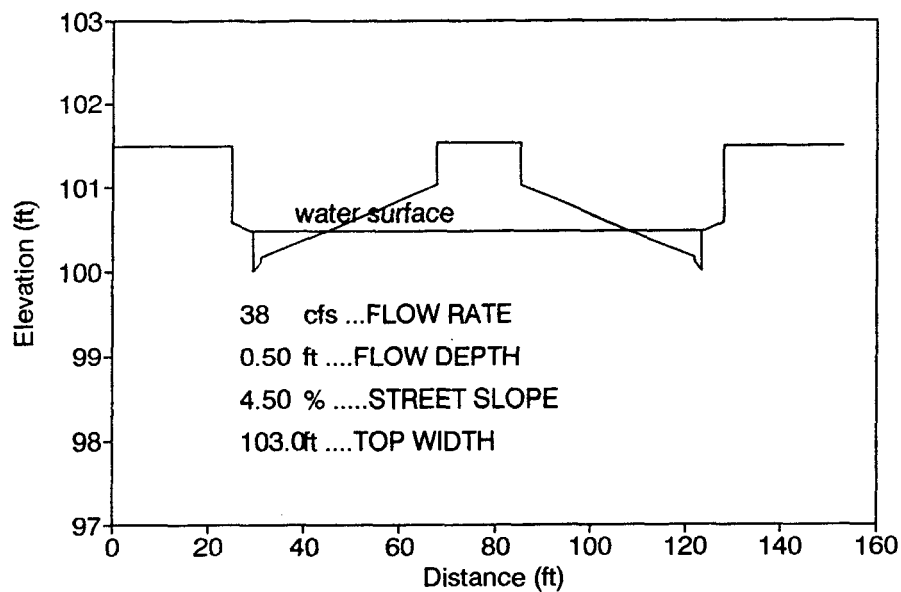
STREET FLOWS

V11-HUALAPAI WAY-V TO Q

Input variables:		Output variables:	
Flow depth, d	0.50 ft	Capacity at d	38.4 cfs
Road width	95.0 ft	Velocity	6.4 fps
Crown height	1.04 ft	Top width	103.0 ft
Street slope	4.50 %	SECTION:	
Sidewalk width	4.0 ft		
Curb height	6 in		
Median width	17.7 ft		
Rt back of walk	100.0 %		
Lt back of walk	100.0 %	Cross Slope	2.0 %
		Gutter Depression	2.0 in
		Depth - Velocity Product	3.21
		Manning's n	0.016

Note: Input 100% slope at back of walk for vertical walls.

V11-HUALAPAI WAY-V TO Q



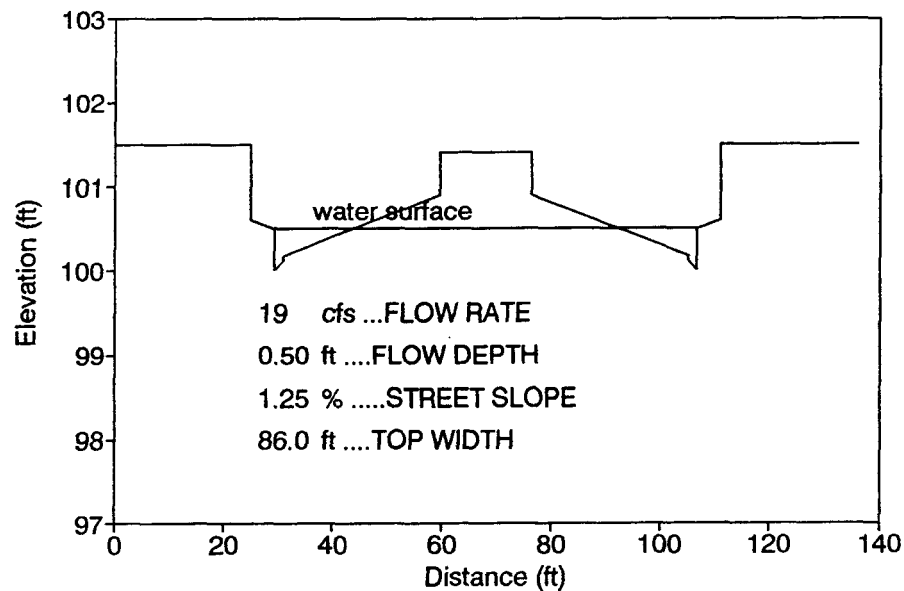
STREET FLOWS

ANASAZI-A4 TO G

Input variables:		Output variables:	
Flow depth, d	0.50 ft	Capacity at d	19.0 cfs
Road width	78.0 ft	Velocity	3.4 fps
Crown height	0.91 ft	Top width	86.0 ft
Street slope	1.25 %	SECTION:	
Sidewalk width	4.0 ft		
Curb height	6 in		
Median width	16.7 ft		
Rt back of walk	100.0 %		
Lt back of walk	100.0 %	Cross Slope	2.0 %
		Gutter Depression	2.0 in
		Depth - Velocity Product	1.70
		Manning's n	0.016

Note: Input 100% slope at back of walk for vertical walls.

ANASAZI-A4 TO G



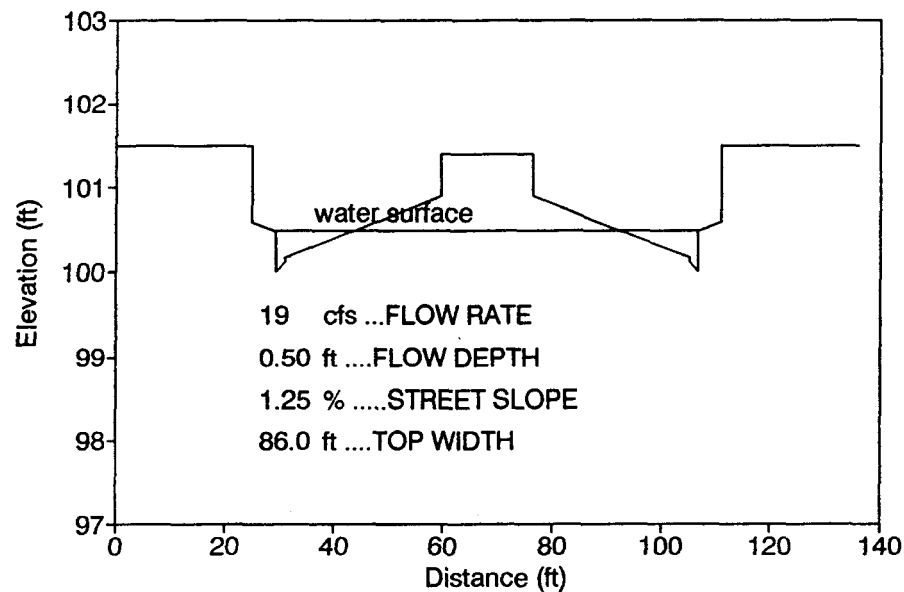
STREET FLOWS

ANASAZI-G TO A3

Input variables:		Output variables:	
Flow depth, d	0.50 ft	Capacity at d	19.0 cfs
Road width	78.0 ft	Velocity	3.4 fps
Crown height	0.91 ft	Top width	86.0 ft
Street slope	1.25 %	SECTION:	
Sidewalk width	4.0 ft		
Curb height	6 in		
Median width	16.7 ft		
Rt back of walk	100.0 %		
Lt back of walk	100.0 %	Cross Slope	2.0 %
		Gutter Depression	2.0 in
		Depth - Velocity Product	1.70
		Manning's n	0.016

Note: Input 100% slope at back of walk for vertical walls.

ANASAZI-G TO A3



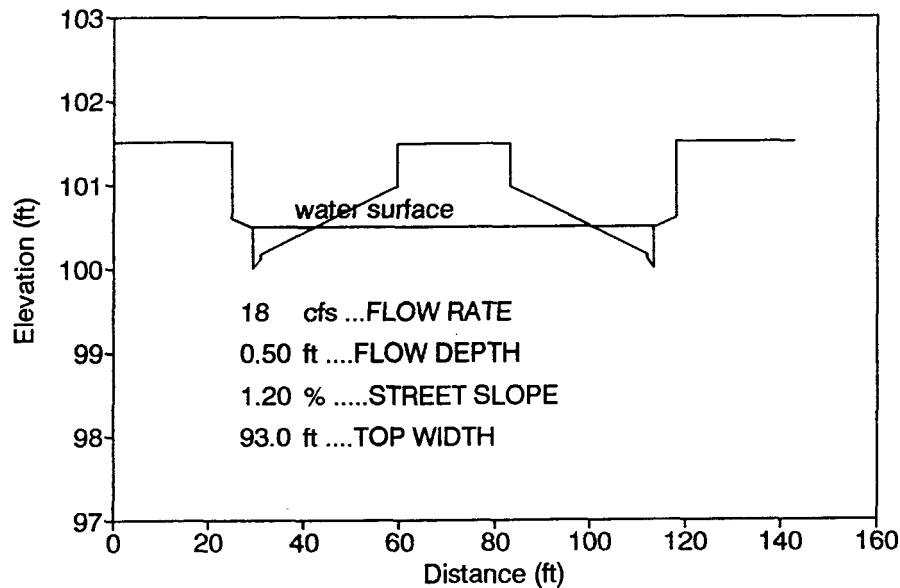
STREET FLOWS

ANASAZI-A3 TO A2

Input variables:		Output variables:	
Flow depth, d	0.50 ft	Capacity at d	17.5 cfs
Road width	85.0 ft	Velocity	3.4 fps
Crown height	0.98 ft	Top width	93.0 ft
Street slope	1.20 %	SECTION:	
Sidewalk width	4.0 ft		
Curb height	6 in		
Median width	23.7 ft		
Rt back of walk	100.0 %		
Lt back of walk	100.0 %	Cross Slope	2.0 %
		Gutter Depression	2.0 in
		Depth - Velocity Product	1.68
		Manning's n	0.016

Note: Input 100% slope at back of walk for vertical walls.

ANASAZI-A3 TO A2



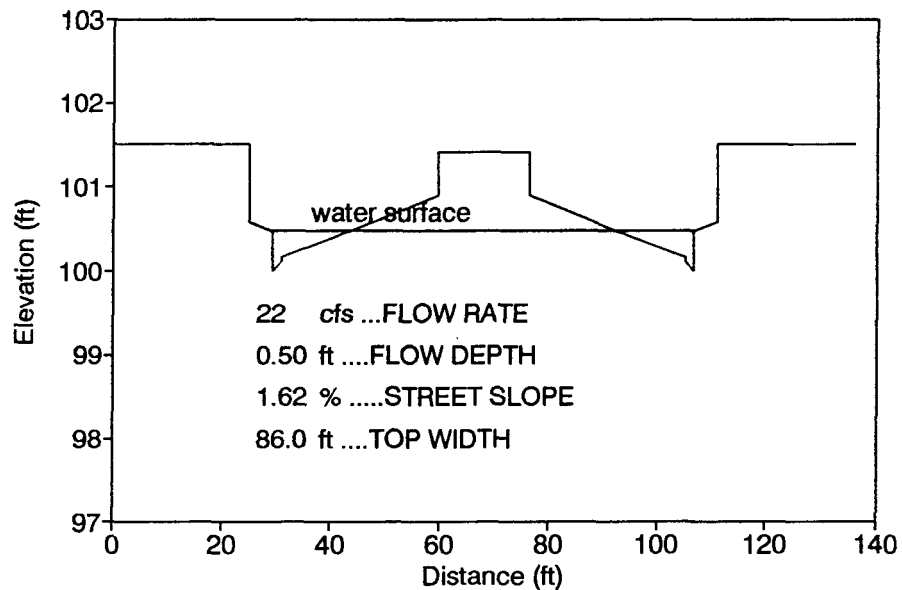
STREET FLOWS

ANASAZI-A2 TO A1

Input variables:		Output variables:	
Flow depth, d	0.50 ft	Capacity at d	21.7 cfs
Road width	78.0 ft	Velocity	3.9 fps
Crown height	0.91 ft	Top width	86.0 ft
Street slope	1.62 %	SECTION:	
Sidewalk width	4.0 ft		
Curb height	6 in		
Median width	16.7 ft		
Rt back of walk	100.0 %		
Lt back of walk	100.0 %	Cross Slope	2.0 %
		Gutter Depression	2.0 in
		Depth - Velocity Product	1.94
		Manning's n	0.016

Note: Input 100% slope at back of walk for vertical walls.

ANASAZI-A2 TO A1



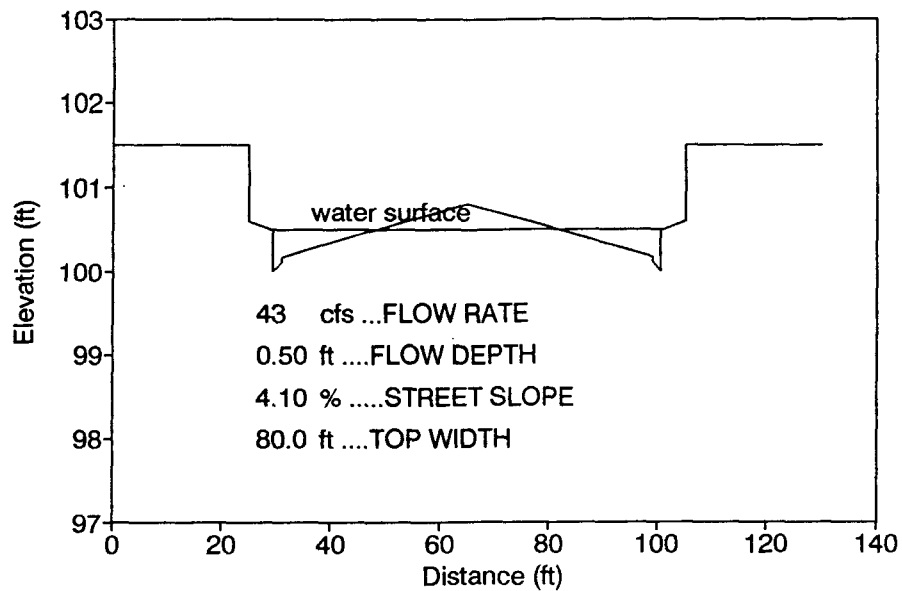
STREET FLOWS

V11-SOUTH LOOP ROAD-W TO NP-2

Input variables:		Output variables:	
Flow depth, d	0.50 ft	Capacity at d	43.5 cfs
Road width	72.0 ft	Velocity	6.1 fps
Crown height	0.81 ft	Top width	80.0 ft
Street slope	4.10 %	SECTION:	
Sidewalk width	4.0 ft		
Curb height	6 in		
Median width	0.0 ft		
Rt back of walk	100.0 %		
Lt back of walk	100.0 %	Cross Slope	2.0 %
		Gutter Depression	2.0 in
		Depth - Velocity Product	3.03
		Manning's n	0.016

Note: Input 100% slope at back of walk for vertical walls.

V11-SOUTH LOOP ROAD-W TO NP-2



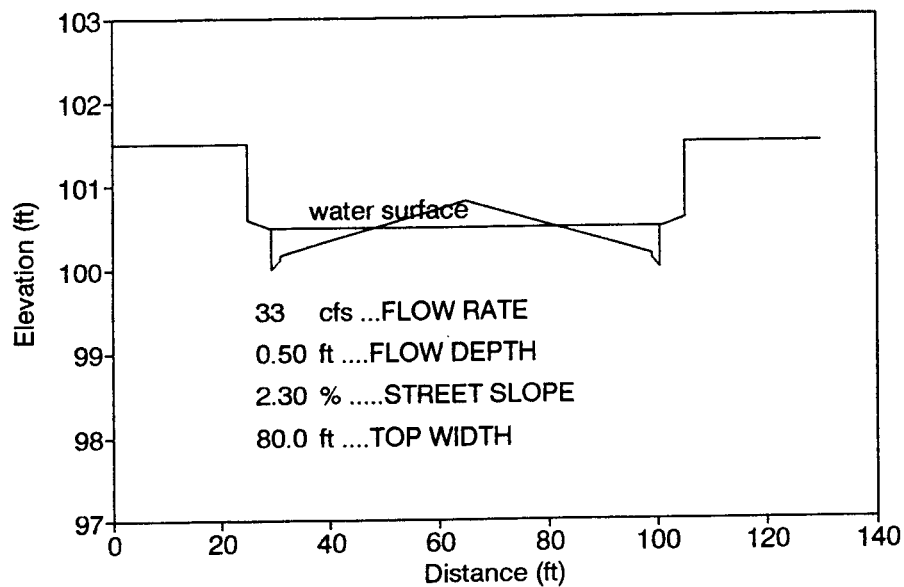
STREET FLOWS

V11-SOUTH LOOP ROAD-NP-2 TO P

Input variables:		Output variables:	
Flow depth, d	0.50 ft	Capacity at d	32.6 cfs
Road width	72.0 ft	Velocity	4.5 fps
Crown height	0.81 ft	Top width	80.0 ft
Street slope	2.30 %	SECTION:	
Sidewalk width	4.0 ft		
Curb height	6 in		
Median width	0.0 ft		
Rt back of walk	100.0 %		
Lt back of walk	100.0 %		
		Cross Slope	2.0 %
		Gutter Depression	2.0 in
		Depth - Velocity Product	2.27
		Manning's n	0.016

Note: Input 100% slope at back of walk for vertical walls.

V11-SOUTH LOOP ROAD-NP-2 TO P



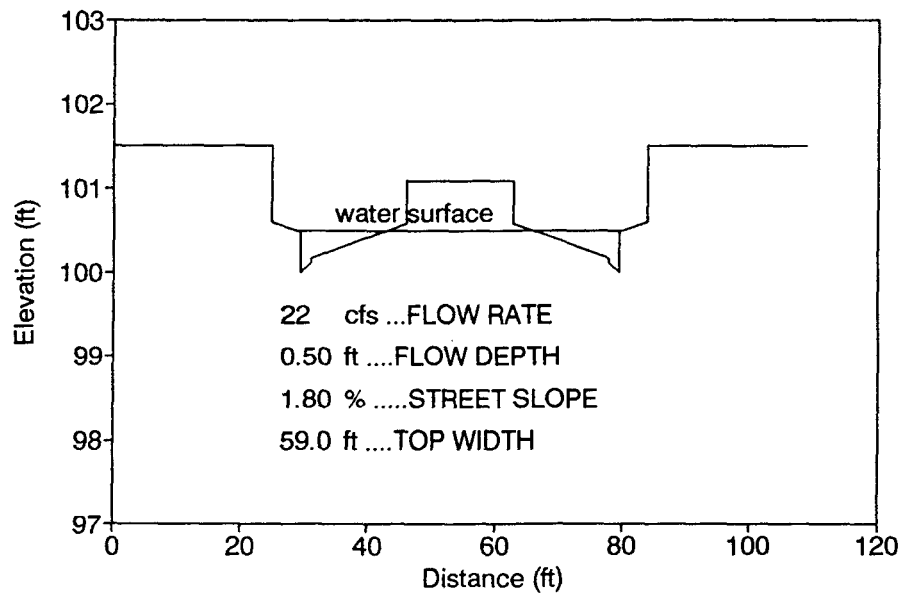
STREET FLOWS

OXFORD CROSS SOUTH-CH-2 TO E

Input variables:		Output variables:	
Flow depth, d	0.50 ft	Capacity at d	21.7 cfs
Road width	51.0 ft	Velocity	4.1 fps
Crown height	0.59 ft	Top width	59.0 ft
Street slope	1.80 %	SECTION:	
Sidewalk width	4.0 ft		
Curb height	6 in		
Median width	16.7 ft		
Rt back of walk	100.0 %		
Lt back of walk	100.0 %		
		Cross Slope	2.0 %
		Gutter Depression	2.0 in
		Depth - Velocity Product	2.05
		Manning's n	0.016

Note: Input 100% slope at back of walk for vertical walls.

OXFORD CROSS SOUTH-CH-2 TO E



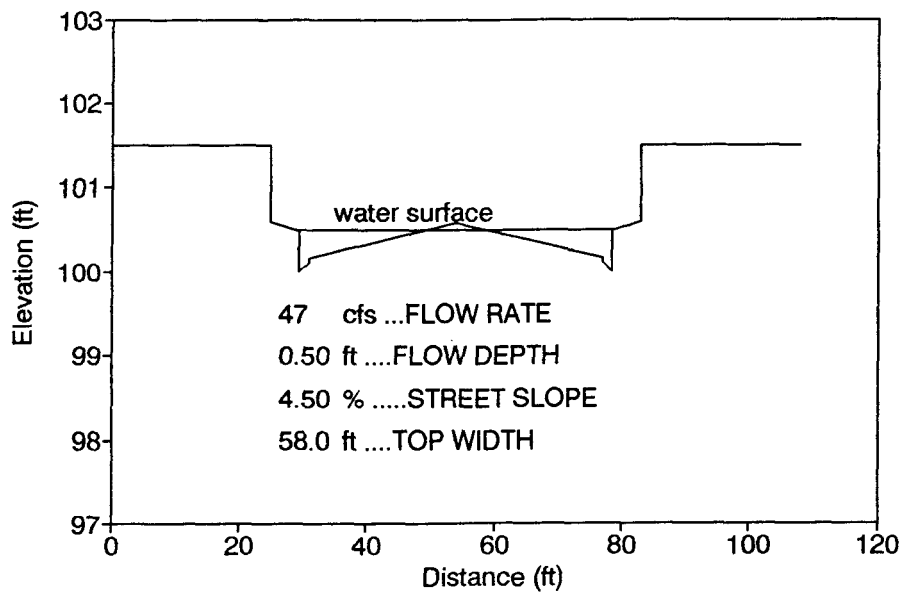
STREET FLOWS

V11-OXFORD CROSS NORTH-P TO A4

Input variables:		Output variables:	
Flow depth, d	0.50 ft	Capacity at d	46.5 cfs
Road width	50.0 ft	Velocity	6.3 fps
Crown height	0.59 ft	Top width	58.0 ft
Street slope	4.50 %	SECTION:	
Sidewalk width	4.0 ft		
Curb height	6 in		
Median width	0.0 ft		
Rt back of walk	100.0 %		
Lt back of walk	100.0 %	Cross Slope	2.0 %
		Gutter Depression	2.0 in
		Depth - Velocity Product	3.17
		Manning's n	0.016

Note: Input 100% slope at back of walk for vertical walls.

V11-OXFORD CROSS NORTH-P TO A4



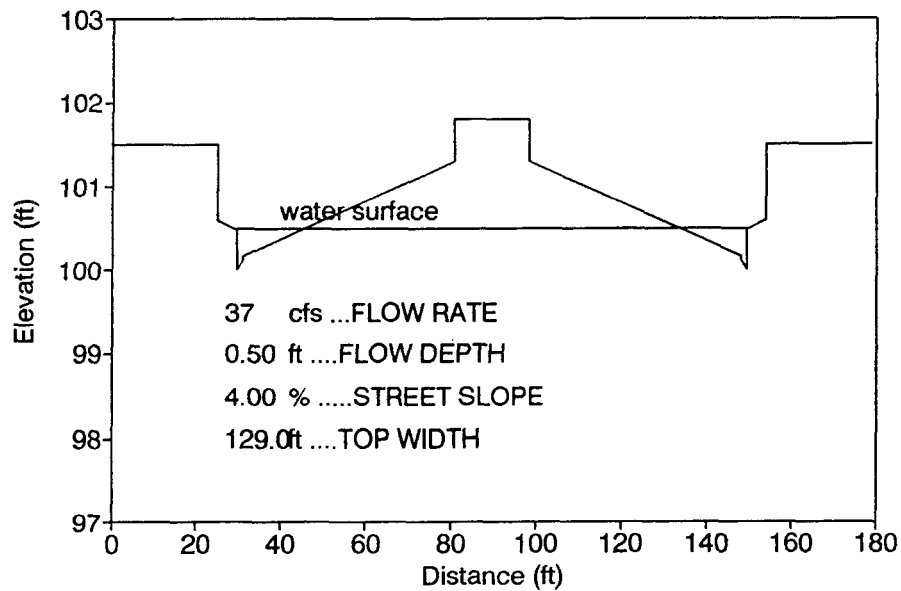
STREET FLOWS

V11-ANASAZI DRIVE-E TO RES

Input variables:		Output variables:	
Flow depth, d	0.50 ft	Capacity at d	37.3 cfs
Road width	121.0 ft	Velocity	6.0 fps
Crown height	1.30 ft	Top width	129.0 ft
Street slope	4.00 %	SECTION:	
Sidewalk width	4.0 ft		
Curb height	6 in		
Median width	17.7 ft		
Rt back of walk	100.0 %		
Lt back of walk	100.0 %	Cross Slope	2.0 %
		Gutter Depression	2.0 in
		Depth - Velocity Product	3.02
		Manning's n	0.016

Note: Input 100% slope at back of walk for vertical walls.

V11-ANASAZI DRIVE-E TO RES



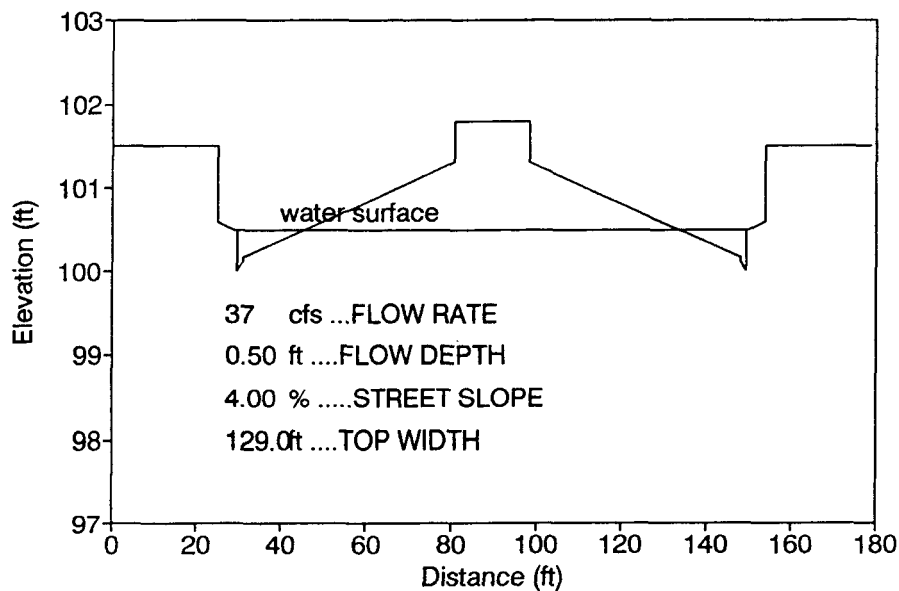
STREET FLOWS

V11-ANASAZI DRIVE-RES TO C

Input variables:		Output variables:	
Flow depth, d	0.50 ft	Capacity at d	37.3 cfs
Road width	121.0 ft	Velocity	6.0 fps
Crown height	1.30 ft	Top width	129.0 ft
Street slope	4.00 %	SECTION:	
Sidewalk width	4.0 ft		
Curb height	6 in		
Median width	17.7 ft		
Rt back of walk	100.0 %		
Lt back of walk	100.0 %	Cross Slope	2.0 %
		Gutter Depression	2.0 in
		Depth - Velocity Product	3.02
		Manning's n	0.016

Note: Input 100% slope at back of walk for vertical walls.

V11-ANASAZI DRIVE-RES TO C



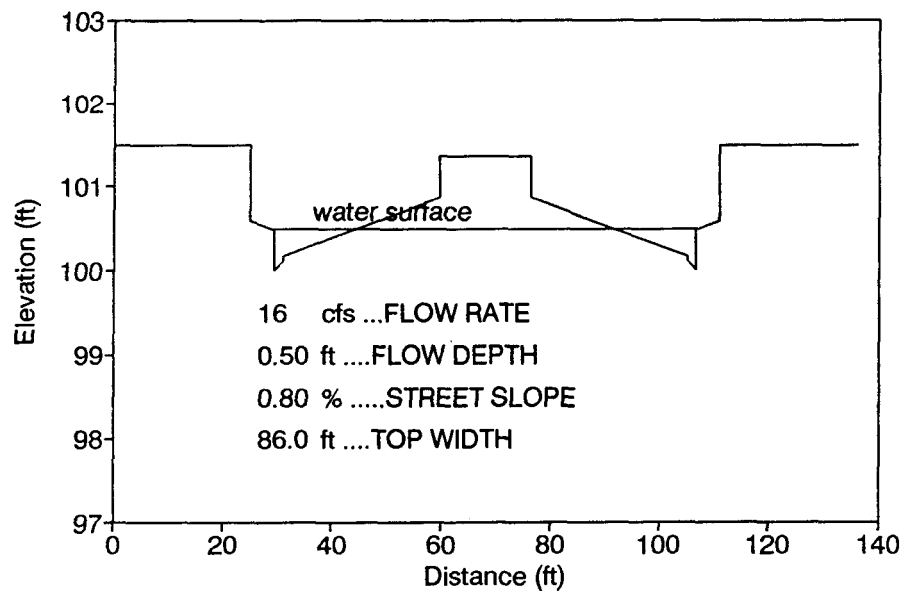
STREET FLOWS

V11-3205 ROAD-X TO Y

Input variables:		Output variables:	
Flow depth, d	0.50 ft	Capacity at d	15.8 cfs
Road width	78.0 ft	Velocity	2.7 fps
Crown height	0.87 ft	Top width	86.0 ft
Street slope	0.80 %	SECTION:	
Sidewalk width	4.0 ft		
Curb height	6 in		
Median width	16.7 ft		
Rt back of walk	100.0 %		
L1 back of walk	100.0 %	Cross Slope	2.0 %
		Gutter Depression	2.0 in
		Depth - Velocity Product	1.36
		Manning's n	0.016

Note: Input 100% slope at back of walk for vertical walls.

V11-3205 ROAD-X TO Y



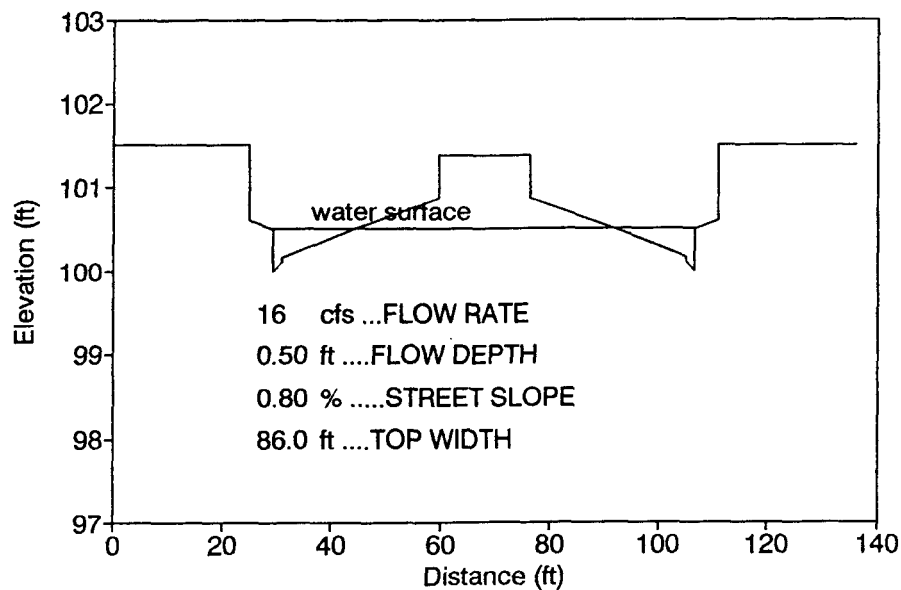
STREET FLOWS

V11-3205 ROAD-Y TO Z

Input variables:		Output variables:	
Flow depth, d	0.50 ft	Capacity at d	15.8 cfs
Road width	78.0 ft	Velocity	2.7 fps
Crown height	0.87 ft	Top width	86.0 ft
Street slope	0.80 %	SECTION:	
Sidewalk width	4.0 ft		
Curb height	6 in		
Median width	16.7 ft		
Rt back of walk	100.0 %		
Lt back of walk	100.0 %		
		Cross Slope	2.0 %
		Gutter Depression	2.0 in
		Depth - Velocity Product	1.36
		Manning's n	0.016

Note: Input 100% slope at back of walk for vertical walls.

V11-3205 ROAD-Y TO Z



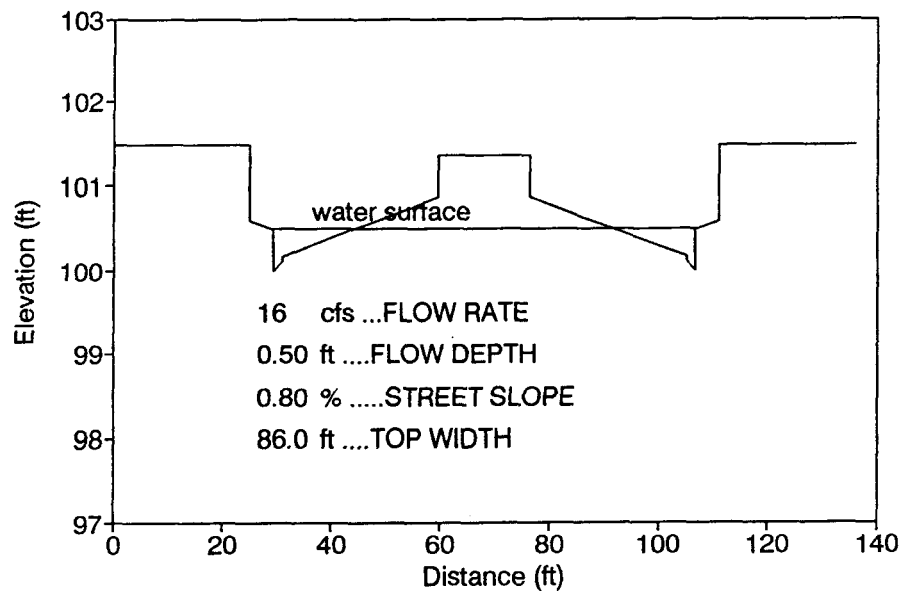
STREET FLOWS

V11-3205 ROAD-Z TO HS

Input variables:		Output variables:	
Flow depth, d	0.50 ft	Capacity at d	15.8 cfs
Road width	78.0 ft	Velocity	2.7 fps
Crown height	0.87 ft	Top width	86.0 ft
Street slope	0.80 %	SECTION:	
Sidewalk width	4.0 ft		
Curb height	6 in		
Median width	16.7 ft		
Rt back of walk	100.0 %		
Lt back of walk	100.0 %	Cross Slope	2.0 %
		Gutter Depression	2.0 in
		Depth - Velocity Product	1.36
		Manning's n	0.016

Note: Input 100% slope at back of walk for vertical walls.

V11-3205 ROAD-Z TO HS



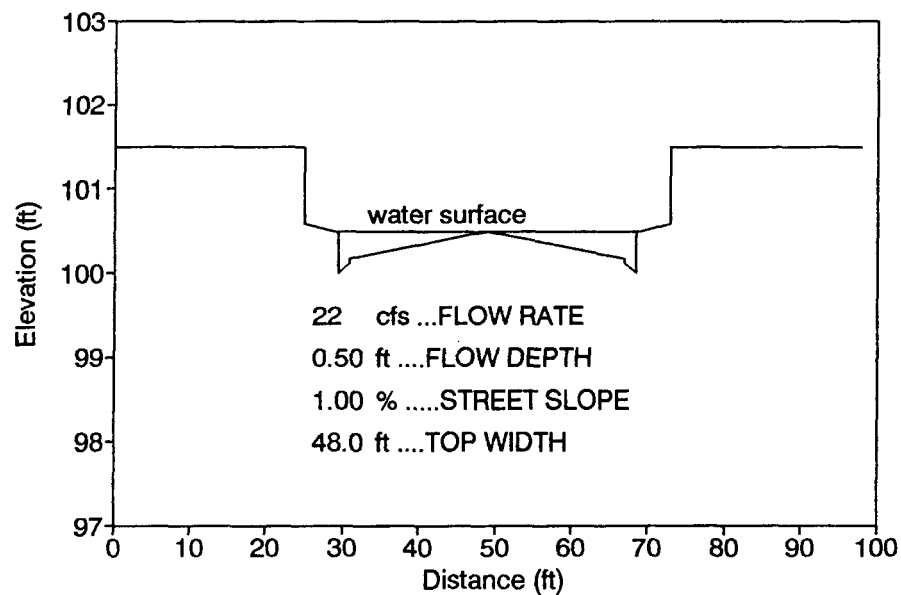
STREET FLOWS

V11-CUL-DE-SAC B

Input variables:		Output variables:	
Flow depth, d	0.50 ft	Capacity at d	21.8 cfs
Road width	40.0 ft	Velocity	3.0 fps
Crown height	0.50 ft	Top width	48.0 ft
Street slope	1.00 %	SECTION:	
Sidewalk width	4.0 ft		
Curb height	6 in		
Median width	0.0 ft		
Rt back of walk	100.0 %		
Lt back of walk	100.0 %		
		Cross Slope	2.0 %
		Gutter Depression	2.0 in
		Depth - Velocity Product	1.49
		Manning's n	0.016

Note: Input 100% slope at back of walk for vertical walls.

V11-CUL-DE-SAC B



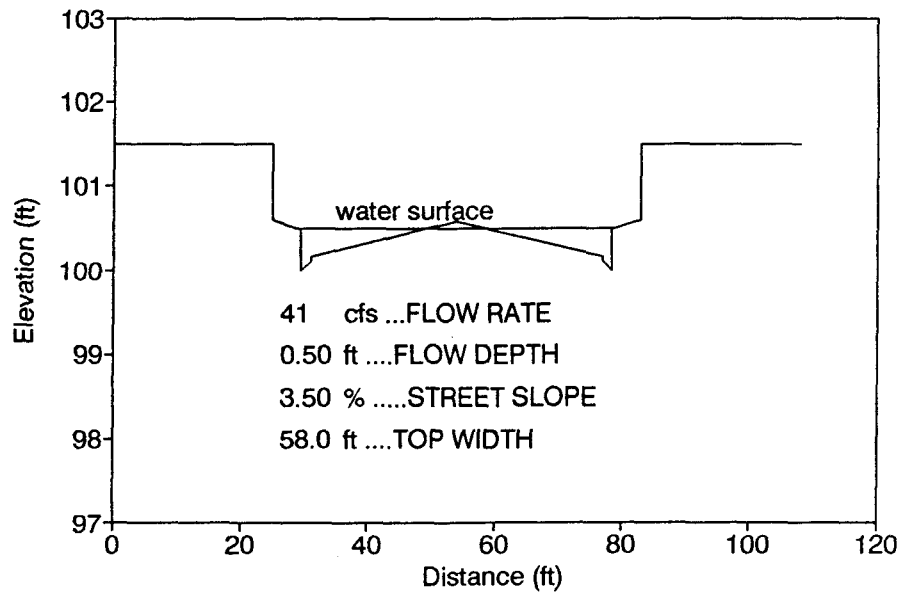
STREET FLOWS

V12-'A' STREET-NN-1 TO NN-2

Input variables:		Output variables:	
Flow depth, d	0.50 ft	Capacity at d	41.0 cfs
Road width	50.0 ft	Velocity	5.6 fps
Crown height	0.59 ft	Top width	58.0 ft
Street slope	3.50 %	SECTION:	
Sidewalk width	4.0 ft		
Curb height	6 in		
Median width	0.0 ft		
Rt back of walk	100.0 %		
Lt back of walk	100.0 %	Cross Slope	2.0 %
		Gutter Depression	2.0 in
		Depth - Velocity Product	2.79
		Manning's n	0.016

Note: Input 100% slope at back of walk for vertical walls.

V12-'A' STREET-NN-1 TO NN-2



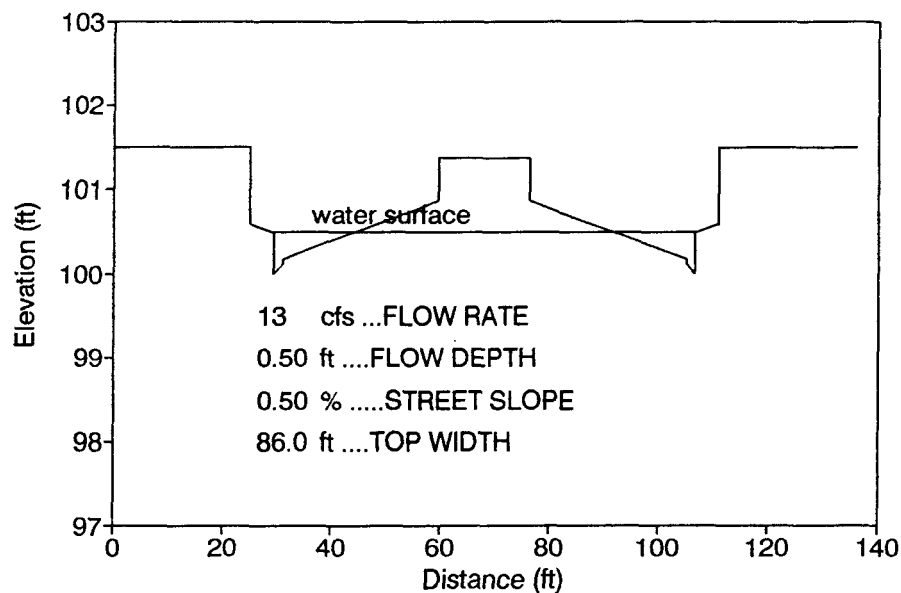
STREET FLOWS

V12-3205 ROAD-NN-2 TO MM

Input variables:		Output variables:	
Flow depth, d	0.50 ft	Capacity at d	12.5 cfs
Road width	78.0 ft	Velocity	2.1 fps
Crown height	0.87 ft	Top width	86.0 ft
Street slope	0.50 %		
Sidewalk width	4.0 ft	SECTION:	
Curb height	6 in	Cross Slope	2.0 %
Median width	16.7 ft	Gutter Depression	2.0 in
Rt back of walk	100.0 %	Depth - Velocity Product	1.07
Lt back of walk	100.0 %	Manning's n	0.016

Note: Input 100% slope at back of walk for vertical walls.

V12-3205 ROAD-NN-2 TO MM



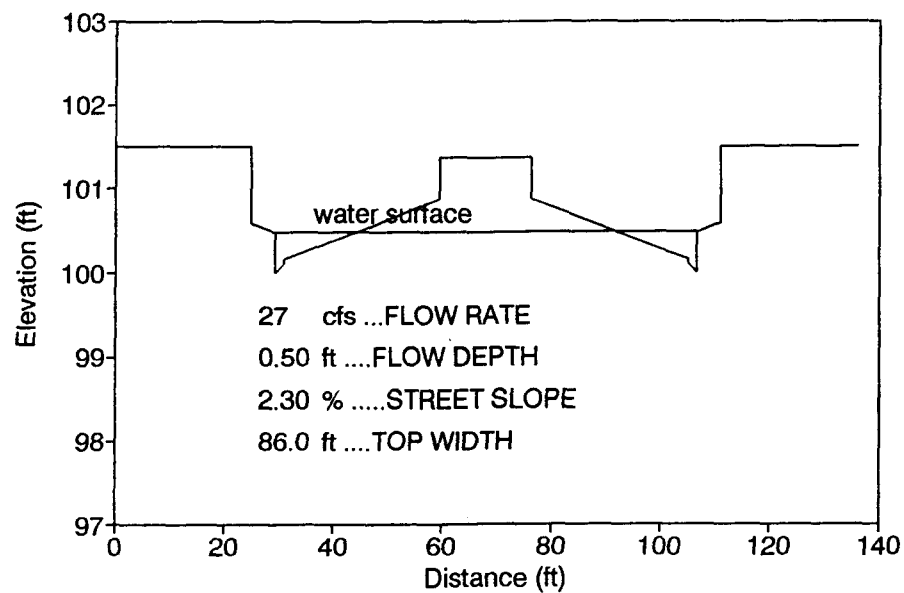
STREET FLOWS

V12-ALTA DRIVE-LL-EE

Input variables:		Output variables:	
Flow depth, d	0.50 ft	Capacity at d	26.9 cfs
Road width	78.0 ft	Velocity	4.6 fps
Crown height	0.87 ft	Top width	86.0 ft
Street slope	2.30 %	SECTION:	
Sidewalk width	4.0 ft		
Curb height	6 in		
Median width	16.7 ft		
Rt back of walk	100.0 %		
Lt back of walk	100.0 %	Cross Slope	2.0 %
		Gutter Depression	2.0 in
		Depth - Velocity Product	2.30
		Manning's n	0.016

Note: Input 100% slope at back of walk for vertical walls.

V12-ALTA DRIVE-LL-EE



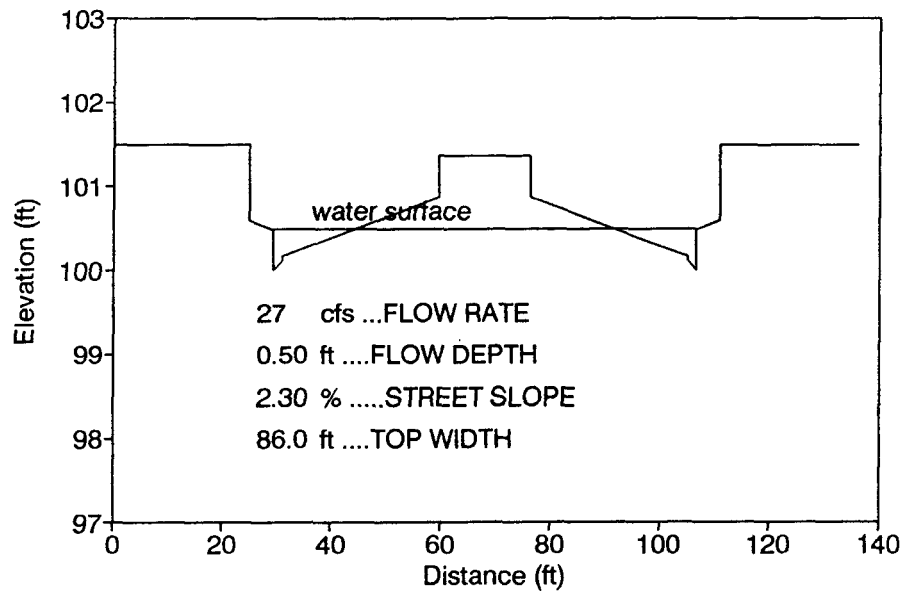
STREET FLOWS

V12-ALTA DRIVE-DD TO CC

Input variables:		Output variables:	
Flow depth, d	0.50 ft	Capacity at d	26.9 cfs
Road width	78.0 ft	Velocity	4.6 fps
Crown height	0.87 ft	Top width	86.0 ft
Street slope	2.30 %		
Sidewalk width	4.0 ft	SECTION:	
Curb height	6 in	Cross Slope	2.0 %
Median width	16.7 ft	Gutter Depression	2.0 in
Rt back of walk	100.0 %	Depth - Velocity Product	2.30
Lt back of walk	100.0 %	Manning's n	0.016

Note: Input 100% slope at back of walk for vertical walls.

V12-ALTA DRIVE-DD TO CC



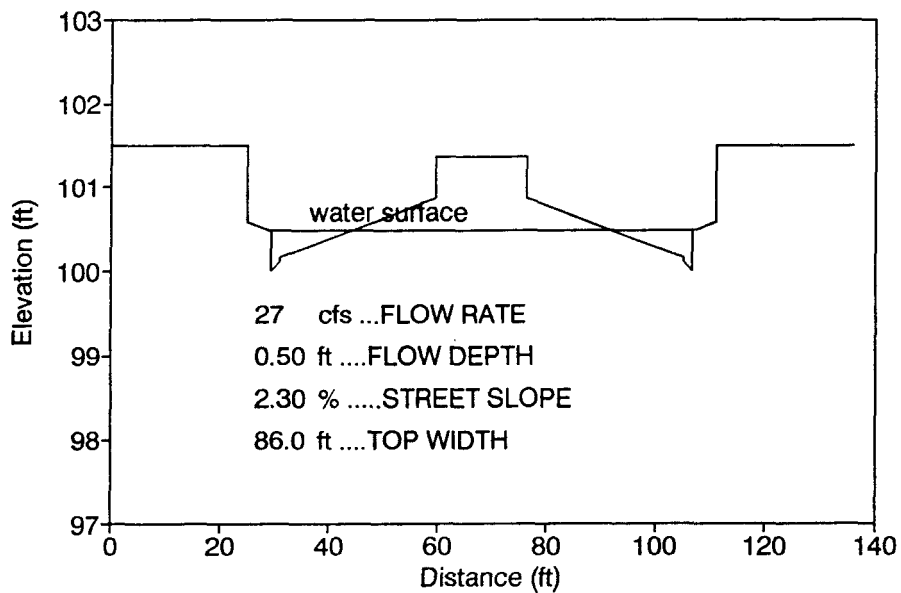
STREET FLOWS

V12-ALTA DRIVE-CC TO BB

Input variables:		Output variables:	
Flow depth, d	0.50 ft	Capacity at d	26.9 cfs
Road width	78.0 ft	Velocity	4.6 fps
Crown height	0.87 ft	Top width	86.0 ft
Street slope	2.30 %	SECTION:	
Sidewalk width	4.0 ft		
Curb height	6 in		
Median width	16.7 ft		
Rt back of walk	100.0 %		
Lt back of walk	100.0 %	Cross Slope	2.0 %
		Gutter Depression	2.0 in
		Depth - Velocity Product	2.30
		Manning's n	0.016

Note: Input 100% slope at back of walk for vertical walls.

V12-ALTA DRIVE-CC TO BB



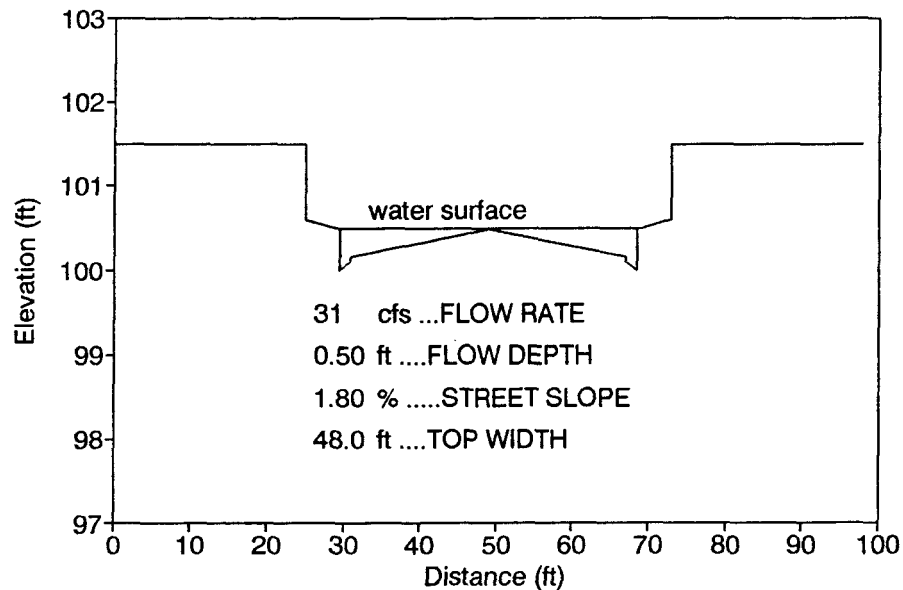
STREET FLOWS

V12-"C" STREET-QQ TO PP/OO

Input variables:		Output variables:	
Flow depth, d	0.50 ft	Capacity at d	30.5 cfs
Road width	40.0 ft	Velocity	4.1 fps
Crown height	0.49 ft	Top width	48.0 ft
Street slope	1.80 %	SECTION:	
Sidewalk width	4.0 ft		
Curb height	6 in		
Median width	0.0 ft		
Rt back of walk	100.0 %		
Lt back of walk	100.0 %	Cross Slope	2.0 %
		Gutter Depression	2.0 in
		Depth - Velocity Product	2.04
		Manning's n	0.016

Note: Input 100% slope at back of walk for vertical walls.

V12-"C" STREET-QQ TO PP/OO



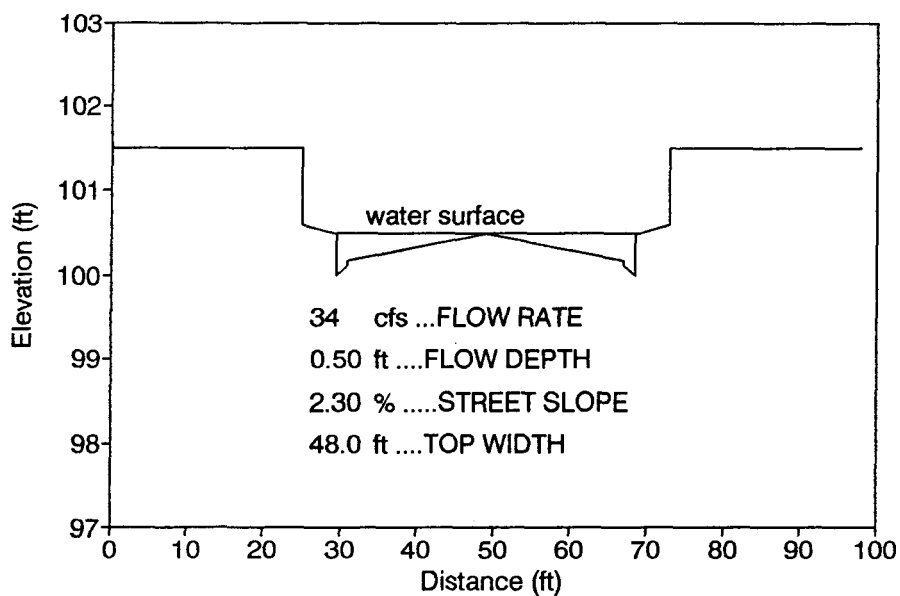
STREET FLOWS

V12-"C" STREET-PP/00 TO KK

Input variables:		Output variables:	
Flow depth, d	0.50 ft	Capacity at d	34.5 cfs
Road width	40.0 ft	Velocity	4.6 fps
Crown height	0.49 ft	Top width	48.0 ft
Street slope	2.30 %	SECTION:	
Sidewalk width	4.0 ft		
Curb height	6 in		
Median width	0.0 ft		
Rt back of walk	100.0 %		
Lt back of walk	100.0 %	Cross Slope	2.0 %
		Gutter Depression	2.0 in
		Depth - Velocity Product	2.30
		Manning's n	0.016

Note: Input 100% slope at back of walk for vertical walls.

V12-"C" STREET-PP/00 TO KK



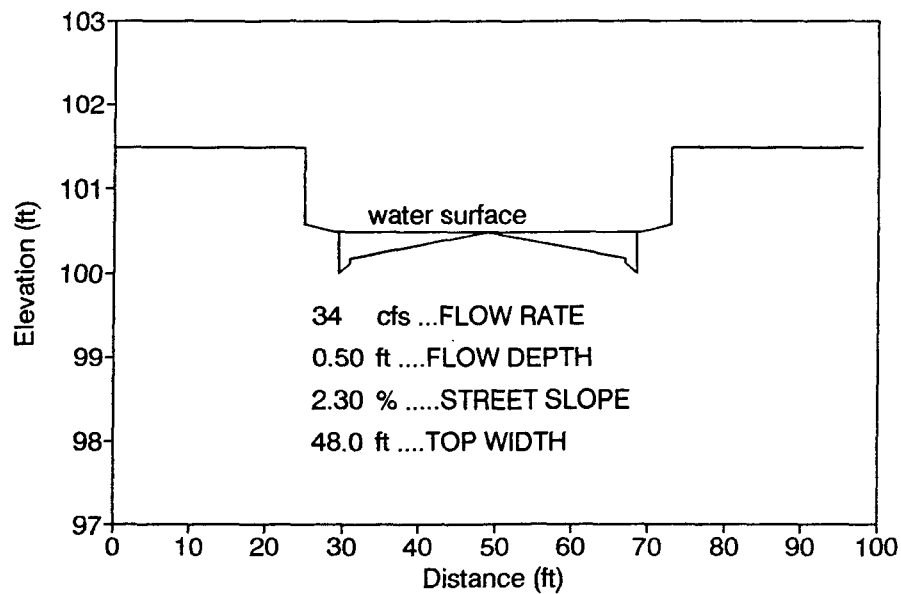
STREET FLOWS

V12-"C" STREET-KK TO II

Input variables:		Output variables:	
Flow depth, d	0.50 ft	Capacity at d	34.5 cfs
Road width	40.0 ft	Velocity	4.6 fps
Crown height	0.49 ft	Top width	48.0 ft
Street slope	2.30 %	SECTION:	
Sidewalk width	4.0 ft		
Curb height	6 in		
Median width	0.0 ft		
Rt back of walk	100.0 %		
Lt back of walk	100.0 %	Cross Slope	2.0 %
		Gutter Depression	2.0 in
		Depth - Velocity Product	2.30
		Manning's n	0.016

Note: Input 100% slope at back of walk for vertical walls.

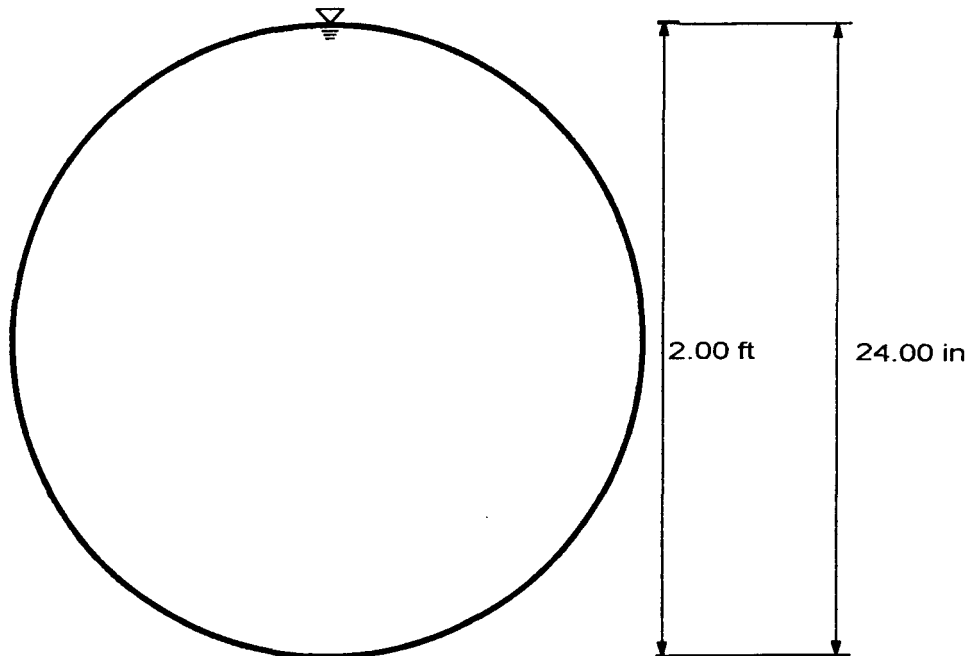
V12-"C" STREET-KK TO II



V11-NORTH LOOP ROAD-U TO T
Cross Section for Circular Channel

Project Description	
Project File	c:\haestad\fmw\project4.fm2
Worksheet	V11
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Discharge

Section Data	
Mannings Coefficient	0.013
Channel Slope	0.046000 ft/ft
Depth	2.00 ft
Diameter	24.00 in
Discharge	48.52 cfs

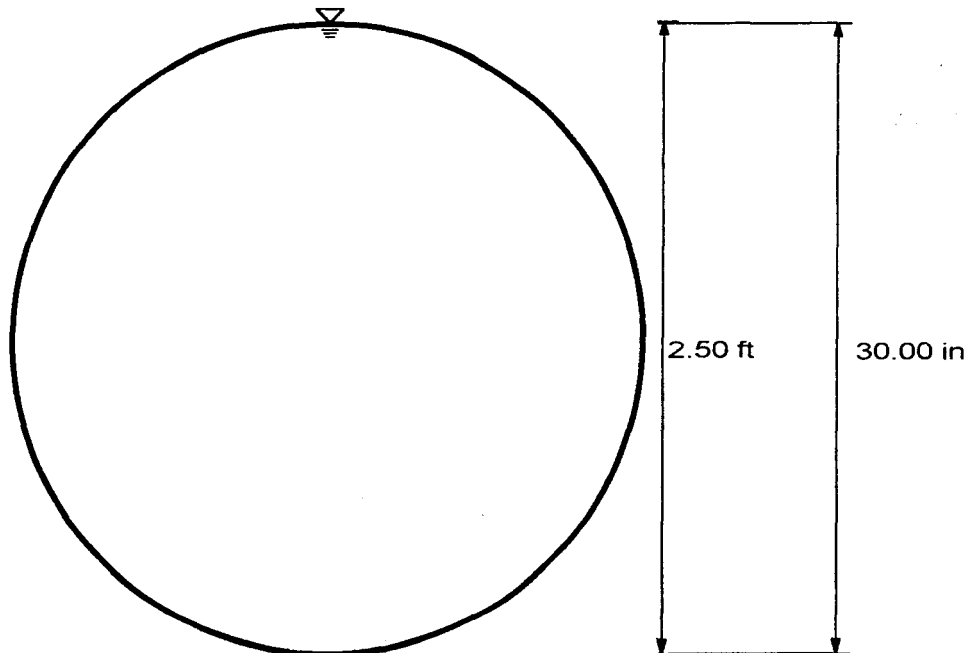


1
v
H 1
NTS

V11-NORTH LOOP ROAD-T TO ES-1
Cross Section for Circular Channel

Project Description	
Project File	c:\haestad\fmw\project4.fm2
Worksheet	V11
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Discharge

Section Data	
Mannings Coefficient	0.013
Channel Slope	0.046000 ft/ft
Depth	2.50 ft
Diameter	30.00 in
Discharge	87.97 cfs

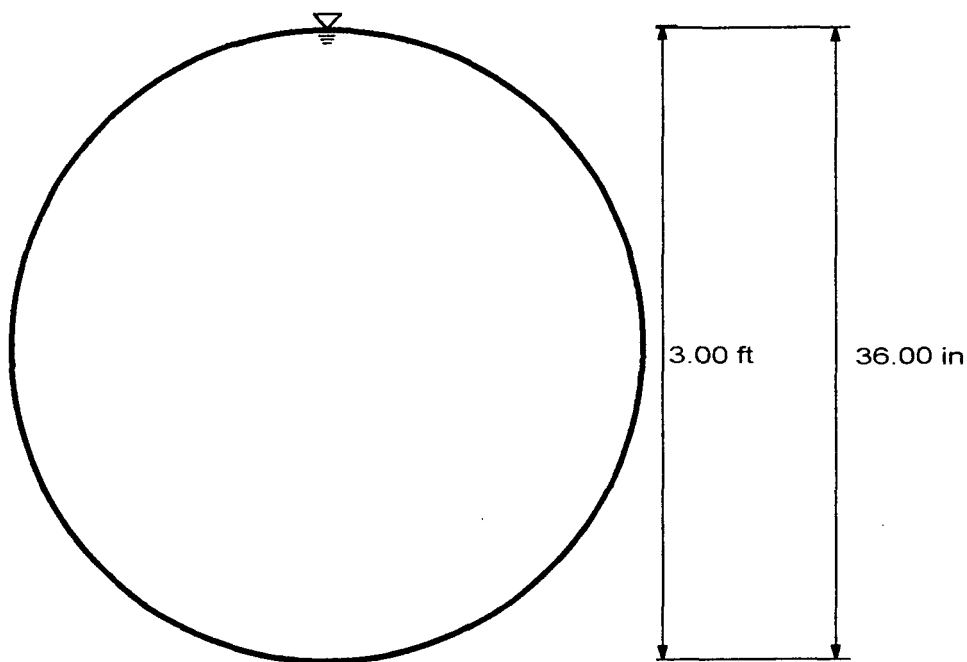


1
√
H 1
NTS

V11-PT T TO T1
Cross Section for Circular Channel

Project Description	
Project File	c:\haestad\fmw\project4.fm2
Worksheet	V11
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Discharge

Section Data	
Mannings Coefficient	0.013
Channel Slope	0.005000 ft/ft
Depth	3.00 ft
Diameter	36.00 in
Discharge	47.16 cfs

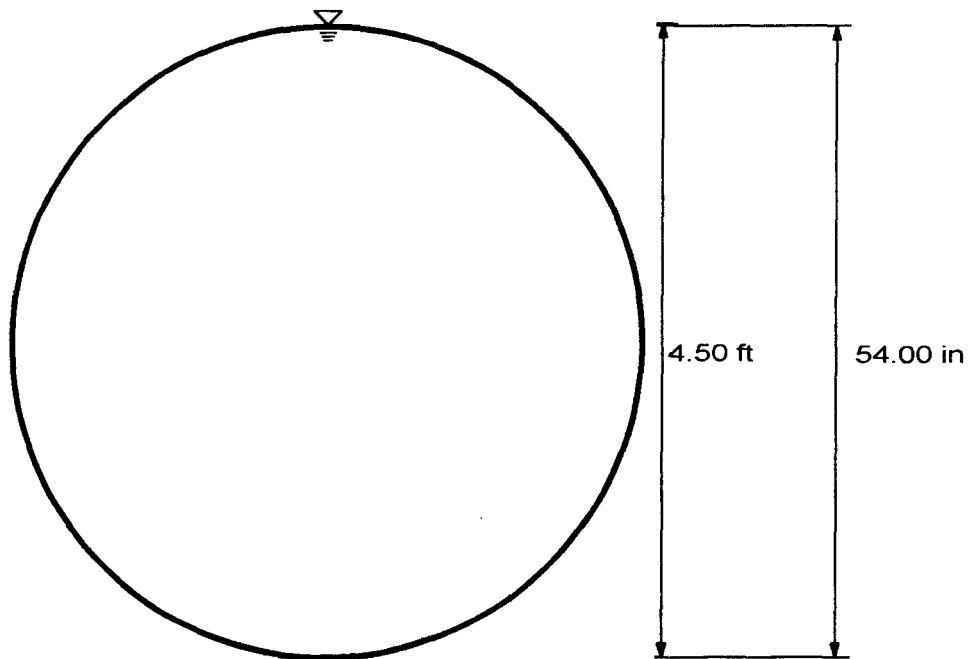


1
V
H 1
NTS

V11-NORTH LOOP ROAD-ES-1 TO NP-1
Cross Section for Circular Channel

Project Description	
Project File	c:\haestad\fmw\project4.fm2
Worksheet	V11
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Discharge

Section Data	
Mannings Coefficient	0.013
Channel Slope	0.041000 ft/ft
Depth	4.50 ft
Diameter	54.00 in
Discharge	398.16 cfs

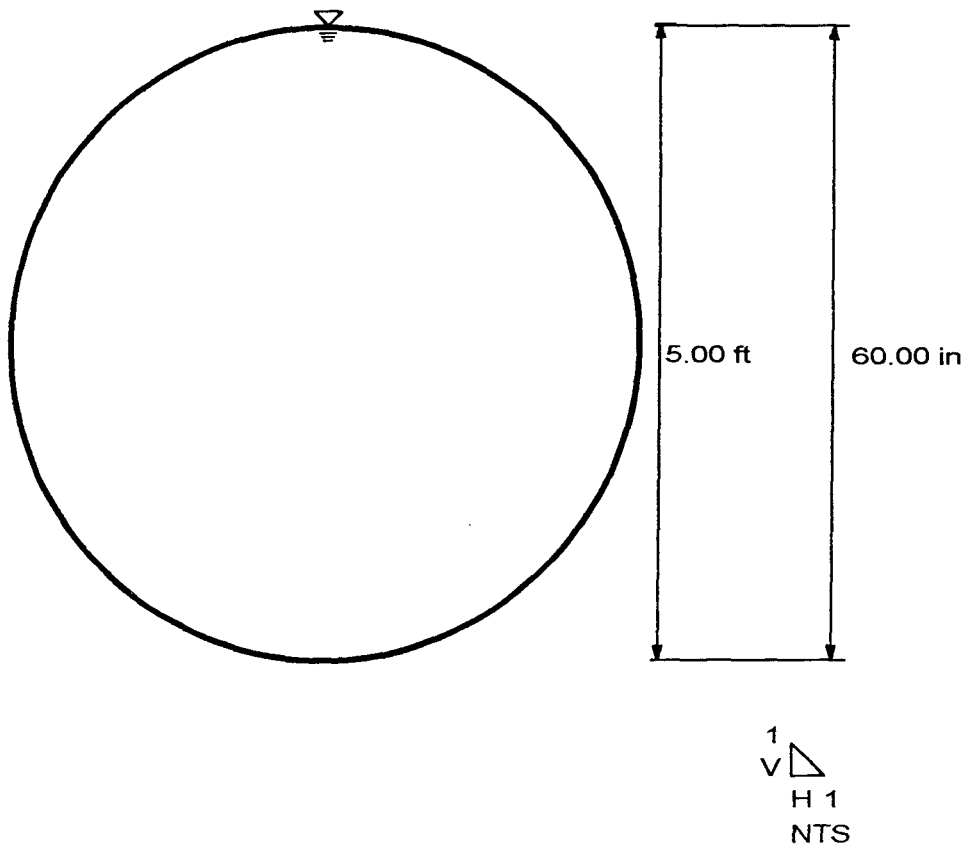


1
v
H 1
NTS

V11-NORTH LOOP ROAD NP-1 TO L2
Cross Section for Circular Channel

Project Description	
Project File	c:\haestad\fmw\project5.fm2
Worksheet	V11
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Discharge

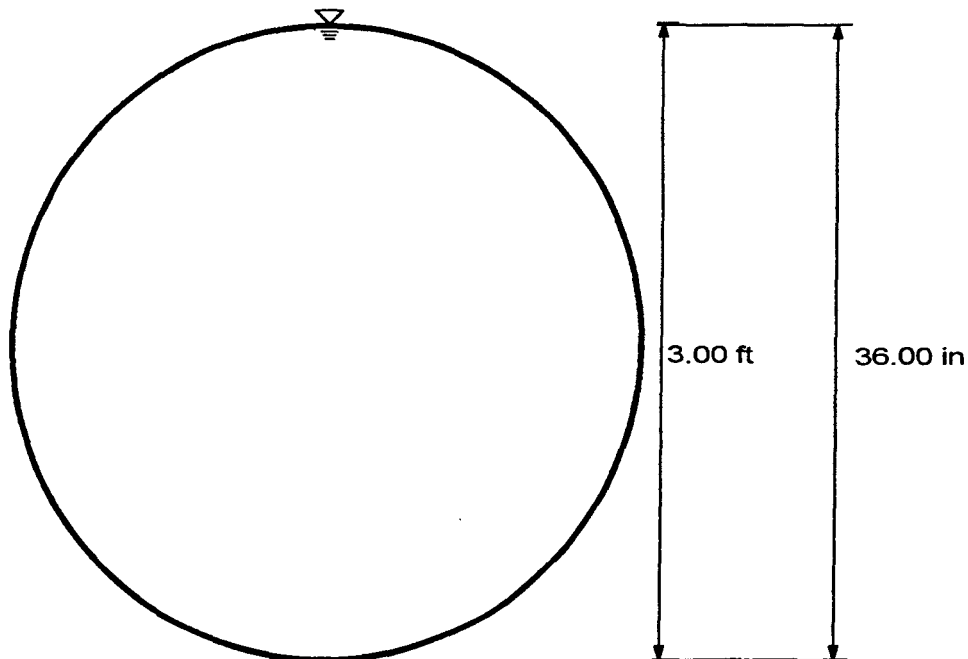
Section Data	
Mannings Coefficient	0.013
Channel Slope	0.041000 ft/ft
Depth	5.00 ft
Diameter	60.00 in
Discharge	527.33 cfs



V11-NORTH LOOP ROAD L1 TO L2
Cross Section for Circular Channel

Project Description	
Project File	c:\haestad\fmw\project5.fm2
Worksheet	V11
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Discharge

Section Data	
Mannings Coefficient	0.013
Channel Slope	0.005000 ft/ft
Depth	3.00 ft
Diameter	36.00 in
Discharge	47.16 cfs

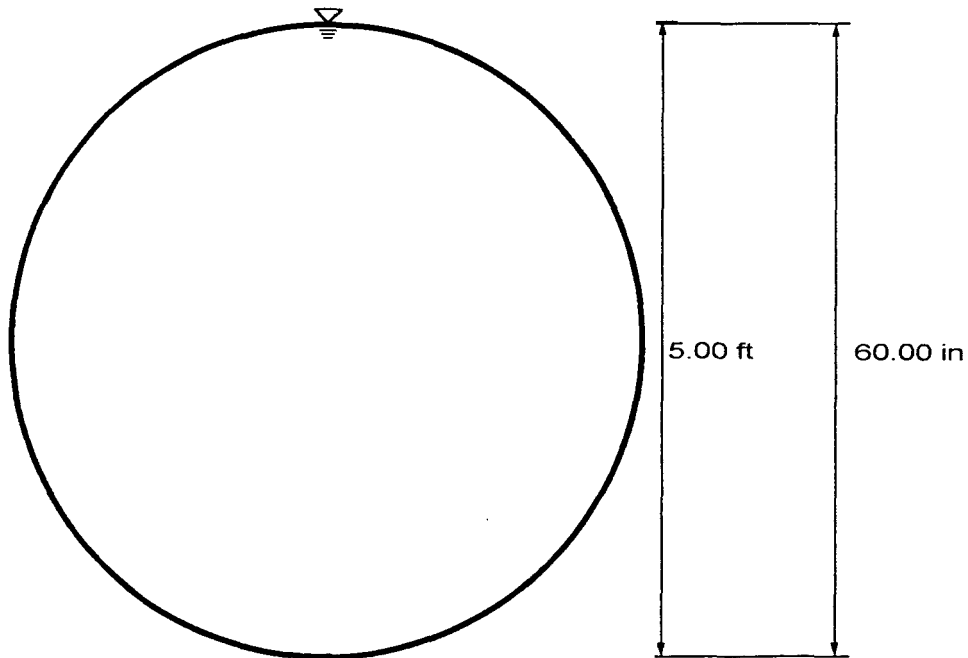


1
v
H 1
NTS

V11-NORTH LOOP ROAD-L2 TO M
Cross Section for Circular Channel

Project Description	
Project File	c:\haestad\fmw\project4.fm2
Worksheet	V11
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Discharge

Section Data	
Mannings Coefficient	0.013
Channel Slope	0.041000 ft/ft
Depth	5.00 ft
Diameter	60.00 in
Discharge	527.33 cfs

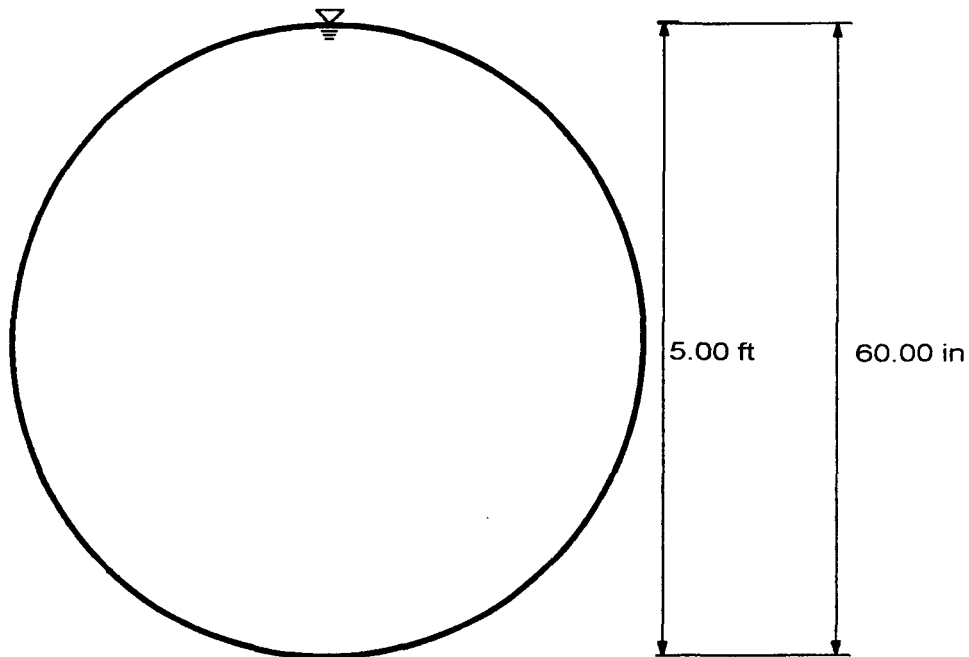


1
V
H 1
NTS

V11-NORTH LOOP ROAD-M TO K2
Cross Section for Circular Channel

Project Description	
Project File	c:\haestad\fmw\project4.fm2
Worksheet	V11
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Discharge

Section Data	
Mannings Coefficient	0.013
Channel Slope	0.045000 ft/ft
Depth	5.00 ft
Diameter	60.00 in
Discharge	552.45 cfs

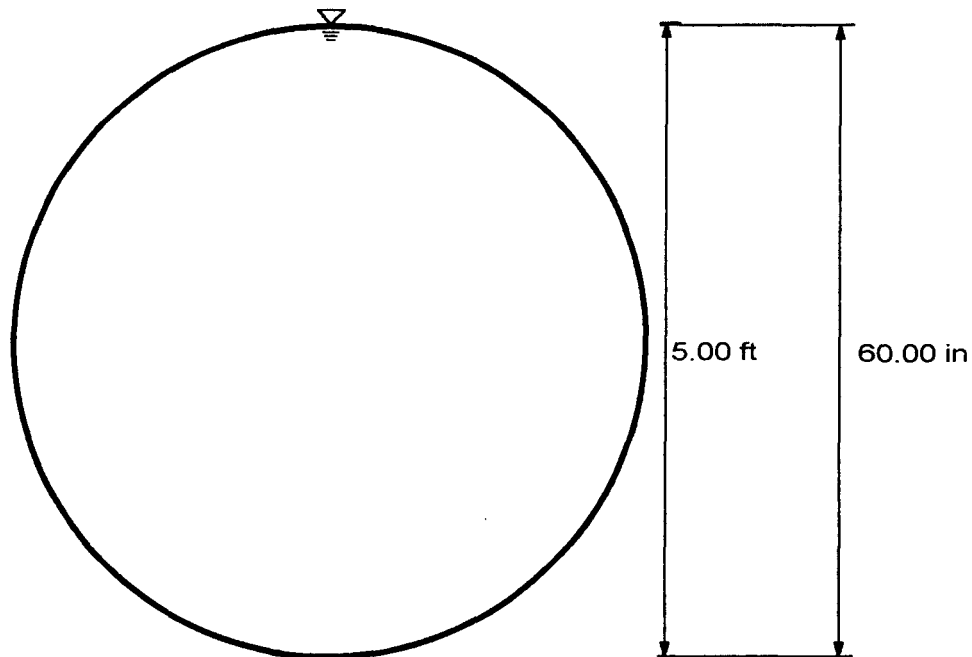


1
V
H 1
NTS

V11-NORTH LOOP ROAD-K2 TO A2
Cross Section for Circular Channel

Project Description	
Project File	c:\haestad\fmw\project4.fm2
Worksheet	V11
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Discharge

Section Data	
Mannings Coefficient	0.013
Channel Slope	0.045000 ft/ft
Depth	5.00 ft
Diameter	60.00 in
Discharge	552.45 cfs

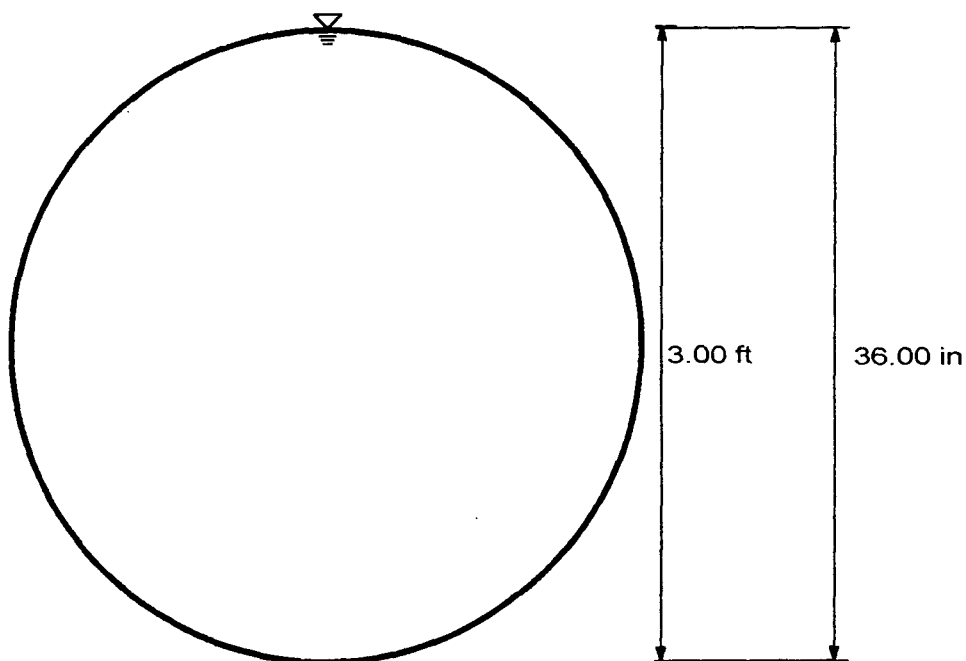


1
v
H 1
NTS

V11-HUALAPA1 WAY-N/O TO A3
Cross Section for Circular Channel

Project Description	
Project File	c:\haestad\fmw\project4.fm2
Worksheet	V11
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Discharge

Section Data	
Mannings Coefficient	0.013
Channel Slope	0.045000 ft/ft
Depth	3.00 ft
Diameter	36.00 in
Discharge	141.48 cfs

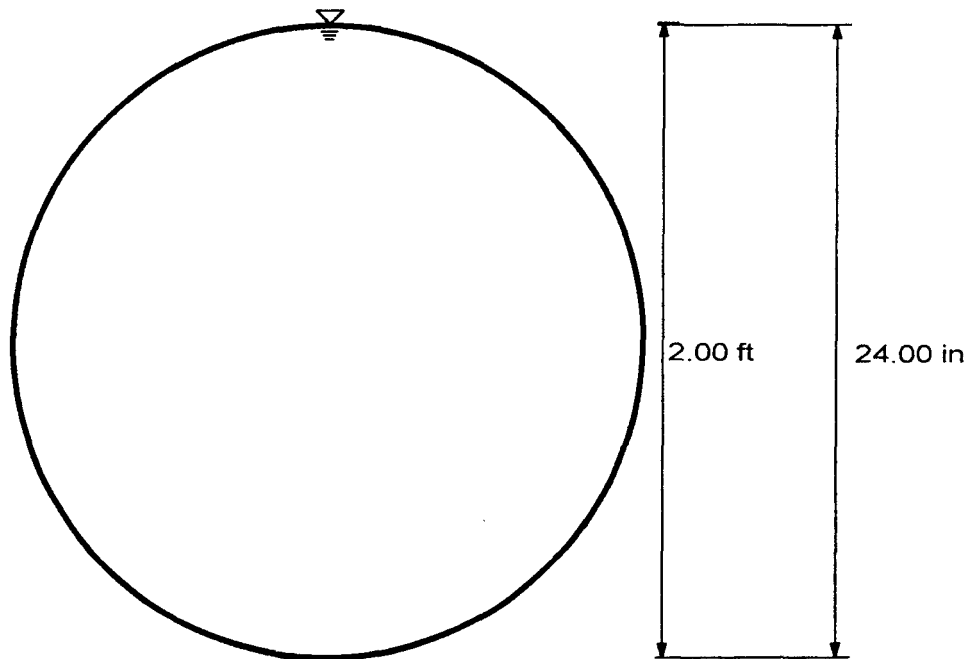


1
V
H 1
NTS

V11-HUALAPAI WAY-V TO Q
Cross Section for Circular Channel

Project Description	
Project File	c:\haestad\fmw\project4.fm2
Worksheet	V11
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Discharge

Section Data	
Mannings Coefficient	0.013
Channel Slope	0.045000 ft/ft
Depth	2.00 ft
Diameter	24.00 in
Discharge	47.99 cfs

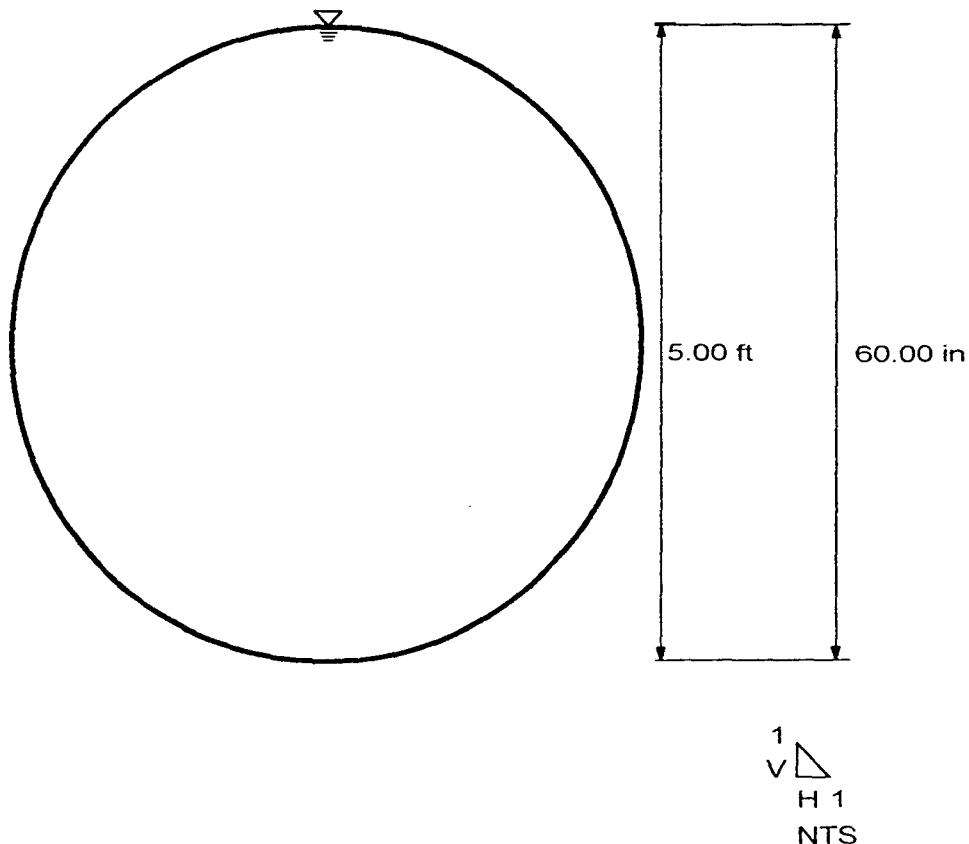


1
V
H 1
NTS

V11-COS-1-Q TO R
Cross Section for Circular Channel

Project Description	
Project File	c:\haestad\fmw\project4.fm2
Worksheet	V11
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Discharge

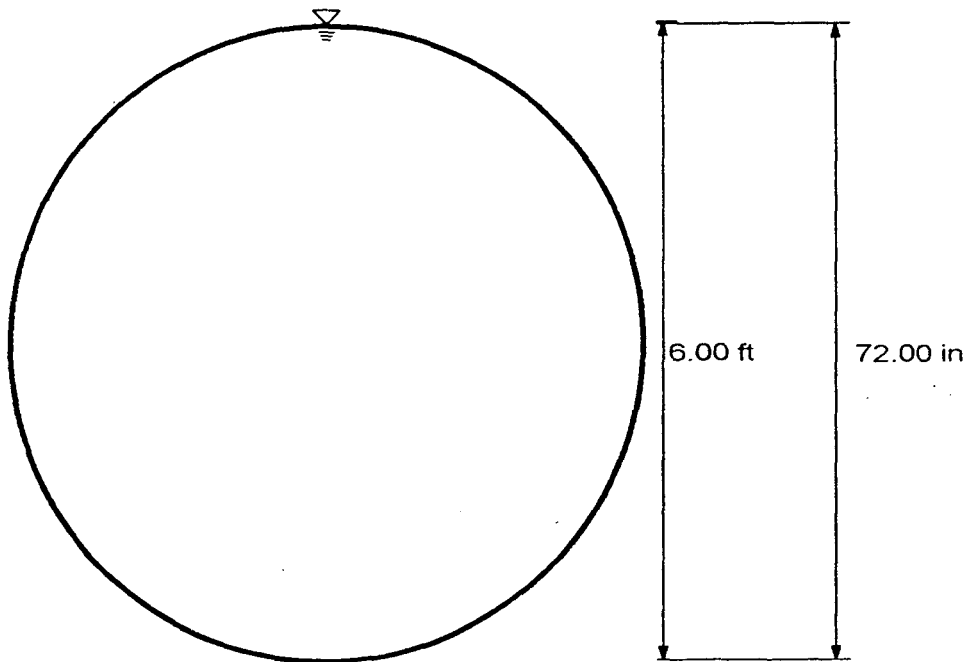
Section Data		
Mannings Coefficient	0.013	
Channel Slope	0.005000 ft/ft	
Depth	5.00	ft
Diameter	60.00	in
Discharge	184.15	cfs



V11-COS-1-R TO S
Cross Section for Circular Channel

Project Description	
Project File	c:\haestad\fmw\project4.fm2
Worksheet	V11
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Discharge

Section Data		
Mannings Coefficient	0.013	
Channel Slope	0.005000 ft/ft	
Depth	6.00	ft
Diameter	72.00	in
Discharge	299.45	cfs

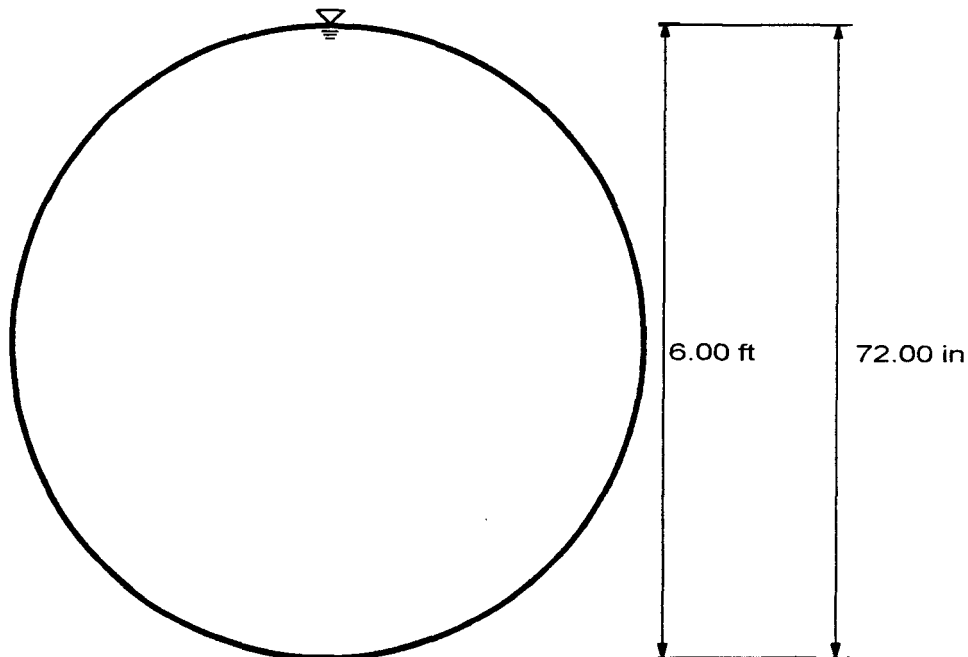


1
V
H 1
NTS

V11-COS-1- S TO ES-1
Cross Section for Circular Channel

Project Description	
Project File	c:\haestad\fmw\project4.fm2
Worksheet	V11
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Discharge

Section Data	
Mannings Coefficient	0.013
Channel Slope	0.005000 ft/ft
Depth	6.00 ft
Diameter	72.00 in
Discharge	299.45 cfs

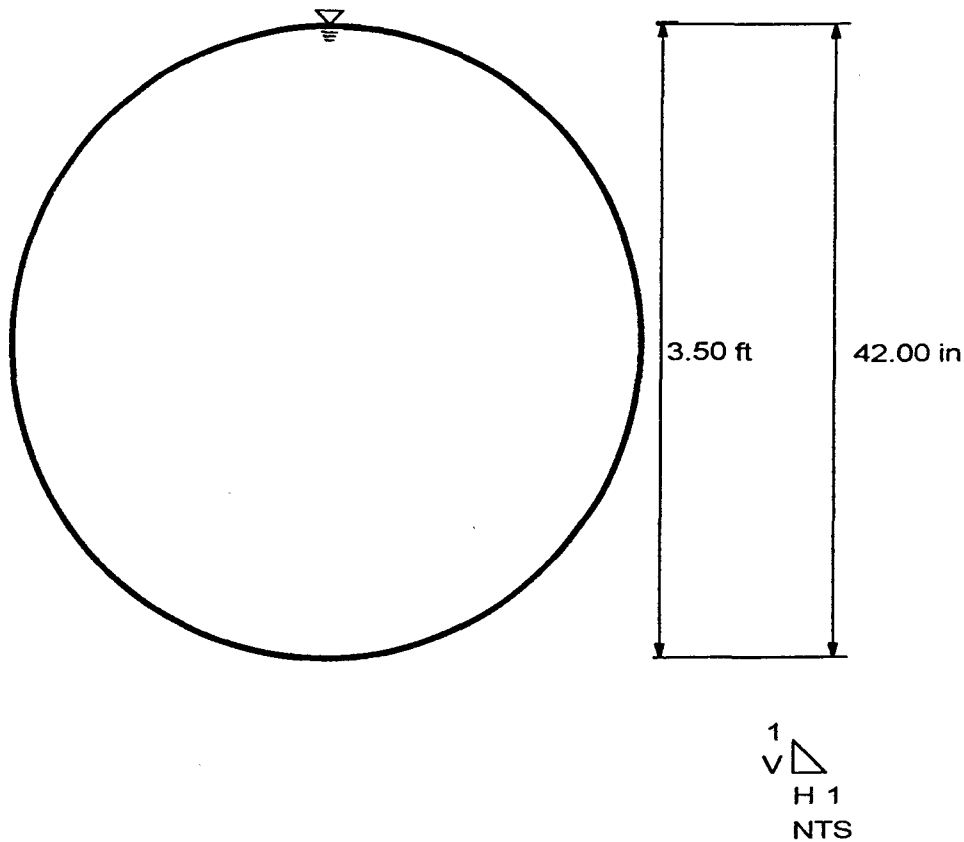


1
V
H 1
NTS

V11-K1 TO A1
Cross Section for Circular Channel

Project Description	
Project File	c:\haestad\fmw\project4.fm2
Worksheet	V11
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Discharge

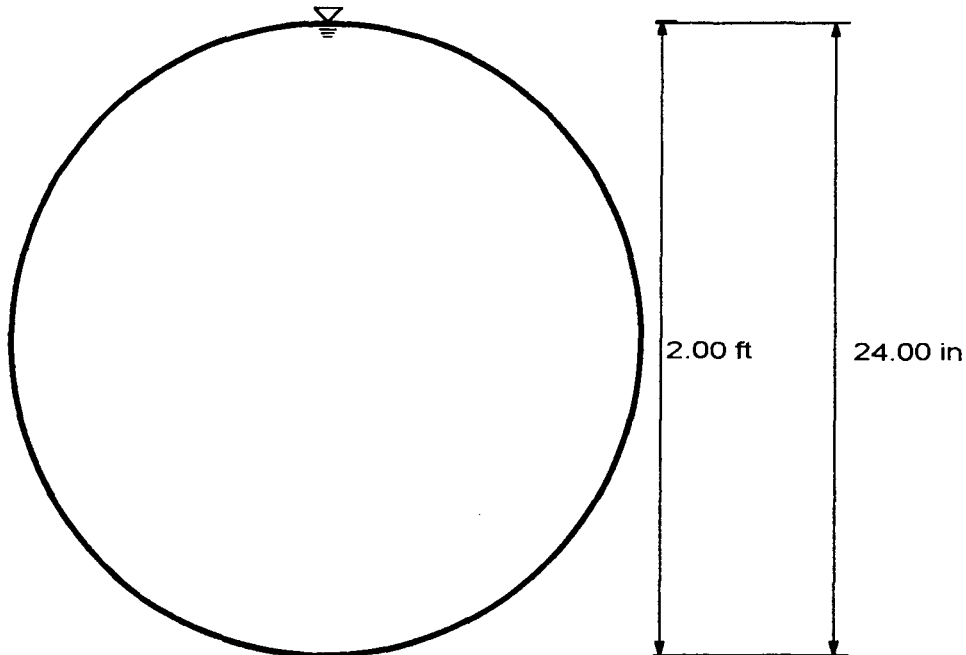
Section Data		
Mannings Coefficient	0.013	
Channel Slope	0.048000	ft/ft
Depth	3.50	ft
Diameter	42.00	in
Discharge	220.41	cfs



V11-SOUTH LOOP ROAD-W TO NP-2
Cross Section for Circular Channel

Project Description	
Project File	c:\haestad\fmw\project4.fm2
Worksheet	V11
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Discharge

Section Data	
Mannings Coefficient	0.013
Channel Slope	0.041000 ft/ft
Depth	2.00 ft
Diameter	24.00 in
Discharge	45.80 cfs

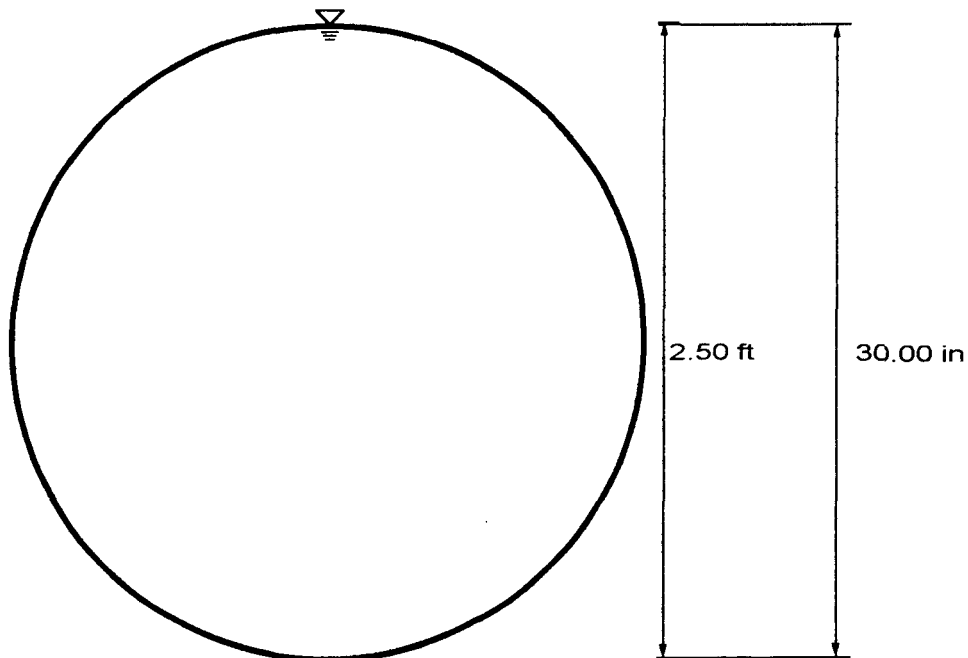


1
V
H 1
NTS

V11-SOUTH LOOP ROAD-NP-2 TO P
Cross Section for Circular Channel

Project Description	
Project File	c:\haestad\fmw\project4.fm2
Worksheet	V11
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Discharge

Section Data	
Mannings Coefficient	0.013
Channel Slope	0.023000 ft/ft
Depth	2.50 ft
Diameter	30.00 in
Discharge	62.20 cfs

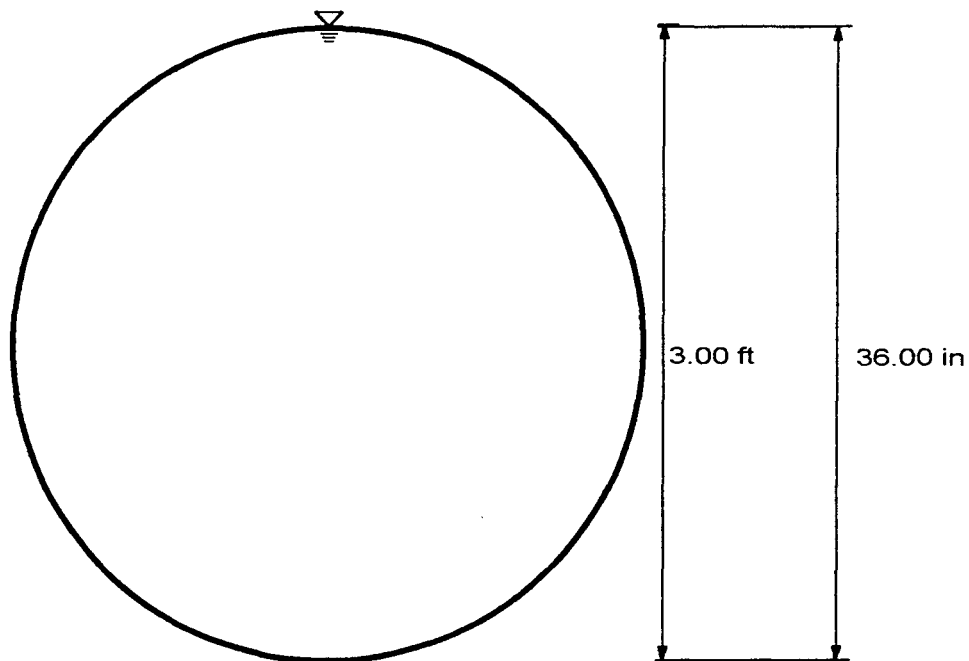


1
V
H 1
NTS

V11-OXFORD CROSS NORTH-P TO A4
Cross Section for Circular Channel

Project Description	
Project File	c:\haestad\fmw\project4.fm2
Worksheet	V11
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Discharge

Section Data	
Mannings Coefficient	0.013
Channel Slope	0.045000 ft/ft
Depth	3.00 ft
Diameter	36.00 in
Discharge	141.48 cfs

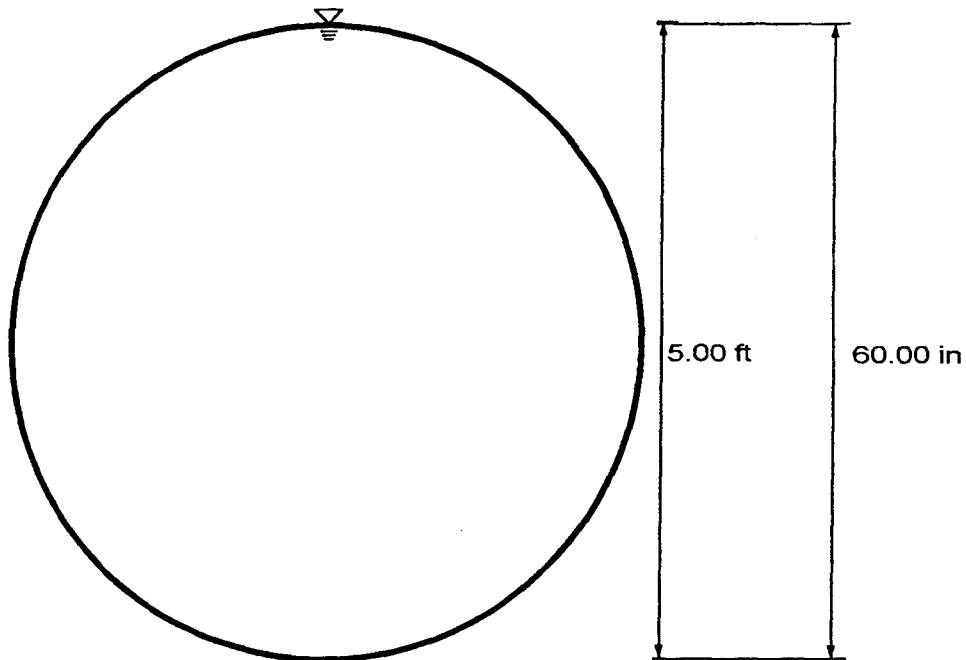


1
V
H 1
NTS

V11-ANASAZI-A4 TO G
Cross Section for Circular Channel

Project Description	
Project File	c:\haestad\fmw\project5.fm2
Worksheet	V11
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Discharge

Section Data	
Mannings Coefficient	0.013
Channel Slope	0.010000 ft/ft
Depth	5.00 ft
Diameter	60.00 in
Discharge	260.43 cfs

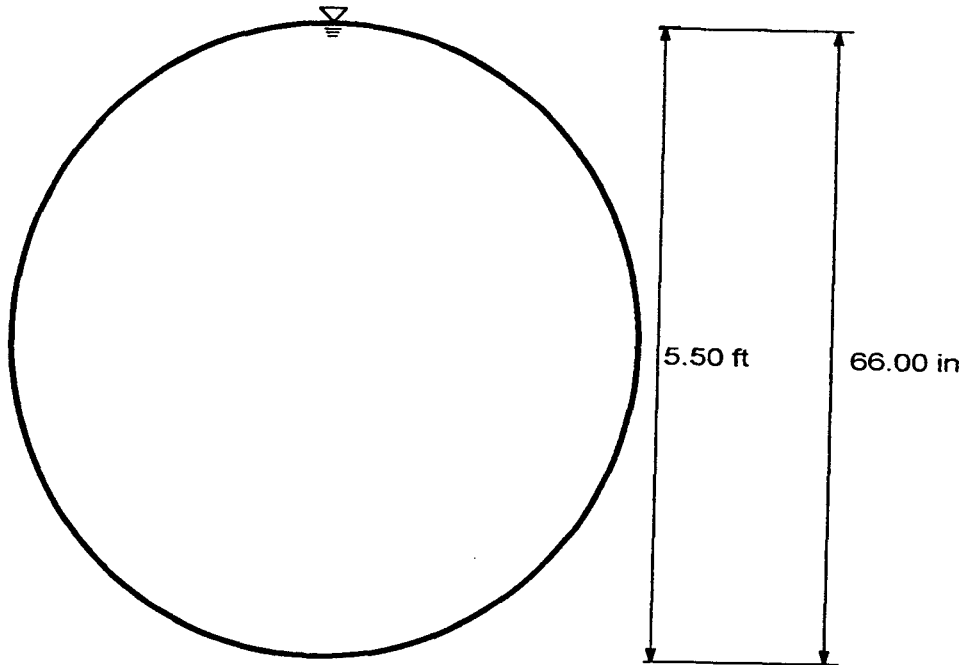


1
V
H 1
NTS

V11-ANASAZI-G TO A3
Cross Section for Circular Channel

Project Description	
Project File	c:\haestad\fmw\project5.fm2
Worksheet	V11
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Discharge

Section Data	
Mannings Coefficient	0.013
Channel Slope	0.010000 ft/ft
Depth	5.50 ft
Diameter	66.00 in
Discharge	335.79 cfs

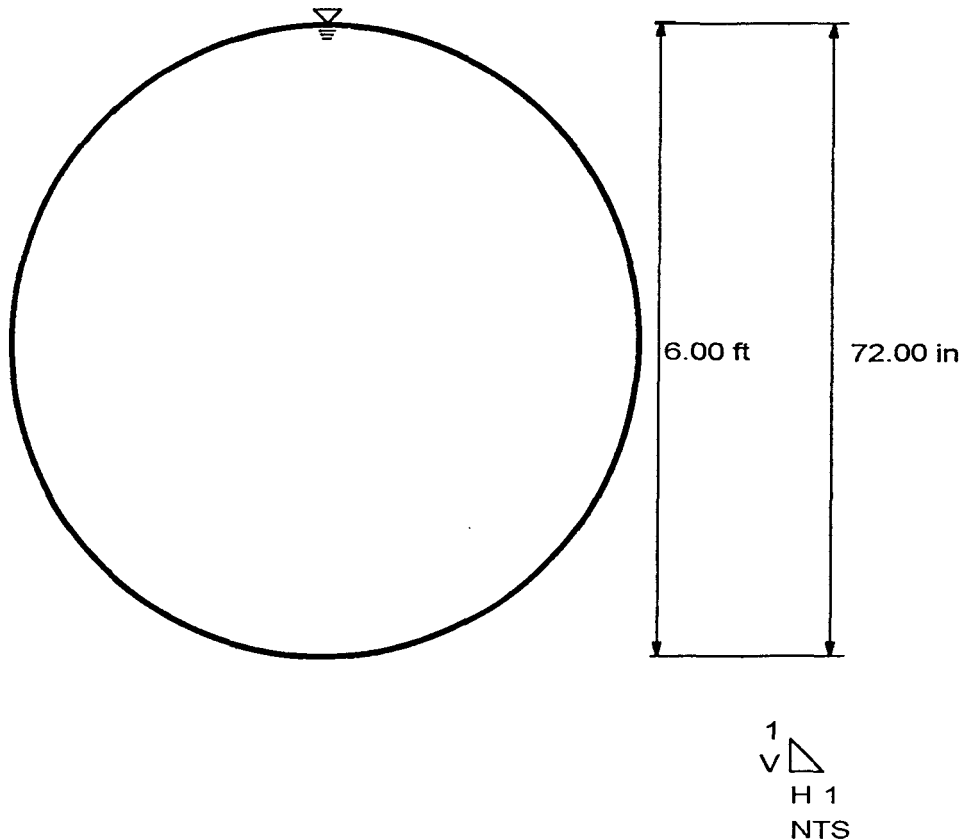


1
V
H 1
NTS

V11-ANASAZI-A3 TO A2
Cross Section for Circular Channel

Project Description	
Project File	c:\haestad\fmw\project5.fm2
Worksheet	V11
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Discharge

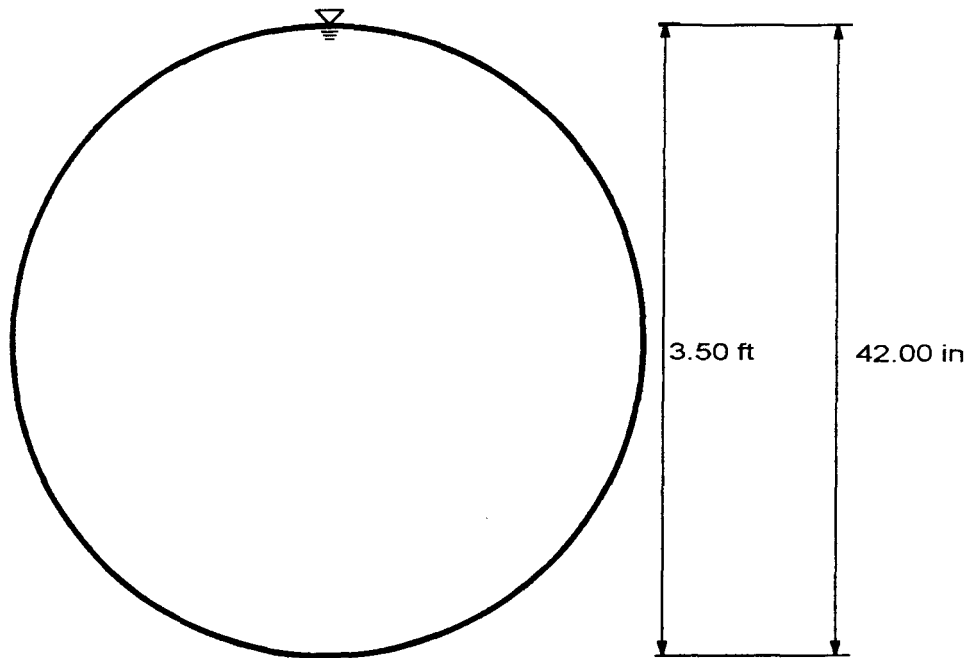
Section Data	
Mannings Coefficient	0.013
Channel Slope	0.014000 ft/ft
Depth	6.00 ft
Diameter	72.00 in
Discharge	501.07 cfs



V11-3205 ROAD-X TO Y
Cross Section for Circular Channel

Project Description	
Project File	c:\haestad\fmw\project4.fm2
Worksheet	V11
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Discharge

Section Data	
Mannings Coefficient	0.013
Channel Slope	0.008000 ft/ft
Depth	3.50 ft
Diameter	42.00 in
Discharge	89.98 cfs

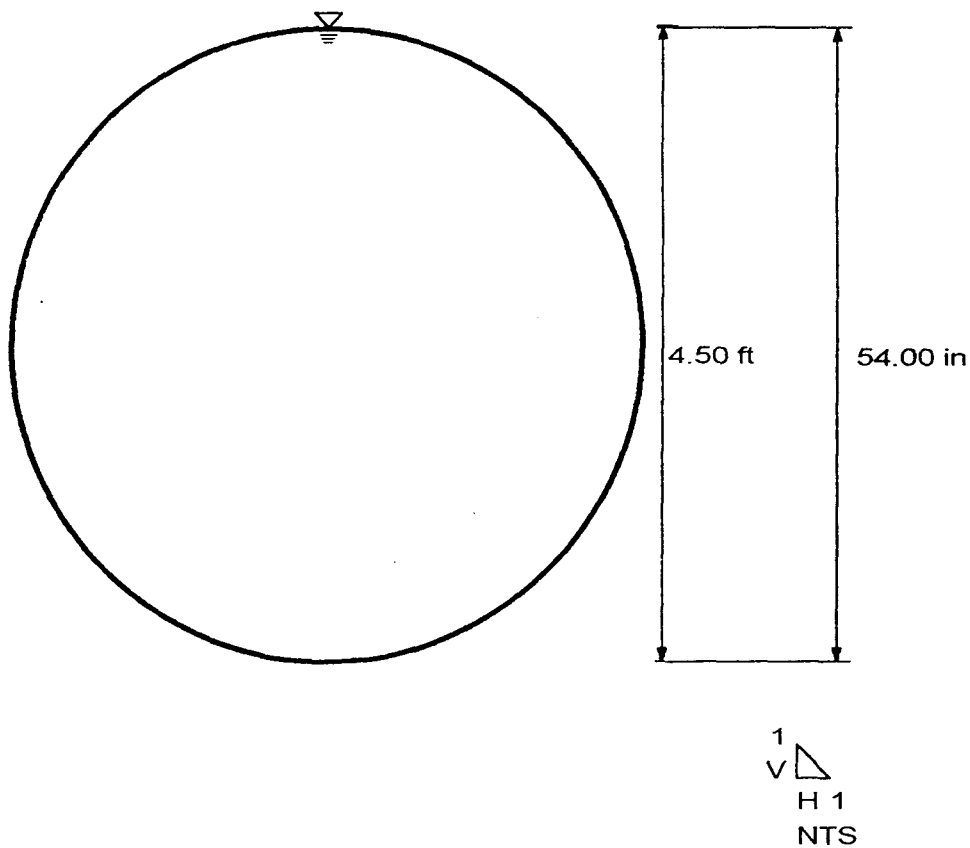


1
V
H 1
NTS

V11-3205 ROAD- Y TO Z
Cross Section for Circular Channel

Project Description	
Project File	c:\haestad\fmw\project4.fm2
Worksheet	V11
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Discharge

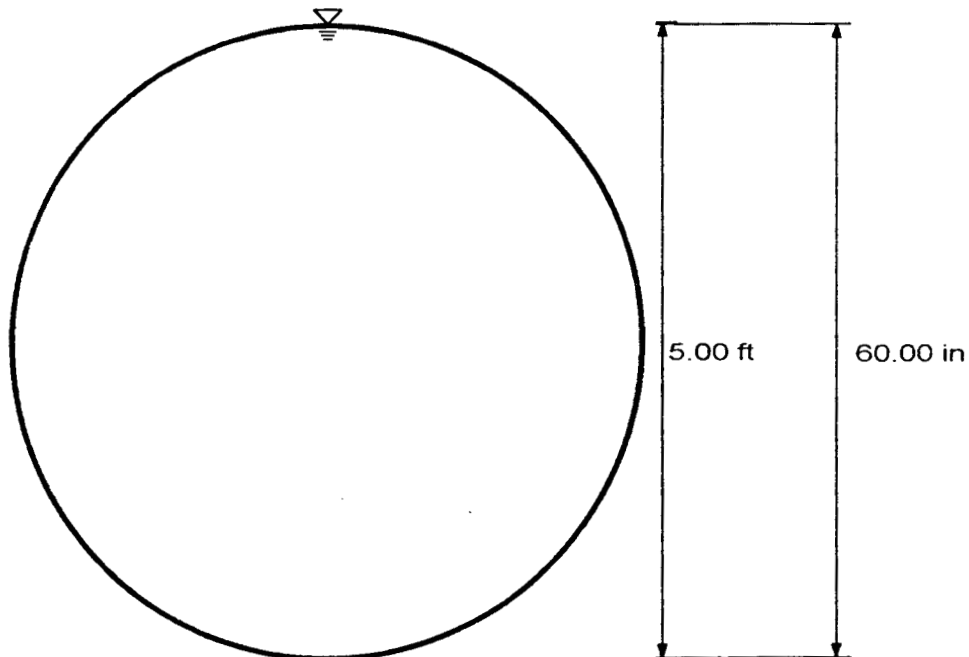
Section Data	
Mannings Coefficient	0.013
Channel Slope	0.008000 ft/ft
Depth	4.50 ft
Diameter	54.00 in
Discharge	175.88 cfs



V11-3205 ROAD- Z TO HS
Cross Section for Circular Channel

Project Description	
Project File	c:\haestad\fmw\project4.fm2
Worksheet	V11
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Discharge

Section Data	
Mannings Coefficient	0.013
Channel Slope	0.008000 ft/ft
Depth	5.00 ft
Diameter	60.00 in
Discharge	232.93 cfs

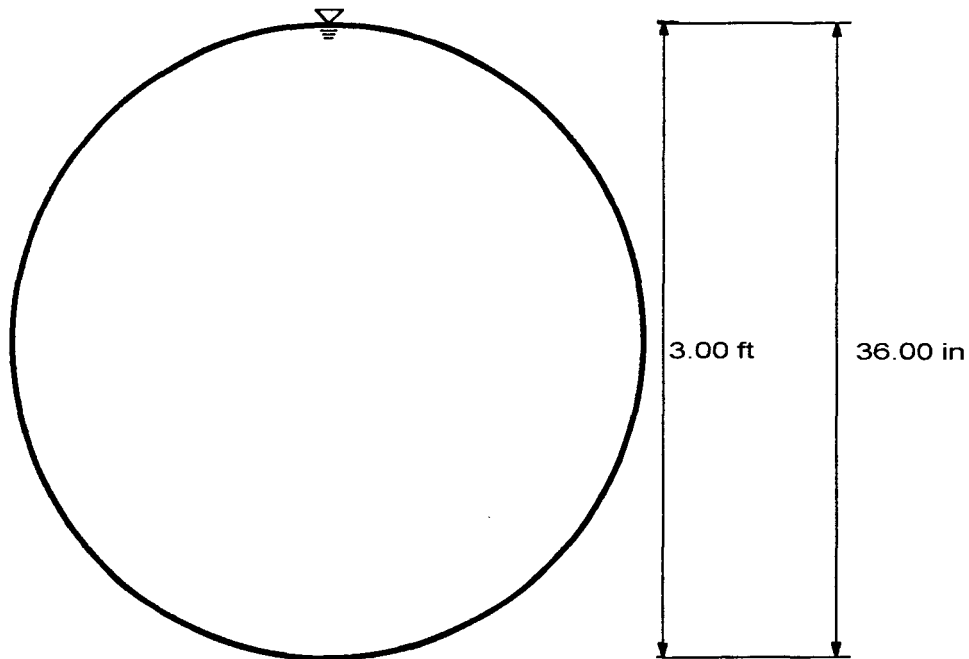


1
v
H 1
NTS

V11-ES-2 TO CH-2
Cross Section for Circular Channel

Project Description	
Project File	c:\haestad\fmw\project4.fm2
Worksheet	V11
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Discharge

Section Data	
Mannings Coefficient	0.013
Channel Slope	0.005000 ft/ft
Depth	3.00 ft
Diameter	36.00 in
Discharge	47.16 cfs

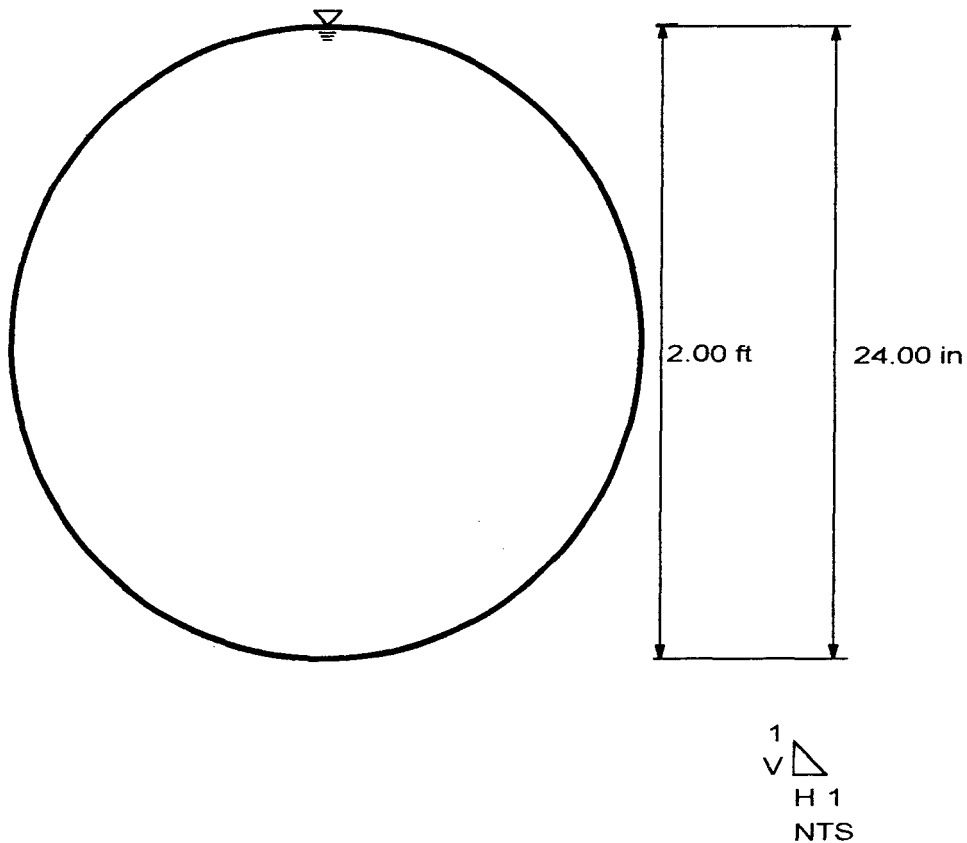


1
v
H 1
NTS

V11-OXFORD CROSS SOUTH-CH2 TO E
Cross Section for Circular Channel

Project Description	
Project File	c:\haestad\fmw\project4.fm2
Worksheet	V11
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Discharge

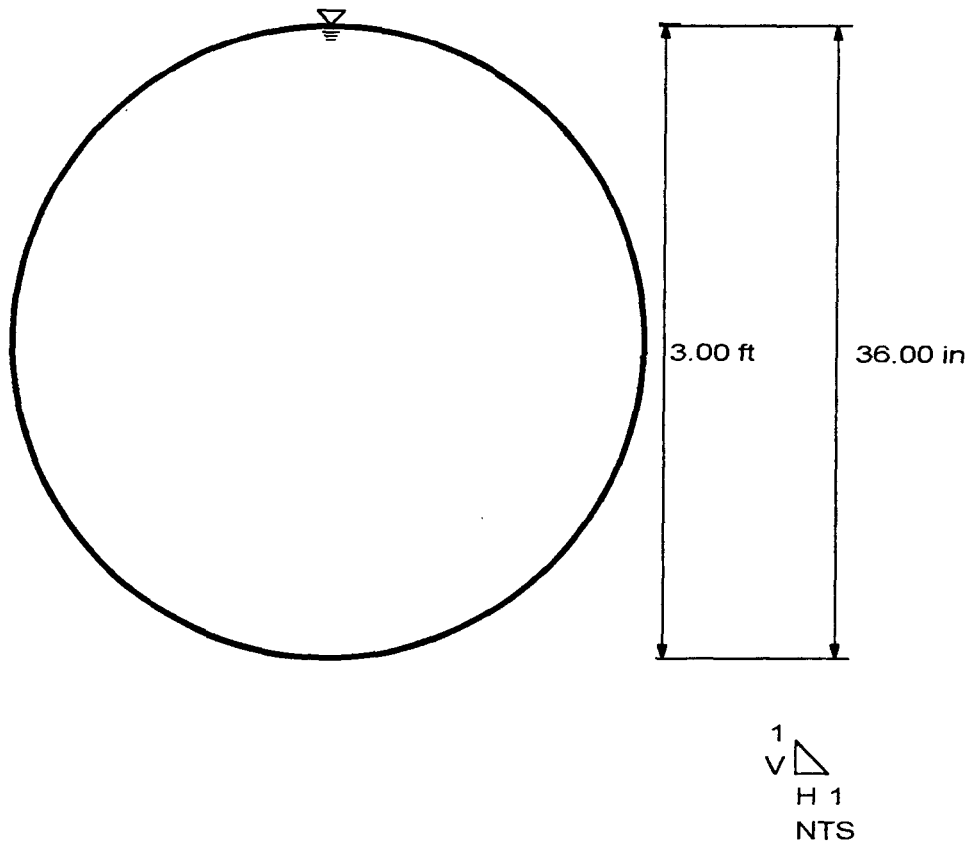
Section Data	
Mannings Coefficient	0.013
Channel Slope	0.018000 ft/ft
Depth	2.00 ft
Diameter	24.00 in
Discharge	30.35 cfs



V11-D1 TO D2
Cross Section for Circular Channel

Project Description	
Project File	c:\haestad\fmw\project4.fm2
Worksheet	V11
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Discharge

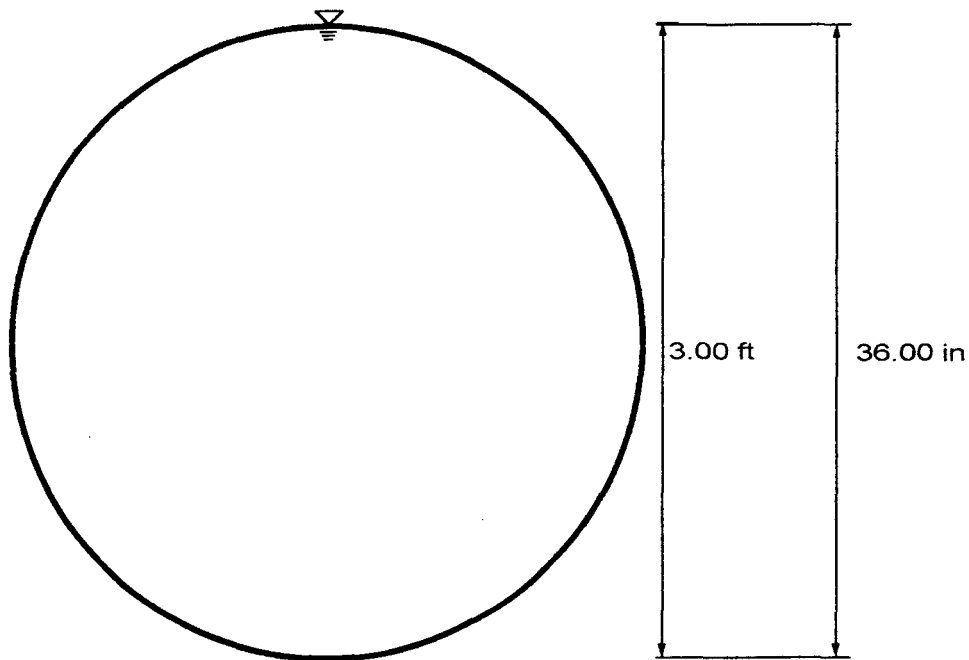
Section Data	
Mannings Coefficient	0.013
Channel Slope	0.005000 ft/ft
Depth	3.00 ft
Diameter	36.00 in
Discharge	47.16 cfs



V11-C1 TO D2
Cross Section for Circular Channel

Project Description	
Project File	c:\haestad\fmw\project4.fm2
Worksheet	V11
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Discharge

Section Data	
Mannings Coefficient	0.013
Channel Slope	0.005000 ft/ft
Depth	3.00 ft
Diameter	36.00 in
Discharge	47.16 cfs

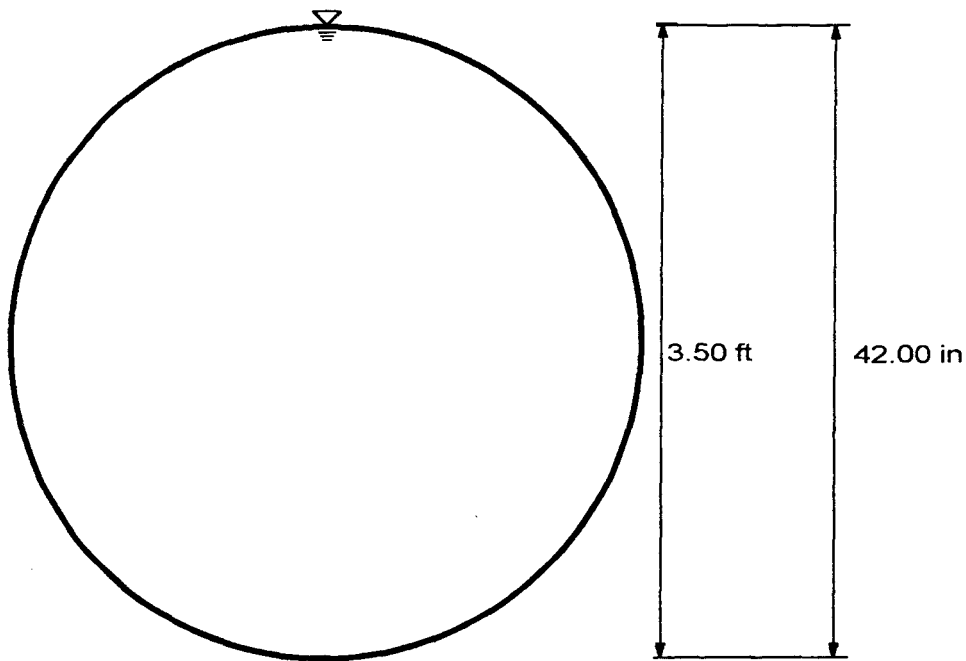


1
V
H 1
NTS

V11-D-2 TO A-1
Cross Section for Circular Channel

Project Description	
Project File	c:\haestad\fmw\project4.fm2
Worksheet	V11
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Discharge

Section Data	
Mannings Coefficient	0.013
Channel Slope	0.022000 ft/ft
Depth	3.50 ft
Diameter	42.00 in
Discharge	149.22 cfs

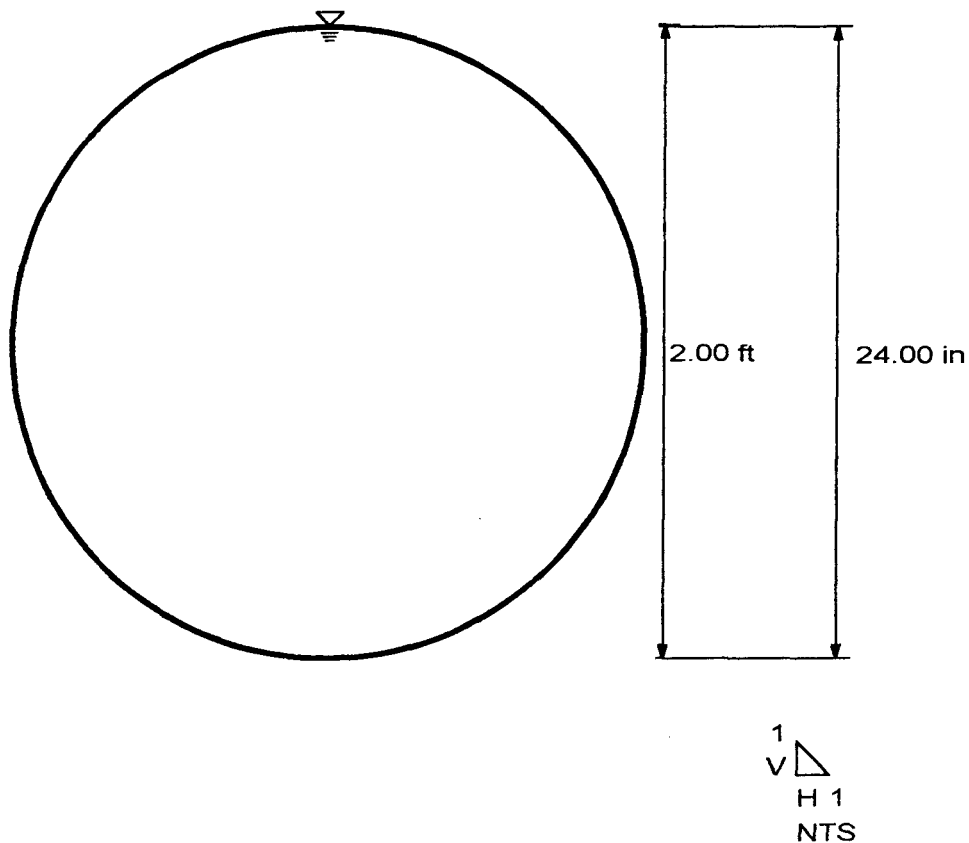


1
V
H 1
NTS

V12-"A" STREET-NN-1 TO NN-2
Cross Section for Circular Channel

Project Description	
Project File	c:\haestad\fmw\project4.fm2
Worksheet	V11
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Discharge

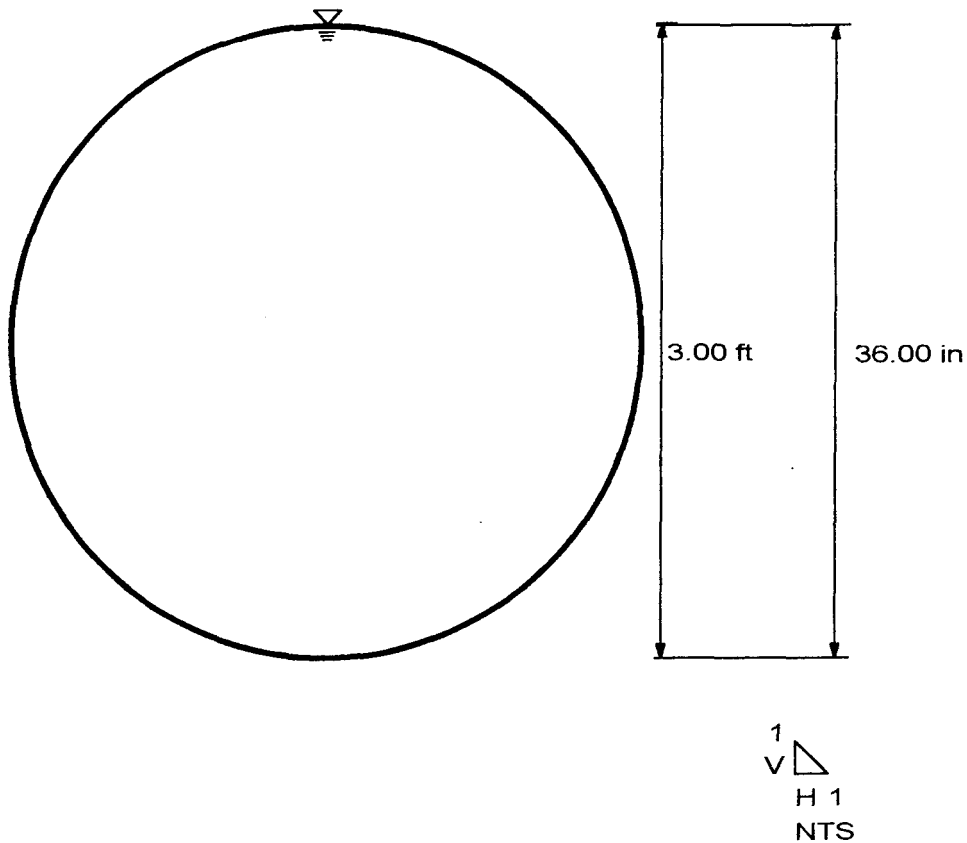
Section Data	
Mannings Coefficient	0.013
Channel Slope	0.022000 ft/ft
Depth	2.00 ft
Diameter	24.00 in
Discharge	33.55 cfs



V12-3205 ROAD-NN-2 TO MM
Cross Section for Circular Channel

Project Description	
Project File	c:\haestad\fmw\project4.fm2
Worksheet	V11
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Discharge

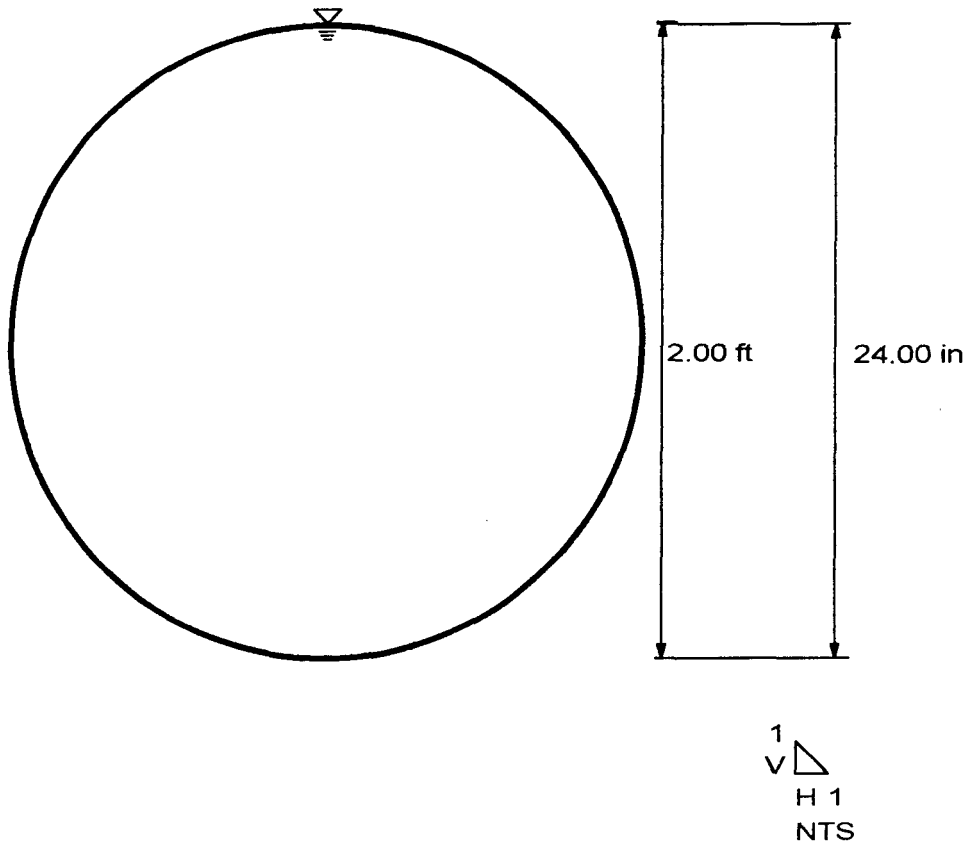
Section Data	
Mannings Coefficient	0.013
Channel Slope	0.005000 ft/ft
Depth	3.00 ft
Diameter	36.00 in
Discharge	47.16 cfs



V12-"C" STREET-QQ TO PP/OO
Cross Section for Circular Channel

Project Description	
Project File	c:\haestad\fmw\project4.fm2
Worksheet	V11
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Discharge

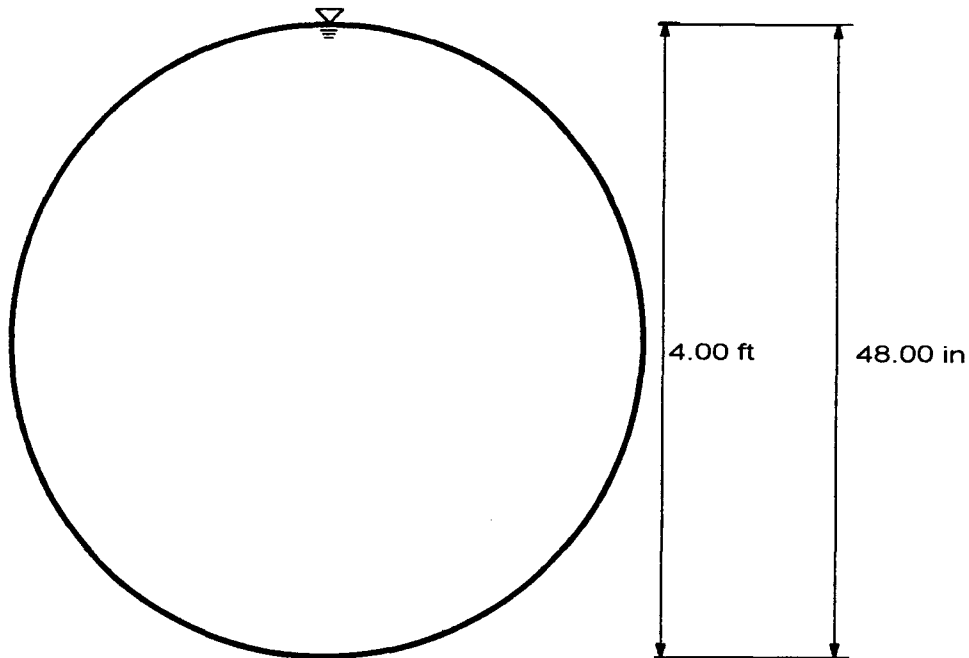
Section Data	
Mannings Coefficient	0.013
Channel Slope	0.018000 ft/ft
Depth	2.00 ft
Diameter	24.00 in
Discharge	30.35 cfs



V12-"C" STREET-PP/OO TO KK
Cross Section for Circular Channel

Project Description	
Project File	c:\haestad\fmw\project4.fm2
Worksheet	V11
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Discharge

Section Data	
Mannings Coefficient	0.013
Channel Slope	0.022000 ft/ft
Depth	4.00 ft
Diameter	48.00 in
Discharge	213.05 cfs

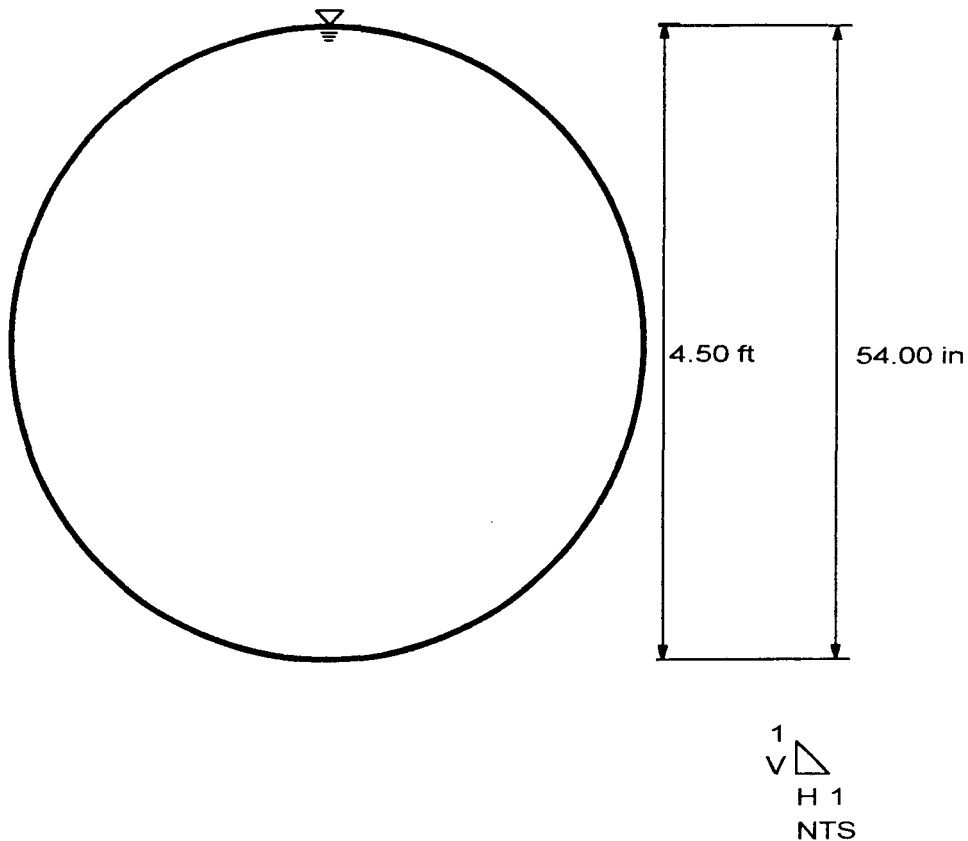


1
V
H 1
NTS

V12-"C" STREET-KK TO II
Cross Section for Circular Channel

Project Description	
Project File	c:\haestad\fmw\project4.fm2
Worksheet	V11
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Discharge

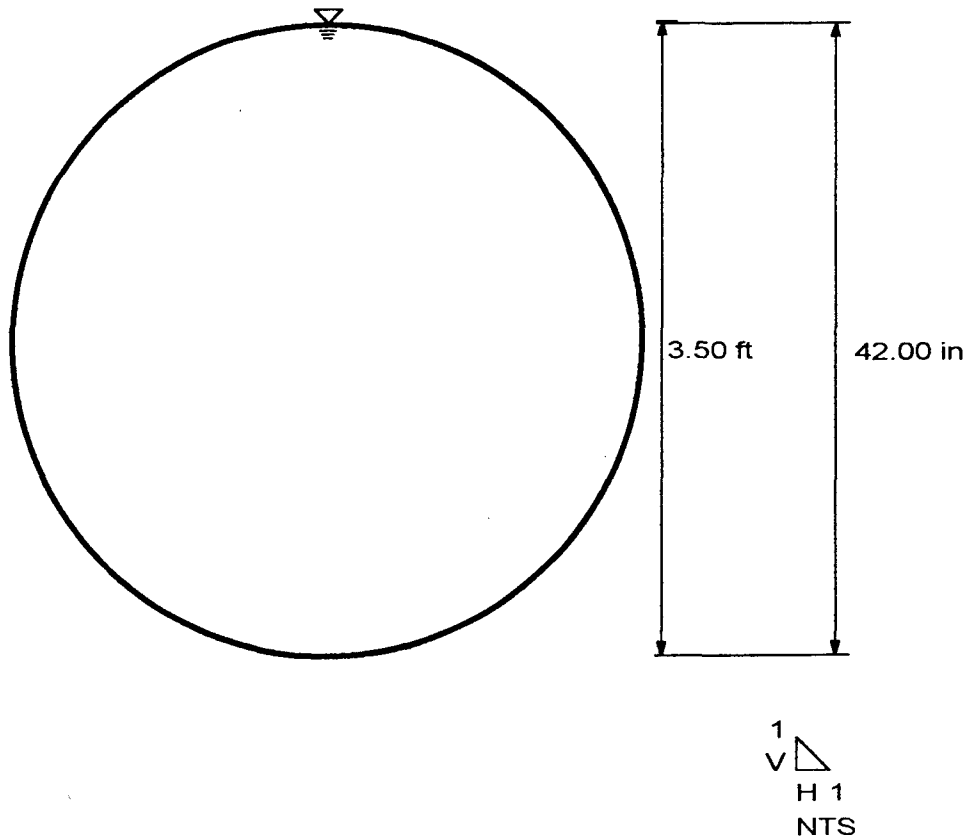
Section Data	
Mannings Coefficient	0.013
Channel Slope	0.022000 ft/ft
Depth	4.50 ft
Diameter	54.00 in
Discharge	291.66 cfs



V12-CHARLESTON BLVD
Cross Section for Circular Channel

Project Description	
Project File	c:\haestad\fmw\project3.fm2
Worksheet	V11
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Discharge

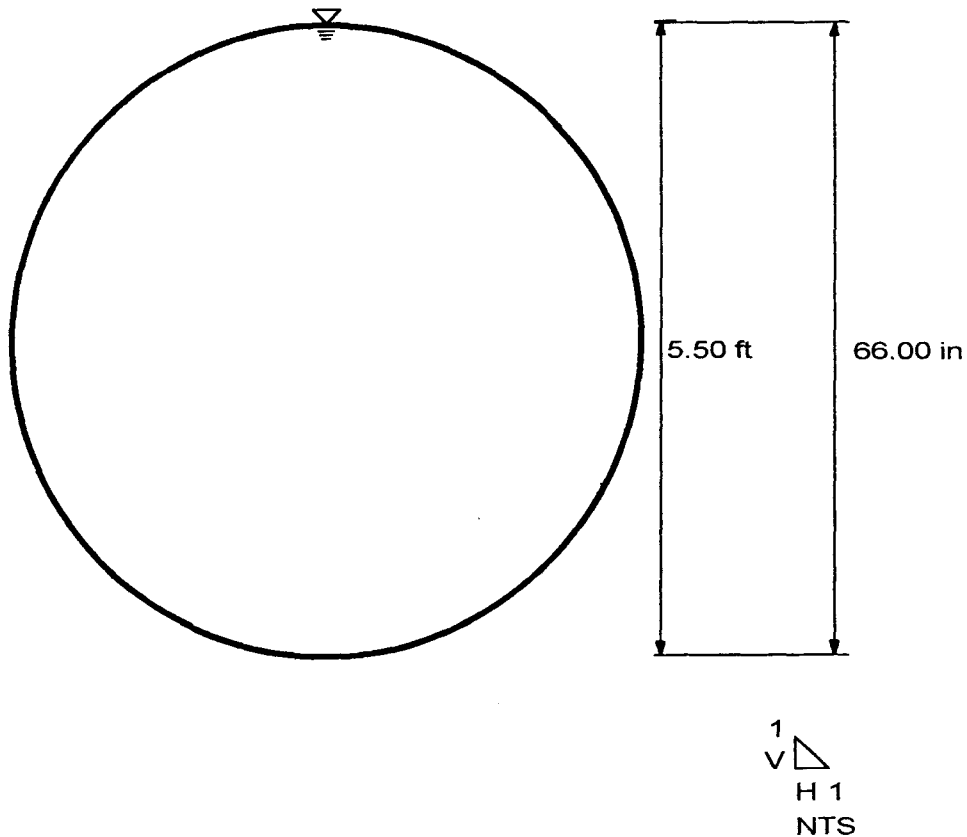
Section Data	
Mannings Coefficient	0.013
Channel Slope	0.022000 ft/ft
Depth	3.50 ft
Diameter	42.00 in
Discharge	149.22 cfs



V12-HH TO II
Cross Section for Circular Channel

Project Description	
Project File	c:\haestad\fmw\project3.fm2
Worksheet	V11
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Discharge

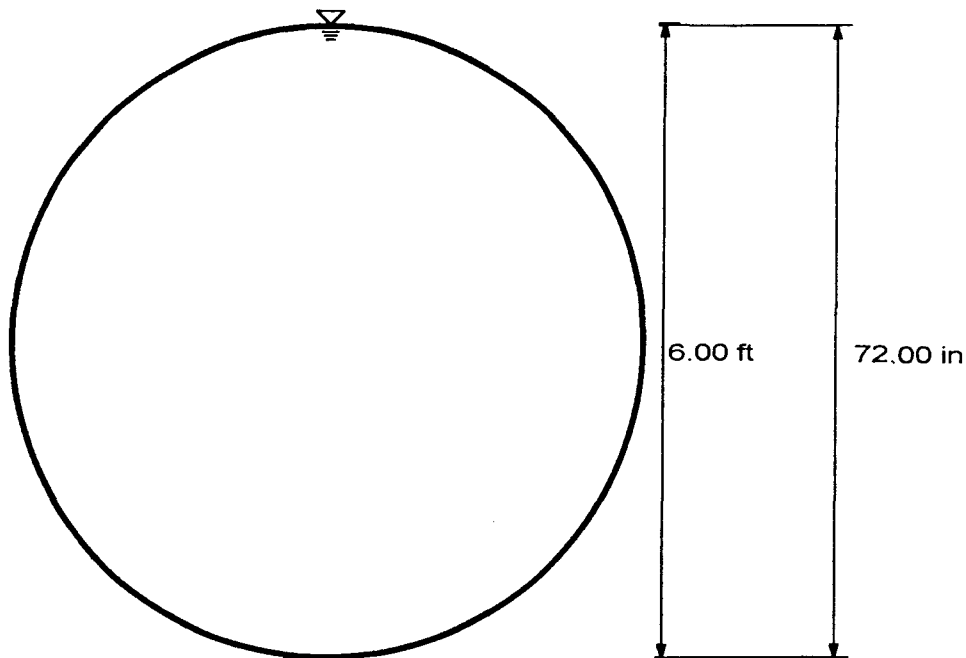
Section Data	
Mannings Coefficient	0.013
Channel Slope	0.005000 ft/ft
Depth	5.50 ft
Diameter	66.00 in
Discharge	237.44 cfs



V12-II TO JJ
Cross Section for Circular Channel

Project Description	
Project File	c:\haestad\fmw\project3.fm2
Worksheet	V11
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Discharge

Section Data	
Mannings Coefficient	0.013
Channel Slope	0.015000 ft/ft
Depth	6.00 ft
Diameter	72.00 in
Discharge	518.66 cfs

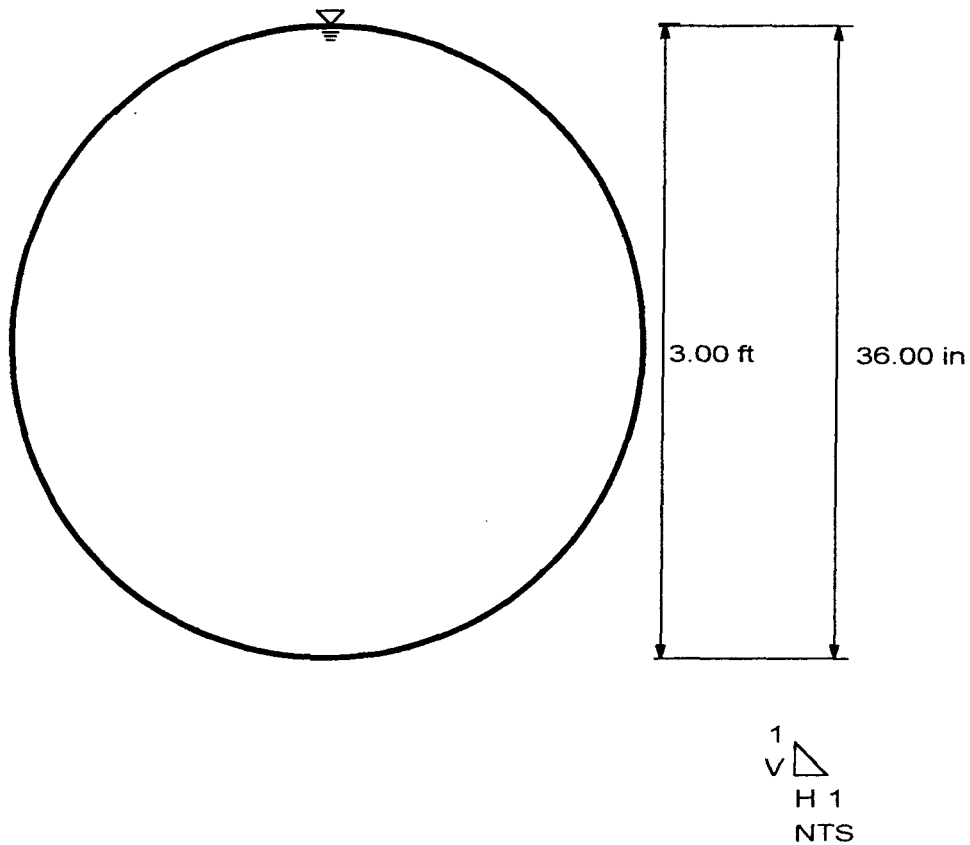


1
V
H 1
NTS

V12-ALTA DRIVE-LL TO EE
Cross Section for Circular Channel

Project Description	
Project File	c:\haestad\fmw\project4.fm2
Worksheet	V11
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Discharge

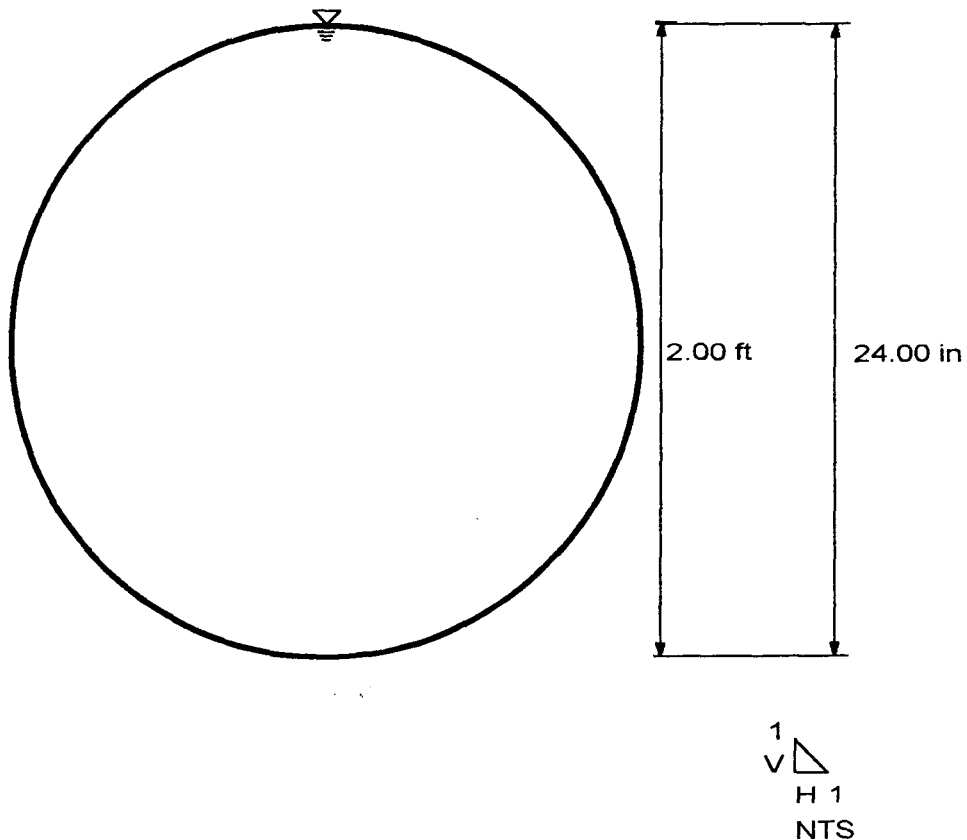
Section Data	
Mannings Coefficient	0.013
Channel Slope	0.023000 ft/ft
Depth	3.00 ft
Diameter	36.00 in
Discharge	101.15 cfs



V12-ALTA DRIVE-DD TO CC
Cross Section for Circular Channel

Project Description	
Project File	c:\haestad\fmw\project4.fm2
Worksheet	V11
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Discharge

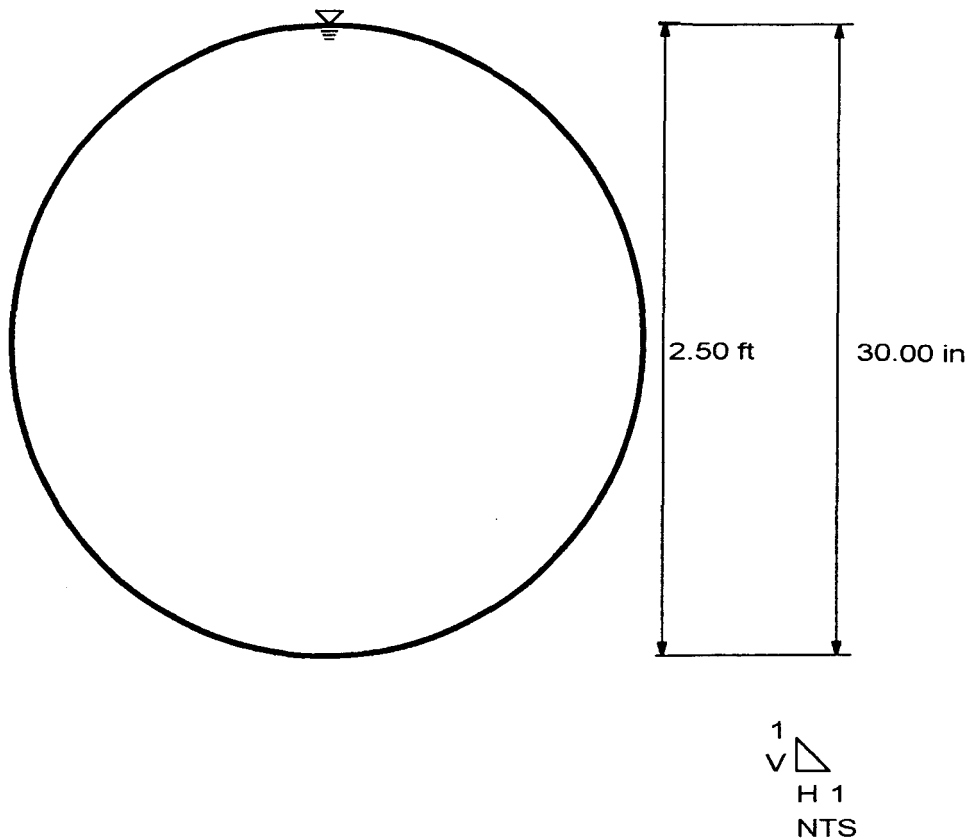
Section Data	
Mannings Coefficient	0.013
Channel Slope	0.023000 ft/ft
Depth	2.00 ft
Diameter	24.00 in
Discharge	34.31 cfs



V12-ALTA DRIVE-CC TO BB
Cross Section for Circular Channel

Project Description	
Project File	c:\haestad\fmw\project4.fm2
Worksheet	V11
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Discharge

Section Data	
Mannings Coefficient	0.013
Channel Slope	0.023000 ft/ft
Depth	2.50 ft
Diameter	30.00 in
Discharge	62.20 cfs



Worksheet
Worksheet for Irregular Channel

Project Description	
Project File	c:\haestad\fmw\project4.fm2
Worksheet	DIVERSION BERM
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

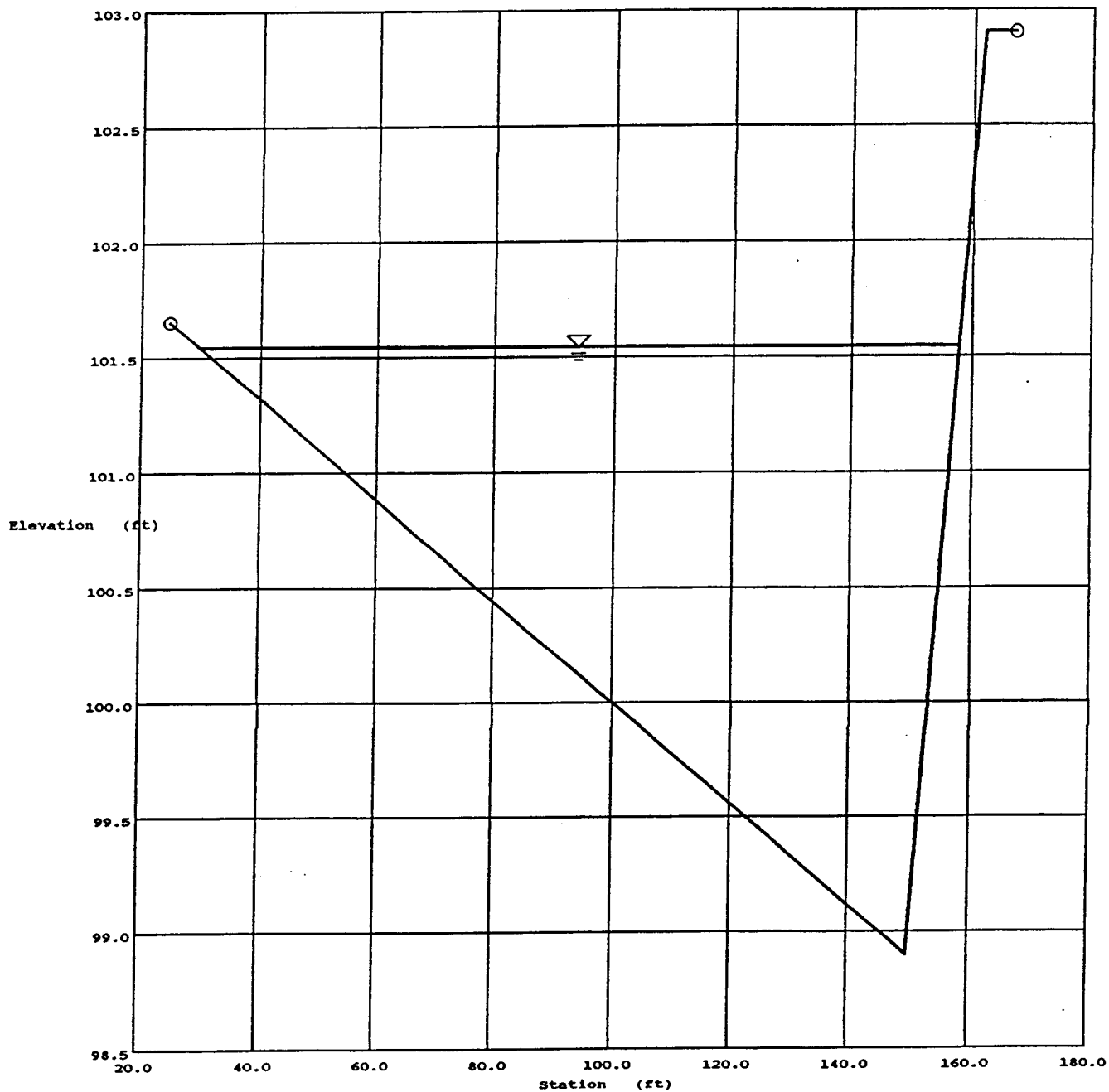
Input Data				
Channel Slope	0.005000ft/ft			
Elevation range: 98.90 ft to 102.90 ft.				
Station (ft)	Elevation (ft)	Start Station	End Station	Roughness
25.00	101.65	25.00	167.00	0.030
50.00	101.10			
100.00	100.00			
150.00	98.90			
153.00	99.90			
156.00	100.90			
159.00	101.90			
162.00	102.90			
167.00	102.90			
Discharge	707.00	cfs		

Results	
Wtd. Mannings Coefficient	0.030
Water Surface Elevation	101.54 ft
Flow Area	168.33 ft ²
Wetted Perimeter	128.18 ft
Top Width	127.72 ft
Height	2.64 ft
Critical Depth	101.11 ft
Critical Slope	0.012743ft/ft
Velocity	4.20 ft/s
Velocity Head	0.27 ft
Specific Energy	101.81 ft
Froude Number	0.64
Flow is subcritical.	

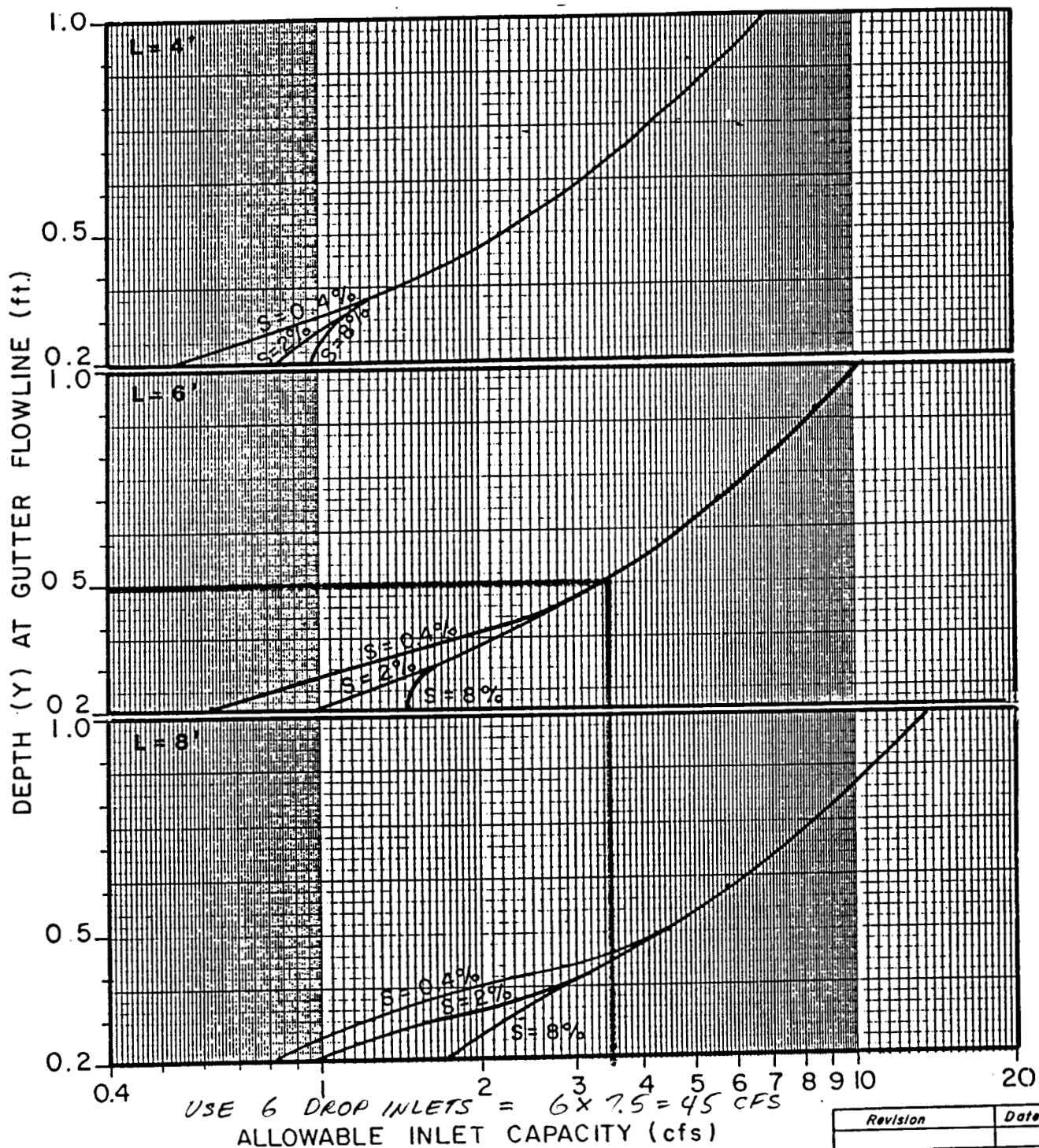
DIVERSION BERM
Cross Section for Irregular Channel

Project Description	
Project File	c:\haestad\fmw\project4.fm2
Worksheet	DIVERSION BERM
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Section Data	
Wtd. Mannings Coefficient	0.030
Channel Slope	0.005000ft/ft
Water Surface Elevation	101.54 ft
Discharge	707.00 cfs



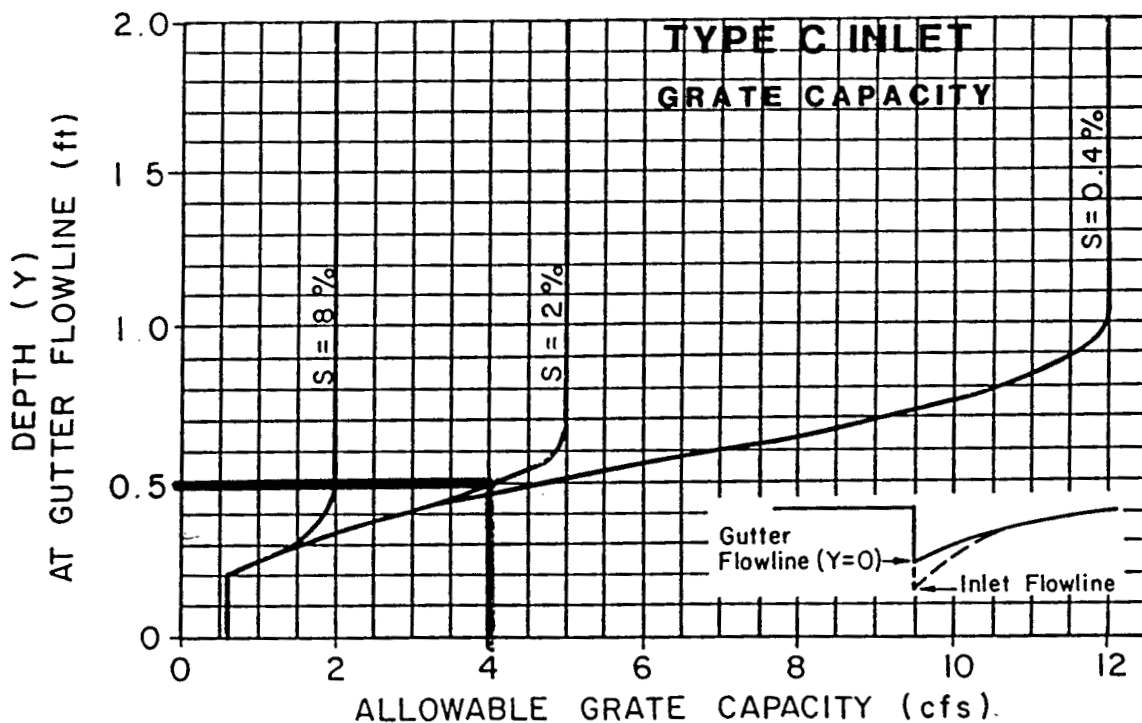
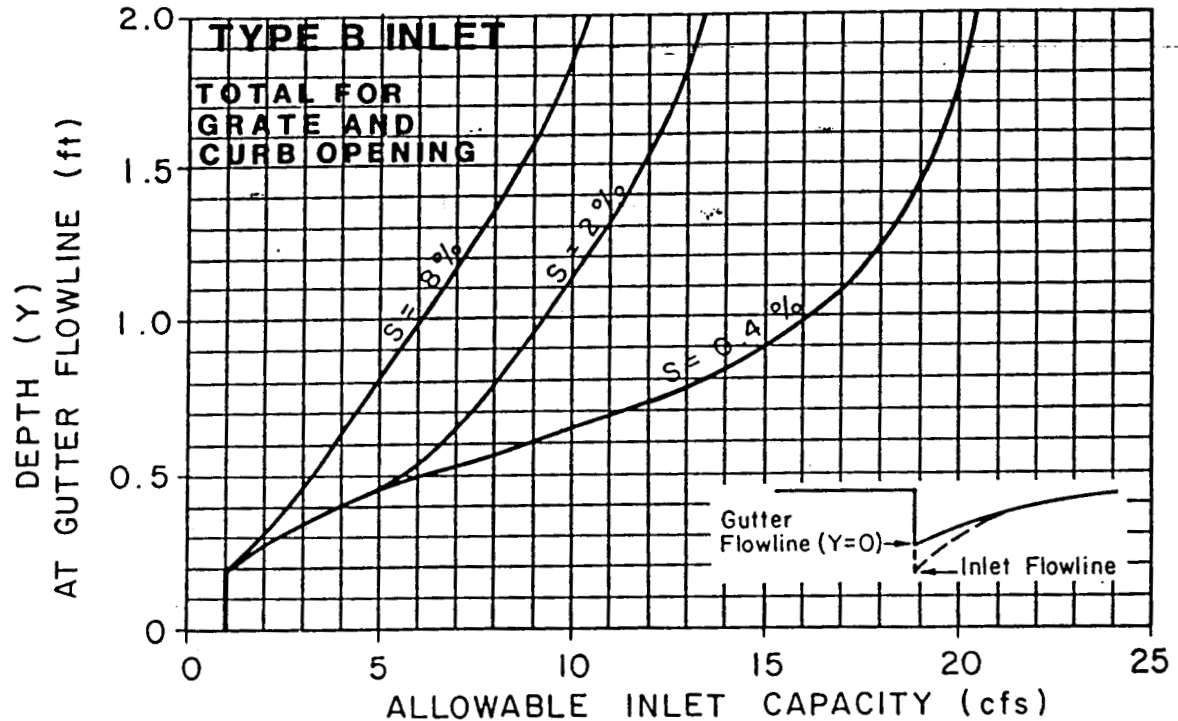
ALLOWABLE INLET CAPACITY CONTINUOUS GRADE CONDITION TYPE A INLET $Y \leq 1$ FOOT



NOTES: Includes capacity reduction factor of 0.80.

Revision	Date

ALLOWABLE INLET CAPACITY CONTINUOUS GRADE CONDITION



- NOTES: 1. Type C Inlet: Add the grate capacity from this graph to curb opening capacity from Type A Inlet-Continuous Grade graphs to obtain Total Inlet Capacity.
2. Type C Inlet: Grate Capacity includes a reduction factor of 0.70.
3. Type B Inlet: Capacity includes a reduction factor of 0.70 applied to grate capacity and 0.80 applied to curb opening capacity.

Revision	Date

SUMMERLIN MASTER PLAN UPDATE



G.C. WALLACE, INC.
Engineering/Architecture

August 8, 1995

62050.302H

City of Las Vegas
400 East Stewart Avenue
Las Vegas, NV 89101

Attention: Randy Fultz, P.E.

Subject: Summerlin Flood Control Master Plan Update
(CLV File No. DS1610A)

Gentlemen:

We have received your review memorandum dated August 1, 1995. We have addressed the comments as follows:

Comment: "1. The Village 26 Detention Basin Report had higher CN values than those contained in this report for future conditions. We do not believe the developed condition CN values are lower. The minimum CN value for developed conditions should equal those presented in the Village 26 Detention Basin Report.

Response: As you are aware, this update included fairly extensive revisions to the drainage area layout for the western part of Summerlin. As a part of the process, the drainage areas were checked and digitized into an AutoCAD file and analyzed with GIS software using computerized soil and land use graphical and tabular data.

This resulted in a more accurate analysis. As you will note on the enclosed calculation sheet entitled "CN Value Comparison," although the same labels were used, the individual drainage area configuration and parameters vary slightly between the Village 26 and the Master Plan Update. However, the composite CN for the Master Plan Update for the entire drainage basin is slightly higher than the composite CN for the original Village 26 study.

G. C. WALLACE, PE/SE, PLS
JAMES A. DUDDLESTEN, PE
RONALD R. THOMAS
TERRILL B. ADAMS
MARIE RAINWATER
MICHAEL D. ROSS, PE
CHRISTOPHER W. ANDERSON, PE
CALVIN L. BLACK, PE, PLS
JACK H. MITCHELL, PE
SCOTT R. PLUNKNER, PE
BENJAMIN C. SMITH, PE

MICHAEL J. CSIZAVADIA, PE
C. RUSSELL DAVIS, PE/SE
JEFFREY J. FREIBERG, PE
DOUGLAS M. HANKEL
DONALD A. HASELHOFF, PE, CEM
BYRON E. JOHNSON, PLS
PAUL H. JUDD, PE, PLS
NOEL C. LAUGHLIN, PE
MARC A. LEMOINE, RA
GREGORY PATCH, PE
JOHN R. TOBIN, PE
HOWARD K. VANDER MEER, PE
EUGENE W. WRIGHT, PE

DOUGLAS F. AHLSTROM
DANA A. AMES, PE/SE
JIM B. BAKKEDAL, PE
DOUGLAS B. BLATCHFORD, PE
JOSEPH A. BODROG, PLS
DENNIS R. BROWN
PAUL BURN, PLS
JOE CANTU
RONALD D. CHAPMAN
RICHARD G. CLARKE
ROY A. DAVIS III, PE
HUBERTO DELUNA, RA
THOMAS P. DYSON, PE
RICHARD A. ENRIGHT, PE
RANDALL K. GREMLICH, PE
SALLY HENSLEY
ROBERT J. HERMAN
DANNY E. HILL, PLS
DON E. HOLLOWAY, PE
BERT A. HUGHES, PE
DIANE C. HUNT, PE
WILLIAM E. HUNTER, PE
BRIAN L. JENSEN
ROBERT C. JOHNSON, PLS
JERRY D. JOHNSTON
ROBERT D. KINGSTON, PE
KRISTOFER D. KORMI
DOW LEELEY, PE
MARVIN W. MAIZE
JACK MANDEL
LLOYD B. MATHESON
TIMOTHY A. MCCOY, PE
WILLIAM NEIGHBORS, PE
JOHNNIE R. PATE, JR., PE
ALLEN PAVEKA, PE
AL L. ROBINSON, PE
BRIAN L. SCHMIDT, PE
JOHN E. SHIELDS, PE
RICHARD STEUBING, PLS
RICHARD A. L. STRUTZ
SAUNDRA L. VANCE, CCS
G. IRA WALLACE, PE
SCOTT H. WILDER, PE
ROBERT WOODSON, PE

G.C. WALLACE, INC.
Engineering/Architecture

City of Las Vegas
August 8, 1995
Page 2

62050.302H

Comment: "2. An updated Hydrology Map similar to Figure 12 in the 1990 Boyle Report should be provided."

Response: Refer to the enclosed Figure 13.

Comment: "3. The Village 26 Detention Basin should be shown on Figures 3 and 4 of the report."

Response: Figures 3 and 4 were copied directly from the previous studies done by Boyle and are included in this report for the purpose of showing what was proposed in those prior studies.

Comment: "4. The Engineer should provide a legend for the column headings and column headings on each page of the tables within Appendix A."

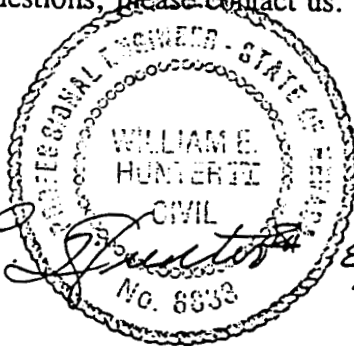
Response: Refer to the revised tables included herein.

Should you have further questions, please contact us.

Very truly yours,

G. C. WALLACE, INC.

William E. Hunter
William E. Hunter, P.E.



8/8/95

WEH:sjl

Encl.

CN VALUE COMPARISON

VILLAGE 26 - PHASE II				SUMMERLIN MPU	
DRAINAGE					
AREA		AREA	CN	AREA	CN
SB1		1.65	88	1.8	88
SB2		0.3047	84	0.22	83
SB3		0.4844	86	0.5	85
SB4		0.6953	84	0.73	86
3A (30)		2.63	87	2.52	87
TOTAL		5.7644		5.77	

COMP. CN : 86.682

COMP. CN : 86.860

CN CALCULATIONS FOR SCS SOIL TYPES

DATE: 5/3/95

CALCULATED BY: WEH

CHECKED BY: CAL

LNSCPG/GRASS
(GOOD CONDITION)

DESERT SHRUB
(POOR CONDITION)

GRADED, NO VEGETATION

A	39	63	77
B	61	77	86
C	74	85	91
D	80	88	94
ROCK	90	92	94

SYMBOL	L/G CN	D. S. CN	G.N.V. CN	sum %	A (%)	B (%)	C (%)	D (%)	ROCK (%)
105	51	71	82	100	50	45		5	
107	42	65	78	100	90	5		5	
112	43	66	79	100	85	10		5	
113	44	66	79	100	85	10			5
117	42	65	78	100	90	5	5		
120	42	65	78	100	90	5	5		
127	41	64	78	100	90	10			
128	41	64	78	100	90	10			
129	44	66	79	100	85	5	5	5	
130	63	78	87	100		90		10	
132	61	77	86	100		100			
133	66	79	87	100	5	75			20
134	61	77	86	100		100			
140	72	84	90	100		15	85		
150	77	86	93	100	5	5		90	
151	78	87	93	100	5			95	
152	76	86	92	100	5	10		85	
155	77	86	93	100	5	5		90	
160	63	78	87	100		90		10	
181	64	79	87	100	10	50	40		
182	60	77	86	100	15	65	20		
183	61	77	86	100		100			
184	61	77	86	100		100			
187	61	77	86	100	5	90	5		
190	60	76	86	100	10	85		5	
191	62	77	86	100	5	85		10	
192	63	78	87	100		90		10	
200	62	77	86	100	3	88	9		
206	73	85	91	100		5	95		
222	72	84	90	100	5		95		
236	62	78	87	100		90	10		
237	61	77	86	100		100			
240	78	87	93	100	5			95	
252	62	78	86	100		95		5	
255	62	78	86	100		95		5	
260	41	64	78	100	95			5	
262	49	69	81	100	75			25	
263	41	64	78	100	95			5	
264	39	63	77	100	100				
270	61	77	86	100		100			
278	79	87	94	100		5		95	
282	73	84	91	100		10	90		
300	78	87	93	100		10		90	
301	79	87	94	100		5		95	
302	68	81	89	100	5	50		45	
305	72	83	91	100	5	30	5	60	

CN CALCULATIONS FOR SCS SOIL TYPES

DATE: 5/3/95

CALCULATED BY: WEH

CHECKED BY: CAL

LNSCPG/GRASS
(GOOD CONDITION)

DESERT SHRUB
(POOR CONDITION)

GRADED, NO VEGETATION

A	39	63	77
B	61	77	86
C	74	85	91
D	80	88	94
ROCK	90	92	94

SYMBOL	L/G CN	D. S. CN	G.N.V. CN	sum %	A (%)	B (%)	C (%)	D (%)	ROCK (%)
307	76	86	92	100		10	30	60	
325	61	77	86	100	5	90		5	
326	61	77	86	100		100			
341	74	85	91	100			100		
360	82	88	93	100		15		35	50
380	73	84	91	100		10	85	5	
390	74	85	91	100			95	5	
400	78	87	93	100		10		90	
415	62	78	86	100		95			5
417	72	83	89	100		60		10	30
418	62	78	86	100		95			5
419	62	77	86	100	5	85		10	
430	61	77	86	100		100			
440	60	76	86	100	5	95			
450	80	88	94	100		5		90	5
481	77	86	93	100	5	5		90	
484	79	87	93	100	5			85	10
500	69	82	89	100		60		35	5
501	61	77	86	100	5	90		5	
502	68	81	89	100	5	55		40	
505	70	82	90	100		55		40	5
510	82	88	93	100		10		55	35
540	62	77	86	100	5	85		10	
542	62	77	86	100	5	85		10	
545	68	81	89	100		60	10	30	
600	80	88	94	100				100	
605	80	88	94	100				100	
610	80	88	94	100				100	
615	80	88	94	100				100	
630	80	88	94	100				100	
635	90	92	94	100					100
640	90	92	94	100					100
645	80	88	94	100				100	

CN CALCULATIONS

CALCULATED BY: WEH					DATE: 5/25/95		
LABEL	ACRE	MI2	VILLAGE	SOIL	ACRE'	CN'	COMP CN
				152	18.1	90.5	8
3A	212.7	0.332	12	152	175.8	86.8	72
3A	212.7	0.332	3	502	18.7	82.5	7
3A	212.7	0.332	3		212.6		87
3B	501.8	0.784	3	152	456.6	86.8	79
3B	501.8	0.784	3	502	2.2	82.5	0
3B	501.8	0.784	AP	152	43.0	82.4	7
					501.8		87
3C	99.3	0.155	3	152	99.3	86.8	87
8A	150.9	0.236	3	152	0.0	86.8	0
8A	150.9	0.236	3	502	0.0	82.5	0
8A	150.9	0.236	8	152	29.2	91.3	18
8A	150.9	0.236	8	152	1.5	91.3	1
8A	150.9	0.236	8	502	120.1	88.9	71
8A	150.9	0.236	8		150.8		89
8B	414.7	0.648	3	152	0.1	86.8	0
8B	414.7	0.648	8	152	215.7	91.3	48
8B	414.7	0.648	8	502	164.5	88.9	35
8B	414.7	0.648	8	502	34.5	88.9	7
					414.8		90
11A	511.9	0.8	11	152	1.6	88.96	0
11A	511.9	0.8	11	152	7.3	88.96	1
11A	511.9	0.8	11	155	15.3	89.38	3
11A	511.9	0.8	11	502	369.2	85.59	62
11A	511.9	0.8	12	152	16.6	90.52	3
11A	511.9	0.8	12	502	79.6	87.75	14
11A	511.9	0.8	20	155	1.9	87.35	0
11A	511.9	0.8	20	502	20.6	82.75	3
					511.9		86
11B	493.9	0.772	11	152	263.0	88.96	47
11B	493.9	0.772	11	155	3.4	89.38	1
11B	493.9	0.772	11	155	18.5	89.38	3
11B	493.9	0.772	11	155	6.4	89.38	1
11B	493.9	0.772	11	502	163.2	85.59	28
11B	493.9	0.772	11	502	24.1	85.59	4
11B	493.9	0.772	21	152	2.8	87.37	0
11B	493.9	0.772	21	152	3.5	87.37	1
11B	493.9	0.772	21	155	2.3	87.81	0
11B	493.9	0.772	21	155	4.6	87.81	1
11B	493.9	0.772	21	155	2.1	87.81	0
					493.8		88
12A	255.8	0.4	12	152	229.0	90.5	81
12A	255.8	0.4	12	502	15.4	87.8	5
12A	255.8	0.4	13	152	0.3	89.8	0
12A	255.8	0.4	19A	152	0.0	87.5	0
12A	255.8	0.4	20	152	8.8	86.9	3
12A	255.8	0.4	20	502	2.3	82.7	1
					255.8		90

[illegible]

LABEL	ACRE	MI2	VILLAGE	SOIL	ACRE'	CN'	COMP CN
23B	620	0.969	23	155	105.1	86.04	15
23B	620	0.969	23	155	3.5	86.04	0
23B	620	0.969	23	502	471.4	80.92	62
23B	620	0.969	28	155	38.8	85.29	5
23B	620	0.969	28	502	1.2	79.77	0
23B	620	0.969	28	502	0.0	79.77	0
23B	620	0.969	28		620.0		82
24A	219.7	0.343	24	155	203.4	86.5	80
24A	219.7	0.343	25	155	16.2	85	6
					219.6		86
24B	305.3	0.477	24	155	305.0	86.47	86
24B	305.3	0.477	24	502	0.3	81.54	0
					305.3		86
24C	221.3	0.346	24	155	89.2	86.47	35
24C	221.3	0.346	24	155	1.0	86.47	0
24C	221.3	0.346	24	155	1.8	86.47	1
24C	221.3	0.346	24	502	107.4	81.54	40
24C	221.3	0.346	27	155	19.1	84.94	7
24C	221.3	0.346	27	502	2.9	79.36	1
24C	221.3	0.346	27		221.3		84
25A	263.1	0.411	25	155	257.9	85	83
25A	263.1	0.411	25	191	0.5	75.5	0
25A	263.1	0.411	25	191	4.4	75.5	1
25A	263.1	0.411	25	502	0.1	79.4	0
					262.9		85
25B	203.6	0.318	24	155	0.0	86.47	0
25B	203.6	0.318	24	155	0.1	86.47	0
25B	203.6	0.318	25	112	15.2	63.63	5
25B	203.6	0.318	25	155	180.0	84.98	75
25B	203.6	0.318	25	640	7.8	92.62	4
25B	203.6	0.318	27	155	0.5	84.94	0
					203.5		84
27A	639.7	1	25	112	15.9	63.63	2
27A	639.7	1	25	155	0.3	84.98	0
27A	639.7	1	25	155	84.3	84.98	11
27A	639.7	1	25	640	14.4	92.62	2
27A	639.7	1	25	640	0.4	92.62	0
27A	639.7	1	25	640	5.5	92.62	1
27A	639.7	1	27	112	10.7	63.58	1
27A	639.7	1	27	155	0.1	84.94	0
27A	639.7	1	27	155	258.6	84.94	34
27A	639.7	1	27	640	33.8	92.62	5
27A	639.7	1	27	640	50.9	92.62	7
27A	639.7	1	27	640	3.6	92.62	1
27A	639.7	1	27	640	161.2	92.6	23
					639.8		87
27B	249.9	0.39	27	155	249.9	84.94	85

LABEL	ACRE	MI2	VILLAGE	SOIL	ACRE'	CN'	COMP CN
						84.9	48
27C	614.4	0.96	27	155	344.2	87.8	2
27C	614.4	0.96	27	360	10.3	85.3	11
27C	614.4	0.96	28	155	76.7	85.3	8
				155	54.0	87.8	19
				360	129.2		86
					614.4		
27D	198.7	0.31	23	155	1.2	86.04	1
27D	198.7	0.31	23	502	0.6	80.92	0
27D	198.7	0.31	24	155	15.9	86.47	7
27D	198.7	0.31	24	502	0.1	81.54	0
27D	198.7	0.31	24	502	0.3	81.54	0
27D	198.7	0.31	27	155	171.0	84.94	73
27D	198.7	0.31	27	502	0.4	79.36	0
27D	198.7	0.31	27	502	3.4	79.36	1
27D	198.7	0.31	27	502	0.4	85.29	0
27D	198.7	0.31	28	155	2.3	85.29	1
27D	198.7	0.31	28	155	3.3	79.77	1
27D	198.7	0.31	28	502	198.7		85
28A	200.6	0.313	27	155	45.6	84.9	19
28A	200.6	0.313	28	155	153.5	85.3	65
28A	200.6	0.313	28	502	1.4	79.8	1
					200.5		85
38A	709	1.108	OFF1	152	709.0	87.7	88
38B	337.8	0.528	OFF1	152	337.9	87.7	88
57A	280.6	0.438	OFF1	152	280.6	87.7	88
57B	875.2	1.368	3	152	1.2	86.8	0
57B	875.2	1.368	AP	152	213.9	82.4	20
57B	875.2	1.368	OFF1	152	660.1	87.7	66
					875.2		86
60A	228.4	0.357	1S	152	228.5	85.7	86
20	1441.8	2.253		360		88	88
50	365.6	0.571		360		88	88
60	189.9	0.297	27	155	9.1	84.9	4
60	189.9	0.297	27	360	0.0	87.8	0
				360	180.8	88	84
					189.9		88
70	447.8	0.7	27	155	40.3	84.9	8
70	447.8	0.7	27	360	127.4	87.8	25
70	447.8	0.7	27	640	1.1	92.6	0
				640	27.8	92.6	6
				360	251.2	87.8	49
					447.8		88
AP	413.1	0.646	AP	152	413.1	82.4	82

CN CALCULATIONS

CALCULATED BY: WEH

DATE: 5/25/95

LABEL	ACRE	MI2	VILLAGE	SOIL	ACRE'	CN'	COMP CN
30	1615.1	2.524	25	155	314.5	84.98	17
30	1615.1	2.524	25	155	56.6	84.98	3
30	1615.1	2.524	25	191	144.3	75.5	7
30	1615.1	2.524	25	360	1076.8	87.83	59
30	1615.1	2.524	25	640	22.9	92.62	1
					1615.1		87
SB1	1152.3	1.802	25	155	2.1	84.98	0
SB1	1152.3	1.802	25	155	160	84.98	12
SB1	1152.3	1.802	25	191	3.3	75.5	0
SB1	1152.3	1.802	25	360	128.1	87.83	10
SB1	1152.3	1.802	25	360	83.7	87.83	6
SB1	1152.3	1.802	25	502	99.2	79.4	7
SB1	1152.3	1.802	26	152	3	85.73	0
SB1	1152.3	1.802	26	360	227.2	88.78	18
SB1	1152.3	1.802	26	360	445.7	88	34
SB1	1152.3	1.802	26	502	18.5	81.11	1
					1152.3		88
SB2	143.6	0.224	26	152	14.2	85.73	8
SB2	143.6	0.224	26	360	27.4	88.78	17
SB2	143.6	0.224	26	502	101.7	81.11	57
					143.3		83
SB3	318.1	0.497	22	155	72	88.65	20
SB3	318.1	0.497	25	155	203.4	84.98	54
SB3	318.1	0.497	25	191	12.8	75.5	3
SB3	318.1	0.497	25	360	1.1	87.83	0
SB3	318.1	0.497	25	502	2.5	79.4	1
SB3	318.1	0.497	25	502	0.1	79.4	0
SB3	318.1	0.497	25	502	1	79.4	0
SB3	318.1	0.497	26	152	4	85.73	1
SB3	318.1	0.497	26	155	19.5	86.18	5
SB3	318.1	0.497	26	502	1.7	81.11	0
					318.1		85
SB4	467.2	0.731	22	152	15.2	88.23	3
SB4	467.2	0.731	22	155	65.5	88.65	12
SB4	467.2	0.731	22	155	104.6	88.65	20
SB4	467.2	0.731	22	502	132.3	84.6	24
SB4	467.2	0.731	22	502	0.6	84.6	0
SB4	467.2	0.731	25	155	44.4	84.98	8
SB4	467.2	0.731	25	155	17.6	84.98	3
SB4	467.2	0.731	25	191	2	75.5	0
SB4	467.2	0.731	25	502	85	79.4	14
					467.2		86

DEVELOPEMENT: SUMMERLIN MASTER PLAN UPDATE
CALCULATED BY: WEH DATE: 5/25/95

DEVELOPEMENT: SUMMERLIN MASTER PLAN UPDATE
CALCULATED BY: WEH DATE: 5/25/95

$$K = (0.0132 * CN) - 0.39 \quad TI = 1.8 * \{1.1 - K\} * L^{1/2} / S^{1/3} \quad TR = L / V \quad TC = TI + TR \quad TLAG = 0.6 * TC$$

[illegible]

DEVELOPEMENT: SUMMERLIN MASTER PLAN UPDATE
CALCULATED BY: WEH DATE: 5/25/95

DEVELOPEMENT: SUMMERLIN MASTER PLAN UPDATE
CALCULATED BY: WEH DATE: 5/25/95

$$K = (0.0132 * CN) - 0.39 \quad Tl = 1.8 * (1.1 - K) * L^{1/2} / S^{1/3} \quad TR = L / V \quad TC = Tl + TR \quad TLAG = 0.6 * TC$$

[illegible]

DEVELOPEMENT: SUMMERLIN MASTER PLAN UPDATE
CALCULATED BY: WEH DATE: 5/25/95

CALCULATED BY: WEH

DATE: 5/25/95

$$K = (0.0132 * CN) - 0.39 \quad TI = 1.8 * (1.1 - K) * L^{1/2} / S^{1/3} \quad TR = L / V \quad TC = TI + TR \quad TLAG = 0.6 * TC$$

[illegible]

S

DATE: 5/25/95

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

$$Tl = 1.8 * (1.1 - K) * L^{1/2} / S^{1/3}$$

$$TR = L / V$$

$$TC = TI + TR$$

$$TLAG = 0.6 * TC$$

[illegible]

TIME OF CONCENTRATION

DEVELOPEMENT: SUMMERLIN MASTER PLAN UPDATE
CALCULATED BY: WEH DATE: 5/25/95

$$K = (0.0132 * CN) - 0.39 \quad TI = 1.8 * (1.1 - K) * L^{1/2} / S^{1/3} \quad TR = L / V \quad TC = TI + TR \quad TLAG = 0.6 * TC$$

LABEL	ACREAGE	CN	K	LENGTH (FT)	SLOPE (%)	TI (MIN)	LENGTH (FT)	SLOPE (%)	V1 (FPS)	V2 (FPS)	TR (MIN)	TC (MIN)	TLAG (HR)
60	189.9	88	0.77	200	2	6.64	2800	50	14.28	21.64	2.36	8.99	0.09
							3600	17	8.33	12.62	4.76	4.76	0.05
													0.14
70	447.8	88	0.77	200	2	6.64	2300	55	14.98	22.69	1.88	8.51	0.09
							2800	30	11.06	16.76	2.78	2.78	0.03
							4400	9	6.06	9.18	7.99	7.99	0.08
													0.19
AP	413.1	82	0.69	100	1	7.34			0.00	0.00	0.00	7.34	0.07

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

*DIAGRAM

```

1 ID DRAINAGE TOWARD ANGEL PARK - FUTURE DEVELOPED CONDITIONS
2 ID 100-YR, 6-HR STORM, SDN 5
3 ID HEC1 MODEL REVISED FROM BOYLE MASTER PLAN 1992 8/26/94
4 ID (ANGEL PARK DETENTION BASIN VOLUMES MODIFIED TO EQUAL 1435 ACRE FT.;
5 ID OPTIONAL DETENTION BASIN NO. 4 INCLUDED)
6 ID
7 ID FILE: SUM_SDN5.DAT
8 ID
9 ID LOCATION AREA(SQ.MI.) DARF
10 ID
11 ID RATIO1 ANGEL PARK 23.14 .774
12 ID RATIO2 RCB AT SUM. PKWY. 14.23 .830
13 ID RATIO3 14.0 .832
14 ID RATIO4 13.0 .839
15 ID RATIO5 12.0 .846
16 ID RATIO6 11.0 .853
17 ID RATIO7 TWA & ALTA DR. 10.67 .855
18 ID RATIO8 10.0 .860
19 ID *****
20 IT 3 0 0 300
21 IO 5 0 0
22 IN 5
23 JR PREC .774 .830 .832 .839 .846 .853 .855 .860

24 KK 20
25 BA 2.253
26 PB 3.72
27 PC .000 .020 .059 .080 .110 .144 .150 .160 .168 .171
28 PC .180 .182 .187 .190 .197 .202 .210 .220 .230 .241
29 PC .250 .259 .265 .280 .290 .300 .305 .309 .310 .317
30 PC .321 .327 .333 .346 .361 .381 .408 .430 .477 .514
31 PC .561 .630 .710 .720 .731 .752 .779 .790 .795 .804
32 PC .810 .820 .826 .840 .859 .889 .910 .938 .966 .970
33 PC .974 .979 .981 .983 .985 .989 .990 .992 .993 .996
34 PC .997 .999 1.00
35 LS 0 88
36 UD .45

37 KK 20-27A
38 RM 4 .19 .3

39 KK 27A
40 BA 1.000
41 PB 3.58
42 LS 0 87
43 UD .27

44 KK N27AA
45 HC 2

```

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

46	KK	60							
47	BA	.297							
48	PB	3.65							
49	LS	0	88						
50	UD	.14							
51	KK	60-70							
52	RM	1	.08		.3				
53	KK	70							
54	BA	.700							
55	PB	3.65							
56	LS	0	88						
57	UD	.19							
58	KK	N70							
59	HC	2							
60	KK	70-27A							
61	RM	1	.06		.3				
62	KK	N27AB							
63	HC	2							
64	KK	DB4							
65	RS	1	STOR	-1					
66	SV	0	20	75	150	252	400		
67	SQ	0	240	740	1020	1200	20000		
68	SE	0	5	10	15	20	25		
69	KK	27A-24C							
70	RM	2	.12		.3				
71	KK	50							
72	BA	.571							
73	PB	3.65							
74	LS	0	88						
75	UD	.18							
76	KK	50-27C							
77	RM	4	.20		.3				
78	KK	27C							
79	BA	.960							
80	PB	3.58							
81	LS	0	86						
82	UD	.22							
83	KK	N27C							
84	HC	2							

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

[illegible]

LINE	ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10
126	KK N24CA
127	HC 2
128	KK 25A
129	BA .411
130	PB 3.50
131	LS 0 85
132	UD 0.21
133	KK 25A-24A
134	RM 2 .10 .3
135	KK 24A
136	BA .343
137	PB 3.43
138	LS 0 86
139	UD 0.18
140	KK N24A
141	HC 2
142	KK 24A-24B
143	RK 3000 .04 .015 TRAP 20 2
144	KK 25B
145	BA .318
146	PB 3.50
147	LS 0 84
148	UD 0.24
149	KK 25B-24B
150	RM 2 .12 .3
151	KK 24B
152	BA 0.477
153	PB 3.43
154	LS 0 86
155	UD .23
156	KK N24B
157	HC 2
158	KK N24CC
159	HC 3
160	KK 24C-23A
161	RK 3600 .04 .015 TRAP 20 2
162	KK 23A
163	BA .300
164	PB 3.34
165	LS 0 81
166	UD 0.22

LINE	ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10
167	KK N23A
168	HC 2
169	KK 23A-20A
170	RK 5000 .04 .015 TRAP 20 2
171	KK 20A
172	BA .755
173	PB 3.22
174	LS 0 83
175	UD 0.24
176	KK N20AA
177	HC 2
178	KK 21C
179	BA .272
180	PB 3.25
181	LS 0 88
182	UD .18
183	KK 21C-21D
184	RK 2700 .04 .015 TRAP 20 2
185	KK 21D
186	BA .146
187	PB 3.22
188	LS 0 88
189	UD 0.16
190	KK N21DA
191	HC 2
192	KK 21A
193	BA .268
194	PB 3.25
195	LS 0 88
196	UD .18
197	KK 21A-21B
198	RK 2900 .04 .015 TRAP 20 2
199	KK 21B
200	BA .241
201	PB 3.22
202	LS 0 88
203	UD .18
204	KK N21B
205	HC 2

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

206	KK	21B-21D						
207	RK	1400	.025	.015		TRAP	20	2
208	KK	N21DB						
209	HC	2						
210	KK	21D-20A						
211	RK	4200	.025	.015		TRAP	20	2
212	KK	N20AB						
213	HC	2						
214	KK	20A-11A						
215	RK	3800	.035	.015		TRAP	20	2
216	KK	11A						
217	BA	.800						
218	PB	3.15						
219	LS	0	86					
220	UD	.31						
221	KK	N11A						
222	HC	2						
223	KK	11A-3A						
224	RM	2	.09	.3				
225	KK	3A						
226	BA	.332						
227	PB	3.00						
228	LS	0	87					
229	UD	.21						
230	KK	N3A						
231	HC	2						
232	KK	3A-3B						
233	RM	6	.27	.3				
234	KK	11B						
235	BA	.772						
236	PB	3.15						
237	LS	0	88					
238	UD	.27						
239	KK	11B-8B						
240	RK	5500	.03	.025		TRAP	20	2
241	KK	8A						
242	BA	.236						
243	PB	3.06						
244	LS	0	89					
245	UD	.16						

[illegible]

LINE	ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10
286	KK 23B-20B
287	RK 3800 .03 .015 TRAP 20 2
288	KK 20B
289	BA 0.521
290	PB 3.26
291	LS 0 84
292	UD .22
293	KK N20B
294	HC 2
295	KK 20B-12A
296	RM 3 .14 .3
297	KK 12A
298	BA .400
299	PB 3.14
300	LS 0 90
301	UD .24
302	KK N12A
303	HC 2
304	KK 12A-12B
305	RM 2 .09 .3
306	KK 12B
307	BA .266
308	PB 3.00
309	LS 0 91
310	UD .17
311	KK N12B
312	HC 2
313	KK 12B-57B
314	RK 8500 .02 .015 TRAP 20 2
315	KK 19A
316	BA 0.459
317	PB 3.20
318	LS 0 87
319	UD 0.25
320	KK 19A-13B
321	RK 6400 .025 .015 TRAP 20 2
322	KK 13B
323	BA .573
324	PB 3.12
325	LS 0 90
326	UD .30

LINE	ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10
327	KK N13B
328	HC 2
329	KK 13B-57A
330	RM 4 .17 .3
331	KK 57A
332	BA .438
333	PB 2.95
334	LS 0 88
335	UD .29
336	KK N57A
337	HC 2
338	KK 57A-57B
339	RK 6000 .02 .015 TRAP 20 2
340	KK 57B
341	BA 1.368
342	PB 2.93
343	LS 0 86
344	UD .49
345	KK N57B
346	HC 3
347	KK 13A
348	BA .609
349	PB 3.12
350	LS 0 90
351	UD .30
352	KK 13A-38A
353	RK 11200 .02 .015 TRAP 20 2
354	KK 38A
355	BA 1.108
356	PB 2.86
357	LS 0 88
358	UD .53
359	KK N38A
360	HC 2
361	KK 38A-38B
362	RK 4200 .02 .015 TRAP 20 2
363	KK 38B
364	BA .528
365	PB 2.86
366	LS 0 88
367	UD .30

LINE	ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10
368	KK N38B
369	HC 2
370	KK 3C
371	BA .155
372	PB 2.89
373	LS 0 87
374	UD .21
375	KK AP
376	BA .646
377	PB 2.86
378	LS 0 82
379	UD .15
380	KK NAP
381	KM TOTAL FLOW AT ANGEL PARK
382	HC 5
383	KK DBAP
384	KM ANGEL PARK DETENTION BASIN: ONE 24" EXST. & ONE 54"
385	KM 1435 ACRE-FEET STORAGE AT 2618.5 ELEV.
386	KO 3
387	RS 1 STOR -1
388	SV 0 10 40 108 240 410 635 890 1200 1410
389	SV 1435 1474 1513 1554 1595 1637 1679 1723 1767 1812
390	SE 2576 2580.0 2585 2590 2595 2600 2605 2610 2616 2618
391	SE 2618.5 2619 2619.5 2620 2620.5 2621 2621.5 2622 2622.5 2623
392	SQ 0 89 194 232 285 316 343 370 392 405
393	SQ 407 1852 4491 7909 11955 16545 21620 27137 33064 39373
394	ZZ

SCHEMATIC DIAGRAM OF STREAM NETWORK

PUT LINE	(V) ROUTING	(--->) DIVERSION OR PUMP FLOW
NO.	(.) CONNECTOR	(<---) RETURN OF DIVERTED OR PUMPED FLOW
24	20	
	V	
	V	
37	20-27A	
	.	
39	.	27A
	.	.
	.	.
44	N27AA.....	
	.	
46	.	60
	.	V
	.	V
51	.	60-70
	.	.
	.	.
53	.	70
	.	.
	.	.
58	.	N70.....
	.	V
	.	V
60	.	70-27A
	.	.
	.	.
62	N27AB.....	
	V	
	V	
64	DB4	
	V	
	V	
69	27A-24	
	.	
	.	
71	.	50
	.	V
	.	V
76	.	50-27C
	.	.
	.	.
78	.	27C
	.	.
	.	.
83	.	N27C.....
	.	V
	.	V
85	.	27C-28
	.	.
	.	.
87	.	28A
	.	.

92	.	.	.	N28A.....
	.	.	.	
94	.	.	.	27B
	.	.	.	V
	.	.	.	V
99	.	.	.	27B-27
	.	.	.	
101	.	.	.	27D
	.	.	.	
106	.	.	.	N27D.....
	.	.	.	
108	.	.	.	NDB5.....
	.	.	.	V
	.	.	.	V
111	.	.	.	DB5
	.	.	.	
117	.	.	.	N24CB.....
	.	.	.	V
	.	.	.	V
119	.	.	.	RN24CB
	.	.	.	
121	.	.	.	24C
	.	.	.	
126	.	.	.	N24CA.....
	.	.	.	
128	.	.	.	25A
	.	.	.	V
	.	.	.	V
133	.	.	.	25A-24
	.	.	.	
135	.	.	.	24A
	.	.	.	
140	.	.	.	N24A.....
	.	.	.	V
	.	.	.	V
142	.	.	.	24A-24
	.	.	.	
144	.	.	.	25B
	.	.	.	V
	.	.	.	V
149	.	.	.	25B-24
	.	.	.	
151	.	.	.	24B
	.	.	.	
156	.	.	.	N24B.....
	.	.	.	

158	N24CC.....		
	V		
	V		
160	24C-23		
	.		
162	.	23A	
	.	.	
	.	.	
167	N23A.....		
	V		
	V		
169	23A-20		
	.		
	.		
171	.	20A	
	.	.	
	.	.	
176	N20AA.....		
	.		
	.		
178	.	21C	
	.	V	
	.	V	
183	.	21C-21	
	.	.	
	.	.	
185	.	.	21D
	.	.	.
	.	.	.
190	.	N21DA.....	
	.	.	
	.	.	
192	.	.	21A
	.	.	V
	.	.	V
197	.	.	21A-21
	.	.	.
	.	.	.
199	.	.	.
	.	.	21B
	.	.	.
	.	.	.
204	.	.	N21B.....
	.	.	V
	.	.	V
206	.	.	21B-21
	.	.	.
	.	.	.
208	.	N21DB.....	
	.	V	
	.	V	
210	.	21D-20	
	.	.	
	.	.	
212	N20AB.....		
	V		
	V		
214	20A-11		
	.		

216	.	11A	
	.	.	
	.	.	
221	N11A.....		
	V		
	V		
223	11A-3A		
	.		
	.		
225	.	3A	
	.	.	
	.	.	
230	N3A.....		
	V		
	V		
232	3A-3B		
	.		
	.		
234	.	11B	
	.	V	
	.	V	
239	.	11B-8B	
	.	.	
	.	.	
241	.	.	8A
	.	.	V
	.	.	V
246	.	.	8A-8B
	.	.	.
	.	.	.
248	.	.	8B
	.	.	.
	.	.	.
253	.	N8B.....	
	.	V	
	.	V	
255	.	8B-3B	
	.	.	
	.	.	
257	.	.	3B
	.	.	.
	.	.	.
262	N3B.....		
	V		
	V		
264	BOX		
	V		
	V		
272	3B-60A		
	.		
	.		
274	.	60A	
	.	.	
	.	.	
279	APN.....		
	.		
	.		
281	.	23B	
	.	V	

286	.	V	
	.	23B-20	
	.	.	
288	.	.	20B
	.	.	.
	.	.	.
293	.	N20B.....	
	.	V	
	.	V	
295	.	20B-12	
	.	.	
	.	.	
297	.	.	12A
	.	.	.
	.	.	.
302	.	N12A.....	
	.	V	
	.	V	
304	.	12A-12	
	.	.	
	.	.	
306	.	.	12B
	.	.	.
	.	.	.
311	.	N12B.....	
	.	V	
	.	V	
313	.	12B-57	
	.	.	
	.	.	
315	.	.	19A
	.	.	V
	.	.	V
320	.	.	19A-13
	.	.	.
	.	.	.
322	.	.	13B
	.	.	.
	.	.	.
327	.	N13B.....	
	.	V	
	.	V	
329	.	13B-57	
	.	.	
	.	.	
331	.	.	57A
	.	.	.
	.	.	.
336	.	N57A.....	
	.	V	
	.	V	
338	.	57A-57	
	.	.	
	.	.	
340	.	.	57B
	.	.	.
	.	.	.
345	.	N57B.....	
	.	.	

347	.	.	13A		
	.	.	V		
	.	.	V		
352	.	.	13A-38		
	.	.	.		
354	.	.	.	38A	
	.	.	.	.	
	.	.	.	.	
359	.	.	N38A.....		
	.	.	V		
	.	.	V		
361	.	.	38A-38		
	.	.	.		
363	.	.	.	38B	
	.	.	.	.	
	.	.	.	.	
368	.	.	N38B.....		
	.	.	.		
370	.	.	.	3C	
	.	.	.	.	
	.	.	.	.	
375	.	.	.	.	AP
	.	.	.	.	.
	.	.	.	.	.
380	NAP.....				
	V				
	V				
383	DBAP				

(***) RUNOFF ALSO COMPUTED AT THIS LOCATION

```

*****
*
* FLOOD HYDROGRAPH PACKAGE (HEC-1)
*   SEPTEMBER 1990
*   VERSION 4.0
*
* RUN DATE 08/24/1995 TIME 10:10:03
*
*****

```

```

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

```

DRAINAGE TOWARD ANGEL PARK - FUTURE DEVELOPED CONDITIONS
 100-YR, 6-HR STORM, SDN 5
 HEC1 MODEL REVISED FROM BOYLE MASTER PLAN 1992 8/26/94
 (ANGEL PARK DETENTION BASIN VOLUMES MODIFIED TO EQUAL 1435 ACRE FT.;
 OPTIONAL DETENTION BASIN NO. 4 INCLUDED)

FILE: SUM_SDN5.DAT

	LOCATION	AREA(SQ.MI.)	DARF
RATIO1	ANGEL PARK	23.14	.774
RATIO2	RCE AT SUM. PKWY.	14.23	.830
RATIO3		14.0	.832
RATIO4		13.0	.839
RATIO5		12.0	.846
RATIO6		11.0	.853
RATIO7	TWA & ALTA DR.	10.67	.855
RATIO8		10.0	.860

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

IT HYDROGRAPH TIME DATA
 NNIN 3 MINUTES IN COMPUTATION INTERVAL
 IDATE 1 0 STARTING DATE
 ITIME 0000 STARTING TIME
 NQ 300 NUMBER OF HYDROGRAPH ORDINATES
 NDDATE 1 0 ENDING DATE
 NDTIME 1457 ENDING TIME
 ICENT 19 CENTURY MARK

COMPUTATION INTERVAL .05 HOURS
 TOTAL TIME BASE 14.95 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
 .77 .83 .83 .84 .85 .85 .86 .86

*** FDKRUT WARNING TIME STEP CALCULATION FAILED TO CONVERGE. STABILITY PROBLEMS MAY RESULT

*** FDKRUT WARNING TIME STEP CALCULATION FAILED TO CONVERGE. STABILITY PROBLEMS MAY RESULT

*** FDKRUT WARNING TIME STEP CALCULATION FAILED TO CONVERGE. STABILITY PROBLEMS MAY RESULT

*** FDKRUT WARNING TIME STEP CALCULATION FAILED TO CONVERGE. STABILITY PROBLEMS MAY RESULT

*** FDKRUT WARNING TIME STEP CALCULATION FAILED TO CONVERGE. STABILITY PROBLEMS MAY RESULT

*** FDKRUT WARNING TIME STEP CALCULATION FAILED TO CONVERGE. STABILITY PROBLEMS MAY RESULT

*** FDKRUT WARNING TIME STEP CALCULATION FAILED TO CONVERGE. STABILITY PROBLEMS MAY RESULT

*** FDKRUT WARNING TIME STEP CALCULATION FAILED TO CONVERGE. STABILITY PROBLEMS MAY RESULT

*** FDKRUT WARNING TIME STEP CALCULATION FAILED TO CONVERGE. STABILITY PROBLEMS MAY RESULT

*** FDKRUT WARNING TIME STEP CALCULATION FAILED TO CONVERGE. STABILITY PROBLEMS MAY RESULT

*** FDKRUT WARNING TIME STEP CALCULATION FAILED TO CONVERGE. STABILITY PROBLEMS MAY RESULT

*** FDKRUT WARNING TIME STEP CALCULATION FAILED TO CONVERGE. STABILITY PROBLEMS MAY RESULT

*** FDKRUT WARNING TIME STEP CALCULATION FAILED TO CONVERGE. STABILITY PROBLEMS MAY RESULT

*** FDKRUT WARNING TIME STEP CALCULATION FAILED TO CONVERGE. STABILITY PROBLEMS MAY RESULT

*** FDKRUT - NEWTON RAPHSON FAILEDFIXED POINT ITERATION USED - ITERATION= 1

*** **

383 KK * DBAP *

386 KO OUTPUT CONTROL VARIABLES

IPRNT 3 PRINT CONTROL
IPLOT 0 PLOT CONTROL
QSCAL 0. HYDROGRAPH PLOT SCALE

HYDROGRAPH ROUTING DATA

387 RS STORAGE ROUTING

NSTPS 1 NUMBER OF SUBREACHES
ITYP STOR TYPE OF INITIAL CONDITION
RSVRIC -1.00 INITIAL CONDITION
X .00 WORKING R AND D COEFFICIENT

		.0	10.0	40.0	108.0	240.0	410.0	635.0	890.0	1200.0	1410.0
388 SV	STORAGE	1435.0	1474.0	1513.0	1554.0	1595.0	1637.0	1679.0	1723.0	1767.0	1812.0
390 SE	ELEVATION	2576.00	2580.00	2585.00	2590.00	2595.00	2600.00	2605.00	2610.00	2616.00	2618.00
		2618.50	2619.00	2619.50	2620.00	2620.50	2621.00	2621.50	2622.00	2622.50	2623.00
392 SQ	DISCHARGE	0.	89.	194.	232.	285.	316.	343.	370.	392.	405.
		407.	1852.	4491.	7909.	11955.	16545.	21620.	27137.	33064.	39373.

*** **

HYDROGRAPH AT STATION DBAP
FOR PLAN 1, RATIO = .77

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
(CFS)	(HR)		6-HR	24-HR	72-HR	14.95-HR
401.	9.10	(CFS)	399.	319.	319.	319.
		(INCHES)	.164	.326	.326	.326
		(AC-FT)	198.	394.	394.	394.

PAK STORAGE	TIME		MAXIMUM AVERAGE STORAGE			
(AC-FT)	(HR)		6-HR	24-HR	72-HR	14.95-HR
1348.	9.15		1315.	890.	890.	890.

PEAK STAGE	TIME		MAXIMUM AVERAGE STAGE			
(FEET)	(HR)		6-HR	24-HR	72-HR	14.95-HR

2617.41 9.10 2617.09 2606.54 2606.54 2606.54

CUMULATIVE AREA = 22.64 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION DBAP
FOR PLAN 1, RATIO = .83

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
(CFS)	(HR)		6-HR	24-HR	72-HR	14.95-HR
1085.	8.05	(CFS)	565.	391.	391.	391.
		(INCHES)	.232	.400	.400	.400
		(AC-FT)	280.	483.	483.	483.

PEAK STORAGE	TIME		MAXIMUM AVERAGE STORAGE			
(AC-FT)	(HR)		6-HR	24-HR	72-HR	14.95-HR
1453.	8.05		1421.	971.	971.	971.

PEAK STAGE	TIME		MAXIMUM AVERAGE STAGE			
(FEET)	(HR)		6-HR	24-HR	72-HR	14.95-HR
2618.73	8.05		2618.26	2607.73	2607.73	2607.73

CUMULATIVE AREA = 22.64 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION DBAP
FOR PLAN 1, RATIO = .83

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
(CFS)	(HR)		6-HR	24-HR	72-HR	14.95-HR
1113.	8.00	(CFS)	577.	396.	396.	396.
		(INCHES)	.237	.405	.405	.405
		(AC-FT)	286.	489.	489.	489.

PEAK STORAGE	TIME		MAXIMUM AVERAGE STORAGE			
(AC-FT)	(HR)		6-HR	24-HR	72-HR	14.95-HR
1454.	8.00		1422.	972.	972.	972.

PEAK STAGE	TIME		MAXIMUM AVERAGE STAGE			
(FEET)	(HR)		6-HR	24-HR	72-HR	14.95-HR
2618.74	8.00		2618.28	2607.75	2607.75	2607.75

CUMULATIVE AREA = 22.64 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION DBAP
FOR PLAN 1, RATIO = .84

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
(CFS)	(HR)		6-HR	24-HR	72-HR	14.95-HR
1209.	7.80	(CFS)	621.	414.	414.	414.
		(INCHES)	.255	.424	.424	.424
		(AC-FT)	308.	511.	511.	511.

PEAK STORAGE	TIME	MAXIMUM AVERAGE STORAGE			
(AC-FT)	(HR)	6-HR	24-HR	72-HR	14.95-HR
1457.	7.80	1425.	977.	977.	977.

PEAK STAGE	TIME	MAXIMUM AVERAGE STAGE			
(FEET)	(HR)	6-HR	24-HR	72-HR	14.95-HR
2618.78	7.80	2618.32	2607.84	2607.84	2607.84

CUMULATIVE AREA = 22.64 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION DBAP
FOR PLAN 1, RATIO = .85

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
(CFS)	(HR)	6-HR	24-HR	72-HR	14.95-HR
1310.	7.60	(CFS) 664.	432.	432.	432.
		(INCHES) .273	.442	.442	.442
		(AC-PT) 329.	534.	534.	534.

PEAK STORAGE	TIME	MAXIMUM AVERAGE STORAGE			
(AC-FT)	(HR)	6-HR	24-HR	72-HR	14.95-HR
1459.	7.60	1429.	981.	981.	981.

PEAK STAGE	TIME	MAXIMUM AVERAGE STAGE			
(FEET)	(HR)	6-HR	24-HR	72-HR	14.95-HR
2618.81	7.60	2618.37	2607.92	2607.92	2607.92

CUMULATIVE AREA = 22.64 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION DBAP
FOR PLAN 1, RATIO = .85

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
(CFS)	(HR)	6-HR	24-HR	72-HR	14.95-HR
1408.	7.50	(CFS) 707.	450.	450.	450.
		(INCHES) .290	.460	.460	.460
		(AC-PT) 351.	556.	556.	556.

PEAK STORAGE	TIME	MAXIMUM AVERAGE STORAGE			
(AC-FT)	(HR)	6-HR	24-HR	72-HR	14.95-HR
1462.	7.50	1431.	985.	985.	985.

PEAK STAGE	TIME	MAXIMUM AVERAGE STAGE			
(FEET)	(HR)	6-HR	24-HR	72-HR	14.95-HR
2618.85	7.50	2618.40	2608.00	2608.00	2608.00

CUMULATIVE AREA = 22.64 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION DBAP
FOR PLAN 1, RATIO = .86

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
(CFS)	(HR)		6-HR	24-HR	72-HR	14.95-HR
1433.	7.45	(CFS)	720.	455.	455.	455.
		(INCHES)	.296	.466	.466	.466
		(AC-FT)	357.	562.	562.	562.

PEAK STORAGE	TIME		MAXIMUM AVERAGE STORAGE			
(AC-FT)	(HR)		6-HR	24-HR	72-HR	14.95-HR
1463.	7.45		1432.	986.	986.	986.

PEAK STAGE	TIME		MAXIMUM AVERAGE STAGE			
(FEET)	(HR)		6-HR	24-HR	72-HR	14.95-HR
2618.85	7.45		2618.41	2608.02	2608.02	2608.02

CUMULATIVE AREA = 22.64 SQ MI

*** *** *** *** ***

HYDROGRAPH AT STATION DBAP
FOR PLAN 1, RATIO = .86

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
(CFS)	(HR)		6-HR	24-HR	72-HR	14.95-HR
1491.	7.40	(CFS)	751.	468.	468.	468.
		(INCHES)	.308	.479	.479	.479
		(AC-FT)	372.	578.	578.	578.

PEAK STORAGE	TIME		MAXIMUM AVERAGE STORAGE			
(AC-FT)	(HR)		6-HR	24-HR	72-HR	14.95-HR
1464.	7.40		1434.	989.	989.	989.

PEAK STAGE	TIME		MAXIMUM AVERAGE STAGE			
(FEET)	(HR)		6-HR	24-HR	72-HR	14.95-HR
2618.88	7.40		2618.44	2608.08	2608.08	2608.08

CUMULATIVE AREA = 22.64 SQ MI

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	RATIO 2	RATIO 3	RATIO 4	RATIO 5	RATIO 6	RATIO 7	RATIO 8
				.77	.83	.83	.84	.85	.85	.86	.86
HYDROGRAPH AT	20	2.25	1 FLOW TIME	1455. 3.80	1605. 3.80	1610. 3.80	1629. 3.80	1648. 3.80	1666. 3.80	1672. 3.80	1685. 3.80
ROUTED TO	20-27A	2.25	1 FLOW TIME	1433. 4.00	1580. 4.00	1585. 4.00	1604. 4.00	1622. 4.00	1641. 4.00	1646. 4.00	1659. 4.00
HYDROGRAPH AT	27A	1.00	1 FLOW TIME	747. 3.65	826. 3.65	829. 3.65	839. 3.65	849. 3.65	859. 3.65	862. 3.65	869. 3.65
2 COMBINED AT	N27AA	3.25	1 FLOW TIME	1849. 3.95	2039. 3.95	2046. 3.95	2069. 3.95	2093. 3.95	2117. 3.95	2124. 3.95	2141. 3.95
HYDROGRAPH AT	60	.30	1 FLOW TIME	303. 3.55	333. 3.55	334. 3.55	338. 3.55	342. 3.55	346. 3.55	347. 3.55	350. 3.55
ROUTED TO	60-70	.30	1 FLOW TIME	284. 3.60	312. 3.60	314. 3.60	317. 3.60	321. 3.60	324. 3.60	325. 3.60	328. 3.60
HYDROGRAPH AT	70	.70	1 FLOW TIME	644. 3.60	709. 3.60	711. 3.60	719. 3.60	727. 3.60	735. 3.60	738. 3.60	743. 3.60
2 COMBINED AT	N70	1.00	1 FLOW TIME	928. 3.60	1021. 3.60	1025. 3.60	1036. 3.60	1048. 3.60	1060. 3.60	1063. 3.60	1071. 3.60
ROUTED TO	70-27A	1.00	1 FLOW TIME	902. 3.65	993. 3.65	996. 3.65	1008. 3.65	1019. 3.65	1030. 3.65	1034. 3.65	1042. 3.65
2 COMBINED AT	N27AB	4.25	1 FLOW TIME	2511. 3.70	2775. 3.70	2785. 3.70	2818. 3.70	2851. 3.70	2884. 3.70	2894. 3.70	2918. 3.70
ROUTED TO	DB4	4.25	1 FLOW TIME	1035. 5.35	1077. 5.35	1078. 5.35	1084. 5.35	1089. 5.35	1095. 5.35	1096. 5.35	1100. 5.40
				** PEAK STAGES IN FEET **							
			1 STAGE TIME	15.42 5.35	16.58 5.35	16.62 5.35	16.77 5.35	16.93 5.35	17.08 5.35	17.12 5.35	17.23 5.40
ROUTED TO	27A-24	4.25	1 FLOW TIME	1035. 5.45	1076. 5.50	1078. 5.50	1084. 5.50	1089. 5.50	1095. 5.50	1096. 5.50	1100. 5.50
HYDROGRAPH AT	50	.57	1 FLOW TIME	533. 3.60	587. 3.60	589. 3.60	595. 3.60	602. 3.60	609. 3.60	611. 3.60	615. 3.60
ROUTED TO	50-27C	.57	1 FLOW TIME	494. 3.80	543. 3.80	545. 3.80	551. 3.80	558. 3.80	564. 3.80	565. 3.80	570. 3.80
HYDROGRAPH AT	27C	.96	1 FLOW TIME	747. 3.60	829. 3.60	832. 3.60	842. 3.60	852. 3.60	862. 3.60	865. 3.60	873. 3.60

2 COMBINED AT	N27C	1.53	1	FLOW TIME	1137. 3.65	1259. 3.65	1263. 3.65	1278. 3.65	1294. 3.65	1309. 3.65	1313. 3.65	1324. 3.65
ROUTED TO	27C-28	1.53	1	FLOW TIME	1109. 3.75	1228. 3.75	1232. 3.75	1247. 3.75	1262. 3.75	1277. 3.75	1281. 3.75	1292. 3.75
HYDROGRAPH AT	28A	.31	1	FLOW TIME	228. 3.60	254. 3.60	255. 3.60	259. 3.60	262. 3.60	265. 3.60	266. 3.60	268. 3.60
2 COMBINED AT	N28A	1.84	1	FLOW TIME	1267. 3.75	1403. 3.75	1408. 3.75	1425. 3.75	1443. 3.75	1460. 3.75	1465. 3.75	1477. 3.75
HYDROGRAPH AT	27B	.39	1	FLOW TIME	310. 3.60	344. 3.60	346. 3.60	350. 3.60	354. 3.60	359. 3.60	360. 3.60	363. 3.60
ROUTED TO	27B-27	.39	1	FLOW TIME	298. 3.70	331. 3.70	332. 3.70	336. 3.70	341. 3.70	345. 3.70	346. 3.70	349. 3.70
HYDROGRAPH AT	27D	.31	1	FLOW TIME	231. 3.60	257. 3.60	258. 3.60	261. 3.60	264. 3.60	268. 3.60	268. 3.60	271. 3.60
2 COMBINED AT	N27D	.70	1	FLOW TIME	503. 3.65	560. 3.65	562. 3.65	569. 3.65	576. 3.65	584. 3.65	586. 3.65	591. 3.65
2 COMBINED AT	NDB5	2.54	1	FLOW TIME	1733. 3.70	1924. 3.70	1930. 3.70	1954. 3.70	1978. 3.70	2002. 3.70	2009. 3.70	2026. 3.70
ROUTED TO	DB5	2.54	1	FLOW TIME	500. 5.30	521. 5.30	522. 5.30	525. 5.30	527. 5.30	530. 5.30	531. 5.30	533. 5.30

** PEAK STAGES IN FEET **

			1	STAGE TIME	3556.32 5.30	3557.76 5.30	3557.81 5.30	3558.00 5.30	3558.18 5.30	3558.36 5.30	3558.42 5.30	3558.55 5.30
2 COMBINED AT	N24CB	6.79	1	FLOW TIME	1534. 5.40	1596. 5.40	1598. 5.40	1607. 5.40	1615. 5.40	1623. 5.40	1625. 5.40	1631. 5.40
ROUTED TO	RN24CB	6.79	1	FLOW TIME	1534. 5.40	1596. 5.40	1598. 5.40	1606. 5.40	1615. 5.40	1623. 5.40	1625. 5.40	1631. 5.45
HYDROGRAPH AT	24C	.35	1	FLOW TIME	230. 3.60	258. 3.60	259. 3.60	262. 3.60	266. 3.60	269. 3.60	270. 3.60	273. 3.60
2 COMBINED AT	N24CA	7.14	1	FLOW TIME	1618. 4.95	1692. 4.95	1695. 4.95	1703. 4.95	1712. 4.95	1721. 4.95	1723. 4.95	1730. 4.95
HYDROGRAPH AT	25A	.41	1	FLOW TIME	303. 3.60	337. 3.60	338. 3.60	343. 3.60	347. 3.60	351. 3.60	353. 3.60	356. 3.60
ROUTED TO	25A-24	.41	1	FLOW TIME	293. 3.70	326. 3.70	327. 3.70	331. 3.70	336. 3.70	340. 3.70	341. 3.70	344. 3.70
HYDROGRAPH AT	24A	.34	1	FLOW TIME	271. 3.60	300. 3.60	301. 3.60	305. 3.60	309. 3.60	313. 3.60	314. 3.60	316. 3.60
2 COMBINED AT	N24A	.75	1	FLOW TIME	523. 3.65	582. 3.65	584. 3.65	592. 3.65	599. 3.65	606. 3.65	609. 3.65	614. 3.65
ROUTED TO	24A-24	.75	1	FLOW TIME	521. 3.65	580. 3.65	582. 3.65	590. 3.65	597. 3.65	604. 3.65	607. 3.65	612. 3.65

HYDROGRAPH AT	25B	.32	1	FLOW TIME	211. 3.65	236. 3.65	237. 3.65	240. 3.65	243. 3.65	246. 3.65	247. 3.65	249. 3.65
ROUTED TO	25B-24	.32	1	FLOW TIME	204. 3.75	228. 3.75	229. 3.75	232. 3.75	235. 3.75	238. 3.75	239. 3.75	241. 3.75
HYDROGRAPH AT	24B	.48	1	FLOW TIME	340. 3.60	377. 3.60	379. 3.60	384. 3.60	388. 3.60	393. 3.60	394. 3.60	398. 3.60
2 COMBINED AT	N24B	.79	1	FLOW TIME	519. 3.65	578. 3.65	580. 3.65	588. 3.65	595. 3.65	603. 3.65	605. 3.65	610. 3.65
3 COMBINED AT	N24CC	8.69	1	FLOW TIME	2186. 4.95	2369. 3.70	2377. 3.70	2406. 3.70	2434. 3.70	2462. 3.70	2470. 3.70	2491. 3.70
ROUTED TO	24C-23	8.69	1	FLOW TIME	2182. 4.95	2361. 3.70	2369. 3.70	2398. 3.70	2426. 3.70	2454. 3.70	2462. 3.70	2483. 3.70
HYDROGRAPH AT	23A	.30	1	FLOW TIME	164. 3.60	186. 3.60	187. 3.60	189. 3.60	192. 3.60	195. 3.60	196. 3.60	198. 3.60
2 COMBINED AT	N23A	8.99	1	FLOW TIME	2282. 3.70	2529. 3.70	2538. 3.70	2569. 3.70	2600. 3.70	2631. 3.70	2640. 3.70	2662. 3.70
ROUTED TO	23A-20	8.99	1	FLOW TIME	2268. 4.95	2515. 3.70	2524. 3.70	2555. 3.70	2586. 3.70	2617. 3.70	2626. 3.70	2648. 3.70
HYDROGRAPH AT	20A	.75	1	FLOW TIME	416. 3.65	468. 3.65	470. 3.65	477. 3.65	484. 3.65	490. 3.65	492. 3.65	497. 3.65
2 COMBINED AT	N20AA	9.74	1	FLOW TIME	2659. 3.70	2957. 3.70	2968. 3.70	3005. 3.70	3042. 3.70	3079. 3.70	3090. 3.70	3116. 3.70
HYDROGRAPH AT	21C	.27	1	FLOW TIME	216. 3.60	238. 3.60	239. 3.60	242. 3.60	245. 3.60	247. 3.60	248. 3.60	250. 3.60
ROUTED TO	21C-21	.27	1	FLOW TIME	213. 3.60	235. 3.60	236. 3.60	239. 3.60	242. 3.60	245. 3.60	245. 3.60	247. 3.60
HYDROGRAPH AT	21D	.15	1	FLOW TIME	118. 3.55	130. 3.55	131. 3.55	132. 3.55	134. 3.55	136. 3.55	136. 3.55	137. 3.55
2 COMBINED AT	N21DA	.42	1	FLOW TIME	330. 3.60	364. 3.60	365. 3.60	370. 3.60	374. 3.60	379. 3.60	380. 3.60	383. 3.60
HYDROGRAPH AT	21A	.27	1	FLOW TIME	212. 3.60	235. 3.60	235. 3.60	238. 3.60	241. 3.60	244. 3.60	245. 3.60	247. 3.60
ROUTED TO	21A-21	.27	1	FLOW TIME	210. 3.60	232. 3.60	232. 3.60	235. 3.60	238. 3.60	241. 3.60	242. 3.60	244. 3.60
HYDROGRAPH AT	21B	.24	1	FLOW TIME	189. 3.60	208. 3.60	209. 3.60	211. 3.60	214. 3.60	216. 3.60	217. 3.60	219. 3.60
2 COMBINED AT	N21B	.51	1	FLOW TIME	398. 3.60	440. 3.60	441. 3.60	447. 3.60	452. 3.60	457. 3.60	459. 3.60	462. 3.60
ROUTED TO	21B-21	.51	1	FLOW TIME	393. 3.60	435. 3.60	437. 3.60	442. 3.60	447. 3.60	453. 3.60	454. 3.60	458. 3.60

2 COMBINED AT	N21DB	.93	1	FLOW TIME	723. 3.60	799. 3.60	802. 3.60	812. 3.60	821. 3.60	831. 3.60	834. 3.60	841. 3.60
ROUTED TO	21D-20	.93	1	FLOW TIME	706. 3.65	779. 3.65	782. 3.65	791. 3.65	800. 3.65	809. 3.65	812. 3.65	818. 3.65
2 COMBINED AT	N20AB	10.67	1	FLOW TIME	3310. 3.65	3688. 3.65	3702. 3.65	3749. 3.65	3795. 3.65	3842. 3.65	3856. 3.65	3889. 3.65
ROUTED TO	20A-11	10.67	1	FLOW TIME	3306. 3.70	3672. 3.70	3685. 3.70	3730. 3.70	3776. 3.70	3821. 3.70	3835. 3.70	3867. 3.70
HYDROGRAPH AT	11A	.80	1	FLOW TIME	441. 3.70	492. 3.70	494. 3.70	500. 3.70	507. 3.70	513. 3.70	515. 3.70	520. 3.70
2 COMBINED AT	N11A	11.47	1	FLOW TIME	3747. 3.70	4164. 3.70	4179. 3.70	4231. 3.70	4283. 3.70	4335. 3.70	4350. 3.70	4387. 3.70
ROUTED TO	11A-3A	11.47	1	FLOW TIME	3686. 3.80	4095. 3.80	4110. 3.80	4161. 3.80	4211. 3.80	4262. 3.80	4277. 3.80	4313. 3.80
HYDROGRAPH AT	3A	.33	1	FLOW TIME	211. 3.60	235. 3.60	236. 3.60	239. 3.60	242. 3.60	245. 3.60	246. 3.60	248. 3.60
2 COMBINED AT	N3A	11.80	1	FLOW TIME	3817. 3.80	4254. 3.75	4270. 3.75	4325. 3.75	4379. 3.75	4434. 3.75	4450. 3.75	4489. 3.75
ROUTED TO	3A-3B	11.80	1	FLOW TIME	3703. 4.05	4123. 4.05	4137. 4.05	4190. 4.05	4241. 4.05	4293. 4.05	4308. 4.05	4345. 4.05
HYDROGRAPH AT	11B	.77	1	FLOW TIME	499. 3.65	552. 3.65	554. 3.65	561. 3.65	568. 3.65	574. 3.65	576. 3.65	581. 3.65
ROUTED TO	11B-8B	.77	1	FLOW TIME	493. 3.70	547. 3.70	550. 3.70	558. 3.70	563. 3.70	572. 3.70	574. 3.70	577. 3.70
HYDROGRAPH AT	8A	.24	1	FLOW TIME	185. 3.55	204. 3.55	205. 3.55	207. 3.55	210. 3.55	212. 3.55	213. 3.55	215. 3.55
ROUTED TO	8A-8B	.24	1	FLOW TIME	183. 3.60	203. 3.60	203. 3.60	207. 3.60	208. 3.60	210. 3.60	212. 3.60	214. 3.60
HYDROGRAPH AT	8B	.65	1	FLOW TIME	408. 3.70	450. 3.70	451. 3.70	456. 3.70	461. 3.70	467. 3.70	468. 3.70	472. 3.70
3 COMBINED AT	N8B	1.66	1	FLOW TIME	1056. 3.70	1167. 3.65	1172. 3.65	1186. 3.70	1200. 3.65	1215. 3.70	1217. 3.70	1226. 3.70
ROUTED TO	8B-3B	1.66	1	FLOW TIME	1054. 3.70	1166. 3.70	1168. 3.70	1185. 3.70	1197. 3.70	1214. 3.70	1217. 3.70	1223. 3.70
HYDROGRAPH AT	3B	.78	1	FLOW TIME	382. 3.75	426. 3.75	427. 3.75	433. 3.75	438. 3.75	444. 3.75	445. 3.75	449. 3.75
3 COMBINED AT	N3B	14.24	1	FLOW TIME	4623. 4.00	5150. 4.00	5169. 4.00	5235. 4.00	5301. 4.00	5366. 4.00	5384. 4.00	5431. 4.00
ROUTED TO	BOX	14.24	1	FLOW TIME	4393. 4.15	4865. 4.15	4882. 4.15	4943. 4.15	5003. 4.15	5062. 4.15	5079. 4.15	5122. 4.15

** PEAK STAGES IN FEET **

			1	STAGE	21.10	22.16	22.20	22.33	22.47	22.60	22.64	22.73
				TIME	4.15	4.15	4.15	4.15	4.15	4.15	4.15	4.15
ROUTED TO	3B-60A	14.24	1	FLOW	4356.	4831.	4848.	4909.	4969.	5029.	5046.	5089.
				TIME	4.20	4.20	4.20	4.20	4.20	4.20	4.20	4.20
HYDROGRAPH AT	60A	.36	1	FLOW	195.	219.	219.	222.	225.	228.	229.	231.
				TIME	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60
2 COMBINED AT	APN	14.60	1	FLOW	4409.	4890.	4907.	4969.	5029.	5090.	5108.	5151.
				TIME	4.20	4.20	4.20	4.20	4.20	4.20	4.20	4.20
HYDROGRAPH AT	23B	.97	1	FLOW	453.	512.	514.	521.	529.	536.	538.	544.
				TIME	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75
ROUTED TO	23B-20	.97	1	FLOW	451.	510.	512.	520.	527.	535.	537.	542.
				TIME	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75
HYDROGRAPH AT	20B	.52	1	FLOW	319.	358.	359.	364.	369.	374.	375.	379.
				TIME	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60
2 COMBINED AT	N20B	1.49	1	FLOW	724.	817.	820.	832.	844.	855.	859.	867.
				TIME	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70
ROUTED TO	20B-12	1.49	1	FLOW	707.	798.	801.	813.	824.	835.	839.	847.
				TIME	3.85	3.85	3.85	3.85	3.85	3.80	3.80	3.80
HYDROGRAPH AT	12A	.40	1	FLOW	293.	322.	323.	327.	331.	334.	335.	338.
				TIME	3.65	3.65	3.65	3.65	3.65	3.65	3.65	3.65
2 COMBINED AT	N12A	1.89	1	FLOW	917.	1031.	1035.	1049.	1063.	1077.	1082.	1092.
				TIME	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75
ROUTED TO	12A-12	1.89	1	FLOW	910.	1022.	1027.	1041.	1055.	1069.	1073.	1083.
				TIME	3.85	3.85	3.85	3.85	3.85	3.85	3.85	3.85
HYDROGRAPH AT	12B	.27	1	FLOW	216.	237.	237.	240.	243.	245.	246.	248.
				TIME	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60
2 COMBINED AT	N12B	2.16	1	FLOW	1006.	1126.	1131.	1146.	1161.	1176.	1181.	1192.
				TIME	3.85	3.85	3.85	3.85	3.85	3.85	3.85	3.85
ROUTED TO	12B-57	2.16	1	FLOW	1002.	1122.	1127.	1142.	1157.	1173.	1178.	1189.
				TIME	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90
HYDROGRAPH AT	19A	.46	1	FLOW	300.	333.	334.	338.	342.	346.	348.	351.
				TIME	3.65	3.65	3.65	3.65	3.65	3.65	3.65	3.65
ROUTED TO	19A-13	.46	1	FLOW	297.	330.	331.	336.	340.	344.	344.	347.
				TIME	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70
HYDROGRAPH AT	13B	.57	1	FLOW	379.	417.	418.	423.	427.	432.	434.	437.
				TIME	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70
2 COMBINED AT	N13B	1.03	1	FLOW	676.	747.	749.	759.	767.	776.	778.	784.
				TIME	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70
ROUTED TO	13B-57	1.03	1	FLOW	656.	725.	727.	737.	745.	754.	756.	762.

				TIME	3.85	3.85	3.85	3.85	3.85	3.85	3.85	3.85
HYDROGRAPH AT	57A	.44	1	FLOW	247.	274.	275.	279.	282.	286.	287.	289.
				TIME	3.65	3.65	3.65	3.65	3.65	3.65	3.65	3.65
2 COMBINED AT	N57A	1.47	1	FLOW	850.	941.	944.	956.	967.	978.	981.	989.
				TIME	3.85	3.85	3.85	3.85	3.85	3.85	3.85	3.85
ROUTED TO	57A-57	1.47	1	FLOW	848.	939.	942.	955.	965.	977.	981.	989.
				TIME	3.85	3.85	3.85	3.85	3.85	3.85	3.85	3.85
HYDROGRAPH AT	57B	1.37	1	FLOW	536.	600.	603.	611.	619.	627.	630.	636.
				TIME	3.90	3.85	3.85	3.85	3.85	3.85	3.85	3.85
3 COMBINED AT	N57B	4.99	1	FLOW	2382.	2655.	2665.	2702.	2736.	2770.	2780.	2804.
				TIME	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90
HYDROGRAPH AT	13A	.61	1	FLOW	402.	443.	444.	449.	454.	459.	461.	464.
				TIME	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70
ROUTED TO	13A-38	.61	1	FLOW	400.	438.	438.	447.	451.	456.	457.	459.
				TIME	3.80	3.75	3.75	3.75	3.75	3.75	3.75	3.75
HYDROGRAPH AT	38A	1.11	1	FLOW	448.	498.	500.	507.	513.	519.	521.	526.
				TIME	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90
2 COMBINED AT	N38A	1.72	1	FLOW	826.	913.	916.	931.	941.	951.	954.	961.
				TIME	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80
ROUTED TO	38A-38	1.72	1	FLOW	826.	912.	915.	929.	940.	949.	952.	959.
				TIME	3.85	3.85	3.85	3.85	3.85	3.85	3.85	3.85
HYDROGRAPH AT	38B	.53	1	FLOW	280.	311.	313.	316.	320.	324.	325.	328.
				TIME	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70
2 COMBINED AT	N38B	2.24	1	FLOW	1062.	1177.	1180.	1199.	1212.	1226.	1230.	1239.
				TIME	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80
HYDROGRAPH AT	3C	.16	1	FLOW	93.	104.	104.	105.	107.	108.	108.	109.
				TIME	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60
HYDROGRAPH AT	AP	.65	1	FLOW	326.	371.	372.	378.	384.	389.	391.	395.
				TIME	3.55	3.55	3.55	3.55	3.55	3.55	3.55	3.55
5 COMBINED AT	NAP	22.64	1	FLOW	7164.	8010.	8038.	8142.	8243.	8346.	8376.	8450.
				TIME	4.05	4.05	4.05	4.05	4.05	4.05	4.05	4.05
ROUTED TO	DBAP	22.64	1	FLOW	401.	1085.	1113.	1209.	1310.	1408.	1433.	1491.
				TIME	9.10	8.05	8.00	7.80	7.60	7.50	7.45	7.40

** PEAK STAGES IN FEET **

1	STAGE	2617.41	2618.73	2618.74	2618.78	2618.81	2618.85	2618.85	2618.88
	TIME	9.10	8.05	8.00	7.80	7.60	7.50	7.45	7.40

```

*****
*
* FLOOD HYDROGRAPH PACKAGE (HEC-1)
*   SEPTEMBER 1990
*   VERSION 4.0
*
* RUN DATE 01/26/1995 TIME 13:34:05
*
*****

```

```

*****
*
* 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   X
XXXXXX XXXX X   XXXX X
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 -AMSK- 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

HEC-1 INPUT

PAGE 1

LINE	ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10
	*DIAGRAM
1	ID SUMMERLIN
2	ID 100-YR 6-HR STORM
3	ID TOWN CENTER DRIVE PHASE 2 ROUGH GRADING
4	ID EXISTING CONDITIONS HYDROLOGY
5	ID THIS IS A MODIFIED VERSION OF THE TOWN WIDE ARTERIAL
6	ID DIVERSION CHANNEL PHASE 2B MODEL
7	ID
8	ID FILE: TCD2EX.H1
9	ID SDN: 3
10	ID
11	ID *****
12	ID
13	ID
14	IT 5 0 0 300
15	IO 5
16	JR PREC 0.9276
17	KK 5A
18	BA .63
19	PB 3.43
20	PC 0 .02 .057 .07 .087 .108 .124 .13 .13 .13

```

62      KK  NODEC12      COMBINE FLOWS AT NODE C12
63      HC      3
64      ZZ

```

SCHEMATIC DIAGRAM OF STREAM NETWORK

INPUT
LINE (V) ROUTING (--->) DIVERSION OR PUMP FLOW
NO. (.) CONNECTOR (<---) RETURN OF DIVERTED OR PUMPED FLOW

```

17      5A
      V
      V
30      5A-12A
      .
      .
32      .      12A
      .      .
      .      .
37      NODE12.....
      V
      V
39      12A-23
      .
      .
41      .      23A
      .      .
      .      .
46      NODE23.....
      V
      V
48      23A-C1
      .
      .
50      .      24A
      .      V
      .      V
55      .      24A-C1
      .      .
      .      .
57      .      .      C12
      .      .      .
      .      .      .
62      NODEC1.....
  
```

(***) RUNOFF ALSO COMPUTED AT THIS LOCATION

```

*****
* FLOOD HYDROGRAPH PACKAGE (HEC-1) *
* SEPTEMBER 1990 *
* VERSION 4.0 *
* RUN DATE 01/26/1995 TIME 13:34:05 *
*****
  
```

```

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

SUMMERLIN
100-YR 6-HR STORM
TOWN CENTER DRIVE PHASE 2 ROUGH GRADING
EXISTING CONDITIONS HYDROLOGY

THIS IS A MODIFIED VERSION OF THE TOWN WIDE ARTERIAL
DIVERSION CHANNEL PHASE 2B MODEL

FILE: TCD2EX.H1
SDN: 3

15 IO

OUTPUT CONTROL VARIABLES

IPRNT 5 PRINT CONTROL
IPLOT 0 PLOT CONTROL
QSCAL 0. HYDROGRAPH PLOT SCALE

IT

HYDROGRAPH TIME DATA

NMIN 5 MINUTES IN COMPUTATION INTERVAL
IDATE 1 0 STARTING DATE
ITIME 0000 STARTING TIME
NQ 300 NUMBER OF HYDROGRAPH ORDINATES
NDDATE 2 0 ENDING DATE
NDTIME 0055 ENDING TIME
ICENT 19 CENTURY MARK

COMPUTATION INTERVAL .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

JP

MULTI-PLAN OPTION

NPLAN 1 NUMBER OF PLANS

JR

MULTI-RATIO OPTION

RATIOS OF PRECIPITATION
.93

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

RATIOS APPLIED TO PRECIPITATION

OPERATION

STATION

AREA

PLAN

RATIO 1
.93

HYDROGRAPH AT

5A

.63

1

FLOW
TIME

872.
3.67

ROUTED TO

5A-12A

.63

1

FLOW
TIME

696.
4.42

HYDROGRAPH AT	12A	1.09	1	FLOW TIME	966. 4.00
---------------	-----	------	---	--------------	--------------

2 COMBINED AT	NODE12	1.72	1	FLOW TIME	1452. 4.25
---------------	--------	------	---	--------------	---------------

ROUTED TO	12A-23	1.72	1	FLOW TIME	1310. 5.00
-----------	--------	------	---	--------------	---------------

HYDROGRAPH AT	23A	.91	1	FLOW TIME	578. 4.08
---------------	-----	-----	---	--------------	--------------

2 COMBINED AT	NODE23	2.63	1	FLOW TIME	1558. 5.00
---------------	--------	------	---	--------------	---------------

ROUTED TO	23A-C1	2.63	1	FLOW TIME	1532. 5.33
-----------	--------	------	---	--------------	---------------

HYDROGRAPH AT	24A	.37	1	FLOW TIME	269. 3.92
---------------	-----	-----	---	--------------	--------------

ROUTED TO	24A-C1	.37	1	FLOW TIME	255. 4.25
-----------	--------	-----	---	--------------	--------------

HYDROGRAPH AT	C12	.76	1	FLOW TIME	747. 3.75
---------------	-----	-----	---	--------------	--------------

3 COMBINED AT	NODEC1	3.76	1	FLOW TIME	1738. 5.25
---------------	--------	------	---	--------------	---------------

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

```

*****
*
* FLOOD HYDROGRAPH PACKAGE (HEC-1)
* SEPTEMBER 1990
* VERSION 4.0
*
* RUN DATE 01/26/1995 TIME 13:24:14
*
*****

```

```

*****
*
* 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   X
XXXXXX XXXX   X   XXXX X
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 -AMSK- 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

HEC-1 INPUT

PAGE 1

```

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

      *DIAGRAM
1      ID      SUMMERLIN DETENTION BASIN NO. 5
2      ID      EXISTING/INTERIM CONDITIONS FOR ANGEL PARK DRAINAGE
3      ID      EXTRACTED FROM:
4      ID      100-YR 6-HR STORM
5      ID      TOWN WIDE ARTERIAL INTERIM DIVERSION CHANNEL - PHASE 2B
6      ID      SUMMERLIN PKWY. TO ALTA DRIVE - EXISTING CONDITIONS MODEL
7      ID      BASIN 3A DIVERSION TO VILLAGE 26 INTERIM DETENTION BASIN
8      ID      NO DETENTION IN THE OUTER PKWY
9      ID      ANGEL PARK DETENTION BASIN 1156 AC-FT
10     ID
11     ID      (DRAINAGE BASINS IN THE VICINITY OF DETENTION BASIN NO. 5 WERE
12     ID      MODIFIED TO REFLECT THE DETENTION BASIN SITE LOCATION)
13     ID
14     ID      FILE:   TCD2INT.H1
15     ID      SDN:    3
16     ID
17     ID      *****
18     ID
19     ID
20     IT      5      0      0      300
21     IO      5

```

22	JR	PREC	.9084									
23	KK	5A										
24	BA	.63										
25	PB	3.65										
26	PC	0	.02	.057	.07	.087	.108	.124	.13	.13	.13	
27	PC	.13	.13	.13	.133	.14	.142	.148	.158	.172	.181	
28	PC	.19	.197	.199	.20	.201	.204	.214	.229	.241	.249	
29	PC	.251	.256	.27	.278	.281	.283	.295	.322	.352	.409	
30	PC	.499	.59	.71	.744	.781	.812	.819	.835	.851	.856	
31	PC	.86	.868	.876	.888	.91	.926	.937	.95	.97	.976	
32	PC	.982	.985	.987	.989	.99	.993	.993	.994	.995	.998	
33	PC	.998	.999	1.00								
34	LS	0	89									
35	UD	.26										

36	KK	5A-12A	ROUTE FLOW THRU BASIN 12A									
37	RH	8	.68	.23								

38	KK	12A	SUB-BASIN 12A HYDROGRAPH									
39	BA	1.10										
40	PB	3.58										
41	LS	0	86									
42	UD	.57										

43	KK	13A	SUB-BASIN 13A HYDROGRAPH									
44	BA	.61										
45	PB	3.5										
46	LS	0	86									
47	UD	.47										

HEC-1 INPUT

PAGE 2

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

48	KK	11A	SUB-BASIN 11A HYDROGRAPH									
49	BA	.33										
50	PB	3.43										
51	LS	0	86									
52	UD	.37										

53	KK	NODE12A	TOTAL FLOW AT DB5									
54	HC	4										

55	KK	DB5										
56	KH											
57	RS	1	STOR	-1								
58	SV	0	15	25	47	92	146	170				
59	SQ	0	56	145	338	481	544	574				
60	SE	3542	3545	3547	3550	3555	3560	3561.5				

61	KK	12A-23A	ROUTE FLOW THRU BASIN 23A									
62	RH	9	.77	.15								

63	KK	23A	SUB-BASIN 23A HYDROGRAPH									
64	BA	.90										
65	PB	3.29										
66	LS	0	82									
67	UD	.592										

68	KK	NODE23A	COMBINE FLOWS AT NODE 23A	
69	HC	2		
70	KK	23A-C12	ROUTE FLOW THRU BASIN C12	
71	RH	5	.38	.30
72	KK	24A	SUB-BASIN 24A HYDROGRAPH	
73	BA	.37		
74	PB	3.29		
75	LS	0	81	
76	UD	.432		
77	KK	24A-C12	ROUTE FLOW THRU BASIN C12	
78	RH	5	.38	.30
79	KK	C12A	SUB-BASIN C12A HYDROGRAPH	
80	BA	.39		
81	PB	3.15		
82	LS	0	92	
83	UD	.333		
84	KK	C12		
85	HC	3		
86	ZZ			

1

SCHEMATIC DIAGRAM OF STREAM NETWORK

INPUT LINE	(V) ROUTING	(--->) DIVERSION OR PUMP FLOW
NO.	(.) CONNECTOR	(<---) RETURN OF DIVERTED OR PUMPED FLOW
23	5A	
	V	
	V	
36	5A-12A	
	.	
38	.	12A
	.	.
43	.	13A
	.	.
48	.	11A
	.	.
53	NODE12.....	
	V	
	V	
55	DB5	
	V	
61	12A-23	
	.	
63	.	23A
	.	.
68	NODE23.....	
	V	

```

      V
70    23A-C1
      .
      .
72    .      24A
      .      V
      .      V
77    .      24A-C1
      .
      .
79    .      .      C12A
      .      .
      .      .
84    C12.....

```

(***) RUNOFF ALSO COMPUTED AT THIS LOCATION

```

*****
*
* FLOOD HYDROGRAPH PACKAGE (HEC-1)
* SEPTEMBER 1990
* VERSION 4.0
*
* RUN DATE 01/26/1995 TIME 13:24:14
*
*****

```

```

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

```

SUMMERLIN DETENTION BASIN NO. 5
 EXISTING/INTERIM CONDITIONS FOR ANGEL PARK DRAINAGE
 EXTRACTED FROM:
 100-YR 6-HR STORM
 TOWN WIDE ARTERIAL INTERIM DIVERSION CHANNEL - PHASE 2B
 SUMMERLIN PKWY. TO ALTA DRIVE - EXISTING CONDITIONS MODEL
 BASIN 3A DIVERSION TO VILLAGE 26 INTERIM DETENTION BASIN
 NO DETENTION IN THE OUTER PKWY
 ANGEL PARK DETENTION BASIN 1156 AC-FT

(DRAINAGE BASINS IN THE VICINITY OF DETENTION BASIN NO. 5 WERE
 MODIFIED TO REFLECT THE DETENTION BASIN SITE LOCATION)

FILE: TCD2INT.H1
 SDN: 3

```

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

```

```

IT       HYDROGRAPH TIME DATA
          NMIN      5 MINUTES IN COMPUTATION INTERVAL
          IDATE     1 0 STARTING DATE
          ITIME     0000 STARTING TIME
          NQ        300 NUMBER OF HYDROGRAPH ORDINATES

```

NDDATE 2 0 ENDING DATE
 NDTIME 0055 ENDING TIME
 ICENT 19 CENTURY MARK

COMPUTATION INTERVAL .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

JP MULTI-PLAN OPTION
 NPLAN 1 NUMBER OF PLANS

JR MULTI-RATIO OPTION
 RATIOS OF PRECIPITATION
 .91

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	
				.91	
HYDROGRAPH AT					
+	5A	.63	1 FLOW	921.	
			TIME	3.67	
ROUTED TO					
+	5A-12A	.63	1 FLOW	735.	
			TIME	4.42	
HYDROGRAPH AT					
+	12A	1.10	1 FLOW	935.	
			TIME	4.00	
HYDROGRAPH AT					
+	13A	.61	1 FLOW	562.	
			TIME	3.92	
HYDROGRAPH AT					
+	11A	.33	1 FLOW	335.	
			TIME	3.83	
4 COMBINED AT					
	NODE12	2.67	1 FLOW	2110.	
			TIME	4.08	
ROUTED TO					
+	DB5	2.67	1 FLOW	569.	
			TIME	5.50	

** PEAK STAGES IN FEET **

1 STAGE 3561.25
TIME 5.50

ROUTED TO

12A-23

2.67

1

FLOW
TIME

567.
6.25

HYDROGRAPH AT

+

23A

.90

1

FLOW
TIME

552.
4.08

2 COMBINED AT

+

NODE23

3.57

1

FLOW
TIME

738.
5.25

ROUTED TO

23A-C1

3.57

1

FLOW
TIME

733.
5.58

HYDROGRAPH AT

24A

.37

1

FLOW
TIME

260.
3.92

ROUTED TO

24A-C1

.37

1

FLOW
TIME

246.
4.25

HYDROGRAPH AT

+

C12A

.39

1

FLOW
TIME

467.
3.75

3 COMBINED AT

+

C12

4.33

1

FLOW
TIME

967.
4.33

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


```

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

*DIAGRAM
1      ID    DRAINAGE TOWARD ANGEL PARK - FUTURE DEVELOPED CONDITIONS
2      ID    100-YR, 6-HR STORM, SDN 3
3      ID    HEC1 MODEL REVISED FROM BOYLE MASTER PLAN 1992 8/26/94
4      ID    DETENTION BASIN NO. 4 AND DETENTION BASIN NO. 5 INCLUDED
5      ID
6      ID      FILE:  SUM_SDN3.DAT
7      ID
8      ID              AREA(SQ.MI.)          DARF
9      ID
10     ID  RATIO1              0.00          1.00
11     ID  RATIO2              0.50           .98
12     ID  RATIO3              1.00           .97
13     ID  RATIO4              1.50           .95
14     ID  RATIO5              2.00           .93
15     ID  RATIO6      DB5      2.54          .925
16     ID  RATIO7      DB4      4.25           .91
17     ID  RATIO8              6.00           .90
18     ID  RATIO9              9.00           .87
19     ID  *****
20     IT    3      0      0      300
21     IO    5      0      0
22     IN    5
23     JR    PREC    1.00    .98    .97    .95    .93    .925    .91    .90    .87

24     KK    20
25     BA    2.253
26     PB    3.72
27     PC    0.000 .0200 .0570 .0700 .0870 .1080 .1240 .1300 .1300 .1300
28     PC    .1300 .1300 .1300 .1330 .1400 .1420 .1480 .1580 .1720 .1810
29     PC    .1900 .1970 .1990 .2000 .2010 .2040 .2140 .2290 .2410 .2490
30     PC    .2510 .2560 .2700 .2780 .2810 .2830 .2950 .3220 .3520 .4090
31     PC    .4990 .5900 .7100 .7440 .7810 .8120 .8190 .8350 .8510 .8560
32     PC    .8600 .8680 .8760 .8880 .9100 .9260 .9370 .9500 .9700 .9760
33     PC    .9820 .9850 .9870 .9890 .9900 .9930 .9930 .9940 .9950 .9980
34     PC    .9980 .9990 1.000
35     LS    0      88
36     UD    .45

37     KK    20-27A
38     RM    4      .19    .3

39     KK    27A
40     BA    1.000
41     PB    3.58
42     LS    0      87
43     UD    .27

44     KK    N27AA
45     EC    2

```

46	KK	60					
47	BA	.297					
48	PB	3.65					
49	LS	0	88				
50	UD	.14					
51	KK	60-70					
52	RM	1	.08	.3			
53	KK	70					
54	BA	.700					
55	PB	3.65					
56	LS	0	88				
57	UD	.19					
58	KK	N70					
59	HC	2					
60	KK	70-27A					
61	RM	1	.06	.3			
62	KK	N27AB					
63	HC	2					
64	KK	DB4					
65	RS	1	STOR	-1			
66	SV	0	20	75	150	252	400
67	SQ	0	240	740	1020	1200	20000
68	SB	0	5	10	15	20	25
69	KK	27A-24C					
70	RM	2	.12	.3			
71	KK	50					
72	BA	.571					
73	PB	3.65					
74	LS	0	88				
75	UD	.18					
76	KK	50-27C					
77	RM	4	.20	.3			
78	KK	27C					
79	BA	.960					
80	PB	3.58					
81	LS	0	86				
82	UD	.22					
83	KK	N27C					
84	HC	2					

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

[illegible]

[illegible]

[illegible]

[illegible]

PAGE 7

[illegible]

[illegible]

[illegible]

PAGE 10

[illegible]

SCHEMATIC DIAGRAM OF STREAM NETWORK

INPUT

(V) ROUTING

(--->) DIVERSION OR PUMP FLOW

NO.

(.) CONNECTOR

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

24	20	
	V	
	V	
37	20-27A	
	.	
39	.	27A
	.	
	.	
44	N27AA.....	
	.	
46	.	60
	V	
	V	
51	.	60-70
	.	
53	.	70
	.	
	.	
	N70.....	
	V	
	V	
60	.	70-27A
	.	
	.	
62	N27AB.....	
	V	
	V	
64	DB4	
	V	
	V	
69	27A-24	
	.	
71	.	50
	V	
	V	
76	.	50-27C
	.	
78	.	27C
	.	
	.	
83	.	N27C.....
	V	
	V	
85	.	27C-28
	.	
	.	
87	.	28A
	.	

92	.	N28A.....	.
	.	.	.
94	.	.	27B
	.	.	V
	.	.	V
99	.	.	27B-27
	.	.	.
101	.	.	27D
	.	.	.
106	.	.	N27D.....
	.	.	.
108	.	.	NDB5.....
	.	.	V
	.	.	V
111	.	.	DB5
	.	.	.
117	.	.	N24CB.....
	.	.	V
	.	.	V
119	.	.	RN24CB
	.	.	.
	.	.	24C
	.	.	.
126	.	.	N24CA.....
	.	.	.
128	.	.	25A
	.	.	V
	.	.	V
133	.	.	25A-24
	.	.	.
135	.	.	24A
	.	.	.
140	.	.	N24A.....
	.	.	V
	.	.	V
142	.	.	24A-24
	.	.	.
144	.	.	25B
	.	.	V
	.	.	V
149	.	.	25B-24
	.	.	.
151	.	.	24B
	.	.	.
156	.	.	N24B.....
	.	.	.

158	N24CC.....		
	V		
	V		
160	24C-23		
	.		
162	.	23A	
	.		
167	N23A.....		
	V		
	V		
169	23A-20		
	.		
171	.	20A	
	.		
176	N20AA.....		
	.		
178	.	21C	
	.	V	
	.	V	
183	.	21C-21	
	.		
	.		
	.	21D	
	.		
190	N21DA.....		
	.		
192	.	21A	
	.	V	
	.	V	
197	.	21A-21	
	.		
199	.		21B
	.		
204	.	N21B.....	
	.	V	
	.	V	
206	.	21B-21	
	.		
208	N21DB.....		
	V		
	V		
210	.	21D-20	
	.		
212	N20AB.....		
	V		
	V		
214	20A-11		

216	.	11A		
	.	.		
221	N11A.....			
	V			
	V			
223	11A-3A			
	.			
225	.	3A		
	.	.		
230	N3A.....			
	V			
	V			
232	3A-3B			
	.			
234	.	11B		
	.	V		
	.	V		
239	.	11B-8B		
	.	.		
241	.	.	8A	
	.	.	V	
	.	.	V	
	.	.	8A-8B	
	.	.	.	
248	.	.	.	8B
	.	.	.	.
253	.	N8B.....		
	.	V		
	.	V		
255	.	8B-3B		
	.	.		
257	.	.	3B	
	.	.	.	
262	.	.	.	
	N3B.....			
	V			
	V			
264	BOX			
	V			
	V			
272	3B-60A			
	.			
274	.	60A		
	.	.		
279	APN.....			
	.			
281	.	23B		
	.	V		

286	V	
	23B-20	
	.	
288	.	20B
	.	
293	N20B.....	
	V	
	V	
295	20B-12	
	.	
297	.	12A
	.	
302	N12A.....	
	V	
	V	
304	12A-12	
	.	
306	.	12B
	.	
311	N12B.....	
	V	
	V	
	12B-57	
	.	
315	.	19A
	.	V
	.	V
320	.	19A-13
	.	
322	.	13B
	.	
327	N13B.....	
	V	
	V	
329	13B-57	
	.	
331	.	57A
	.	
336	N57A.....	
	V	
	V	
338	57A-57	
	.	
340	.	57B
	.	
345	N57B.....	

347	.	.	13A	.
	.	.	V	
	.	.	V	
352	.	.	13A-38	
	.	.	.	
354	.	.	.	38A
	.	.	.	.
359	.	.	N38A.....	
	.	.	V	
	.	.	V	
361	.	.	38A-38	
	.	.	.	
363	.	.	.	38B
	.	.	.	.
368	.	.	N38B.....	
	.	.	.	
370	.	.	.	3C
	.	.	.	.
375	.	.	.	AP

(***) RUNOFF ALSO COMPUTED AT THIS LOCATION


```

*****
*
* FLOOD HYDROGRAPH PACKAGE (HEC-1)
*   SEPTEMBER 1990
*   VERSION 4.0
*
* RUN DATE 08/22/1995 TIME 15:21:46
*
*****

```

```

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

```

DRAINAGE TOWARD ANGEL PARK - FUTURE DEVELOPED CONDITIONS
 100-YR, 6-HR STORM, SDN 3
 HEC1 MODEL REVISED FROM BOYLE MASTER PLAN 1992 8/26/94
 DETENTION BASIN NO. 4 AND DETENTION BASIN NO. 5 INCLUDED

FILE: SUM_SDN3.DAT

		AREA(SQ.MI.)	DARF
RATIO1		0.00	1.00
RATIO2		0.50	.98
RATIO3		1.00	.97
RATIO4		1.50	.95
RATIO5		2.00	.93
RATIO6	DB5	2.54	.925
RATIO7	DB4	4.25	.91
RATIO8		6.00	.90
RATIO9		9.00	.87

21 IO

OUTPUT CONTROL VARIABLES

IPRNT 5 PRINT CONTROL
 IPLOT 0 PLOT CONTROL
 QSCAL 0. HYDROGRAPH PLOT SCALE

IT

HYDROGRAPH TIME DATA

NMIN 3 MINUTES IN COMPUTATION INTERVAL
 IDATE 1 0 STARTING DATE
 ITIME 0000 STARTING TIME
 NQ 300 NUMBER OF HYDROGRAPH ORDINATES
 NDDATE 1 0 ENDING DATE
 NDTIME 1457 ENDING TIME
 ICENT 19 CENTURY MARK

COMPUTATION INTERVAL .05 HOURS
 TOTAL TIME BASE 14.95 HOURS

ENGLISH UNITS

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

JP MULTI-PLAN OPTION
 NPLAN 1 NUMBER OF PLANS

JR MULTI-RATIO OPTION
 RATIOS OF PRECIPITATION
 1.00 .98 .97 .95 .93 .91 .90 .87

*** FDKRUT - NEWTON RAPHSON FAILEDFIXED POINT ITERATION USED - ITERATION= 1

*** FDKRUT - NEWTON RAPHSON FAILEDFIXED POINT ITERATION USED - ITERATION= 1

*** FDKRUT WARNING TIME STEP CALCULATION FAILED TO CONVERGE. STABILITY PROBLEMS MAY RESULT

*** FDKRUT WARNING TIME STEP CALCULATION FAILED TO CONVERGE. STABILITY PROBLEMS MAY RESULT

*** FDKRUT WARNING TIME STEP CALCULATION FAILED TO CONVERGE. STABILITY PROBLEMS MAY RESULT

*** FDKRUT WARNING TIME STEP CALCULATION FAILED TO CONVERGE. STABILITY PROBLEMS MAY RESULT

*** FDKRUT WARNING TIME STEP CALCULATION FAILED TO CONVERGE. STABILITY PROBLEMS MAY RESULT

*** FDKRUT WARNING TIME STEP CALCULATION FAILED TO CONVERGE. STABILITY PROBLEMS MAY RESULT

*** FDKRUT WARNING TIME STEP CALCULATION FAILED TO CONVERGE. STABILITY PROBLEMS MAY RESULT

*** FDKRUT WARNING TIME STEP CALCULATION FAILED TO CONVERGE. STABILITY PROBLEMS MAY RESULT

*** FDKRUT WARNING TIME STEP CALCULATION FAILED TO CONVERGE. STABILITY PROBLEMS MAY RESULT

*** FDKRUT WARNING TIME STEP CALCULATION FAILED TO CONVERGE. STABILITY PROBLEMS MAY RESULT

*** FDKRUT WARNING TIME STEP CALCULATION FAILED TO CONVERGE. STABILITY PROBLEMS MAY RESULT

TIME TO PEAK IN HOURS

OPERATION	STATION	AREA	PLAN	RATIOS APPLIED TO PRECIPITATION								
				RATIO 1	RATIO 2	RATIO 3	RATIO 4	RATIO 5	RATIO 6	RATIO 7	RATIO 8	RATIO 9
				1.00	.98	.97	.95	.93	.93	.91	.90	.87
HYDROGRAPH AT	20	2.25	1 FLOW TIME	2885. 3.90	2809. 3.90	2771. 3.90	2696. 3.90	2620. 3.90	2601. 3.90	2545. 3.90	2507. 3.90	2394. 3.90
ROUTED TO	20-27A	2.25	1 FLOW TIME	2834. 4.05	2759. 4.05	2722. 4.05	2647. 4.05	2572. 4.05	2553. 4.05	2497. 4.10	2460. 4.10	2349. 4.10
HYDROGRAPH AT	27A	1.00	1 FLOW TIME	1527. 3.70	1485. 3.70	1464. 3.70	1423. 3.70	1381. 3.70	1371. 3.70	1340. 3.70	1319. 3.70	1258. 3.70
2 COMBINED AT	N27AA	3.25	1 FLOW TIME	3593. 4.00	3498. 4.00	3450. 4.00	3355. 4.00	3260. 4.00	3237. 4.00	3166. 4.00	3118. 4.00	2976. 4.00
HYDROGRAPH AT	60	.30	1 FLOW TIME	611. 3.55	595. 3.55	587. 3.55	571. 3.55	555. 3.55	551. 3.55	539. 3.55	531. 3.55	507. 3.55
ROUTED TO	60-70	.30	1 FLOW TIME	584. 3.65	569. 3.65	561. 3.65	546. 3.65	531. 3.65	527. 3.65	515. 3.65	508. 3.65	485. 3.65
HYDROGRAPH AT	70	.70	1 FLOW TIME	1309. 3.60	1274. 3.60	1257. 3.60	1223. 3.60	1188. 3.60	1180. 3.60	1154. 3.60	1137. 3.60	1085. 3.60
2 COMBINED AT	N70	1.00	1 FLOW TIME	1878. 3.60	1828. 3.60	1803. 3.60	1754. 3.60	1704. 3.60	1692. 3.60	1655. 3.60	1630. 3.60	1556. 3.60
ROUTED TO	70-27A	1.00	1 FLOW TIME	1827. 3.70	1779. 3.70	1755. 3.70	1708. 3.70	1660. 3.70	1648. 3.70	1613. 3.70	1589. 3.70	1518. 3.70
2 COMBINED AT	N27AB	4.25	1 FLOW TIME	4736. 3.80	4609. 3.80	4546. 3.80	4419. 3.80	4292. 3.80	4260. 3.80	4165. 3.80	4102. 3.80	3913. 3.80
ROUTED TO	DB4	4.25	1 FLOW TIME	2279. 4.45	2025. 4.50	1889. 4.55	1659. 4.65	1462. 4.85	1413. 4.95	1198. 5.15	1190. 5.15	1163. 5.15
** PEAK STAGES IN FEET **												
			1 STAGE TIME	20.29 4.45	20.22 4.50	20.18 4.55	20.12 4.65	20.07 4.85	20.06 4.95	19.96 5.15	19.71 5.15	18.99 5.15
ROUTED TO	27A-24	4.25	1 FLOW TIME	2211. 4.55	1969. 4.65	1851. 4.65	1644. 4.80	1450. 5.00	1408. 5.10	1198. 5.30	1189. 5.30	1163. 5.25
HYDROGRAPH AT	50	.57	1 FLOW TIME	1090. 3.60	1061. 3.60	1047. 3.60	1018. 3.60	990. 3.60	983. 3.60	961. 3.60	947. 3.60	904. 3.60
ROUTED TO	50-27C	.57	1 FLOW TIME	1021. 3.80	994. 3.80	981. 3.80	954. 3.80	927. 3.80	920. 3.80	900. 3.80	887. 3.80	847. 3.80
HYDROGRAPH AT	27C	.96	1 FLOW TIME	1548. 3.65	1505. 3.65	1483. 3.65	1440. 3.65	1397. 3.65	1387. 3.65	1354. 3.65	1333. 3.65	1269. 3.65

2 COMBINED AT	N27C	1.53	1	FLOW TIME	2359. 3.70	2294. 3.70	2262. 3.70	2197. 3.70	2133. 3.70	2117. 3.70	2069. 3.70	2036. 3.70	1940. 3.70
ROUTED TO	27C-28	1.53	1	FLOW TIME	2306. 3.80	2243. 3.80	2211. 3.80	2148. 3.80	2085. 3.80	2069. 3.85	2023. 3.85	1992. 3.85	1899. 3.85
HYDROGRAPH AT	28A	.31	1	FLOW TIME	474. 3.60	460. 3.60	453. 3.60	439. 3.60	425. 3.60	422. 3.60	412. 3.60	405. 3.60	384. 3.60
2 COMBINED AT	N28A	1.84	1	FLOW TIME	2646. 3.80	2573. 3.80	2537. 3.80	2464. 3.80	2391. 3.80	2373. 3.80	2319. 3.80	2283. 3.80	2174. 3.80
HYDROGRAPH AT	27B	.39	1	FLOW TIME	644. 3.60	626. 3.60	617. 3.60	598. 3.60	580. 3.60	575. 3.60	561. 3.60	552. 3.60	525. 3.60
ROUTED TO	27B-27	.39	1	FLOW TIME	623. 3.70	605. 3.70	596. 3.70	578. 3.70	560. 3.70	556. 3.70	542. 3.70	533. 3.70	507. 3.70
HYDROGRAPH AT	27D	.31	1	FLOW TIME	481. 3.60	467. 3.60	460. 3.60	446. 3.60	432. 3.60	429. 3.60	418. 3.60	411. 3.60	391. 3.60
2 COMBINED AT	N27D	.70	1	FLOW TIME	1054. 3.65	1024. 3.65	1008. 3.65	978. 3.65	947. 3.65	940. 3.70	917. 3.70	902. 3.70	858. 3.70
2 COMBINED AT	NDB5	2.54	1	FLOW TIME	3597. 3.75	3496. 3.75	3445. 3.75	3345. 3.75	3244. 3.75	3219. 3.75	3144. 3.75	3094. 3.75	2944. 3.75
ROUTED TO	DB5	2.54	1	FLOW TIME	877. 4.35	806. 5.05	788. 5.05	633. 5.20	569. 5.20	568. 5.20	564. 5.20	561. 5.20	553. 5.20
** PEAK STAGES IN FEET **													
			1	STAGE TIME	3561.60 4.35	3561.57 5.05	3561.57 5.05	3561.52 5.20	3561.16 5.20	3561.05 5.20	3560.75 5.20	3560.54 5.20	3559.92 5.20
2 COMBINED AT	N24CB	6.79	1	FLOW TIME	2920. 4.55	2604. 4.65	2428. 4.80	2214. 4.80	2018. 5.00	1975. 5.10	1762. 5.25	1750. 5.25	1716. 5.25
ROUTED TO	RN24CB	6.79	1	FLOW TIME	2910. 4.55	2602. 4.65	2426. 4.80	2210. 4.80	2016. 5.00	1974. 5.10	1762. 5.25	1750. 5.25	1716. 5.25
HYDROGRAPH AT	24C	.35	1	FLOW TIME	489. 3.65	475. 3.65	467. 3.65	453. 3.65	438. 3.65	435. 3.65	424. 3.65	416. 3.65	395. 3.65
2 COMBINED AT	N24CA	7.14	1	FLOW TIME	2993. 4.55	2702. 4.65	2530. 4.80	2312. 4.80	2110. 5.00	2051. 5.05	1847. 4.95	1835. 4.95	1797. 4.95
HYDROGRAPH AT	25A	.41	1	FLOW TIME	629. 3.65	611. 3.65	602. 3.65	584. 3.65	566. 3.65	562. 3.65	548. 3.65	539. 3.65	513. 3.65
ROUTED TO	25A-24	.41	1	FLOW TIME	613. 3.75	595. 3.75	586. 3.75	569. 3.75	551. 3.75	547. 3.75	534. 3.75	525. 3.75	499. 3.75
HYDROGRAPH AT	24A	.34	1	FLOW TIME	564. 3.60	548. 3.60	540. 3.60	524. 3.60	509. 3.60	505. 3.60	493. 3.60	485. 3.60	461. 3.60
2 COMBINED AT	N24A	.75	1	FLOW TIME	1094. 3.65	1062. 3.65	1046. 3.65	1015. 3.65	983. 3.65	976. 3.65	952. 3.65	936. 3.65	890. 3.65
ROUTED TO	24A-24	.75	1	FLOW TIME	1090. 3.70	1059. 3.70	1044. 3.70	1013. 3.70	982. 3.70	974. 3.70	951. 3.70	935. 3.70	889. 3.70

HYDROGRAPH AT	25B	.32	1	FLOW TIME	446. 3.65	433. 3.65	426. 3.65	413. 3.65	400. 3.65	396. 3.65	387. 3.65	380. 3.65	360. 3.65
ROUTED TO	25B-24	.32	1	FLOW TIME	431. 3.80	418. 3.80	412. 3.80	399. 3.80	387. 3.80	383. 3.80	374. 3.80	368. 3.80	349. 3.80
HYDROGRAPH AT	24B	.48	1	FLOW TIME	712. 3.65	692. 3.65	682. 3.65	662. 3.65	642. 3.65	637. 3.65	622. 3.65	612. 3.65	582. 3.65
2 COMBINED AT	N24B	.79	1	FLOW TIME	1084. 3.70	1053. 3.70	1037. 3.70	1006. 3.70	974. 3.70	967. 3.70	943. 3.70	928. 3.70	881. 3.70
3 COMBINED AT	N24CC	8.69	1	FLOW TIME	3751. 3.75	3655. 3.75	3606. 3.75	3509. 3.75	3412. 3.75	3387. 3.75	3312. 3.75	3261. 3.75	3108. 3.75
ROUTED TO	24C-23	8.69	1	FLOW TIME	3747. 3.75	3649. 3.75	3599. 3.75	3500. 3.75	3401. 3.75	3376. 3.75	3300. 3.75	3249. 3.75	3095. 3.75
HYDROGRAPH AT	23A	.30	1	FLOW TIME	361. 3.65	350. 3.65	344. 3.65	332. 3.65	320. 3.65	317. 3.65	308. 3.65	303. 3.65	285. 3.65
2 COMBINED AT	N23A	8.99	1	FLOW TIME	4069. 3.75	3961. 3.75	3906. 3.75	3797. 3.75	3688. 3.75	3661. 3.75	3577. 3.75	3521. 3.75	3352. 3.75
ROUTED TO	23A-20	8.99	1	FLOW TIME	4061. 3.75	3951. 3.75	3895. 3.75	3784. 3.75	3673. 3.75	3645. 3.75	3561. 3.75	3504. 3.75	3334. 3.75
GRAPH AT	20A	.75	1	FLOW TIME	895. 3.65	867. 3.65	853. 3.65	824. 3.65	796. 3.65	789. 3.65	768. 3.65	754. 3.65	712. 3.65
2 COMBINED AT	N20AA	9.74	1	FLOW TIME	4898. 3.75	4762. 3.75	4693. 3.75	4557. 3.75	4420. 3.75	4386. 3.75	4283. 3.75	4213. 3.75	4005. 3.75
HYDROGRAPH AT	21C	.27	1	FLOW TIME	445. 3.60	433. 3.60	426. 3.60	414. 3.60	402. 3.60	399. 3.60	390. 3.60	384. 3.60	366. 3.60
ROUTED TO	21C-21	.27	1	FLOW TIME	436. 3.60	424. 3.60	418. 3.60	406. 3.60	394. 3.60	391. 3.60	382. 3.60	376. 3.60	358. 3.60
HYDROGRAPH AT	21D	.15	1	FLOW TIME	244. 3.60	237. 3.60	234. 3.60	227. 3.60	221. 3.60	219. 3.60	214. 3.60	211. 3.60	201. 3.60
2 COMBINED AT	N21DA	.42	1	FLOW TIME	680. 3.60	661. 3.60	652. 3.60	634. 3.60	615. 3.60	610. 3.60	596. 3.60	587. 3.60	559. 3.60
HYDROGRAPH AT	21A	.27	1	FLOW TIME	438. 3.60	426. 3.60	420. 3.60	408. 3.60	396. 3.60	394. 3.60	385. 3.60	379. 3.60	361. 3.60
ROUTED TO	21A-21	.27	1	FLOW TIME	429. 3.60	417. 3.60	411. 3.60	399. 3.60	388. 3.60	385. 3.60	376. 3.60	370. 3.60	352. 3.60
HYDROGRAPH AT	21B	.24	1	FLOW TIME	389. 3.60	378. 3.60	373. 3.60	363. 3.60	352. 3.60	349. 3.60	341. 3.60	336. 3.60	320. 3.60
2 COMBINED AT	N21B	.51	1	FLOW TIME	818. 3.60	796. 3.60	784. 3.60	762. 3.60	740. 3.60	734. 3.60	717. 3.60	706. 3.60	673. 3.60
ROUTED TO	21B-21	.51	1	FLOW TIME	808. 3.60	785. 3.60	774. 3.60	752. 3.60	729. 3.60	724. 3.60	707. 3.60	696. 3.60	663. 3.60

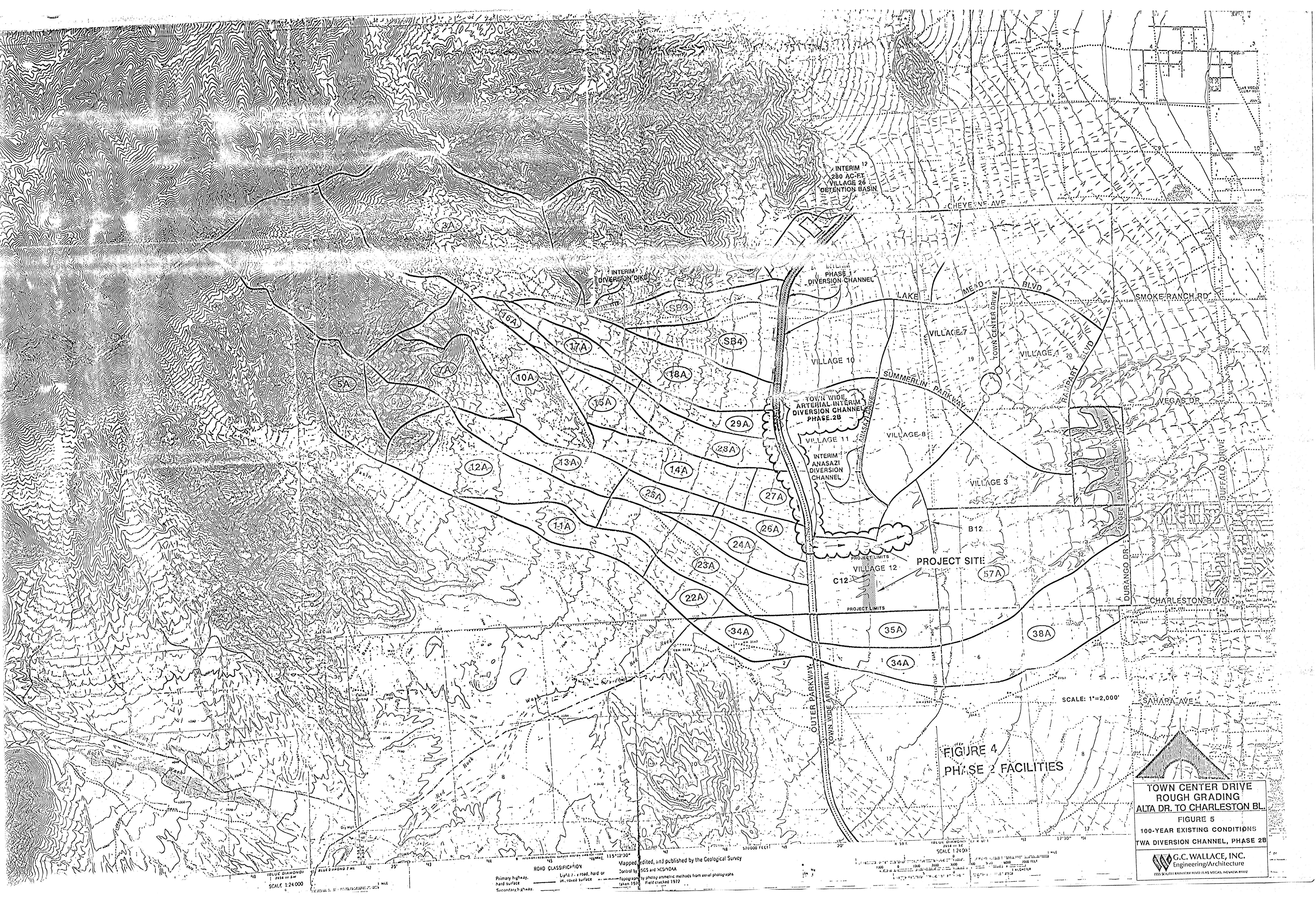
2 COMBINED AT	N21DB	.93	1	FLOW TIME	1487. 3.60	1447. 3.60	1426. 3.60	1385. 3.60	1344. 3.60	1334. 3.60	1304. 3.60	1284. 3.60	1222. 3.60
ROUTED TO	21D-20	.93	1	FLOW TIME	1469. 3.65	1430. 3.65	1410. 3.65	1370. 3.65	1330. 3.65	1321. 3.65	1291. 3.65	1271. 3.65	1212. 3.65
2 COMBINED AT	N20AB	10.67	1	FLOW TIME	6259. 3.70	6080. 3.70	5991. 3.70	5812. 3.70	5634. 3.70	5590. 3.70	5456. 3.70	5367. 3.70	5100. 3.70
ROUTED TO	20A-11	10.67	1	FLOW TIME	6229. 3.70	6050. 3.70	5960. 3.70	5781. 3.70	5602. 3.70	5558. 3.70	5423. 3.70	5334. 3.70	5065. 3.70
HYDROGRAPH AT	11A	.80	1	FLOW TIME	923. 3.75	896. 3.75	883. 3.75	856. 3.75	829. 3.75	822. 3.75	802. 3.75	789. 3.75	749. 3.75
2 COMBINED AT	N11A	11.47	1	FLOW TIME	7142. 3.70	6936. 3.70	6832. 3.70	6627. 3.70	6420. 3.70	6369. 3.70	6215. 3.70	6112. 3.70	5803. 3.70
ROUTED TO	11A-3A	11.47	1	FLOW TIME	7056. 3.80	6854. 3.80	6751. 3.80	6550. 3.80	6347. 3.80	6297. 3.80	6145. 3.80	6044. 3.80	5740. 3.80
HYDROGRAPH AT	3A	.33	1	FLOW TIME	438. 3.65	426. 3.65	419. 3.65	407. 3.65	394. 3.65	391. 3.65	382. 3.65	376. 3.65	357. 3.65
2 COMBINED AT	N3A	11.80	1	FLOW TIME	7384. 3.80	7173. 3.80	7066. 3.80	6856. 3.80	6644. 3.80	6592. 3.80	6433. 3.80	6328. 3.80	6010. 3.80
ROUTED TO	3A-3B	11.80	1	FLOW TIME	7105. 4.10	6907. 4.10	6806. 4.10	6608. 4.10	6410. 4.10	6361. 4.10	6211. 4.10	6111. 4.10	5810. 4.10
HYDROGRAPH AT	11B	.77	1	FLOW TIME	1023. 3.70	995. 3.70	981. 3.70	953. 3.70	925. 3.70	918. 3.70	897. 3.70	883. 3.70	841. 3.70
ROUTED TO	11B-8B	.77	1	FLOW TIME	1014. 3.75	987. 3.75	976. 3.75	949. 3.75	919. 3.75	912. 3.75	892. 3.75	876. 3.75	837. 3.75
HYDROGRAPH AT	8A	.24	1	FLOW TIME	381. 3.60	371. 3.60	365. 3.60	355. 3.60	345. 3.60	343. 3.60	335. 3.60	330. 3.60	315. 3.60
ROUTED TO	8A-8B	.24	1	FLOW TIME	375. 3.60	365. 3.60	360. 3.60	350. 3.60	340. 3.60	337. 3.60	330. 3.60	324. 3.60	309. 3.60
HYDROGRAPH AT	8B	.65	1	FLOW TIME	823. 3.75	802. 3.75	791. 3.75	769. 3.75	748. 3.75	743. 3.75	726. 3.75	716. 3.75	684. 3.75
3 COMBINED AT	N8B	1.66	1	FLOW TIME	2158. 3.70	2100. 3.70	2076. 3.70	2017. 3.70	1957. 3.70	1940. 3.70	1898. 3.70	1867. 3.70	1783. 3.70
ROUTED TO	8B-3B	1.66	1	FLOW TIME	2148. 3.75	2089. 3.75	2066. 3.75	2008. 3.75	1949. 3.75	1933. 3.75	1891. 3.75	1860. 3.75	1777. 3.75
HYDROGRAPH AT	3B	.78	1	FLOW TIME	791. 3.80	768. 3.80	757. 3.80	734. 3.80	711. 3.80	705. 3.80	688. 3.80	677. 3.80	643. 3.80
3 COMBINED AT	N3B	14.24	1	FLOW TIME	8929. 4.05	8677. 4.05	8551. 4.05	8300. 4.05	8047. 4.05	7984. 4.05	7795. 4.05	7669. 4.05	7290. 4.05
ROUTED TO	BOX	14.24	1	FLOW TIME	8871. 4.05	8613. 4.05	8484. 4.05	8224. 4.10	7975. 4.10	7913. 4.10	7722. 4.10	7587. 4.10	7071. 4.10

** PEAK STAGES IN FEET **

			1	STAGE TIME	26.44 4.05	26.24 4.05	26.14/ 4.05	25.94 4.10	25.75 4.10	25.70 4.10	25.56 4.10	25.45 4.10	25.05 4.10
ROUTED TO	3B-60A	14.24	1	FLOW TIME	8732. 4.15	8473. 4.15	8342. 4.15	8073. 4.15	7798. 4.15	7729. 4.15	7528. 4.20	7394. 4.20	6971. 4.20
HYDROGRAPH AT	60A	.36	1	FLOW TIME	416. 3.65	403. 3.65	397. 3.65	384. 3.65	372. 3.65	369. 3.65	360. 3.65	353. 3.65	335. 3.65
2 COMBINED AT	APN	14.60	1	FLOW TIME	8846. 4.15	8584. 4.15	8451. 4.15	8179. 4.15	7900. 4.15	7831. 4.15	7614. 4.15	7478. 4.20	7051. 4.20
HYDROGRAPH AT	23B	.97	1	FLOW TIME	982. 3.80	951. 3.80	935. 3.80	904. 3.80	873. 3.80	865. 3.80	842. 3.80	826. 3.80	780. 3.80
ROUTED TO	23B-20	.97	1	FLOW TIME	978. 3.80	947. 3.80	931. 3.80	900. 3.80	868. 3.80	861. 3.80	837. 3.80	822. 3.80	775. 3.80
HYDROGRAPH AT	20B	.52	1	FLOW TIME	682. 3.65	661. 3.65	651. 3.65	630. 3.65	610. 3.65	605. 3.65	589. 3.65	579. 3.65	548. 3.65
2 COMBINED AT	N20B	1.49	1	FLOW TIME	1554. 3.75	1505. 3.75	1481. 3.75	1432. 3.75	1383. 3.75	1371. 3.75	1334. 3.75	1310. 3.75	1238. 3.75
ROUTED TO	20B-12	1.49	1	FLOW TIME	1523. 3.90	1475. 3.90	1451. 3.90	1403. 3.90	1356. 3.90	1344. 3.90	1308. 3.90	1285. 3.90	1214. 3.90
HYDROGRAPH AT	12A	.40	1	FLOW TIME	596. 3.65	581. 3.65	573. 3.65	558. 3.65	542. 3.65	538. 3.65	527. 3.65	519. 3.65	496. 3.65
2 COMBINED AT	N12A	1.89	1	FLOW TIME	1947. 3.85	1887. 3.85	1858. 3.85	1799. 3.85	1740. 3.85	1725. 3.85	1681. 3.85	1652. 3.85	1564. 3.85
ROUTED TO	12A-12	1.89	1	FLOW TIME	1926. 3.90	1867. 3.90	1837. 3.90	1778. 3.90	1720. 3.90	1705. 3.90	1661. 3.90	1632. 3.90	1545. 3.95
HYDROGRAPH AT	12B	.27	1	FLOW TIME	440. 3.60	429. 3.60	423. 3.60	412. 3.60	401. 3.60	398. 3.60	390. 3.60	384. 3.60	368. 3.60
2 COMBINED AT	N12B	2.16	1	FLOW TIME	2105. 3.90	2041. 3.90	2009. 3.90	1946. 3.90	1883. 3.90	1867. 3.90	1820. 3.90	1789. 3.90	1695. 3.90
ROUTED TO	12B-57	2.16	1	FLOW TIME	2096. 3.95	2032. 3.95	2001. 3.95	1942. 3.95	1879. 3.95	1859. 3.95	1816. 3.95	1782. 3.95	1692. 3.95
HYDROGRAPH AT	19A	.46	1	FLOW TIME	619. 3.65	601. 3.65	592. 3.65	575. 3.65	557. 3.65	553. 3.65	540. 3.65	531. 3.65	505. 3.65
ROUTED TO	19A-13	.46	1	FLOW TIME	614. 3.70	600. 3.70	589. 3.70	571. 3.70	554. 3.70	552. 3.70	537. 3.70	528. 3.70	504. 3.70
HYDROGRAPH AT	13B	.57	1	FLOW TIME	765. 3.70	745. 3.70	735. 3.70	715. 3.70	695. 3.70	690. 3.70	675. 3.70	665. 3.70	635. 3.70
2 COMBINED AT	N13B	1.03	1	FLOW TIME	1379. 3.70	1345. 3.70	1324. 3.70	1286. 3.70	1248. 3.70	1241. 3.70	1212. 3.70	1193. 3.70	1139. 3.70
ROUTED TO	13B-57	1.03	1	FLOW	1346.	1312.	1292.	1255.	1219.	1212.	1183.	1165.	1113.

				TIME	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90
HYDROGRAPH AT	57A	.44	1	FLOW	513.	498.	491.	477.	462.	459.	448.	441.	419.
				TIME	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70
2 COMBINED AT	N57A	1.47	1	FLOW	1767.	1721.	1695.	1646.	1597.	1587.	1550.	1525.	1454.
				TIME	3.85	3.85	3.85	3.85	3.85	3.85	3.85	3.85	3.85
ROUTED TO	57A-57	1.47	1	FLOW	1760.	1714.	1688.	1640.	1592.	1582.	1545.	1521.	1451.
				TIME	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90
HYDROGRAPH AT	57B	1.37	1	FLOW	1110.	1076.	1060.	1026.	993.	985.	960.	944.	894.
				TIME	3.95	3.95	3.95	3.95	3.95	3.95	3.95	3.95	3.95
3 COMBINED AT	N57B	4.99	1	FLOW	4949.	4805.	4731.	4590.	4445.	4407.	4304.	4227.	4016.
				TIME	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90
HYDROGRAPH AT	13A	.61	1	FLOW	813.	792.	781.	760.	739.	733.	717.	707.	675.
				TIME	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70
ROUTED TO	13A-38	.61	1	FLOW	809.	790.	779.	758.	737.	730.	716.	704.	672.
				TIME	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80
HYDROGRAPH AT	38A	1.11	1	FLOW	899.	874.	861.	835.	809.	803.	783.	771.	733.
				TIME	3.95	3.95	3.95	3.95	3.95	3.95	3.95	4.00	4.00
2 COMBINED AT	N38A	1.72	1	FLOW	1640.	1596.	1574.	1528.	1483.	1471.	1440.	1417.	1350.
				TIME	3.85	3.85	3.85	3.85	3.85	3.85	3.85	3.85	3.85
TO	38A-38	1.72	1	FLOW	1636.	1592.	1570.	1525.	1481.	1470.	1437.	1415.	1349.
				TIME	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90
HYDROGRAPH AT	38B	.53	1	FLOW	580.	564.	555.	539.	523.	519.	506.	498.	474.
				TIME	3.70	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75
2 COMBINED AT	N38B	2.24	1	FLOW	2141.	2083.	2054.	1994.	1935.	1919.	1877.	1847.	1758.
				TIME	3.85	3.85	3.85	3.85	3.85	3.85	3.85	3.85	3.85
HYDROGRAPH AT	3C	.16	1	FLOW	194.	188.	185.	180.	174.	173.	169.	166.	158.
				TIME	3.65	3.65	3.65	3.65	3.65	3.65	3.65	3.65	3.65
HYDROGRAPH AT	AP	.65	1	FLOW	722.	698.	685.	661.	638.	632.	614.	602.	567.
				TIME	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60

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



INTERIM
280 AC-FT
VILLAGE 26
DETENTION BASIN

INTERIM
DIVERSION DIKE

PHASE 1
DIVERSION CHANNEL

TOWN WIDE
ARTERIAL INTERIM
DIVERSION CHANNEL
PHASE 2B

INTERIM
ANASAZI
DIVERSION
CHANNEL

PROJECT SITE

VILLAGE 12

C12

PROJECT LIMITS

FIGURE 4
PHASE 2 FACILITIES

SCALE: 1"=2,000'

TOWN CENTER DRIVE
ROUGH GRADING
ALTA DR. TO CHARLESTON BL.

FIGURE 5
100-YEAR EXISTING CONDITIONS
TWA DIVERSION CHANNEL, PHASE 2B

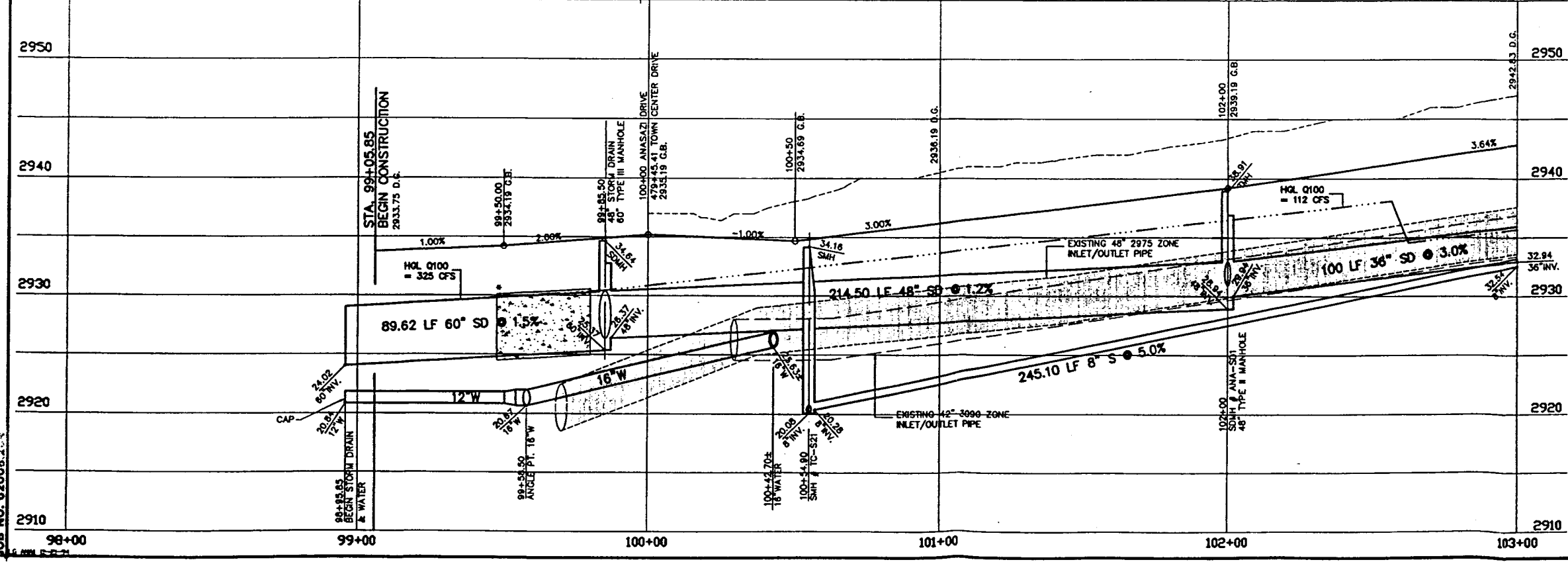
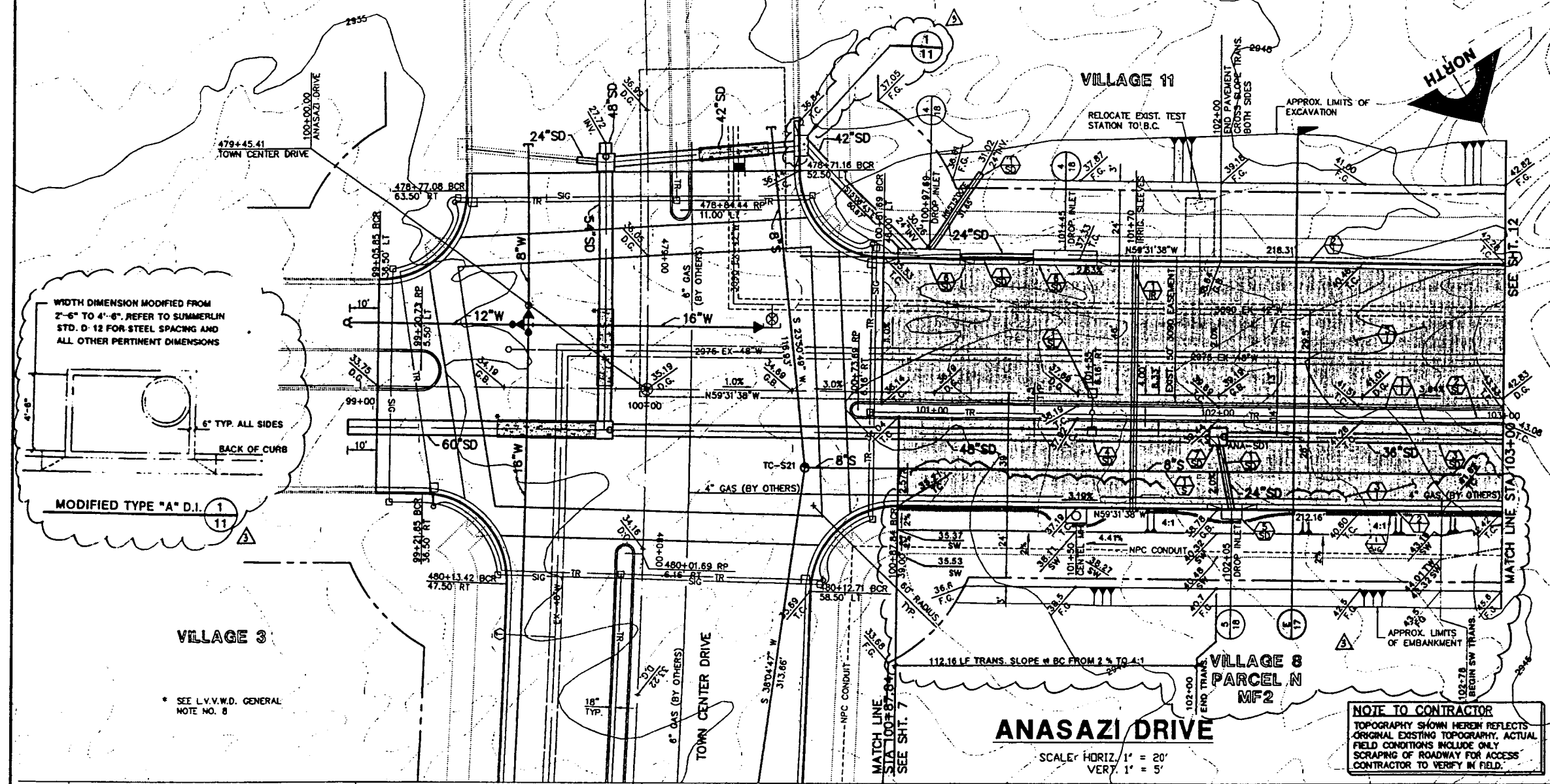
G.C. WALLACE, INC.
Engineering/Architecture

ROAD CLASSIFICATION
Primary highway, hard surface
Secondary highway, hard surface
Light duty road, hard or im. road surface
Unimproved road

Mapped, edited, and published by the Geological Survey
Control by SCS and NCS/NOAA
Topography by photogrammetric methods from aerial photographs taken 1972
Field checked 1972

SCALE 1:24,000

ANASAZI DRIVE



CONSTRUCTION NOTES

IMPROVEMENTS

- INSTALL "A" TYPE CURB (S-50)
- INSTALL "L" TYPE CURB & GUTTER (S-47)
- INSTALL AC PAVEMENT PER SECTION SHIT. 17

STORM DRAIN

- INSTALL 24" DIA. STORM DRAIN PIPE (U-20)
- INSTALL 30" DIA. STORM DRAIN PIPE (U-20)
- INSTALL 36" DIA. STORM DRAIN PIPE (U-20)
- INSTALL 48" DIA. STORM DRAIN PIPE (U-20)
- INSTALL 6" TYPE "A" DROP INLET (D-12)
- INSTALL 21" MODIFIED TYPE "C" DROP INLET (D-12)
- INSTALL STORM DRAIN MANHOLE (D-14)

SEWER

- INSTALL 8" DIA. SEWER PIPE (U-20)

STREET LIGHTING

- INSTALL STREET LIGHT, SEE ELECTRICAL PLANS (E-2)
- STREET LIGHT OR COMMON TRENCH, SEE ELECTRICAL PLANS

IRRIGATION

- INSTALL 1-6" & 2-4" SDR 35 PVC IRRIG. SLEEVES (U-18)

TRAFFIC

- INSTALL 2" INTERCONNECT

NOTE TO CONTRACTOR

TOPOGRAPHY SHOWN HEREIN REFLECTS ORIGINAL EXISTING TOPOGRAPHY. ACTUAL FIELD CONDITIONS INCLUDE ONLY SCRAPING OF ROADWAY FOR ACCESS. CONTRACTOR TO VERIFY IN FIELD.

RECORD DRAWINGS

G.C. WALLACE, INC.
THESE PLANS SHOW RECORD INFORMATION RECEIVED FROM:
CONTRACTOR: WELLS CARGO, INC.
DATE: _____
THIS DATA MAY OR MAY NOT REFLECT THE ACTUAL FIELD LOCATIONS. ALL DATA SHOULD BE CONFIRMED PRIOR TO USE ON DEVELOPMENT OR ENGINEERING PLANS.
PROJECT MANAGER REVIEW
BY: _____ DATE: _____

SHEET INDEX MAP

APPROVAL:

[Signature]
LAS VEGAS VALLEY WATER DISTRICT
DATE: 1-13-95

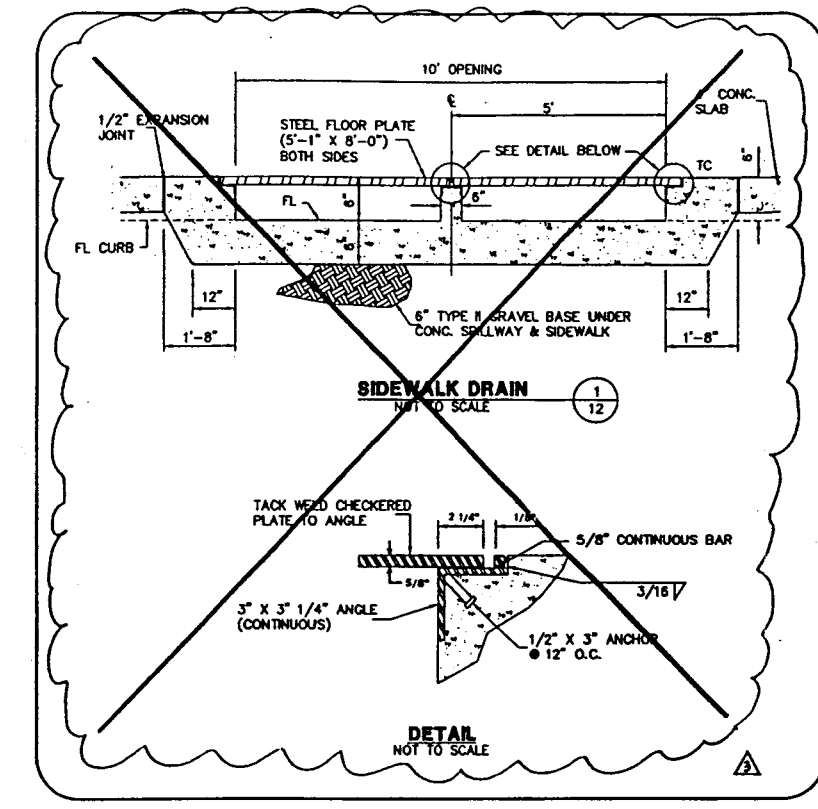
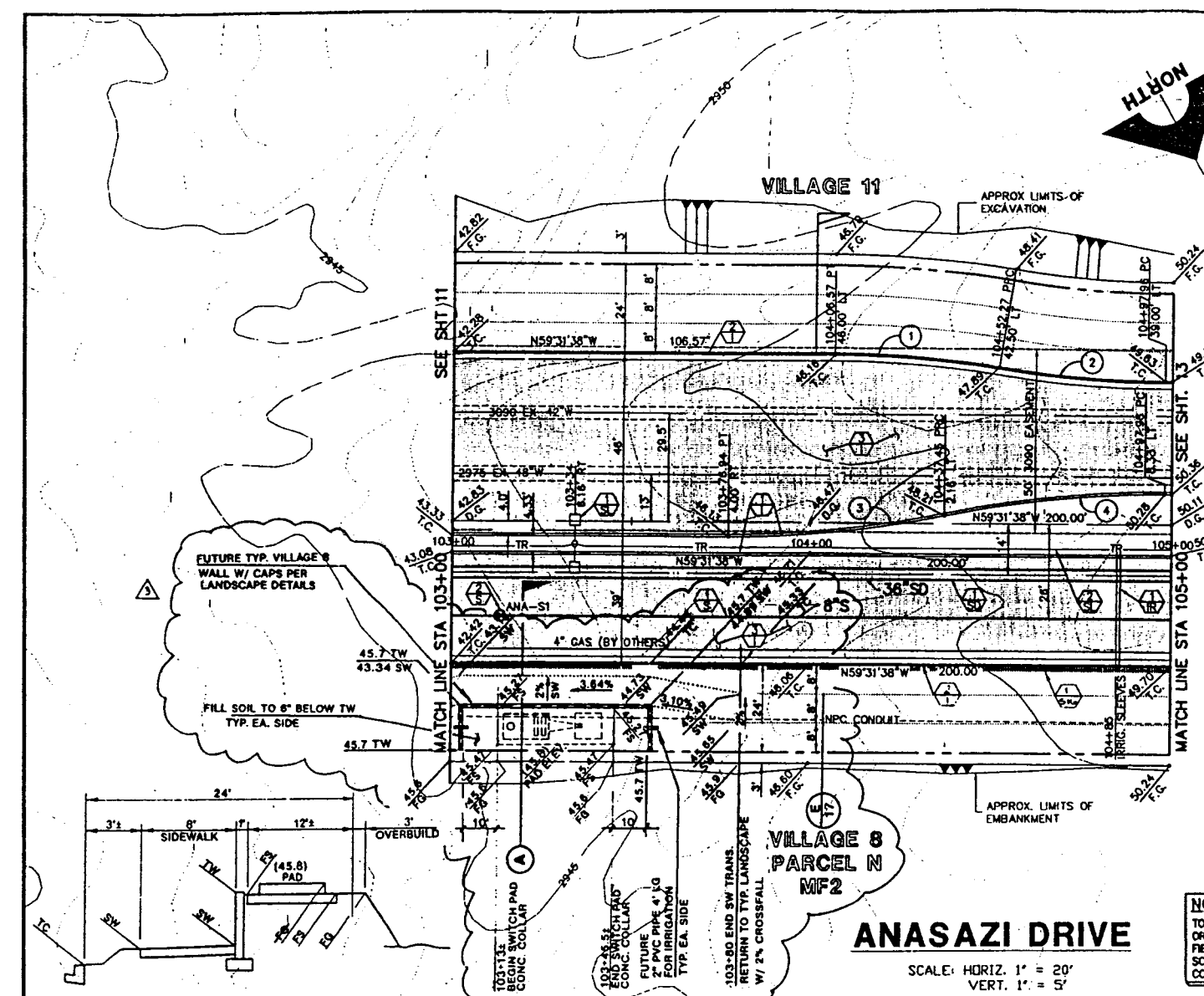
ENGINEER'S STATE OF NEVADA

REGISTERED PROFESSIONAL ENGINEER
G.C. WALLACE, INC.
Engineering/Architecture
1955 SOUTH RAINBOW AVENUE, SUITE 100, LAS VEGAS, NV 89102
DATE: 1-13-95

PROJECT INFORMATION

SUMMERLIN
TOWN CENTER DRIVE - UNIT 3
ANASAZI DRIVE
PLAN & PROFILE
STA 100+87.84 TO 103+00
SHEET 11 OF 19

JOB NO. 02003-4-0-5



CURVE DATA

NO.	Δ	R	L	T	DESCRIPTION
1	08°45'38"	300.00'	45.87'	22.98'	BC
2	08°45'38"	300.00'	45.87'	22.98'	BC
3	11°38'08"	300.00'	60.92'	30.57'	ISBC
4	11°38'08"	300.00'	60.92'	30.57'	ISBC

BC = BACK OF CURB
ISBC = ISLAND BACK OF CURB

- CONSTRUCTION NOTES**
- IMPROVEMENTS**
- INSTALL "A" TYPE CURB (S-50 S)
 - INSTALL "L" TYPE CURB & GUTTER (S-47 S)
 - INSTALL AC PAVEMENT PER SECTION SHIT. 17

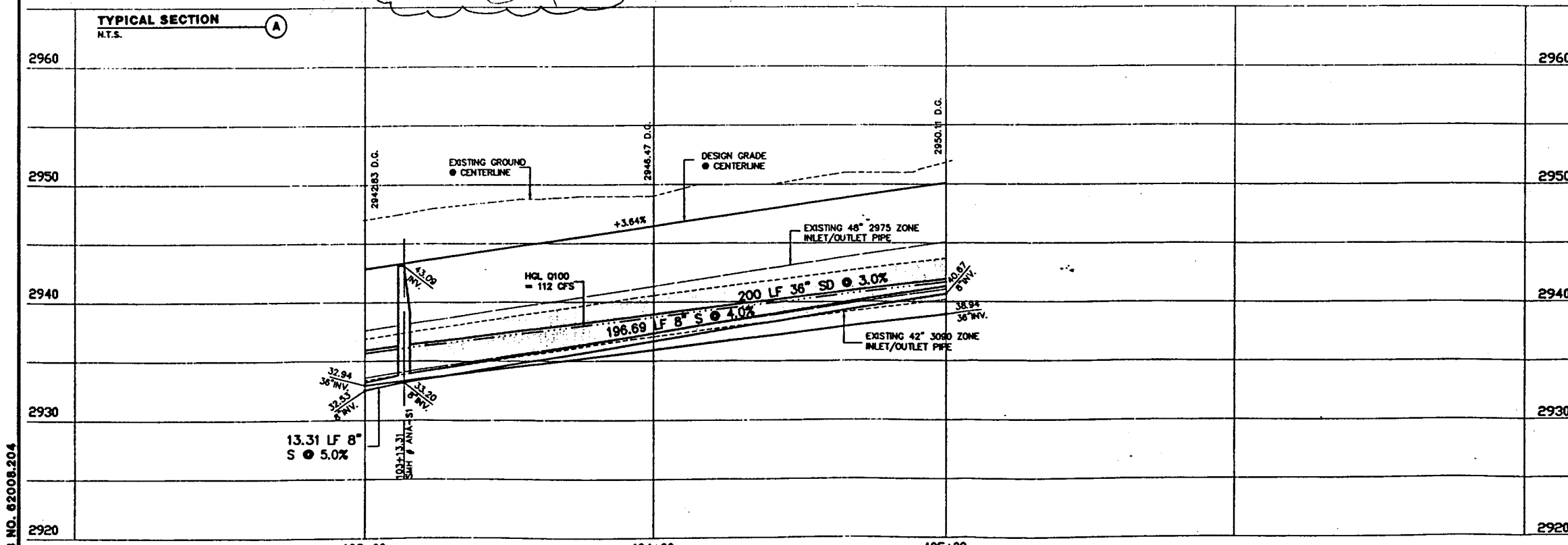
- STORM DRAIN**
- INSTALL 36" DIA. STORM DRAIN PIPE (U-20 S)

- SEWER**
- INSTALL 8" DIA. SEWER PIPE (U-20 S)
 - INSTALL SEWER MANHOLE (SD-1-CLV)

- STREET LIGHTING**
- INSTALL STREET LIGHT, SEE ELECTRICAL PLANS (E-2 S)
 - STREET LIGHT OR COMMON TRENCH, SEE ELECTRICAL PLANS

- IRRIGATION**
- INSTALL 2-4" SDR 35 PVC IRRIG. SLEEVES (U-18 S)

- TRAFFIC**
- INSTALL 2" INTERCONNECT

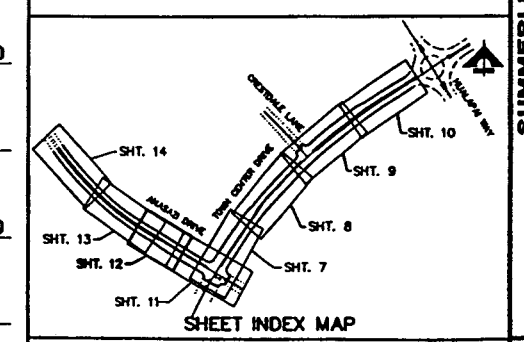


RECORD DRAWINGS
G.C. WALLACE, INC.

THESE PLANS SHOW RECORD INFORMATION RECEIVED FROM:
CONTRACTOR: WELLS CARGO, INC.
DATE: _____

THESE DATA MAY OR MAY NOT REFLECT THE ACTUAL FIELD LOCATIONS. ALL DATA SHOULD BE CONFIRMED PRIOR TO USE ON DEVELOPMENT OR ENGINEERING PLANS.

PROJECT MANAGER REVIEW
BY: _____ DATE: _____



APPROVAL: M. Brantner 1.13.95

G.C. WALLACE, INC.
Engineering/Architecture

SUMMERLIN TOWN CENTER DRIVE - UNIT 3
ANASAZI DRIVE
PLAN & PROFILE
STA 103+00 TO 105+00

SHEET 12

NOTE: INSTALL 9" MIN. TYPE I OR TYPE II AGGREGATE BASE TOPPED WITH 4" TYPE II TOPPED WITH 3" A.C. PAVEMENT & FOG SEAL FOR RESERVOIR DRIVEWAY.

VILLAGE 11

REMOVE EXIST. CONC. SLAB & INSTALL 10" CURB OUTLET TYPE "B" PER MATCH EXIST. OUTLET FLOW LINE (56.5 FL)

SEE SHEET 19A FOR DRIVEWAY DETAIL STA. 107+42.74

EXISTING 2975 RESERVOIR & 3090 PUMP STATION



MATCH LINE STA 105+00 SEE SHIT 12

TOCH LINE STA 110+00 SEE SHIT 13

NOTE TO CONTRACTOR
TOPOGRAPHY SHOWN HEREIN REFLECTS ROADWAY IN A ROUGH GRADED CONDITION. ACTUAL FIELD CONDITIONS INCLUDE ONLY SCRAPING OF ROADWAY FOR ACCESS. CONTRACTOR TO VERIFY IN FIELD.

VILLAGE 8
PARCEL N
MF2

VILLAGE 8
PARCEL O
SF3

ANASAZI DRIVE

SCALE: HORIZ. 1" = 20'
VERT. 1" = 5'

RECORD DRAWINGS

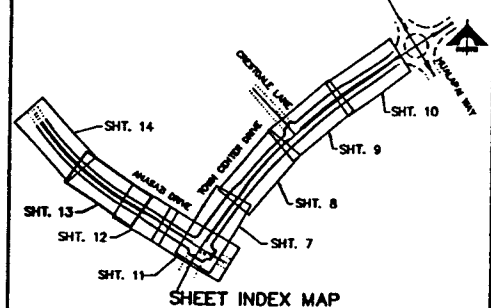
THESE PLANS AND RECORD INFORMATION RECEIVED FROM:
OWNER: TOWN OF SUMNER
DESIGNER: G.C. WALLACE, INC.
DATE: 10/25/74
THIS DATA MAY OR MAY NOT REFLECT THE ACTUAL FIELD CONDITIONS. ALL DATA SHOULD BE CONFIRMED FROM THE FIELD BY THE CONTRACTOR OR ENGINEERING PLANS.

CURVE DATA					INDICATES CURVE NUMBER
NO.	Δ	R	L	T	DESCRIPTION
1	11°42'29"	2000.00'	408.69'	205.06'	CENTERLINE
2	11°42'29"	2008.33'	410.39'	205.91'	ISBC
3	10°20'50"	1991.67'	359.68'	180.33'	ISBC
4	11°42'29"	1961.00'	400.72'	201.06'	BC
5	03°27'52"	2039.00'	123.29'	61.66'	BC
6	89°27'52"	15.00'	23.42'	14.86'	BC
7	88°48'22"	15.00'	23.25'	14.69'	BC
8	06°30'51"	2039.00'	231.82'	116.04'	BC
9	09°05'32"	300.00'	47.61'	23.85'	ISBC

BC = BACK OF CURB
ISBC = ISLAND BACK OF CURB

CONSTRUCTION NOTES

- IMPROVEMENTS**
- INSTALL "A" TYPE CURB (S-50 S)
 - INSTALL "L" TYPE CURB & GUTTER (S-50 S)
 - INSTALL AC PAVEMENT PER SECTION SHIT. 17
 - INSTALL DRIVEWAY CROSS GUTTER (61 S)
 - INSTALL DEPRESSED CURB (1 18 S)
 - INSTALL SIDEWALK UNDERDRAIN (D-31 S)
- WATER**
- ADJUST EXIST. TEST STATION TO GRADE
 - ADJUST EXIST. VAULT MANHOLE TO GRADE
 - RELOCATE AND ADJUST EXIST. BLOW-OFF TO GRADE
- STORM DRAIN**
- INSTALL 24" DIA. STORM DRAIN PIPE (U-20 S)
 - INSTALL 30" DIA. STORM DRAIN PIPE (U-20 S)
 - INSTALL 36" DIA. STORM DRAIN PIPE (U-20 S)
 - INSTALL STORM DRAIN MANHOLE (D1, D4 S)
 - INSTALL 18" MODIFIED TYPE "C" DROP INLET (D-12 S)
 - INSTALL CONCRETE ENCASEMENT (G 17)
- SEWER**
- INSTALL 8" DIA. SEWER PIPE (U-20 S)
 - INSTALL SEWER MANHOLE (SD1-A CLV)
- STREET LIGHTING**
- INSTALL STREET LIGHT, SEE ELECTRICAL PLANS (E-2 S)
 - STREET LIGHT OR COMMON TRENCH, SEE ELECTRICAL PLANS
- IRRIGATION**
- INSTALL 1-8" & 2-4" SDR 35 PVC IRRIG. SLEEVES (U-18 S)
 - INSTALL 2-4" SDR 35 PVC IRRIG. SLEEVES (U-18 S)
- TRAFFIC**
- INSTALL 2" INTERCONNECT (E-32 S)
 - INSTALL No. 5 PULLBOX (E-32 S)



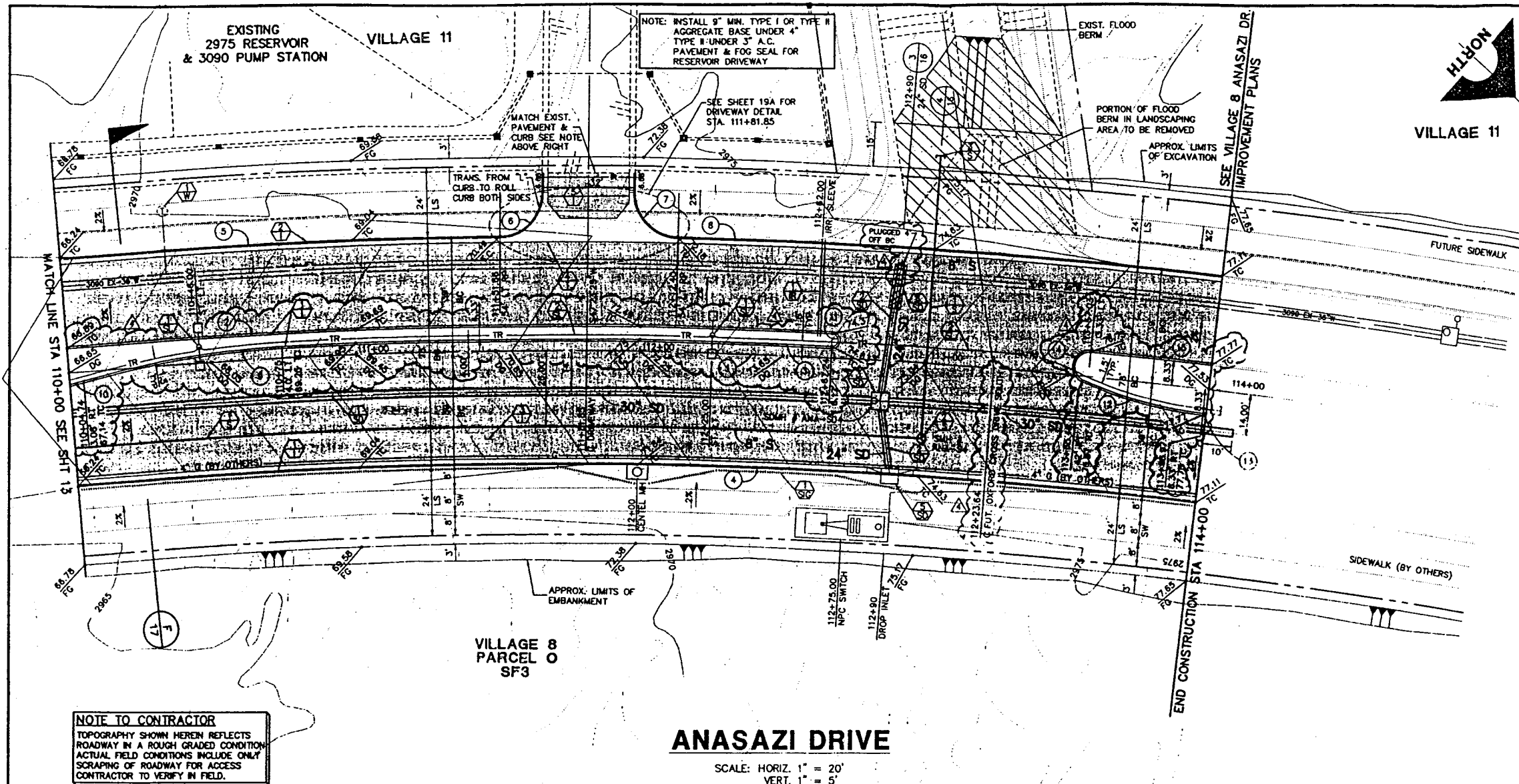
APPROVAL:

RECOMMENDED
BY: A. HUGHES
DATE: 10/25/74
REVISED: 10/25/74
BY: A. HUGHES
DATE: 10/25/74
REVISED: 10/25/74
BY: A. HUGHES
DATE: 10/25/74
REVISED: 10/25/74

REGISTERED PROFESSIONAL ENGINEER - STATE OF NEVADA
G.C. WALLACE, INC.
Engineering/Architecture
1235 SOUTH RICHMOND AVENUE, LAS VEGAS, NEVADA 89102

SUMMERLIN
TOWN CENTER DRIVE - UNIT 3
ANASAZI DRIVE
PLAN & PROFILE
STA 105+00 TO 110+00

SHEET
13



CURVE DATA

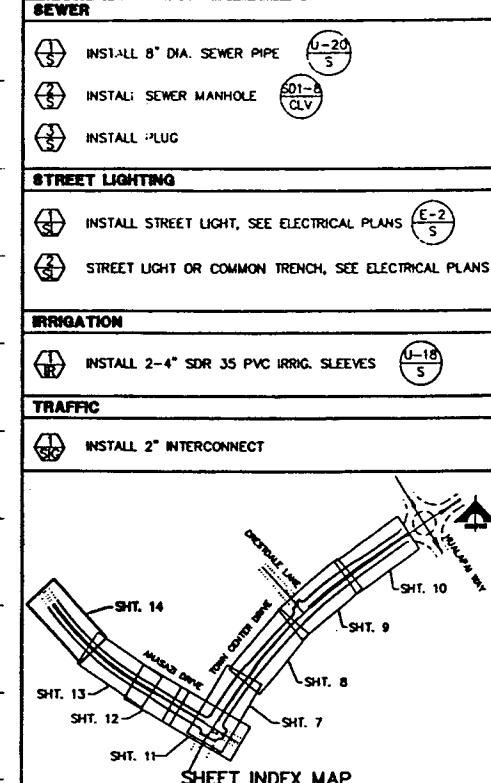
NO.	Δ	R	L	T	DESCRIPTION
1	11°27'33"	2000.00'	400.00'	200.67'	CENTERLINE
2	07°39'21"	2008.33'	268.35'	134.37'	ISBC
3	05°30'27"	2004.00'	192.63'	96.39'	ISBC
4	11°27'33"	1961.00'	392.20'	196.76'	BC
5	04°20'41"	2039.00'	154.82'	77.35'	BC
6	89°08'08"	15.00'	23.34'	14.78'	BC
7	89°08'08"	15.00'	23.34'	14.78'	BC
8	05°23'05"	2039.00'	191.63'	95.89'	BC
9	13°31'12"	300.00'	70.79'	35.56'	ISBC
10	00°55'07"	300.00'	4.81'	2.40'	ISBC
11	180°00'00"	2.17'	6.80'	infinite	ISBC
12	118°50'31"	150.00'	44.09'	22.21'	ISBC
13	00°01'45"	1991.67'	1.02'	0.51'	ISBC
14	16°57'23"	5.00'	14.13'	31.49'	ISBC
15	01°13'51"	2008.33'	43.15'	21.57'	ISBC

BC = BACK OF CURB
ISBC = ISLAND BACK OF CURB

- CONSTRUCTION NOTES**
- IMPROVEMENTS**
- INSTALL "A" TYPE CURB
 - INSTALL "L" TYPE CURB & GUTTER
 - INSTALL AC PAVEMENT PER SECTION 511.17

- WATER**
- ADJUST EXIST. TEST STATION TO GRADE
- STORM DRAIN**
- INSTALL 30" DIA. STORM DRAIN PIPE
 - INSTALL 24" DIA. STORM DRAIN PIPE
 - INSTALL STORM DRAIN MANHOLE
 - INSTALL 6" TYPE "A" DROP INLET
 - INSTALL CONCRETE ENCASEMENT

- SEWER**
- INSTALL 8" DIA. SEWER PIPE
 - INSTALL SEWER MANHOLE
 - INSTALL PLUG
- STREET LIGHTING**
- INSTALL STREET LIGHT, SEE ELECTRICAL PLANS
 - STREET LIGHT OR COMMON TRENCH, SEE ELECTRICAL PLANS
- IRRIGATION**
- INSTALL 2-4" SDR 35 PVC IRRIG. SLEEVES
- TRAFFIC**
- INSTALL 2" INTERCONNECT



RECORD DRAWINGS
G.C. WALLACE, INC.
THESE PLANS SHOW RECORD INFORMATION RECEIVED FROM:
CONTRACTOR: WALLS-CARGO, INC.
DATE: _____
THIS DATA MAY OR MAY NOT REFLECT THE ACTUAL FIELD LOCATIONS. ALL DATA SHOULD BE CONFIRMED PRIOR TO USE ON DEVELOPMENT OR ENGINEERING PLANS.
PROJECT MANAGER REVIEW
BY: _____ DATE: _____

APPROVAL:
LAS VEGAS VALLEY WATER DISTRICT
DATE: _____

ENGINEER'S STATE OF MIND
G.C. WALLACE, INC.
Engineering Architecture
10258
DATE: _____
REV. NO. _____
DATE: _____

SUMMERLIN TOWN CENTER DRIVE - UNIT 3
ANASAZI DRIVE
PLAN & PROFILE
STA 110+00 TO 114+00

SHEET 14
SHEET 14 OF 18

TOWN CENTER DRIVE

ALTA TO CHARLESTON

HYDRAULIC GRADE LINE CALCULATIONS
TOWN CENTER DRIVE
STA 433+36.18 TO STA 426+37.26

STA	LENGTH	INVERT	DEPTH	DIA	AREA	Q100	V	V HEAD	K	Sf	hf	h _m	h _t	HGL	EGL	MANNING	TOP	FG
43336.2	0.0	43.56	3.00	3.0	7.1	59	8.35	1.08	667	0.0078		0.00	0.00	46.06	47.14	0.013	46.56	55.8
43000.0	336.2	46.66	2.05	3.0	7.1	59	8.35	1.08	667	0.0078	2.63	0.02	2.65	48.71	49.80	0.013	49.66	60.9
42637.3	362.7	50.00	1.57	3.0	7.1	59	8.35	1.08	667	0.0078	2.84	0.02	2.86	51.57	52.66	0.013	53.00	69.8

HYDRAULIC GRADE LINE CALCULATIONS
TOWN CENTER DRIVE
STA 433+36.2 TO STA 442+00

STA	LENGTH	INVERT	DEPTH	DIA	AREA	Q100	V	V HEAD	K	Sf	hf	h _m	h _t	HGL	EGL	MANNING	TOP	FG
43336.2	0.0	39.79	2.00	2.0	3.1	33	10.51	1.72	226	0.0213		0.00	0.00	41.79	43.51	0.013	41.79	56.3
43400.0	63.8	41.20	2.00	2.0	3.1	33	10.51	1.72	226	0.0213	1.36		1.36	43.20	44.86	0.013	43.20	56.1
43444.1	44.1	42.18	2.00	2.0	3.1	33	10.51	1.72	226	0.0213	0.94	0.02	0.96	44.18	45.82	0.013	44.18	55.5
43775.0	330.9	50.10	2.00	2.0	3.1	33	10.51	1.72	226	0.0213	7.05	0.02	7.07	52.10	52.89	0.013	52.10	58.9
43900.0	125.0	53.14	2.00	2.0	3.1	33	10.51	1.72	226	0.0213	2.66		2.66	55.14	56.64	0.013	55.14	61.2
44200.0	300.0	60.38	2.00	2.0	3.1	33	10.51	1.72	226	0.0213	6.39	0.02	6.41	62.38	63.10	0.013	62.38	66.8

AMENDMENT NO 1 TO THE DRAINAGE STUDY FOR TOWN CENTER DRIVE ROUGH GRADING

HYDRAULIC GRADE LINE CALCULATIONS
TOWN CENTER DRIVE OUTLET
STA 433+36.38

STA	LENGTH	INVERT	DEPTH	DIA	AREA	Q100	V	V HEAD	K	Sf	hf	hm	ht	HGL	EGL	MANNING	TOP	FG
0.0	0.0	32.02	8.00	3.0	7.1	92	13.02	2.63	667	0.0190		0.00	0.00	40.02	42.65	0.013	35.02	35.0
80.5	80.5	38.79	3.00	3.0	7.1	92	13.02	2.63	667	0.0190	1.53		1.53	41.79	44.42	0.013	41.79	55.8

HYDRAULIC GRADE LINE CALCULATIONS
STREET "C" LATERAL
STA 426+37.2

STA	LENGTH	INVERT	DEPTH	DIA	AREA	Q100	V	V HEAD	K	Sf	hf	hm	ht	HGL	EGL	MANNING	TOP	FG
0.0	0.0	50.50	11.40	2.5	4.9	59	12.03	2.25	410	0.0207		1.32	1.32	61.90	64.15	0.013	53.00	69.8
139.5	139.5	52.91	11.90	2.5	4.9	59	12.03	2.25	410	0.0207	2.89	0.02	2.91	64.81	67.05	0.013	55.41	69.5
158.5	19.0	53.29	11.91	2.5	4.9	59	12.03	2.25	410	0.0207	0.39		0.39	65.20	67.45	0.013	55.79	69.4

SUMMERLIN



TOWN CENTER DRIVE IMPROVEMENT PLANS

STA. 450+80.00 TO 421+10.28
ALTA DR. TO CHARLESTON BLVD.
1995

DEVELOPER

HOWARD HUGHES PROPERTIES LIMITED PARTNERSHIP,
• DELAWARE limited partnership
By its sole general partner,
The HOWARD HUGHES CORPORATION,
• DELAWARE corporation

ENGINEER



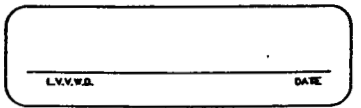
G.C. WALLACE, INC.
Engineering/Architecture

1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102
TELEPHONE: NCL (702) 363-1200

ISSUED FOR PRICING 10-04-95

FINAL SUBMITTAL

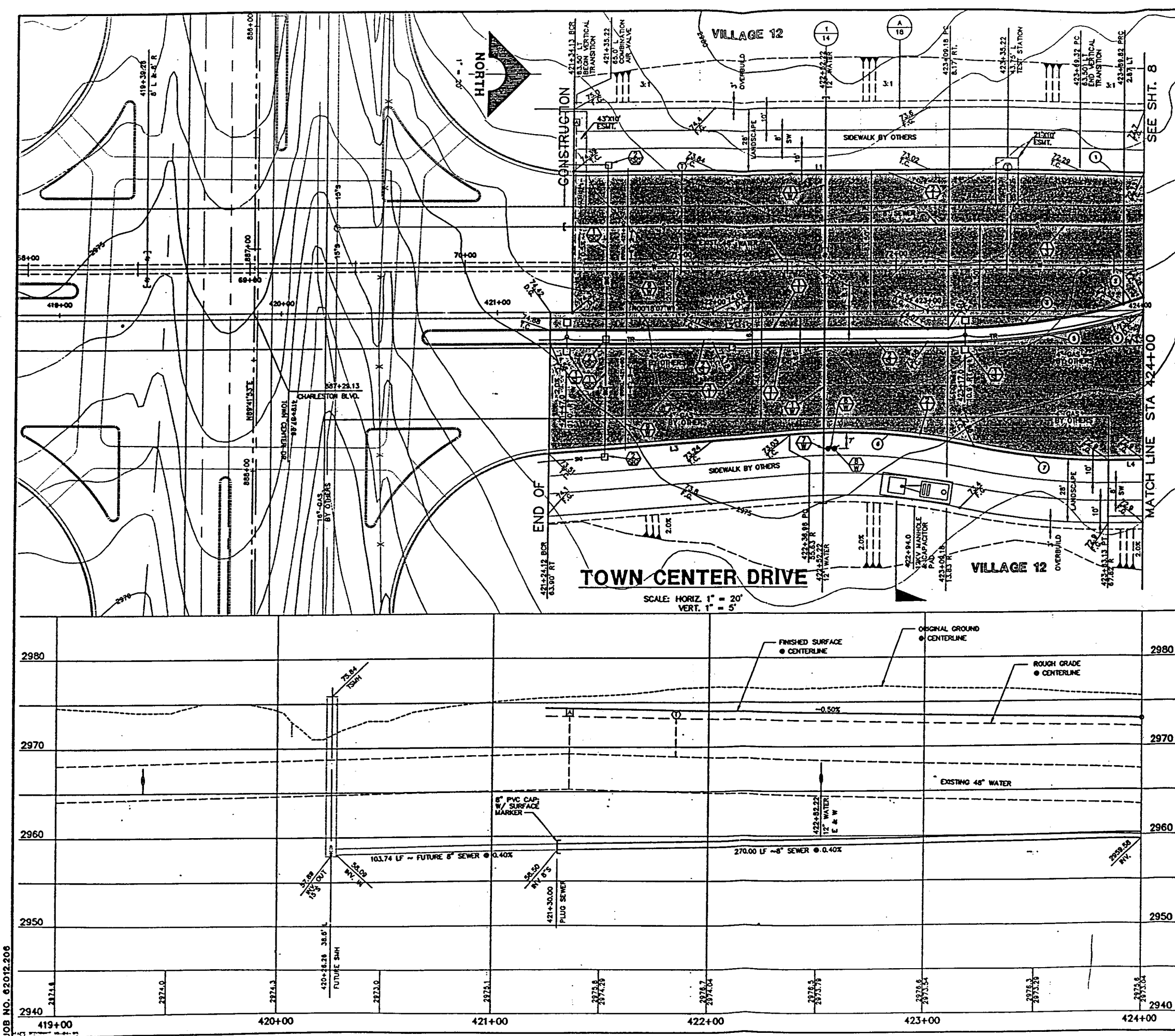
1. ALL BARRICADE AND TEMPORARY TRAFFIC CONTROL DEVICES OR METHODS USED DURING CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE "NEVADA TRAFFIC CONTROL MANUAL", MOST RECENT EDITION, PUBLISHED BY THE STATE OF NEVADA DEPARTMENT OF HIGHWAYS. ALL SUCH DEVICES OR METHODS SHALL BE IN ACCORDANCE WITH AS REQUIRED BY THE ENGINEER.
2. AT THE TIME OF PRE-CONSTRUCTION CONFERENCE, THE CONTRACTOR SHALL FURNISH FOR APPROVAL, A TRAFFIC BARRICADE PLAN AND METHOD OF MAINTAINING PUBLIC CONVENIENCE AND SAFETY THROUGHOUT THE CONSTRUCTION AREA. TRAFFIC BARRICADE PLANS SHALL COMPLY WITH APPLICABLE PORTIONS OF SECTIONS 624 AND 625 OF THE NEVADA STATUTES, THE TRAFFIC CONTROL MANUAL, AND APPLICABLE CITY ORDINANCES.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE VERTICAL ADJUSTMENT OF EXISTING CURBS, GUTTERS AND STORM DRAIN MANHOLES TO THE FINAL FINISH GRADES AS NOTED ON THE CONTRACT DRAWINGS, AND IN ACCORDANCE WITH SECTION 606 OF THE "STANDARD SPECIFICATIONS," AND ANY VERTICAL ADJUSTMENTS SHALL BE TO THE FINISH GRADE. STANDARD SPECIFICATIONS SHALL BE IN ACCORDANCE WITH THE DETAILS SHOWN ON THE CONTRACT DRAWINGS.
4. NOTICES GRADING AUTHORIZED ONLY AFTER PERMITTEE'S FULL COMPLIANCE WITH FEDERAL EXHAUSTION SPICES ACT.
5. THE DESIGN GRADE (DG) INDICATED ON THESE PLANS IS FOR VERTICAL ELEVATION CALCULATION PURPOSES ONLY AND DOES NOT NECESSARILY REPRESENT THE FINISH IMPROVEMENT GRADES OR CENTERLINE, (I.E. THRU MEDIAN AREAS), SEE STANDARD STREET SECTIONS ON SHEET 10.



PLACES 100-302 PAGE 01/07/02

SHEET 5 OF 20	5	SHEET	SUMMERLIN TOWN CENTER DRIVE STORM DRAIN MASTER PLAN	 G.C. WALLACE, INC. Engineering/Architecture	225 SOUTH HUNTER AVENUE SUITE 200 ANAHEIM, CALIFORNIA 92805 (714) 771-1111	REGISTERED PROFESSIONAL ENGINEER - STATE OF CALIFORNIA LICENSE NO. 40000 DATE 01/01/01	RECOMMENDED SUPERVISOR'S NAME APPROVED DATE	REVIEWER DATE	DATE	APPROVAL

JOB NO. 62012.206



CURVE DATA

① INDICATES CURVE NUMBER

CURVE	DELTA	RADIUS	LENGTH	TANGENT
1	68.37°	300.00'	30.74'	15.00'
2	123.00°	300.00'	10.57'	5.28'
3	123.00°	300.00'	10.57'	5.28'
4	123.00°	300.00'	10.57'	5.28'
5	123.00°	300.00'	10.57'	5.28'
6	123.00°	300.00'	10.57'	5.28'
7	123.00°	300.00'	10.57'	5.28'
8	123.00°	300.00'	10.57'	5.28'
9	123.00°	300.00'	10.57'	5.28'
10	123.00°	300.00'	10.57'	5.28'
11	123.00°	300.00'	10.57'	5.28'
12	123.00°	300.00'	10.57'	5.28'

LINE BEARING DISTANCE

LINE	BEARING	DISTANCE
1	N00°18'07"W	23.35'
2	N00°18'07"W	18.81'
3	N00°18'07"W	11.13'
4	N00°18'07"W	14.87'

CONSTRUCTION NOTES

- IMPROVEMENTS
- ① INSTALL "A" TYPE CURB (S-50)
 - ② INSTALL "L" TYPE CURB & CUTTER (S-47)
 - ③ INSTALL AC PAVEMENT PER SECTION SHT. 18
 - ④ INSTALL CROSSWALK (S-78)
 - ⑤ INSTALL DEPRESSED CURB (1/18)

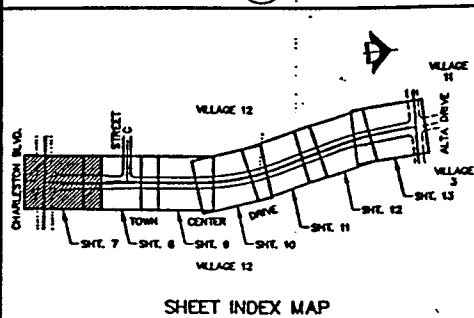
- WATER
- ⑥ INSTALL 12" DIA. WATER PIPE (U-20)
 - ⑦ INSTALL 16" DIA. WATER PIPE (U-20)
 - ⑧ INSTALL 12" DIA. GATE VALVE & BOX (U-34)
 - ⑨ INSTALL 16" DIA. GATE VALVE & BOX (U-34)
 - ⑩ INSTALL 2" TEMP. BLOW-OFF (U-32)
 - ⑪ INSTALL 6" DIA. WATER PIPE (U-20)
 - ⑫ INSTALL 6" GATE VALVE @ 12"x6" TEE (U-20)
 - ⑬ INSTALL FIRE HYDRANT (U-33)
 - ⑭ INSTALL IRRIGATION SLEEVE (U-18)

- STORM DRAIN
- ⑮ INSTALL 24" DIA. STORM DRAIN PIPE (U-20)
 - ⑯ INSTALL 36" DIA. STORM DRAIN PIPE (U-20)
 - ⑰ INSTALL 48" DIA. STORM DRAIN PIPE (U-20)
 - ⑱ INSTALL 54" DIA. STORM DRAIN PIPE (U-20)
 - ⑲ INSTALL 60" DIA. STORM DRAIN PIPE (U-20)
 - ⑳ INSTALL STORM DRAIN MANHOLE (D1.05)
 - ㉑ INSTALL 6" TYPE "A" DROP INLET (D-12)

- SEWER
- ㉒ INSTALL 6" DIA. SEWER PIPE (U-20)
 - ㉓ INSTALL SEWER MANHOLE (S01-3 CLV)

- STREET LIGHTING
- ㉔ INSTALL STREET LIGHT, SEE ELECTRICAL PLANS (E-2)
 - ㉕ STREET LIGHT OR COMMON TRENCH, SEE ELECTRICAL PLANS

- TRAFFIC
- ㉖ INSTALL 2-3" CONDUIT
 - ㉗ INSTALL NO. 5 PULLBOX (E-32)



APPROVAL: _____ DATE _____

LAS VEGAS VALLEY WATER DISTRICT

RECOMMENDED BY: _____ DATE: _____

APPROVED BY: _____ DATE: _____

ENGINEER: STATE OF NEVADA

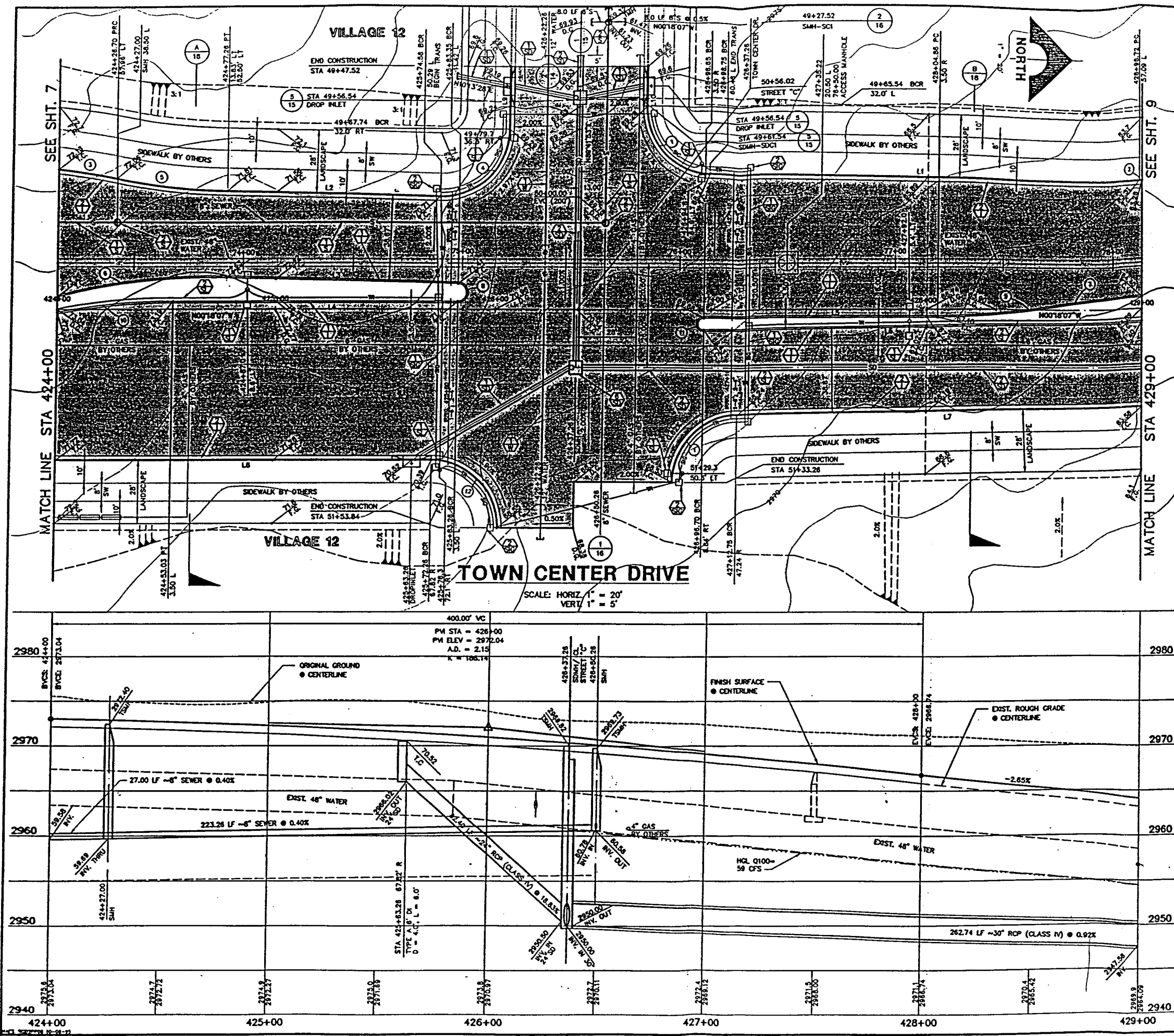
G.C. WALLACE, INC.
Engineering/Architecture

SUMMERLIN
TOWN CENTER DRIVE
TOWN CENTER DR. - ALTA TO CHARLESTON
PLAN & PROFILE
STA 421+10.28 TO 424+00

SHEET 7 OF 20

FINAL SUBMITTAL

JOB NO. 62012.206



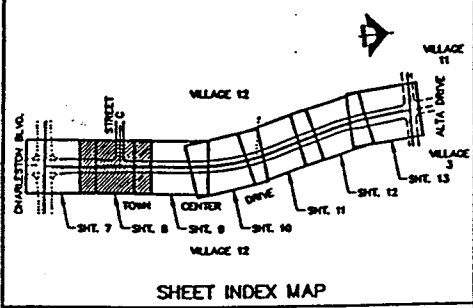
CURVE DATA

CURVE	DELTA	RADIUS	LENGTH	TANGENT
1	89°01'47"	200.00'	28.50'	28.50'
2	93°01'25"	200.00'	27.00'	27.00'
3	91°11'07"	200.00'	27.00'	27.00'
4	90°43'30"	200.00'	27.00'	27.00'
5	90°43'30"	200.00'	27.00'	27.00'
6	90°43'30"	200.00'	27.00'	27.00'
7	90°43'30"	200.00'	27.00'	27.00'
8	90°43'30"	200.00'	27.00'	27.00'
9	90°43'30"	200.00'	27.00'	27.00'
10	90°43'30"	200.00'	27.00'	27.00'
11	90°43'30"	200.00'	27.00'	27.00'
12	90°43'30"	200.00'	27.00'	27.00'
13	90°43'30"	200.00'	27.00'	27.00'
14	90°43'30"	200.00'	27.00'	27.00'
15	90°43'30"	200.00'	27.00'	27.00'
16	90°43'30"	200.00'	27.00'	27.00'

LINE BEARING DISTANCE

LINE	BEARING	DISTANCE
1	N00°40'11"E	200.00'
2	N01°00'00"E	27.00'
3	N01°00'00"E	27.00'
4	N01°00'00"E	27.00'
5	N01°00'00"E	27.00'
6	N01°00'00"E	27.00'
7	N01°00'00"E	27.00'
8	N01°00'00"E	27.00'
9	N01°00'00"E	27.00'
10	N01°00'00"E	27.00'
11	N01°00'00"E	27.00'
12	N01°00'00"E	27.00'
13	N01°00'00"E	27.00'
14	N01°00'00"E	27.00'
15	N01°00'00"E	27.00'
16	N01°00'00"E	27.00'

- CONSTRUCTION NOTES
- IMPROVEMENTS
- INSTALL "A" TYPE CURB (S-50)
 - INSTALL "L" TYPE CURB & GUTTER (S-47)
 - INSTALL AC PAVEMENT PER SECTION SHT. 16
 - INSTALL CROSSWALK (S-78)
 - INSTALL DEPRESSED CURB (S-16)
- WATER
- INSTALL 12" DIA. WATER PIPE (U-20)
 - INSTALL 16" DIA. WATER PIPE (U-20)
 - INSTALL 12" DIA. GATE VALVE & BOX (U-34)
 - INSTALL 16" DIA. GATE VALVE & BOX (U-34)
 - INSTALL 2" TEMP. BLOW-OFF (U-32)
- STORM DRAIN
- INSTALL 24" DIA. STORM DRAIN PIPE (U-20)
 - INSTALL 30" DIA. STORM DRAIN PIPE (U-20)
 - INSTALL 48" DIA. STORM DRAIN PIPE (U-20)
 - INSTALL 54" DIA. STORM DRAIN PIPE (U-20)
 - INSTALL 60" DIA. STORM DRAIN PIPE (U-20)
 - INSTALL STORM DRAIN MANHOLE (D-12)
 - INSTALL 6" TYPE "A" DROP INLET (D-12)
- SEWER
- INSTALL 8" DIA. SEWER PIPE (U-20)
 - INSTALL SEWER MANHOLE (D-12)
- STREET LIGHTING
- INSTALL STREET LIGHT, SEE ELECTRICAL PLANS (E-2)
 - STREET LIGHT OR COMMON TRENCH, SEE ELECTRICAL PLANS
- TRAFFIC
- INSTALL 2-3" CONDUIT
 - INSTALL NO. 5 PULLBOX (E-32)



APPROVAL:

LAS VEGAS VALLEY WATER DISTRICT

DATE:

FINAL SUBMITTAL

RECOMMENDED BY: [Signature]

DESIGNED BY: [Signature]

CHECKED BY: [Signature]

DATE: [Date]

SCALE: HORIZ. 1" = 20'

VERT. 1" = 5'

G.C. WALLACE, INC.

Engineering/Architecture

SEE SOUTH ARROW & VILLAGE 12 FOR ALTA DRIVE

SUMMERLIN

TOWN CENTER DRIVE

TOWN CENTER DR. - ALTA TO CHARLESTON

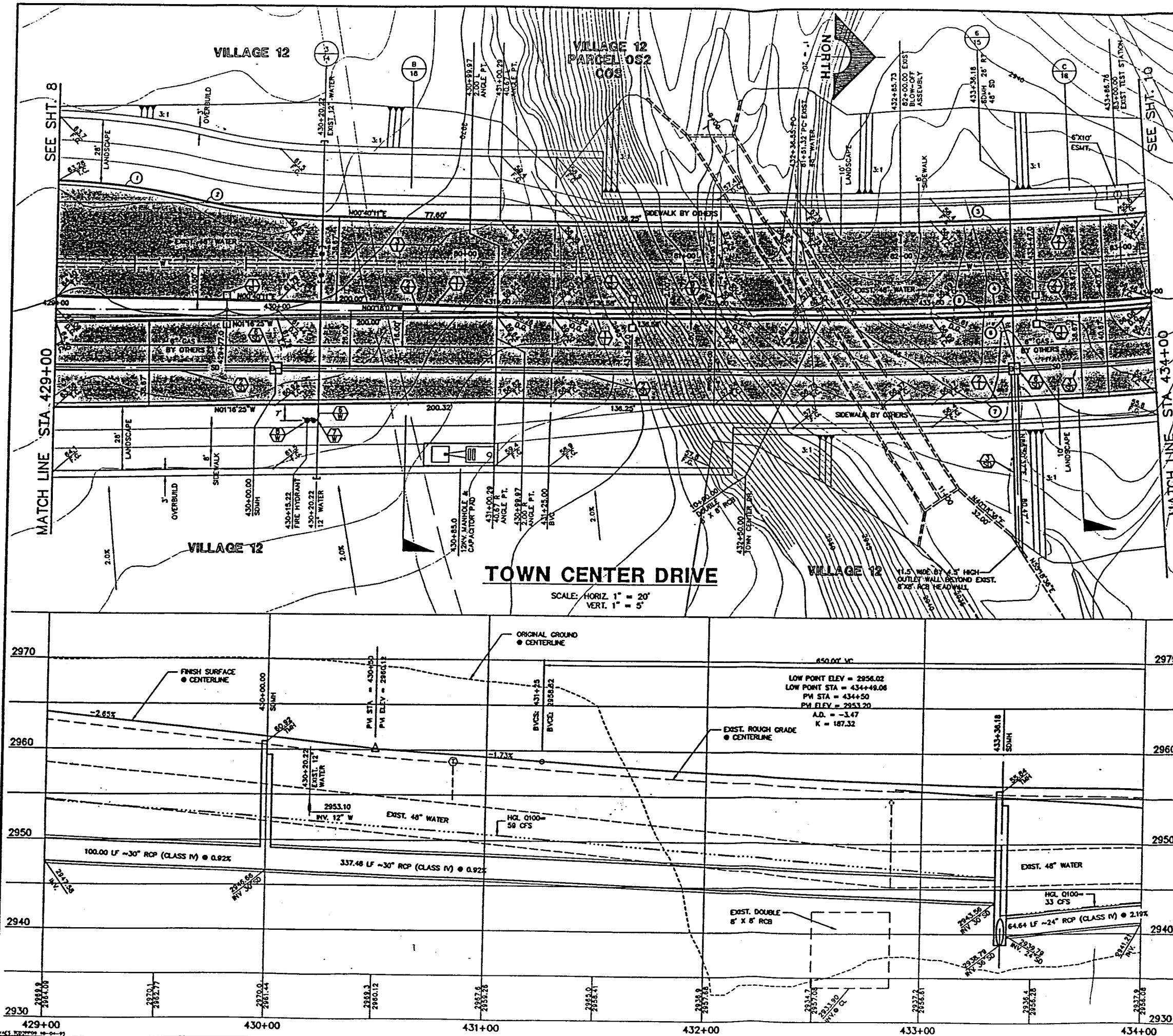
PLAN & PROFILE

STA 424+00 TO 429+00

SHEET

8

SHT. 8 OF 20



CURVE DATA

CURVE	DELTA	RADIUS	LENGTH	TANGENT
1	11°42'17"	300.00'	61.29'	30.75'
2	11°56'55"	300.00'	62.82'	31.40'
3	04°40'57"	1998.00'	163.29'	81.69'
4	04°40'57"	1998.00'	163.29'	81.69'
5	04°40'57"	2000.00'	163.45'	81.77'
6	04°40'57"	2000.00'	163.45'	81.77'
7	04°40'57"	2040.67'	168.77'	83.43'

CONSTRUCTION NOTES

IMPROVEMENTS

- INSTALL "A" TYPE CURB (S-50)
- INSTALL "L" TYPE CURB & CUTTER (S-17)
- INSTALL AC PAVEMENT PER SECTION SHT. 16
- INSTALL CROSSWALK (S-78)
- INSTALL DEPRESSED CURB (1-16)

WATER

- INSTALL 12" DIA. WATER PIPE (U-20)
- INSTALL 16" DIA. WATER PIPE (U-20)
- INSTALL 12" DIA. GATE VALVE & BOX (U-34)
- INSTALL 16" DIA. GATE VALVE & BOX (U-34)
- INSTALL 2" TEMP. BLOW-OFF (U-32)
- INSTALL 6" DIA. WATER PIPE (U-20)
- INSTALL 6" GATE VALVE @ 12"x6" TEE (U-20)
- INSTALL FIRE HYDRANT (U-33)
- IRRIGATION SLEEVE (U-18)

STORM DRAIN

- INSTALL 24" DIA. STORM DRAIN PIPE (U-20)
- INSTALL 30" DIA. STORM DRAIN PIPE (U-20)
- INSTALL 48" DIA. STORM DRAIN PIPE (U-20)
- INSTALL 54" DIA. STORM DRAIN PIPE (U-20)
- INSTALL 60" DIA. STORM DRAIN PIPE (U-20)
- INSTALL STORM DRAIN MANHOLE (D-12)
- INSTALL 6" TYPE "A" DROP INLET (D-12)

SEWER

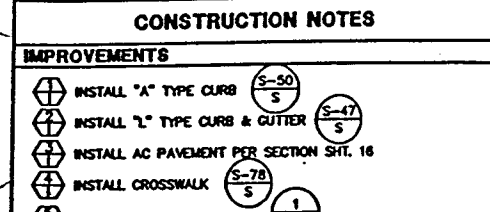
- INSTALL 8" DIA. SEWER PIPE (U-20)
- INSTALL SEWER MANHOLE (SD-1-8 CLV)

STREET LIGHTING

- INSTALL STREET LIGHT, SEE ELECTRICAL PLANS (E-2)
- STREET LIGHT OR COMMON TRENCH, SEE ELECTRICAL PLANS

TRAFFIC

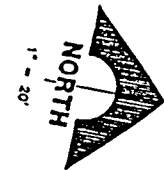
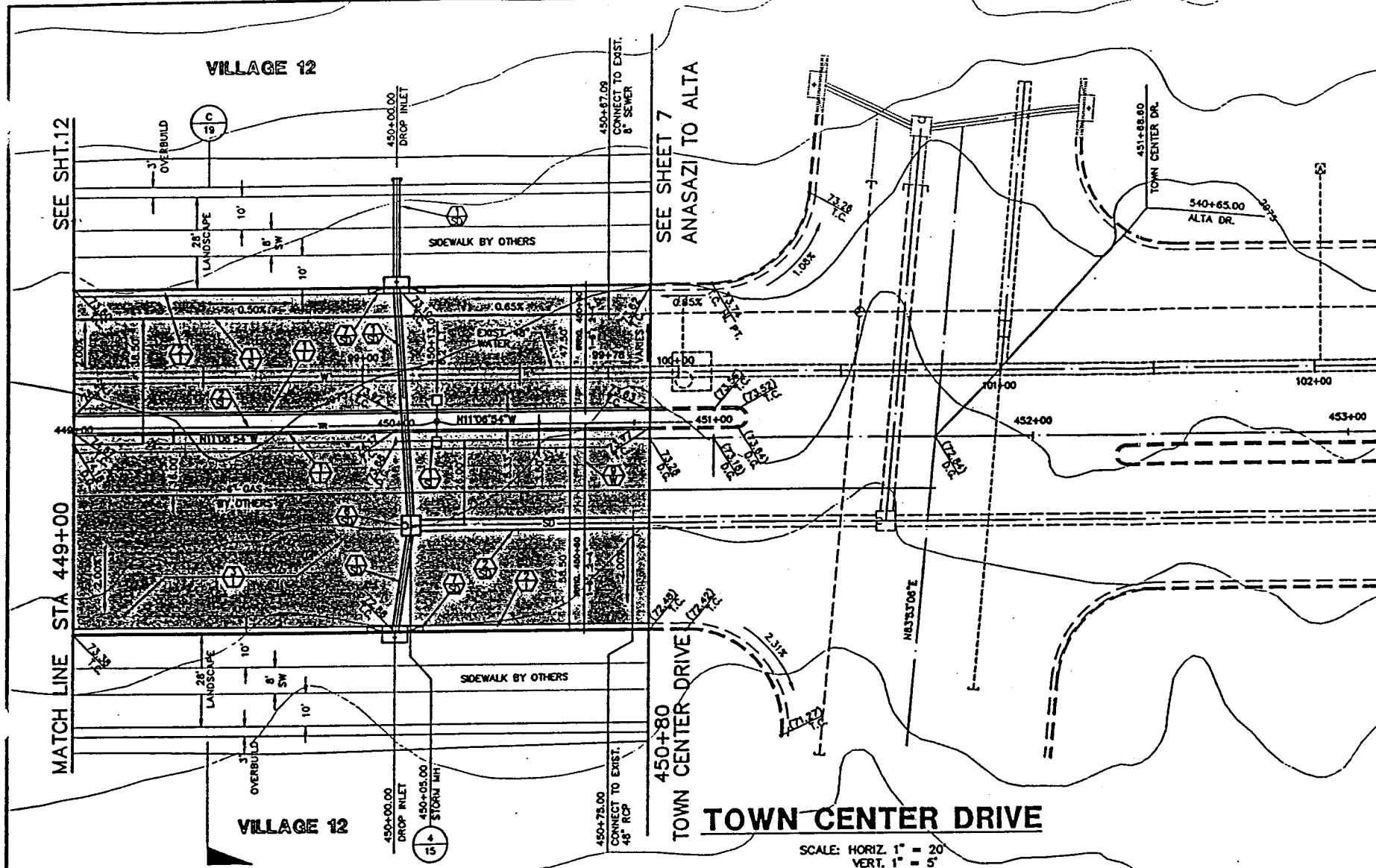
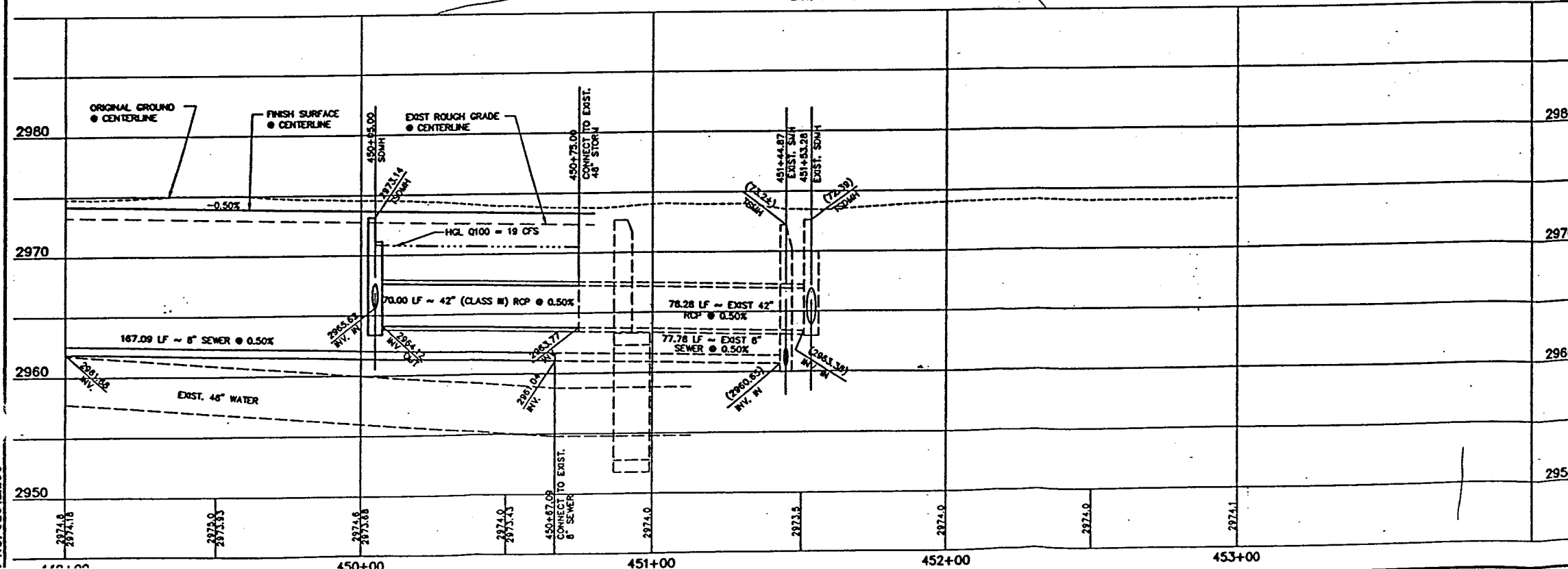
- INSTALL 1-3" CONDUIT
- INSTALL NO. 5 PULLBOX (E-37)



APPROVAL:

DATE:

[illegible]



CURVE DATA (1) INDICATES CURVE NUMBER

CURVE	DELTA	RADIUS	LENGTH	TANGENT

CONSTRUCTION NOTES

- IMPROVEMENTS**
- INSTALL "A" TYPE CURB (S-50)
 - INSTALL "L" TYPE CURB & GUTTER (S-47)
 - INSTALL AC PAVEMENT PER SECTION SHT. 16
 - INSTALL CROSSWALK (S-78)
 - INSTALL DEPRESSED CURB (1/16)

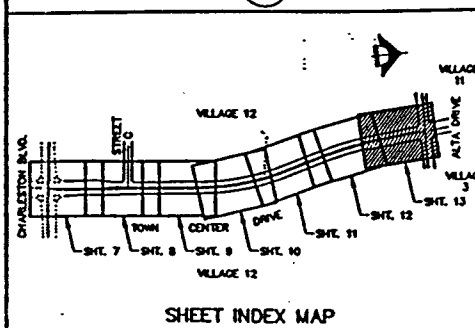
- WATER**
- INSTALL 12" DIA. WATER PIPE (U-20)
 - INSTALL 16" DIA. WATER PIPE (U-20)
 - INSTALL 12" DIA. GATE VALVE & BOX (U-34)
 - INSTALL 16" DIA. GATE VALVE & BOX (U-34)
 - INSTALL 2" TEMP. BLOW-OFF (U-32)
 - INSTALL 6" DIA. WATER PIPE (U-20)
 - INSTALL 6" GATE VALVE @ 12"x6" TEE (U-20)
 - INSTALL FIRE HYDRANT (U-33)
 - IRRIGATION SLEEVE (U-16)

- STORM DRAIN**
- INSTALL 24" DIA. STORM DRAIN PIPE (U-20)
 - INSTALL 42" DIA. STORM DRAIN PIPE (U-20)
 - INSTALL 48" DIA. STORM DRAIN PIPE (U-20)
 - INSTALL 54" DIA. STORM DRAIN PIPE (U-20)
 - INSTALL 60" DIA. STORM DRAIN PIPE (U-20)
 - INSTALL STORM DRAIN MANHOLE (D1.05)
 - INSTALL 6" TYPE "A" DROP INLET (D-12)

- SEWER**
- INSTALL 6" DIA. SEWER PIPE (U-20)
 - INSTALL SEWER MANHOLE (SD1-B CLV)

- STREET LIGHTING**
- INSTALL STREET LIGHT, SEE ELECTRICAL PLANS (E-2)
 - STREET LIGHT OR COMMON TRENCH, SEE ELECTRICAL PLANS

- TRAFFIC**
- INSTALL 1-3" CONDUIT
 - INSTALL NO. 5 PULLBOX (E-32)



SHEET INDEX MAP

APPROVAL: _____
 LAS VEGAS VALLEY WATER DISTRICT _____ DATE _____

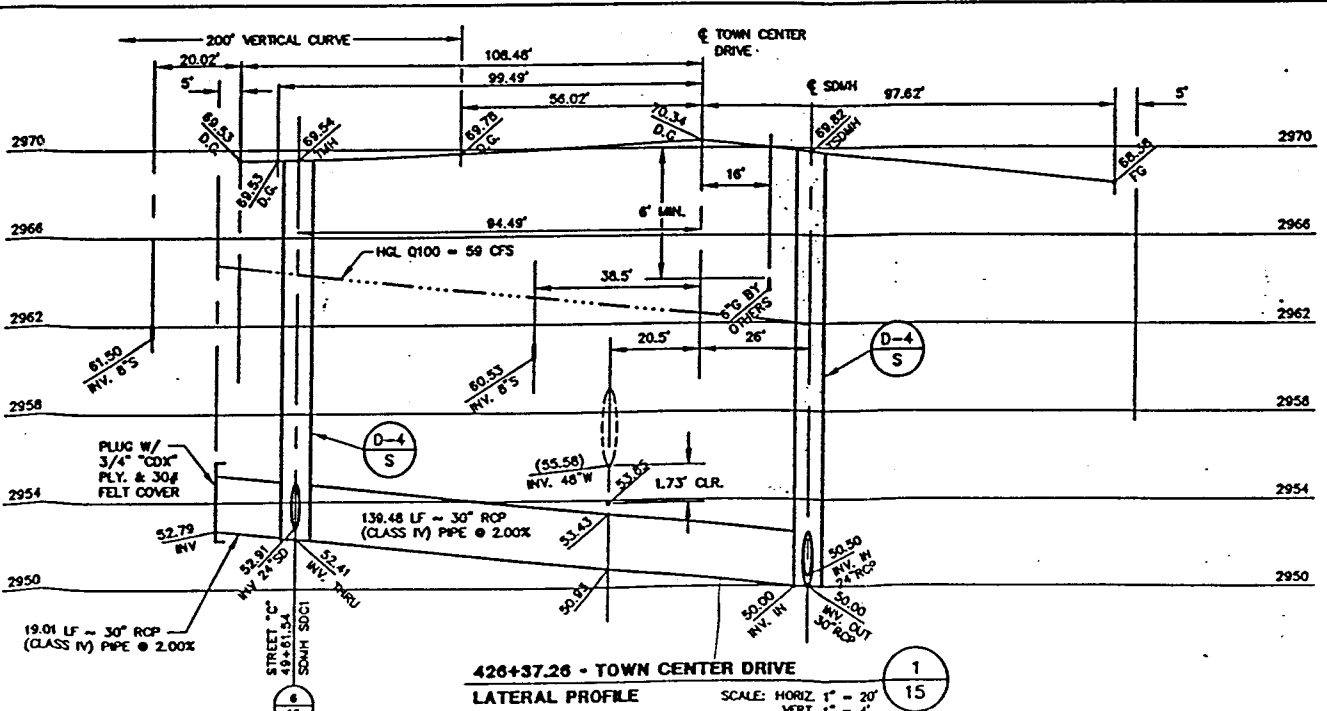
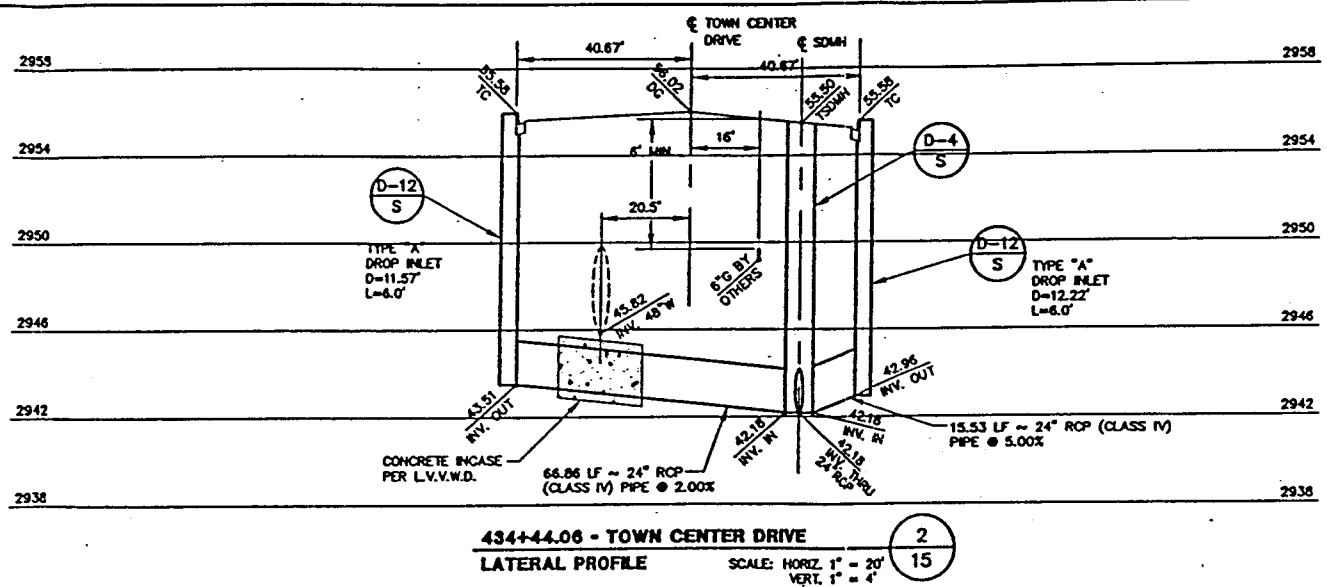
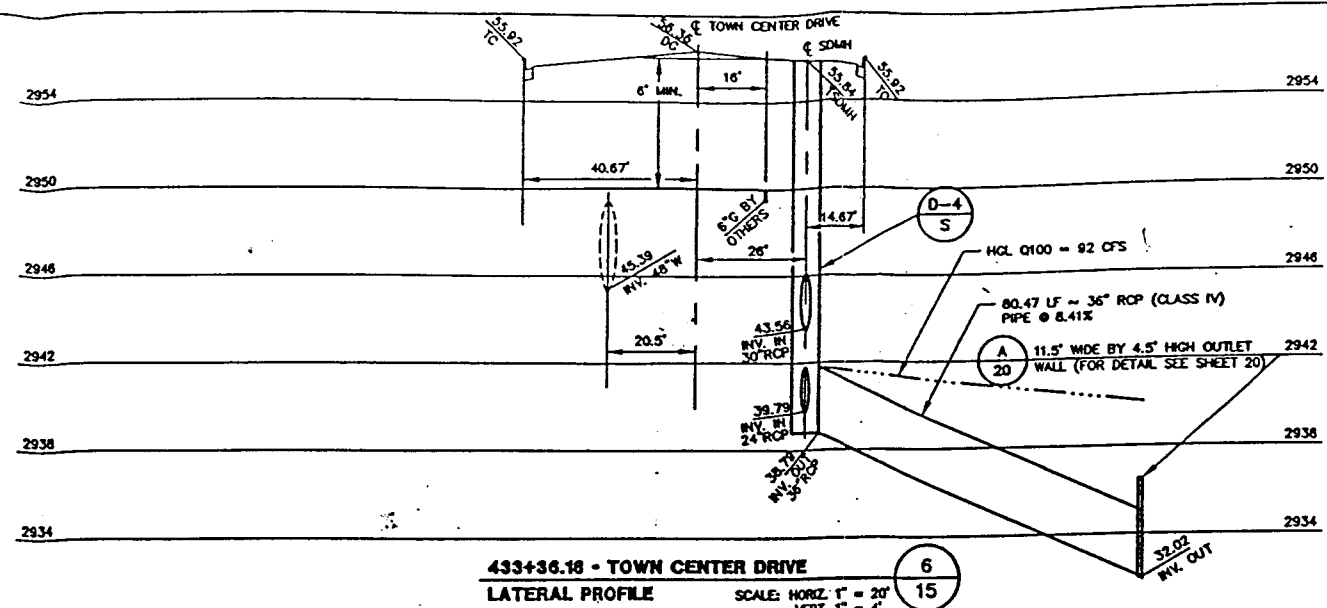
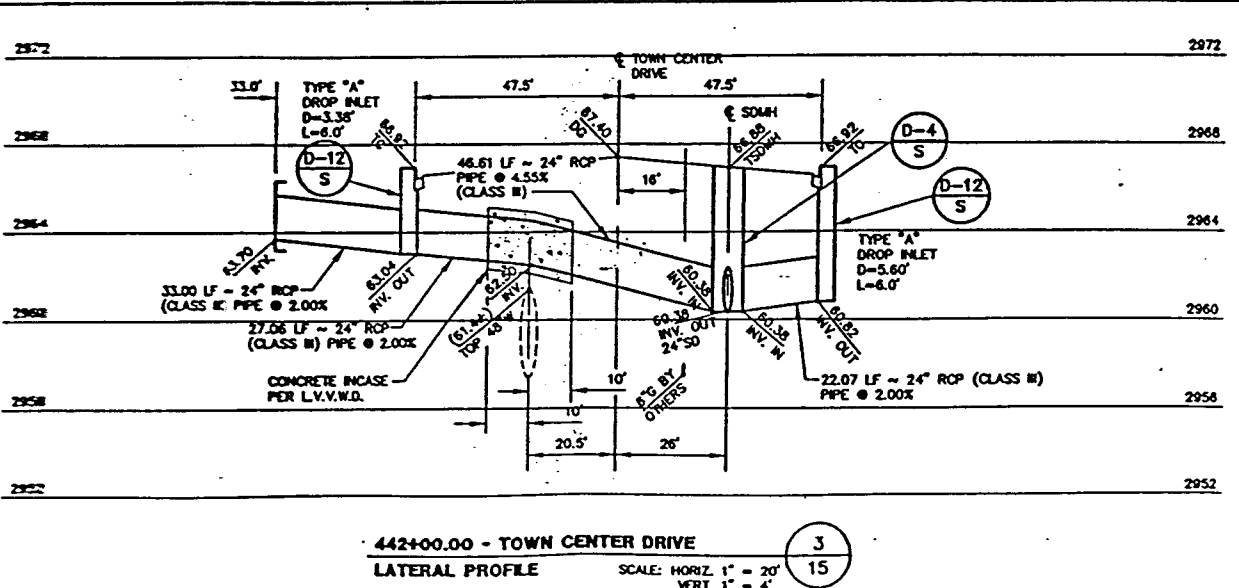
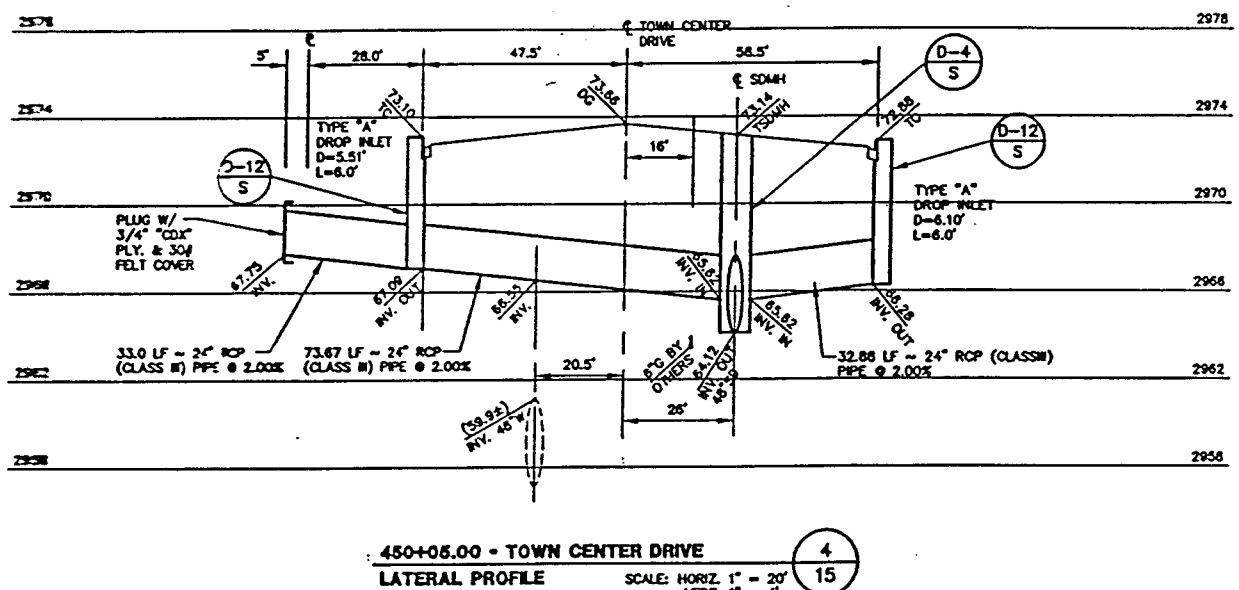
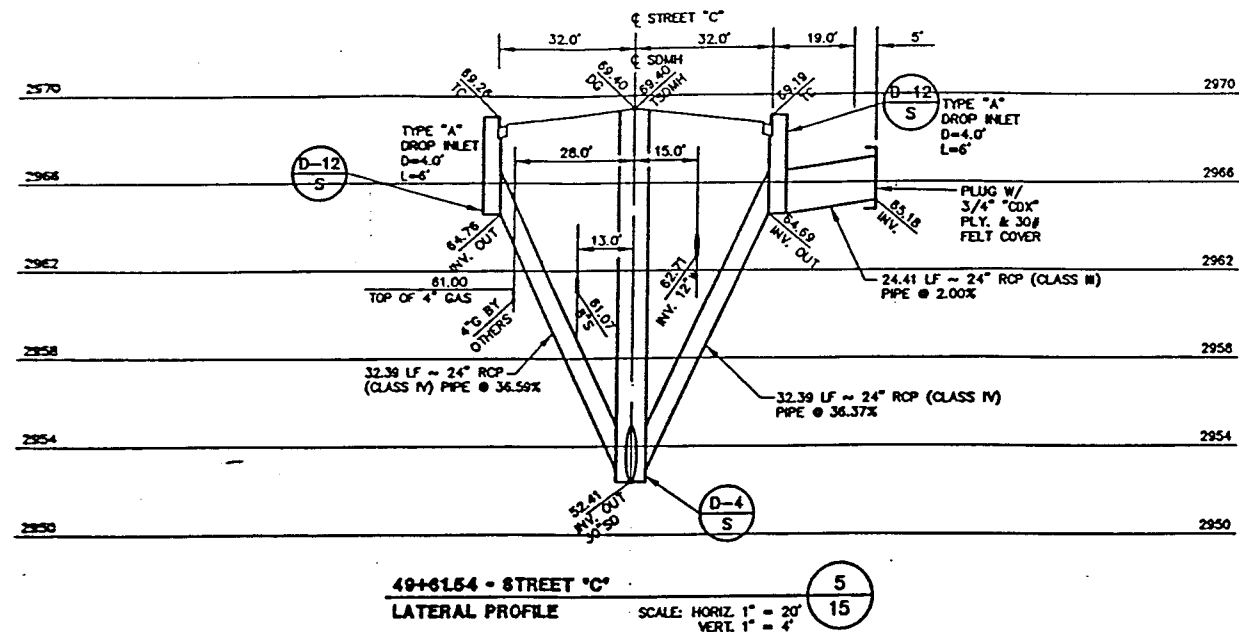


G.C. WALLACE, INC.
 Engineering/Architecture
 2225 SOUTH RABBIT BLVD. LAS VEGAS, NEVADA 89102

SUMMERLIN DRIVE
 TOWN CENTER DRIVE
 TOWN CENTER DRIVE - ALTA TO CHARLESTON
 PLAN & PROFILE
 STA 449+00 TO 450+80

SHEET
13
 SHT 13 OF 20

FINAL SUBMITTAL

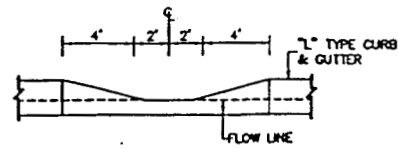


RECOMMENDED	APPROVED	DATE	DESCRIPTION
CHRISTOPHER R. ANDERSON	CHRISTOPHER R. ANDERSON	07/11/12	FINAL SUBMITTAL

STATE OF KENTUCKY
DEPARTMENT OF HIGHWAYS
DESIGNED BY: CHRISTOPHER R. ANDERSON
CHECKED BY: G.C. WALLACE, INC.
DATE: 07/11/12

G.C. WALLACE, INC.
Engineering/Architecture
100 SOUTH MAIN STREET, SUITE 200, CHARLESTON, KY 40301
TEL: 606/261-1111 FAX: 606/261-1112

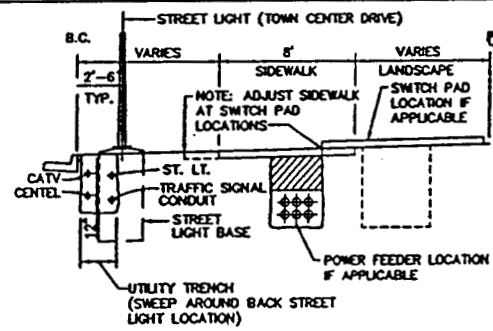
SHEET 15
15
SHEET 15 OF 20



DEPRESSED CURB DETAIL
SCALE: N.T.S.

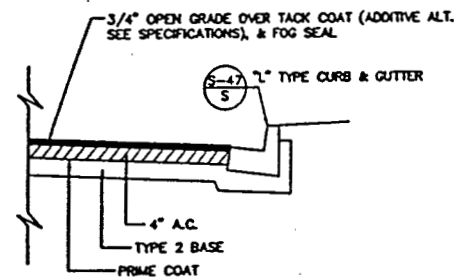
SEE 5-75
S

8
1



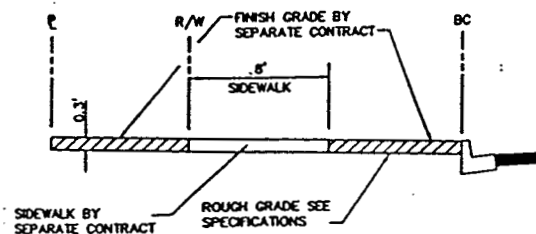
TYPICAL UTILITY LOCATION DETAIL
SCALE: N.T.S.

7
1



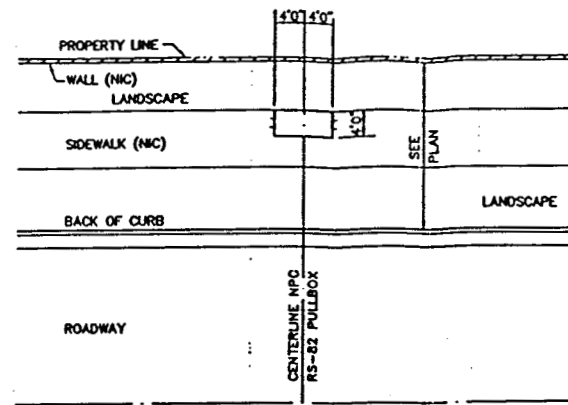
A.C. OVERLAY DETAIL
SCALE: N.T.S.

6
1



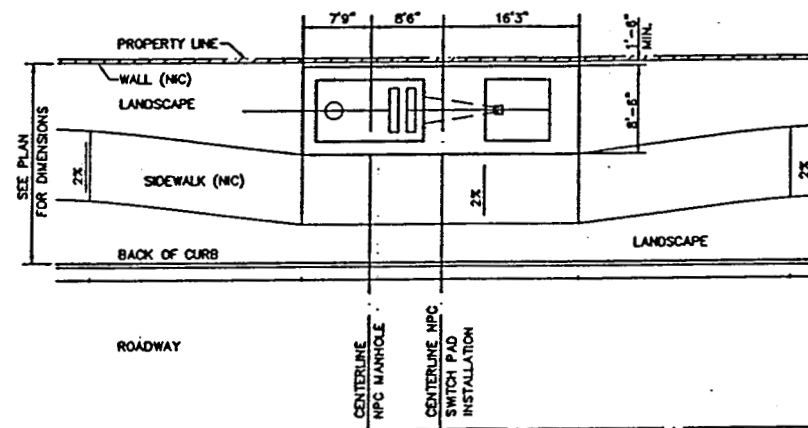
FINE GRADING DETAIL
SCALE: N.T.S.

5
1



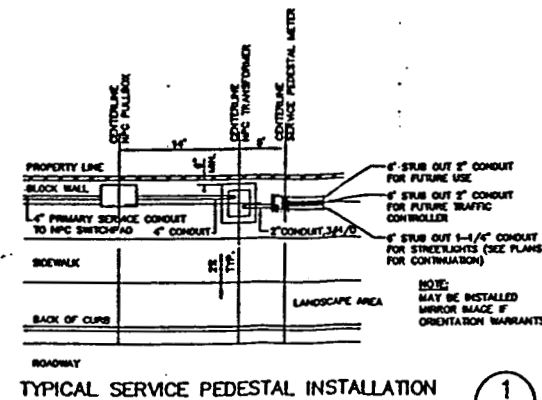
TYPICAL NPC PULL BOX LOCATION

3
1



TYPICAL SIDEWALK LAYOUT AT SWITCH PADS

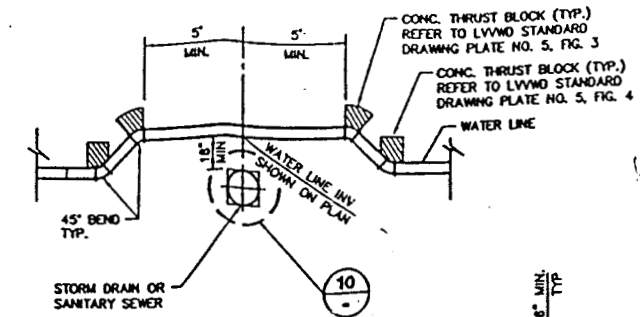
2
1



TYPICAL SERVICE PEDESTAL INSTALLATION

1
1

TYPICAL N.P.C. DETAILS
SCALE: N.T.S.
(FOR REFERENCE ONLY)

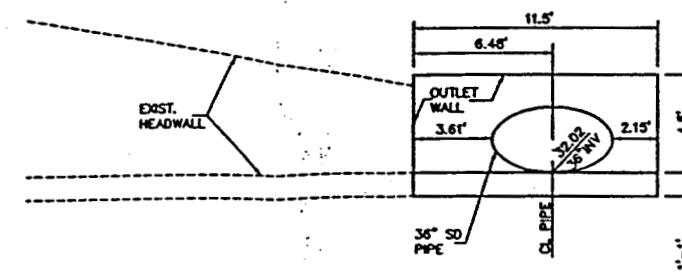


WATER - STORM DRAIN CROSS OVER DETAIL

9
20

CONC. ENCASEMENT DETAIL
SCALE: N.T.S.

10
1



STORM DRAIN OUTLET DETAIL

A
20

APPROVAL:

LAS VEGAS VALLEY WATER DISTRICT

DATE

REV.	DATE	DESCRIPTION	APPROVAL
1	07/11/20	ISSUED FOR PERMIT	
2	07/11/20	REVISED	
3	07/11/20	REVISED	
4	07/11/20	REVISED	
5	07/11/20	REVISED	
6	07/11/20	REVISED	
7	07/11/20	REVISED	
8	07/11/20	REVISED	
9	07/11/20	REVISED	
10	07/11/20	REVISED	
11	07/11/20	REVISED	
12	07/11/20	REVISED	
13	07/11/20	REVISED	
14	07/11/20	REVISED	
15	07/11/20	REVISED	
16	07/11/20	REVISED	
17	07/11/20	REVISED	
18	07/11/20	REVISED	
19	07/11/20	REVISED	
20	07/11/20	REVISED	

G.C. WALLACE, INC.
Engineering/Architecture

SUMMERLIN
TOWN CENTER DRIVE
MISC. DETAILS

SHEET
20
SHT 20 OF 20

TOWN CENTER DRIVE

ALTA TO ANASAZI

HYDRAULIC GRADE LINE CALCULATIONS
TOWN CENTER DRIVE-STA 479+59.4 TO STA 466+34.0

STA	LENGTH	INVERT	DEPTH	DIA	AREA	Q100	V	V HEAD	K	Sf	hf	hm	ht	HGL	EGL	MANNING
47959.4	0.0	25.87	33.50	4.5	15.9	274	17.24	4.61	1965	0.0194		0.02	0.02	33.27	37.88	0.013
47867.8	91.6	27.65	7.42	4.5	15.9	274	17.24	4.61	1965	0.0194	1.78	0.02	1.80	35.07	39.68	0.013
47855.7	12.1	27.78	8.48	4.0	12.6	194	15.45	3.70	1436	0.0183	0.24	0.05	0.29	36.26	39.97	0.013
47595.4	269.4	30.63	9.67	4.5	15.9	194	12.20	2.31	1965	0.0097	2.62	0.02	2.64	40.30	42.61	0.013
47075.0	517.4	42.96	4.00	4.0	12.6	137	10.91	1.85	1436	0.0091	5.04		5.04	46.96	48.81	0.013
46770.2	301.8	46.56	4.00	4.0	12.6	137	10.91	1.85	1436	0.0091	2.75	0.02	2.77	50.56	52.41	0.013
46637.0	130.2	49.62	3.50	3.5	9.6	46	4.78	0.36	1006	0.0021	1.19	0.02	1.21	53.12	53.48	0.013

HYDRAULIC GRADE LINE CALCULATIONS
TOWN CENTER DRIVE-STA 466+37-36" LATERAL

STA	LENGTH	INVERT	DEPTH	DIA	AREA	Q100	V	V HEAD	K	Sf	hf	hm	ht	HGL	EGL	MANNING
0.0	0.0	50.12	3.00	3.0	7.1	46	6.51	0.66	667	0.0048			0.00	53.12	53.78	0.013
46.5	46.5	52.93	3.00	3.0	7.1	46	6.51	0.66	667	0.0048	0.22		0.22	55.93	56.59	0.013
73.5	27.0	53.44	3.00	3.0	7.1	46	6.51	0.66	667	0.0048	0.13		0.13	56.44	57.10	0.013
77.5	4.0	53.44	3.00	3.0	7.1	46	6.51	0.66	667	0.0048	0.02	0.75	0.77	56.44	57.10	0.013
110.8	33.0	54.06	3.00	3.0	7.1	46	6.51	0.66	667	0.0048	0.16		0.16	57.06	57.72	0.013

REVISED HGL CALCS-CITY COMMENTS-9/21/95

HYDRAULIC GRADE LINE CALCULATIONS TOWN CENTER DRIVE-STA 467+70-42" LATERAL

STA	LENGTH	INVERT	DEPTH	DIA	AREA	Q100	V	V HEAD	K	Sf	hf	hm	ht	HGL	EGL	MANNING
0.0	0.0	47.06	3.50	3.5	9.6	91	9.46	1.39	1006	0.0082			0.00	50.56	51.95	0.013
46.5	46.5	49.95	3.50	3.5	9.6	91	9.46	1.39	1006	0.0082	0.38		0.38	53.45	54.84	0.013
107.4	40.9	50.86	3.50	3.5	9.6	91	9.46	1.39	1006	0.0082	0.33		0.33	54.36	55.75	0.013
111.4	4.0	50.87	3.50	3.5	9.6	91	9.46	1.39	1006	0.0082	0.03	0.02	0.05	54.37	55.76	0.013
130.4	19.0	51.15	3.50	3.5	9.6	91	9.46	1.39	1006	0.0082	0.16		0.16	54.65	56.04	0.013

HYDRAULIC GRADE LINE CALCULATIONS
TOWN CENTER DRIVE-STA 475+95.42-36" LATERAL

STA	LENGTH	INVERT	DEPTH	DIA	AREA	Q100	V	V HEAD	K	Sf	hf	hm	ht	HGL	EGL	MANNING
0.0	0.0	30.63	9.67	3.0	7.1	49	6.94	0.75	667	0.0054			0.00	40.30	41.05	0.013
46.5	46.5	36.24	4.31	3.0	7.1	49	6.94	0.75	667	0.0054	0.25		0.25	40.55	41.30	0.013
78.5	32.0	36.88	3.84	3.0	7.1	49	6.94	0.75	667	0.0054	0.17		0.17	40.72	41.47	0.013
111.5	33.0	37.54	3.36	3.0	7.1	49	6.94	0.75	667	0.0054	0.18		0.18	40.90	41.65	0.013

HYDRAULIC GRADE LINE CALCULATIONS
TOWN CENTER DRIVE-STA 457+50 TO STA 450+67.09

STA	LENGTH	INVERT	DEPTH	DIA	AREA	Q100	V	V HEAD	K	Sf	hf	hm	ht	HGL	EGL	MANNING
45750.0	0.0	55.43	58.93	3.5	9.6	91	9.46	1.39	1006	0.0082		1.00	1.00	58.43	59.82	0.013
45587.5	162.5	61.20	64.70	3.5	9.6	91	9.46	1.39	1006	0.0397	1.33		1.33	64.70	66.09	0.013
45581.5	6.0	61.23	64.73	3.5	9.6	91	9.46	1.39	1006	0.0082	0.24	0.02	0.26	61.73	66.12	0.013
45156.3	425.2	63.88	4.33	3.5	9.6	91	9.46	1.39	1006	0.0082	3.48		3.48	68.21	69.60	0.013
45141.9	6.0	63.38	4.90	3.5	9.6	91	9.46	1.39	1006	0.0082	0.05	0.02	0.07	68.28	69.67	0.013
45075.0	76.3	63.77	6.28	3.5	9.6	38	3.95	0.24	1006	0.0014	0.62		0.62	70.05	70.30	0.013
45005.0	70.0	64.12	6.05	3.5	9.6	38	3.95	0.24	1006	0.0014	0.10	0.02	0.12	70.17	70.42	0.013
0.0	0.0	65.62	4.55	2.0	3.1	38	12.10	2.27	226	0.0282	0.00	0.00	0.00	70.17	72.44	0.013
73.7	73.7	67.09	5.16	2.0	3.1	38	12.10	2.27	226	0.0282	2.08		2.08	72.25	74.52	0.013
106.7	33.0	67.75	5.45	2.0	3.1	38	12.10	2.27	226	0.0282	0.93	0.02	0.95	73.20	75.47	0.013

[illegible]

STORM SEWER HYDRAULIC CALCULATIONS

SOFFIT OF EX 48" RCP
 $48" \frac{V^2}{2g} = \frac{(120/12.57)^2}{64.4} = 1.415'$

CONDUIT DATA						FLOW DATA							ENERGY LOSS DATA							ENERGY AND HYDRAULIC DATA				COMMENTS				
STATION		SIZE / TYPE	INVERTS		LENGTH	A (FT ²)	I	Q (CFS)	V (FPS)	H _v = V ² /2g (FT)	S _f (FT/FT)	AVE. S _f (FT/FT)	PIPE H _f (FT)	TRANSITIONS							PIPE		TRANSITION		PRESS. FLOW?	OTHER		
FROM	TO		D/S ELEV.	U/S ELEV.										H ₁ (FT)	H ₂ (FT)	H ₃ (FT)	H _m (FT)	H ₄ (FT)	H ₅ (FT)	TOTAL (FT)	U/S EGL ELEV.	U/S HGL ELEV.	U/S EGL ELEV.	U/S HGL ELEV.				
TOWN CENTER DRIVE													Enter Starting EGL and HGL Here → 85.26 83.84 ←															
497+90	493+12.17	36" RCP	79.84	90.37	477.8	7.069	.00492	93	13.16	2.69	.0194	.0194	9.27				1.5±				10.77	96.03	93.34			Yes		
493+12	489+76	30" RCP	90.87	97.57	335	4.909	.00492	61	12.43	2.397	.0221	.021	6.94				1.0±				7.94	103.97	101.57			Yes		
489+76	485+15	30" RCP	97.77	99.92	107	4.909	.00492	60	12.2	2.32	.0213	.021	2.25				1.0±				3.25	107.22	104.90			Yes		
ANASAZI DRIVE																							33.3	29.0		Soffit of 60"		
98+45	99+85.5	60"	24.02	25.37	90	19.64	.00492	325	16.55	4.25	.0156	.0156	1.40								1.4	34.7	30.45			Yes		
99+85	102+100	48"	26.37	28.94	215	12.57	.00492	112	8.91	1.23	.006	.0068	2.3				0.5				2.8	37.5	36.3			Yes		
102+100	106+40	36"	29.94	43.13	440	7.07	.00492	112	15.84	3.89	.028	.045	8.58				0.5				9.1	46.6	42.7			NO	O.C. FLOW DN ≈ 2.2	
SOUTH SIDE LATERAL INTO ANASAZI																						34.7	30.45					
99+85.5	100+5.5	54"	25.87	27.15	90	15.9	.00492	213	13.4	2.79	.0117	.0117	1.05				0.5				1.55	36.3	33.5			Yes		
100+75	101+42	42"	28.93	29.40	67	9.62	.00492	80	8.3	1.07	.0063	.0063	0.4				.1				0.5	36.8	35.8					
101+42	101+93	42"	29.10	29.75	51	9.62	.00492	80	8.3	1.07	.0063	.006	0.3								0.3	37.1	36.0					
																								96.63	93.34			
493+12	D.I	24" RCP	91.37	92.83	73'	3.142	.00492	32	10.18	1.61	.0199	.0199	1.46								1.46			97.49	95.88	Yes	h for inlet control = 4.5'± OK✓	
																								EGL 85.26	HGL 83.84			
497+90	D.I	24" RCP	81.84	83.09	60	3.142	.00492	27	9.59	1.15	.0142	.0142	0.85								0.85	86.11	84.96			Yes	D.I D ≥ 3.5 for inlet control OK✓	

$S_f = \frac{K H_v}{R^{1.33}}$ $K = \frac{2g(n^2)}{2.21}$

Revision	L

THIS RUN EXECUTED 22SEP95 09:53:51

HEC-2 WATER SURFACE PROFILES

Version 4.6.2; May 1991

T1 TOWN CENTER DRIVE-STILLING BASIN DOWNSTREAM OF TRIPPLE 12 x 8 BOX

T2 FILE: TCD1.H2 28 SEP 95

T3 SUBCRITICAL RUN

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	PQ
		2		0					35.35	

J2	NPROF	IPLT	PRFVS	XSECV	XSECH	FN	ALLDC	IBW	CENIM	ITRACE
	-1		-1				-1			

J3 VARIABLE CODES FOR SUMMARY PRINTOUT

	38	43	8	42	1	53	54	33	26	25
NC	.033	.033	.033	0.3	0.5					
QT	1	4388								
XI	1	4	72	170	25	25	40			
GR	38	72	32.5	78	32.5	155	38	170		
XI	2	4	71	163	10	10	5			
GR	50	71	37.5	71	37.5	163	50	163		
XI	3	4	63	131	94	60	0			
GR	57.5	63	38.1	75	38.1	117	50	131		
XI	4	4	61	131	33	29	25			
GR	58.7	61	38.4	82	38.4	115	54.6	131		
XI	5	4	67	132	30	30	30			
GR	59.3	67	38.7	83	38.7	122	55.6	132		
XI	6	4	65	141	38	30	25			
GR	61.2	65	39	81	39	115	56.8	141		
XI	7	4	61	142	5	5	5			
GR	61.2	61	44	81	44	118	56.8	142		
XI	8	4	70	130	34	30	29			
GR	61.9	70	44.3	84	44.3	116	58	130		

X1	9	4	56	124	39	33	30		
GR	64.3	56	44.6	80	44.6	117	59	124	

NC .1 .3

EFFECTIVE AREA LIMITED TO WIDTH OF BRIDGE OPENING-USE X3 CARD

X1	10	4	81	119	30	30	30		
GR	64	51	44.9	81	44.9	119	59.5	144	
X3	10							64	64

DOWNSTREAM FACE OF BRIDGE

BEGIN NORMAL BRIDGE ROUTINE LOW CHORD OPTION- USE X2 CARD

X1	11	14	81	119	7	7	7		
SET BRIDGE LOW CHORD TO 54.5									
X2			0	54.5	70				
GR	64	44	53	81	45	81	45	93	53
GR	53	94	45	94	45	106	53	106	53
GR	45	107	45	119	53	119	61	170	107

NC .014 .014 .014

UPSTREAM FACE OF BRIDGE

SET BRIDGE LOW CHORD TO 64.0

X1	12	14	81	119	235	235	235		
X2			0	64	68				
GR	68	50	64	81	56	81	56	93	64
GR	64	94	56	94	56	106	64	106	64
GR	56	107	56	119	64	119	68	170	107

NC .033 .033 .033

X1 13 4 81 119 5 5 5

X3 10 50 56.25 81 56.25 119 68 75 75

GR 68 50 56.25 81 56.25 119 68 170

X1 14 4 81 119 40 40 40

GR 70 50 57.5 81 57.5 119 70 170

SECNO	DEPTH	CWSEL	CRWS	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

CRITICAL DEPTH TO BE CALCULATED AT ALL CROSS SECTIONS

CCRV= .300 CERV= .500

*SECNO 1.000

3720 CRITICAL DEPTH ASSUMED

1.000	4.46	36.96	36.96	35.35	39.02	2.05	.00	.00	38.00
4388.0	.0	4388.0	.0	.0	381.6	.0	.0	.0	38.00
.00	.00	11.50	.00	.000	.033	.000	.000	32.50	73.13
.010433	25.	40.	25.	0	13	0	.00	94.04	167.17

*SECNO 2.000

7185 MINIMUM SPECIFIC ENERGY

3720 CRITICAL DEPTH ASSUMED

2.000	4.12	41.62	41.62	.00	43.70	2.08	.05	.01	50.00
4388.0	.0	4388.0	.0	.0	378.9	.0	.0	.0	50.00
.00	.00	11.58	.00	.000	.033	.000	.000	37.50	71.00
.011228	10.	5.	10.	0	11	0	.00	92.00	163.00

*SECNO 3.000

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY

3720 CRITICAL DEPTH ASSUMED

3.000	6.61	44.71	44.71	.00	47.69	2.98	.00	.45	57.50
4388.0	.0	4388.0	.0	.0	316.9	.0	.0	.0	50.00
.00	.00	13.85	.00	.000	.033	.000	.000	38.10	70.91
.010274	94.	0.	60.	0	14	0	.00	53.87	124.78

*SECNO 4.000

7185 MINIMUM SPECIFIC ENERGY

3720 CRITICAL DEPTH ASSUMED

4.000	7.54	45.94	45.94	.00	49.13	3.19	.25	.11	58.70
4388.0	.0	4388.0	.0	.0	306.3	.0	.2	.0	54.60
.00	.00	14.33	.00	.000	.033	.000	.000	38.40	74.20
.010117	33.	25.	29.	0	8	0	.00	48.25	122.45

SECNO	DEPTH	CMSL	CRWS	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	KNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 5.000

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.62

5.000	9.47	48.17	45.69	.00	49.78	1.61	.18	.47	59.30
4388.0	.0	4388.0	.0	.0	430.8	.0	.5	.1	55.60
.00	.00	10.18	.00	.000	.033	.000	.000	38.70	75.64
.003858	30.	30.	30.	5	11	0	.00	51.96	127.61

*SECNO 6.000

6.000	9.16	48.16	46.36	.00	50.00	1.84	.11	.12	61.20
4388.0	.0	4388.0	.0	.0	402.9	.0	.7	.1	56.80
.00	.00	10.89	.00	.000	.033	.000	.000	39.00	74.40
.004773	38.	25.	30.	2	15	0	.00	53.98	128.38

*SECNO 7.000

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY

3720 CRITICAL DEPTH ASSUMED

7.000	6.85	50.85	50.85	.00	53.69	2.84	.03	.50	61.20
4388.0	.0	4388.0	.0	.0	324.6	.0	.8	.1	56.80
.00	.00	13.52	.00	.000	.033	.000	.000	44.00	73.04
.009923	5.	5.	5.	0	15	0	.00	57.80	130.84

*SECNO 8.000

7185 MINIMUM SPECIFIC ENERGY

3720 CRITICAL DEPTH ASSUMED

8.000	7.72	52.02	52.02	.00	55.32	3.29	.29	.23	61.90
4388.0	.0	4388.0	.0	.0	301.4	.0	1.0	.1	58.00
.00	.00	14.56	.00	.000	.033	.000	.000	44.30	77.86
.010278	34.	29.	30.	0	8	0	.00	46.04	123.89

*SECNO 9.000

SECNO	DEPTH	CWSEL	CRINS	WSELX	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.75

9.000	9.99	54.59	51.74	.00	56.03	1.45	.16	.55	64.30
4388.0	.0	4388.0	.0	.0	454.7	.0	1.2	.2	59.00
.00	.00	9.65	.00	.000	.033	.000	.000	44.60	67.83
.003353	39.	30.	33.	5	11	0	.00	54.03	121.86

CCHV= .100 CEHV= .300

*SECNO 10.000

10.000	10.11	55.01	51.76	.00	56.14	1.12	.07	.03	44.90
4388.0	413.5	3516.7	457.8	80.4	384.4	87.6	1.6	.2	44.90
.00	5.15	9.15	5.23	.033	.033	.033	.000	44.90	65.11
.001886	30.	30.	30.	2	14	0	.00	71.21	136.32

*SECNO 11.000

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .34

3370 NORMAL BRIDGE, WRD= 0 MIN ELTRD= 70.00 MAX ELIC= 54.50

11.000	8.76	53.76	52.65	.00	56.72	2.96	.03	.55	53.00
4388.0	2.9	4379.6	5.5	1.0	316.8	1.8	1.6	.2	53.00
.00	2.95	13.82	3.01	.033	.033	.033	.000	45.00	78.45
.016557	7.	7.	7.	4	12	0	.00	45.39	123.84

*SECNO 12.000

3265 DIVIDED FLOW

3301 HV CHANGED MORE THAN HVINS

SECNO	DEPTH	CWSEL	CRINS	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

3370 NORMAL BRIDGE, NRD= 0 MIN ELTRD= 68.00 MAX ELIC= 64.00

7185 MINIMUM SPECIFIC ENERGY

3720 CRITICAL DEPTH ASSUMED

12.000	7.73	63.73	63.73	.00	67.59	3.87	1.79	.27	64.00
4388.0	.0	4388.0	.0	.0	278.1	.0	3.3	.5	64.00
.01	.00	15.78	.00	.000	.014	.000	.000	56.00	81.00
.004360	235.	235.	235.	0	9	0	.00	36.00	119.00

CCHV= .300 CCHV= .500

*SECNO 13.000

3301 HV CHANGED MORE THAN HVINS

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELREA= 75.00 ELREA= 75.00

13.000	9.60	65.85	63.70	.00	68.09	2.25	.02	.48	56.25
4388.0	.0	4388.0	.0	.0	364.5	.0	3.3	.5	56.25
.01	.00	12.04	.00	.000	.033	.000	.000	56.25	81.00
.003505	5.	5.	5.	16	8	0	.00	38.00	119.00

*SECNO 14.000

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.83

14.000	10.57	68.07	63.85	.00	68.66	.59	.07	.50	57.50
4388.0	582.2	2818.0	987.8	138.5	401.6	227.9	3.8	.5	57.50
.01	4.20	7.02	4.33	.033	.033	.033	.000	57.50	54.79
.001047	40.	40.	40.	4	14	0	.00	107.33	162.12

THIS RUN EXECUTED 22SEP95 09:54:18

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

SUBCRITICAL RUN

SUMMARY PRINTOUT

	SECTNO	Q	DEPTH	ELMIN	CWSEL	SSTA	ENDST	K*CHSL	VCH	AREA
*	1.000	4388.00	4.46	32.50	36.96	73.13	167.17	.00	11.50	381.64
*	2.000	4388.00	4.12	37.50	41.62	71.00	163.00	1000.00	11.58	378.93
*	3.000	4388.00	6.61	38.10	44.71	70.91	124.78	600.00	13.85	316.90
*	4.000	4388.00	7.54	38.40	45.94	74.20	122.45	12.00	14.33	306.28
*	5.000	4388.00	9.47	38.70	48.17	75.64	127.61	10.00	10.18	430.83
	6.000	4388.00	9.16	39.00	48.16	74.40	128.38	12.00	10.89	402.87
*	7.000	4388.00	6.85	44.00	50.85	73.04	130.84	1000.00	13.52	324.60
*	8.000	4388.00	7.72	44.30	52.02	77.86	123.89	10.34	14.56	301.37
*	9.000	4388.00	9.99	44.60	54.59	67.83	121.86	10.00	9.65	454.65
	10.000	4388.00	10.11	44.90	55.01	65.11	136.32	10.00	9.15	552.36
*	11.000	4388.00	8.76	45.00	53.76	78.45	123.84	14.29	13.82	319.65
*	12.000	4388.00	7.73	56.00	63.73	81.00	119.00	46.81	15.78	278.12
	13.000	4388.00	9.60	56.25	65.85	81.00	119.00	50.00	12.04	364.54
*	14.000	4388.00	10.57	57.50	68.07	54.79	162.12	31.25	7.02	768.00

SUMMARY OF ERRORS AND SPECIAL NOTES

CAUTION SECNO= 1.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 2.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 2.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 3.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 3.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 4.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 4.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY
WARNING SECNO= 5.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
CAUTION SECNO= 7.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 7.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 8.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 8.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY
WARNING SECNO= 9.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO= 11.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
CAUTION SECNO= 12.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 12.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY
WARNING SECNO= 14.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

THIS RUN EXECUTED 22SEP95 10:26:20

HEC-2 WATER SURFACE PROFILES

Version 4.6.2; May 1991

T1 TOWN CENTER DRIVE-STILLING BASIN DOWNSTREAM OF TRIPPLE 12 x 8 BOX
T2 FILE: TCD1.H2 22 AUG 95
T3 SUPERCRITICAL RUN

J1	ICHECK	INQ	WINV	IDIR	STRT	METRIC	NVLNS	Q	WSEL	PQ
		2		1					35.35	
J2	NPROP	IPLT	PRFVS	XSECV	XSECH	FN	ALLDC	IBW	CHNIM	ITRACE
	-1		-1				-1			

J3 VARIABLE CODES FOR SUMMARY PRINTOUT

[illegible]

NC				.1	.3			
XI	9	4	56	124	39	33	30	
GR	64.3	56	44.6	80	44.6	117	59	124
XI	8	4	70	130	34	30	29	
GR	61.9	70	44.3	84	44.3	116	58	130
XI	7	4	61	142	5	5	5	
GR	61.2	61	44	81	44	118	56.8	142
XI	6	4	65	141	38	30	25	
GR	61.2	65	39	81	39	115	56.8	141
XI	5	4	67	132	30	30	30	
GR	59.3	67	38.7	83	38.7	122	55.6	132
XI	4	4	61	131	33	29	25	
GR	58.7	61	38.4	82	38.4	115	54.6	131
XI	3	4	63	131	94	60	0	
GR	57.5	63	38.1	75	38.1	117	50	131
XI	2	4	71	163	10	10	5	
GR	50	71	37.5	71	37.5	163	50	163
XI	1	4	72	170	25	25	40	
GR	35.5	72	32.5	78	32.5	155	38	170

SECNO	DEPTH	CWSEL	CRWS	WSELK	EG	HV	HL	GLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	YNL	YNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*PROP 1

CRITICAL DEPTH TO BE CALCULATED AT ALL CROSS SECTIONS

CCHV= .300 CCHV= .500

*SECNO 14.000

14.000	5.00	62.50	63.49	35.35	66.00	3.50	.00	.00	57.50
4388.0	370.4	3139.2	878.4	36.9	190.0	85.0	.0	.0	57.50
.00	10.04	16.52	10.33	.033	.033	.033	.000	57.50	66.24
.015744	0.	0.	0.	0	14	0	.00	86.76	153.00

*SECNO 13.000

3685 20 TRIALS ATTEMPTED WSEL,CWSEL

3693 PROBABLE MINIMUM SPECIFIC ENERGY

3720 CRITICAL DEPTH ASSUMED

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELREA= 68.00 ELREA= 68.00

13.000	7.45	63.70	63.70	.00	67.43	3.73	.44	.86	56.25
4388.0	.0	4388.0	.0	.0	283.1	.0	.3	.1	56.25
.00	.00	15.50	.00	.000	.033	.000	.000	56.25	81.00
.008138	40.	40.	40.	20	11	0	.00	38.00	119.00

*SECNO 12.000

3265 DIVIDED FLOW

3370 NORMAL BRIDGE, HRO= 0 MIN ELTD= 68.00 MAX ELIC= 64.00

3685 20 TRIALS ATTEMPTED WSEL,CWSEL

3693 PROBABLE MINIMUM SPECIFIC ENERGY

3720 CRITICAL DEPTH ASSUMED

12.000	7.73	63.73	63.73	.00	67.59	3.87	.03	.57	64.00
4388.0	.0	4388.0	.0	.0	278.1	.0	.3	.1	64.00
.00	.00	15.78	.00	.000	.014	.000	.000	56.00	81.00
.004360	5.	5.	5.	20	9	0	.00	36.00	119.00

SECNO	DEPTH	CWSEL	CRWS	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 11.000

3265 DIVIDED FLOW

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 2.32

3370 NORMAL BRIDGE, NRD= 0 MIN ELTRD= 70.00 MAX ELLC= 54.50

11.000	4.13	49.13	52.65	.00	62.68	13.55	2.00	2.91	53.00
4388.0	.0	4388.0	.0	.0	148.5	.0	1.5	.3	53.00
.00	.00	29.54	.00	.000	.014	.000	.000	45.00	81.00
.023515	235.	235.	235.	6	12	0	.00	36.00	119.00

CCHV= .300 CCHV= .500

*SECNO 10.000

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

10.000	3.46	48.36	51.75	.00	62.28	13.92	.29	.11	44.90
4388.0	162.7	4045.2	180.1	9.4	131.5	10.2	1.5	.3	44.90
.00	17.31	30.77	17.58	.033	.033	.033	.000	44.90	75.57
.089246	7.	7.	7.	11	14	0	.00	49.36	124.92

CCHV= .100 CCHV= .300

*SECNO 9.000

3301 HV CHANGED MORE THAN HVINS

9.000	4.23	48.83	51.74	.00	58.99	10.15	2.16	1.13	64.30
4388.0	.0	4388.0	.0	.0	171.6	.0	1.6	.3	59.00
.00	.00	25.57	.00	.000	.033	.000	.000	44.60	74.85
.059558	30.	30.	30.	7	17	0	.00	44.20	119.05

*SECNO 8.000

SECNO	DEPTH	CWSEL	CRINS	WSELX	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

8.000	5.64	49.94	52.02	.00	56.76	6.82	1.23	1.00	61.90
4388.0	.0	4388.0	.0	.0	209.3	.0	1.7	.3	58.00
.00	.00	20.96	.00	.000	.033	.000	.000	44.30	79.51
.029788	39.	30.	33.	5	14	0	.00	42.25	121.76

*SECNO 7.000

7.000	4.66	48.66	50.84	.00	55.76	7.10	.97	.03	61.20
4388.0	.0	4388.0	.0	.0	205.2	.0	1.9	.4	56.80
.00	.00	21.39	.00	.000	.033	.000	.000	44.00	75.59
.038084	34.	29.	30.	11	11	0	.00	51.14	126.73

*SECNO 6.000

3301 HV CHANGED MORE THAN HVINS

6.000	4.12	43.12	46.36	.00	55.02	11.90	.26	.48	61.20
4388.0	.0	4388.0	.0	.0	158.5	.0	1.9	.4	56.80
.00	.00	27.68	.00	.000	.033	.000	.000	39.00	78.03
.073373	5.	5.	5.	15	14	0	.00	42.98	121.02

*SECNO 5.000

3301 HV CHANGED MORE THAN HVINS

5.000	4.14	42.84	45.69	.00	52.80	9.96	1.64	.58	59.30
4388.0	.0	4388.0	.0	.0	173.2	.0	2.0	.4	55.60
.00	.00	25.33	.00	.000	.033	.000	.000	38.70	79.78
.058851	38.	25.	30.	8	14	0	.00	44.67	124.45

*SECNO 4.000

3301 HV CHANGED MORE THAN HVINS

4.000	5.48	43.88	45.93	.00	50.60	6.72	1.23	.97	58.70
4388.0	.0	4388.0	.0	.0	210.9	.0	2.1	.4	54.60
.00	.00	20.80	.00	.000	.033	.000	.000	38.40	76.34
.030117	30.	30.	30.	6	14	0	.00	44.07	120.41

SECTNO	DEPTH	CMSL	CRIMS	WSEK	EG	HV	HL	OLSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TVA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	RTN	ELMIN	SSZA
SLOPE	XLOB	XCH	XROB	LRAL	IDC	ICOMT	CORAR	TOPWID	ENDST

*SECTNO 3.000

2.000	1.88	39.38	41.62	.00	49.42	10.05	.00	.29	50.00
4388.0	.0	4388.0	.0	.0	172.5	.0	2.2	.4	50.00
.01	.00	25.43	.00	.000	.033	.000	.000	37.50	71.00
.145511	94.	0.	60.	16	11	0	.00	92.00	163.00

*SECTNO 2.000

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, RATIO = 1.94

*SECTNO 1.000

3301 HV CHANGED MORE THAN HVINS

1.000	1.80	34.30	36.90	.00	48.16	13.86	.88	.38	35.50
4388.0	.0	4388.0	.0	.0	146.9	.0	2.2	.5	38.00
.01	.00	29.87	.00	.000	.033	.000	.000	32.50	74.39
.216527	10.	5.	10.	14	17	0	.00	85.54	159.93

THIS RUN EXECUTED 22SEP95 10:26:43

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

SUPERCRITICAL RUN

SUMMARY PRINTOUT

	SECNO	Q	DEPTH	ELMIN	CWSEL	SSTA	ENDST	K*CHSL	VCH	AREA
	14.000	4388.00	5.00	57.50	62.50	66.24	153.00	.00	16.52	311.90
*	13.000	4388.00	7.45	56.25	63.70	81.00	119.00	-31.25	15.50	283.13
*	12.000	4388.00	7.73	56.00	63.73	81.00	119.00	-50.00	15.78	278.12
*	11.000	4388.00	4.13	45.00	49.13	81.00	119.00	-46.81	29.54	148.54
*	10.000	4388.00	3.46	44.90	48.36	75.57	124.92	-14.29	30.77	151.10
	9.000	4388.00	4.23	44.60	48.83	74.85	119.05	-10.00	25.57	171.62
	8.000	4388.00	5.64	44.30	49.94	79.51	121.76	-10.00	20.96	209.34
	7.000	4388.00	4.66	44.00	48.66	75.59	126.73	-10.34	21.39	205.15
	6.000	4388.00	4.12	39.00	43.12	78.03	121.02	-1000.00	27.68	158.51
	5.000	4388.00	4.14	38.70	42.84	79.78	124.45	-12.00	25.33	173.22
	4.000	4388.00	5.48	38.40	43.88	76.34	120.41	-10.00	20.80	210.93
	3.000	4388.00	4.45	38.10	42.55	72.25	122.23	-12.00	21.48	204.33
*	2.000	4388.00	1.88	37.50	39.38	71.00	163.00	-600.00	25.43	172.52
	1.000	4388.00	1.80	32.50	34.30	74.39	159.93	-1000.00	29.87	146.89

SUMMARY OF ERRORS AND SPECIAL NOTES

CAUTION SECNO= 13.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 13.000 PROFILE= 1 PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 13.000 PROFILE= 1 20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO= 12.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 12.000 PROFILE= 1 PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 12.000 PROFILE= 1 20 TRIALS ATTEMPTED TO BALANCE WSEL

WARNING SECNO= 11.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 10.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO= 2.000 PROFILE= 1 CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

SUMMERLIN



TOWN CENTER DRIVE IMPROVEMENT PLANS STA.450+80 TO 478+71.16 ANASAZI DR. TO ALTA DR. 1995

DEVELOPER

HOWARD HUGHES PROPERTIES LIMITED PARTNERSHIP,
a DELAWARE limited partnership
By its sole general partner,
The HOWARD HUGHES CORPORATION,
a DELAWARE corporation

ENGINEER

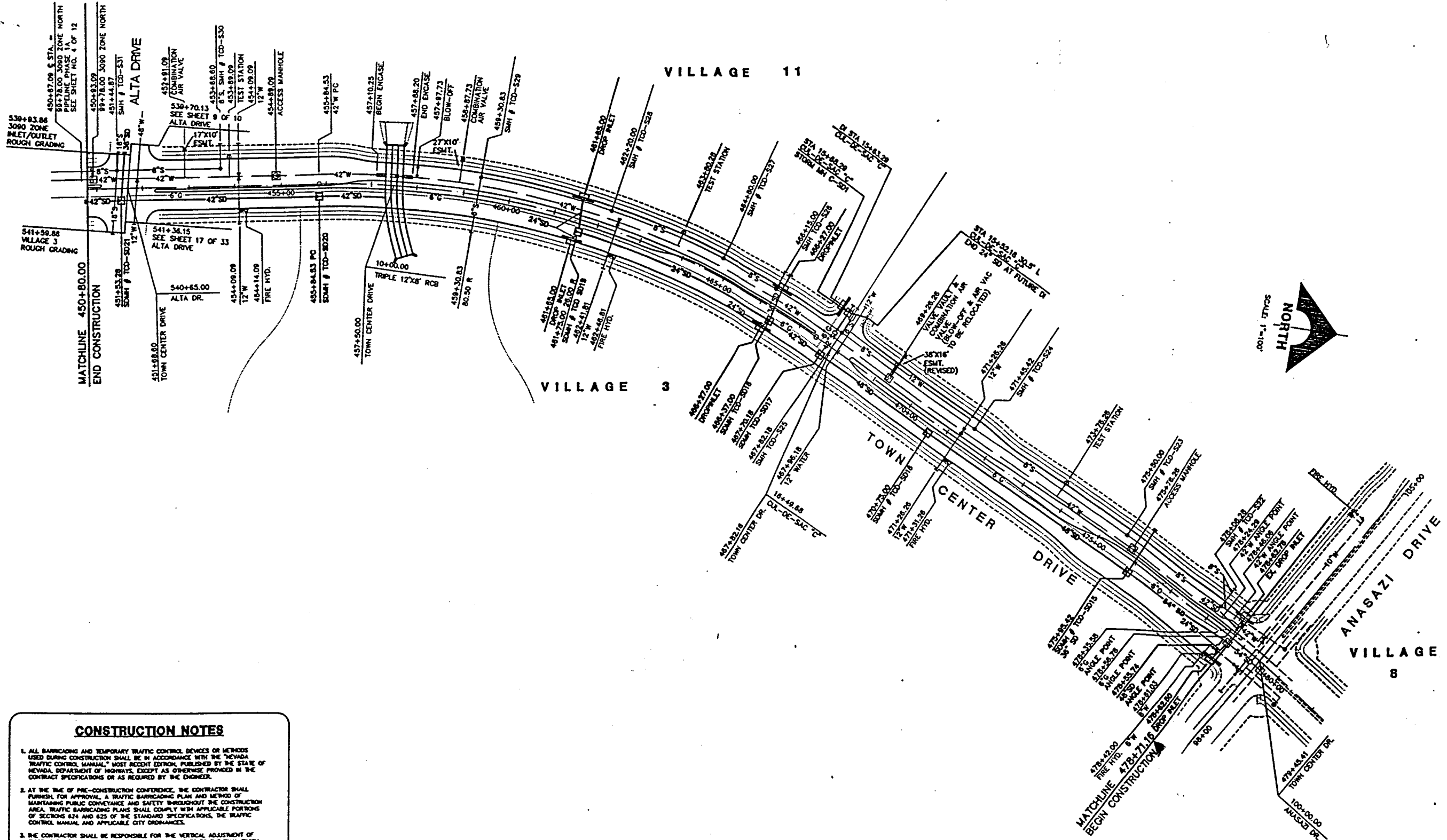


G.C. WALLACE, INC.
Engineering/Architecture

1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102
TELEPHONE NO. (702) 363-1200

CONSTRUCTION NOTES

1. ALL BARRICADE AND TEMPORARY TRAFFIC CONTROL DEVICES OR METHODS USED DURING CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE "NEVADA TRAFFIC CONTROL MANUAL," MOST RECENT EDITION, PUBLISHED BY THE STATE OF NEVADA, DEPARTMENT OF HIGHWAYS, EXCEPT AS OTHERWISE PROVIDED IN THE CONTRACT SPECIFICATIONS OR AS REQUIRED BY THE ENGINEER.
2. AT THE TIME OF PRE-CONSTRUCTION CONFERENCE, THE CONTRACTOR SHALL FURNISH FOR APPROVAL, A TRAFFIC BARRICADE PLAN AND METHOD OF MAINTAINING PUBLIC CONVEYANCE AND SAFETY THROUGHOUT THE CONSTRUCTION AREA. TRAFFIC BARRICADE PLANS SHALL COMPLY WITH APPLICABLE PORTIONS OF SECTIONS 624 AND 625 OF THE STANDARD SPECIFICATIONS, THE TRAFFIC CONTROL MANUAL, AND APPLICABLE CITY ORDINANCES.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE VERTICAL ADJUSTMENT OF EXISTING SANITARY, WATER AND STORM SEWER MANHOLES TO THE FINAL FINISH GRADES AS NOTED ON THE CONTRACT DRAWINGS, AND IN ACCORDANCE WITH SECTION 609 OF THE "STANDARD SPECIFICATIONS," AND ANY VERTICAL ADJUSTMENTS OF WATER VALVE BOXES AND OTHER APPURTENANCES SHALL BE IN ACCORDANCE WITH THE DETAILS SHOWN ON THE CONTRACT DRAWINGS.
4. NOTICE: GRADING AUTHORIZED ONLY AFTER PERMITTEE'S FULL COMPLIANCE WITH FEDERAL ENGINEERING SPECIES ACT.
5. THE DESIGN GRADE (DG) INDICATED ON THESE PLANS IS FOR VERTICAL ELEVATION DESIGN CALCULATION PURPOSES AND DOES NOT NECESSARILY REPRESENT THE FINISH IMPROVEMENT GRADES @ CENTERLINE, (I.E. 34" W/ MEDIAN AREAS). SEE STANDARD STREET SECTIONS ON SHEET 16.



SUMMERLIN
TOWN CENTER DRIVE
STORM DRAIN MASTER PLAN

G.C. WALLACE, INC.
Engineering/Architecture 1225 SOUTH SANDY AVENUE, SUITE 1000, LAS VEGAS, NEVADA 89109

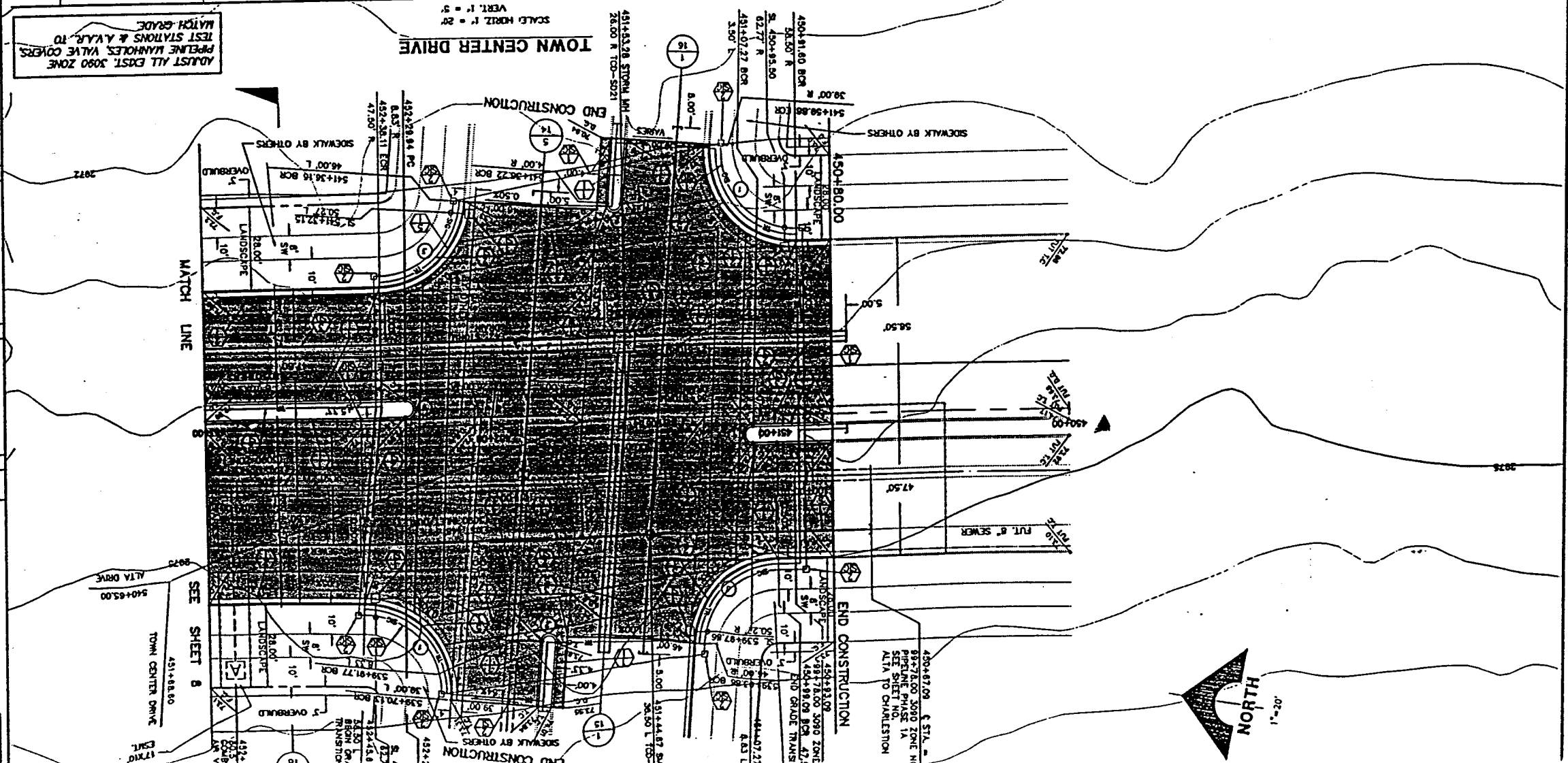
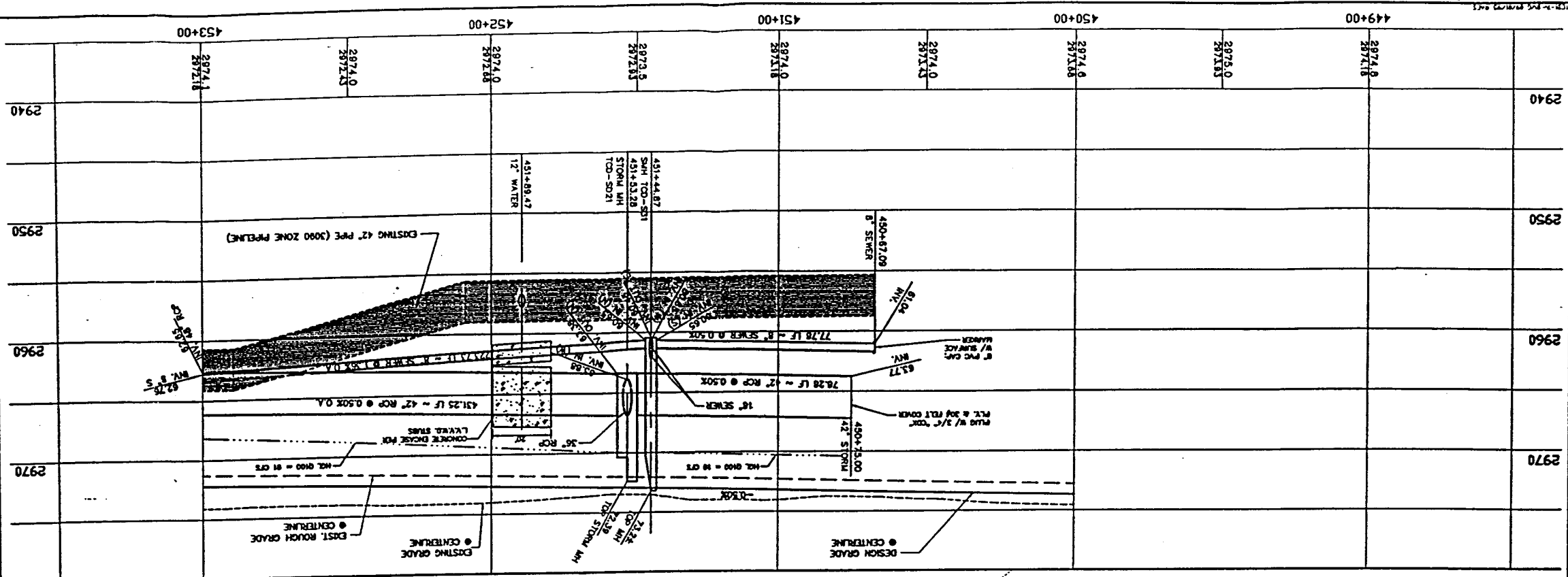


RECOMMENDED
APPROVED
DATE

REVISIONS
DATE
BY
FINAL SUBMITTAL

SHEET
5

SHT 5 OF 21



APPROVAL:

SHEET INDEX MAP

TRAFFIC

STREET LIGHTING

SEWER

STORM DRAIN

WATER

IMPROVEMENTS

CONSTRUCTION NOTES

INSTALL NO. 5 PULLBOX

INSTALL 2-3\" CONDUIT

STREET LIGHT OR COMMON TRENCH SEE ELECTRICAL PLANS

INSTALL STREET LIGHT SEE ELECTRICAL PLANS

INSTALL 16\" DIA. SEWER PIPE

INSTALL SEWER MANHOLE

INSTALL 6\" DIA. SEWER PIPE

INSTALL 6\" TYPE \"A\" DROP INLET

INSTALL STORM DRAIN MANHOLE

INSTALL 60\" DIA. STORM DRAIN PIPE

INSTALL 54\" DIA. STORM DRAIN PIPE

INSTALL 48\" DIA. STORM DRAIN PIPE

INSTALL 36\" DIA. STORM DRAIN PIPE

INSTALL 24\" DIA. STORM DRAIN PIPE

INSTALL 2\" TEMP. BLOW-OFF

INSTALL 16\" DIA. GATE VALVE & BOX

INSTALL 12\" DIA. GATE VALVE & BOX

INSTALL 16\" DIA. WATER PIPE

INSTALL 12\" DIA. WATER PIPE

INSTALL DEPRESSED CURB

INSTALL CROSSWALK

INSTALL AC PAVEMENT PER SECTION SHT. 10

INSTALL 7\" TYPE CURB & CUTTER

INSTALL \"A\" TYPE CURB

CONSTRUCTION NOTES

DELTA

RADIUS

LENGTH

ANGLE

DATE

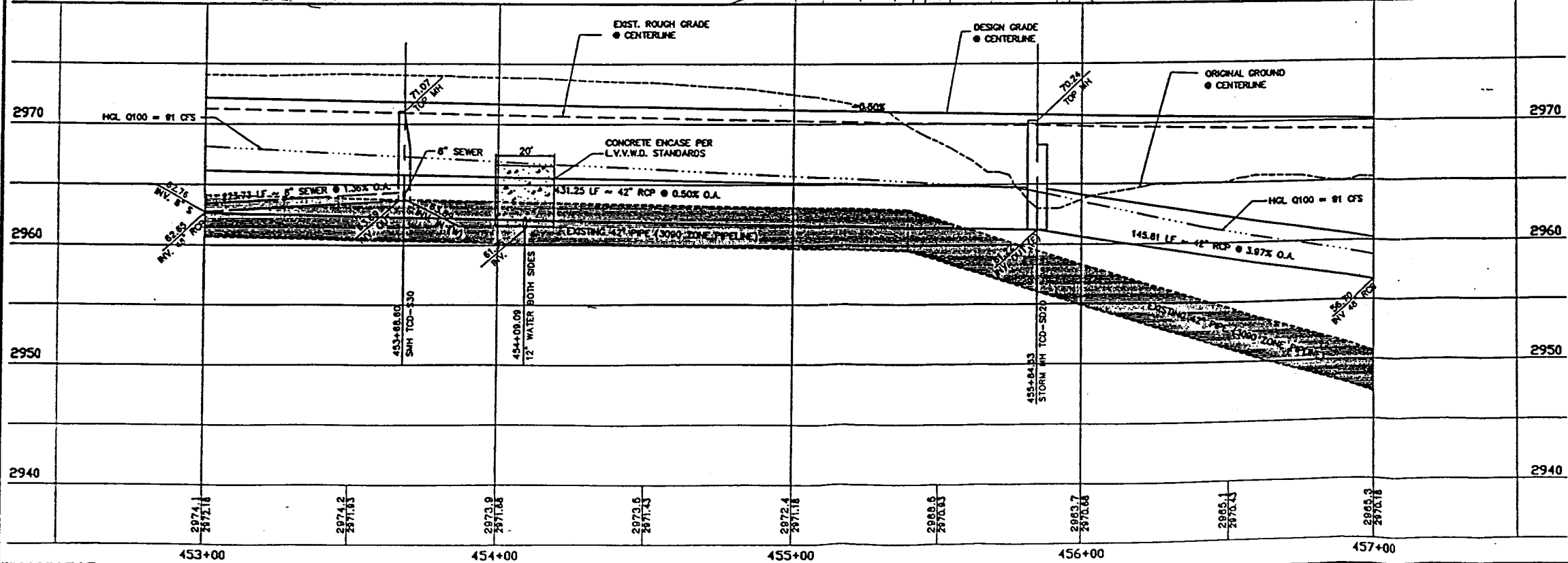
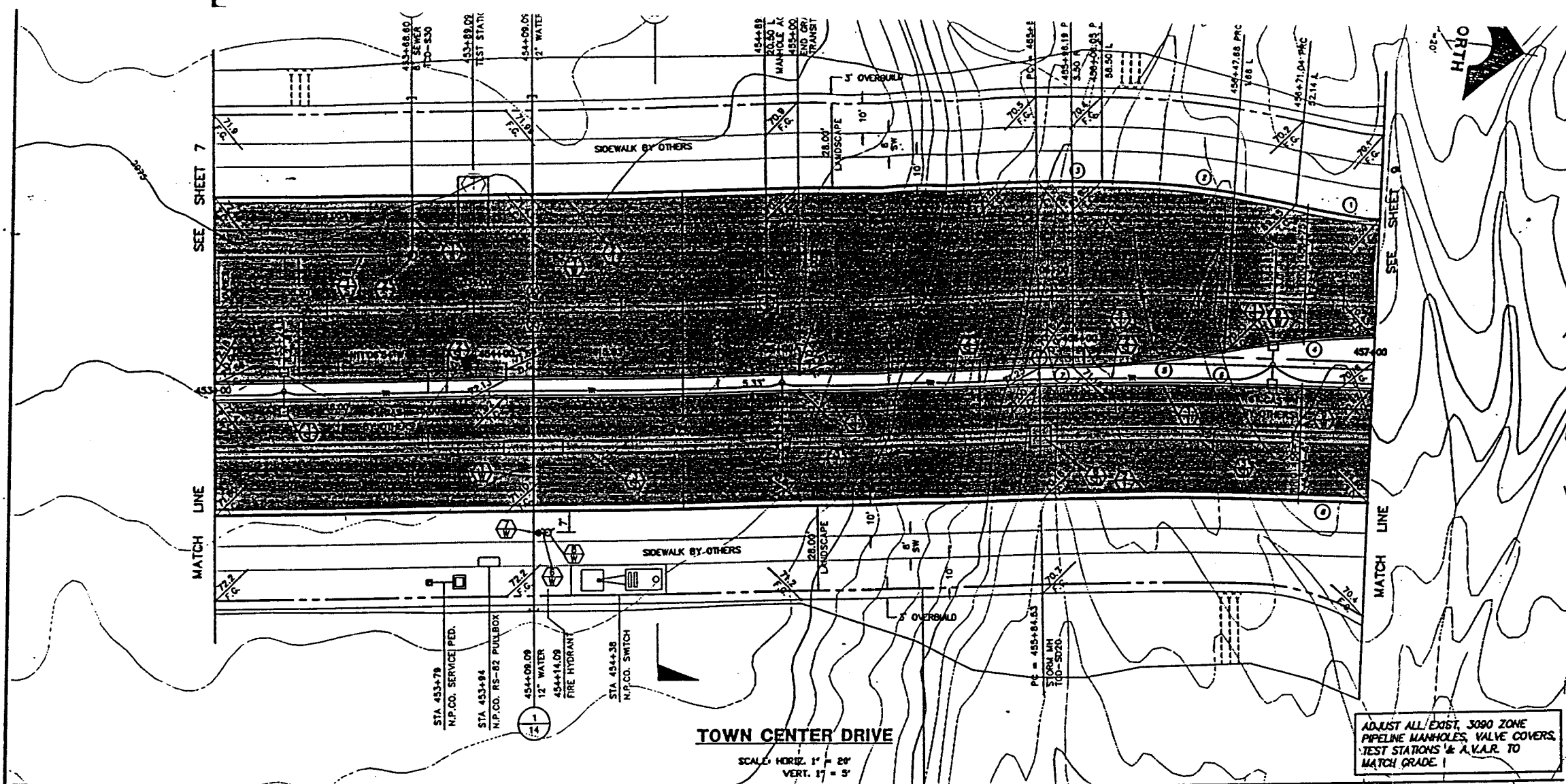
DESIGNER

CHECKER

APPROVER

SUMMERLIN
TOWN CENTER DRIVE





CURVE	DELTA	PC	PY	PT	LC
1	90°	453+00	453+00	453+00	15.07
2	90°	453+00	453+00	453+00	15.07
3	90°	453+00	453+00	453+00	15.07
4	90°	453+00	453+00	453+00	15.07
5	90°	453+00	453+00	453+00	15.07
6	90°	453+00	453+00	453+00	15.07
7	90°	453+00	453+00	453+00	15.07
8	90°	453+00	453+00	453+00	15.07
9	90°	453+00	453+00	453+00	15.07
10	90°	453+00	453+00	453+00	15.07

- CONSTRUCTION NOTES**
- IMPROVEMENTS**
- 1. INSTALL "A" TYPE CURB (S-50) 1
 - 2. INSTALL "L" TYPE CURB & GUTTER (S-47) 1
 - 3. INSTALL AC PAVEMENT PER SECTION SHT. 18
 - 4. INSTALL CROSSWALK (S-78) 1
 - 5. INSTALL DEPRESSED CURB (S-19) 1

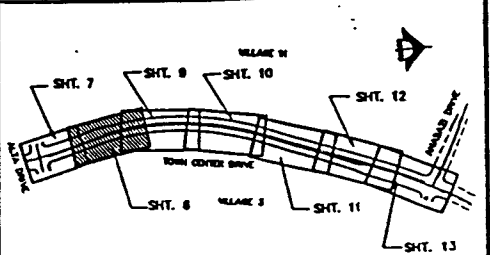
- WATER**
- 1. INSTALL 12" DIA. WATER PIPE (U-20) 1
 - 2. INSTALL 16" DIA. WATER PIPE (U-20) 1
 - 3. INSTALL 12" DIA. GATE VALVE & BOX (U-34) 1
 - 4. INSTALL 16" DIA. GATE VALVE & BOX (U-34) 1
 - 5. INSTALL 2" TEMP. BLOW-OFF (U-32) 1
 - 6. INSTALL 6" DIA. WATER PIPE (U-20) 1
 - 7. INSTALL 6" GATE VALVE @ 12"x6" TEE (U-33) 1
 - 8. INSTALL FIRE HYDRANT (U-18) 1
 - 9. IRRIGATION SLEEVE (U-18) 1

- STORM DRAIN**
- 1. INSTALL 24" DIA. STORM DRAIN PIPE (U-20) 1
 - 2. INSTALL 42" DIA. STORM DRAIN PIPE (U-20) 1
 - 3. INSTALL 48" DIA. STORM DRAIN PIPE (U-20) 1
 - 4. INSTALL 54" DIA. STORM DRAIN PIPE (U-20) 1
 - 5. INSTALL 60" DIA. STORM DRAIN PIPE (U-20) 1
 - 6. INSTALL STORM DRAIN MANHOLE (D1.05) 1
 - 7. INSTALL 6" TYPE "A" DROP INLET (D-12) 1

- SEWER**
- 1. INSTALL 6" DIA. SEWER PIPE (U-20) 2
 - 2. INSTALL SEWER MANHOLE (S01-8) 1

- STREET LIGHTING**
- 1. INSTALL STREET LIGHT, SEE ELECTRICAL PLANS (E-2) 1
 - 2. STREET LIGHT OR COMMON TRENCH, SEE ELECTRICAL PLANS

- TRAFFIC**
- 1. INSTALL 1-3" CONDUIT
 - 2. INSTALL NO. 5 PULLBOX (E-32) 1

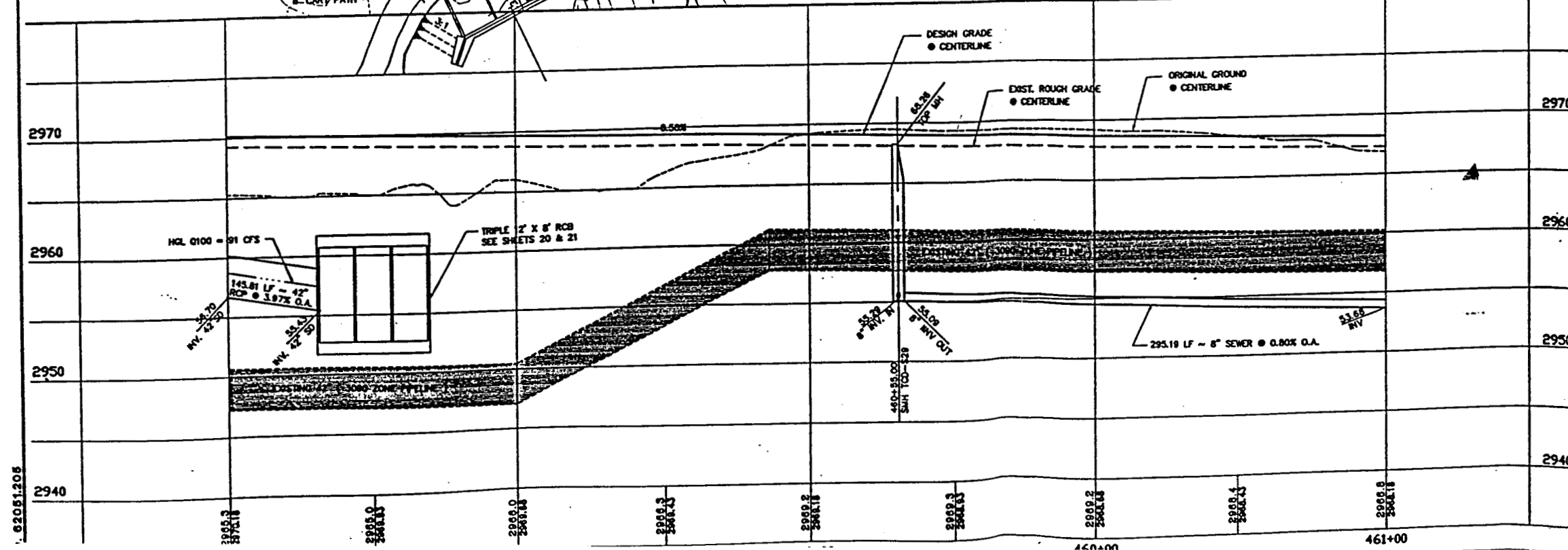
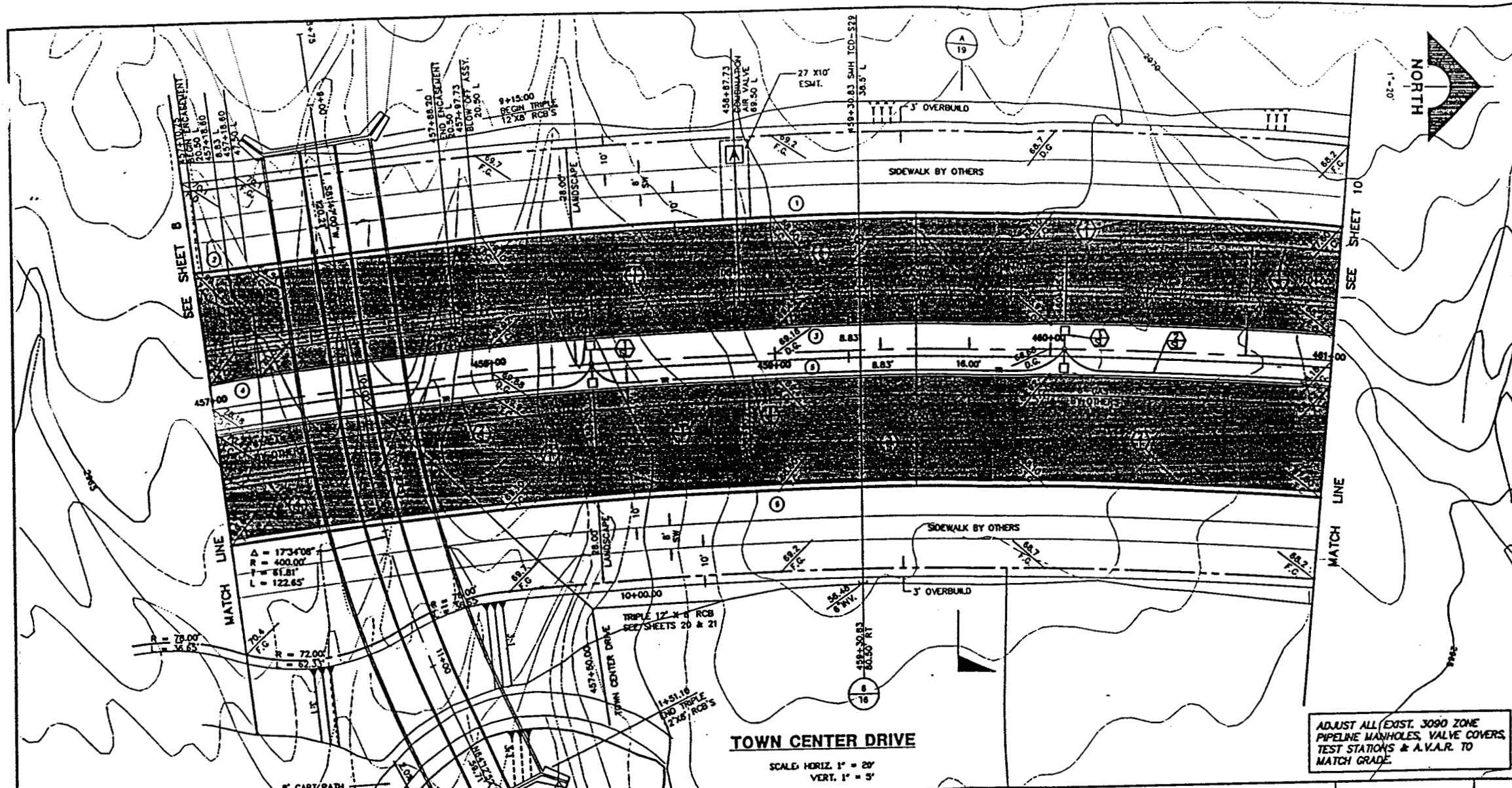


APPROVAL:

LAS VEGAS VALLEY WATER DISTRICT

DATE

JOB NO. 62081205



CURVE DATA

① INDICATES CURVE NUMBER

CURVE	DELTA	RADIUS	LENGTH	TANGENT
1	11°48'44"	1897.50	391.19	106.29
2	03°38'50"	500.00	19.10	9.53
3	11°48'44"	1898.83	383.37	187.29
4	03°38'50"	500.00	18.70	9.35
5	12°21'18"	1841.17	398.09	199.83
6	12°21'18"	1802.50	389.73	125.67

CONSTRUCTION NOTES

- IMPROVEMENTS**
- INSTALL "A" TYPE CURB (S-50 S)
 - INSTALL "L" TYPE CURB & GUTTER (S-47 S)
 - INSTALL AC PAVEMENT PER SECTION SHT. 18
 - INSTALL CROSSWALK (S-78 S)
 - INSTALL DEPRESSED CURB (1/18)

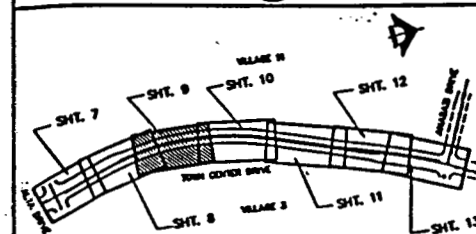
- WATER**
- INSTALL 12" DIA. WATER PIPE (U-20 S)
 - INSTALL 16" DIA. WATER PIPE (U-20 S)
 - INSTALL 12" DIA. GATE VALVE & BOX (U-34 S)
 - INSTALL 16" DIA. GATE VALVE & BOX (U-34 S)
 - INSTALL 2" TEMP. BLOW-OFF (U-32 S)

- STORM DRAIN**
- INSTALL 24" DIA. STORM DRAIN PIPE (U-20 S)
 - INSTALL 42" DIA. STORM DRAIN PIPE (U-20 S)
 - INSTALL 48" DIA. STORM DRAIN PIPE (U-20 S)
 - INSTALL 54" DIA. STORM DRAIN PIPE (U-20 S)
 - INSTALL 60" DIA. STORM DRAIN PIPE (U-20 S)
 - INSTALL STORM DRAIN MANHOLE (D1.D5 S)
 - INSTALL 6" TYPE "A" DROP INLET (D-12 S)

- SEWER**
- INSTALL 8" DIA. SEWER PIPE (U-20 S)
 - INSTALL SEWER MANHOLE (S01-B CLV)
 - INSTALL 6" DIA. SEWER PIPE (U-20 S)
 - INSTALL 6" WYE

- STREET LIGHTING**
- INSTALL STREET LIGHT, SEE ELECTRICAL PLANS (E-2 S)
 - STREET LIGHT OR COMMON TRENCH, SEE ELECTRICAL PLANS

- TRAFFIC**
- INSTALL 1-3" CONDUIT
 - INSTALL NO. 5 PULLBOX (E-32 S)



APPROVAL: _____

LAS VEGAS VALLEY WATER DISTRICT

DATE: _____

FINAL SUBMITTAL

RECOMMENDED BY: _____

DESIGNED BY: _____

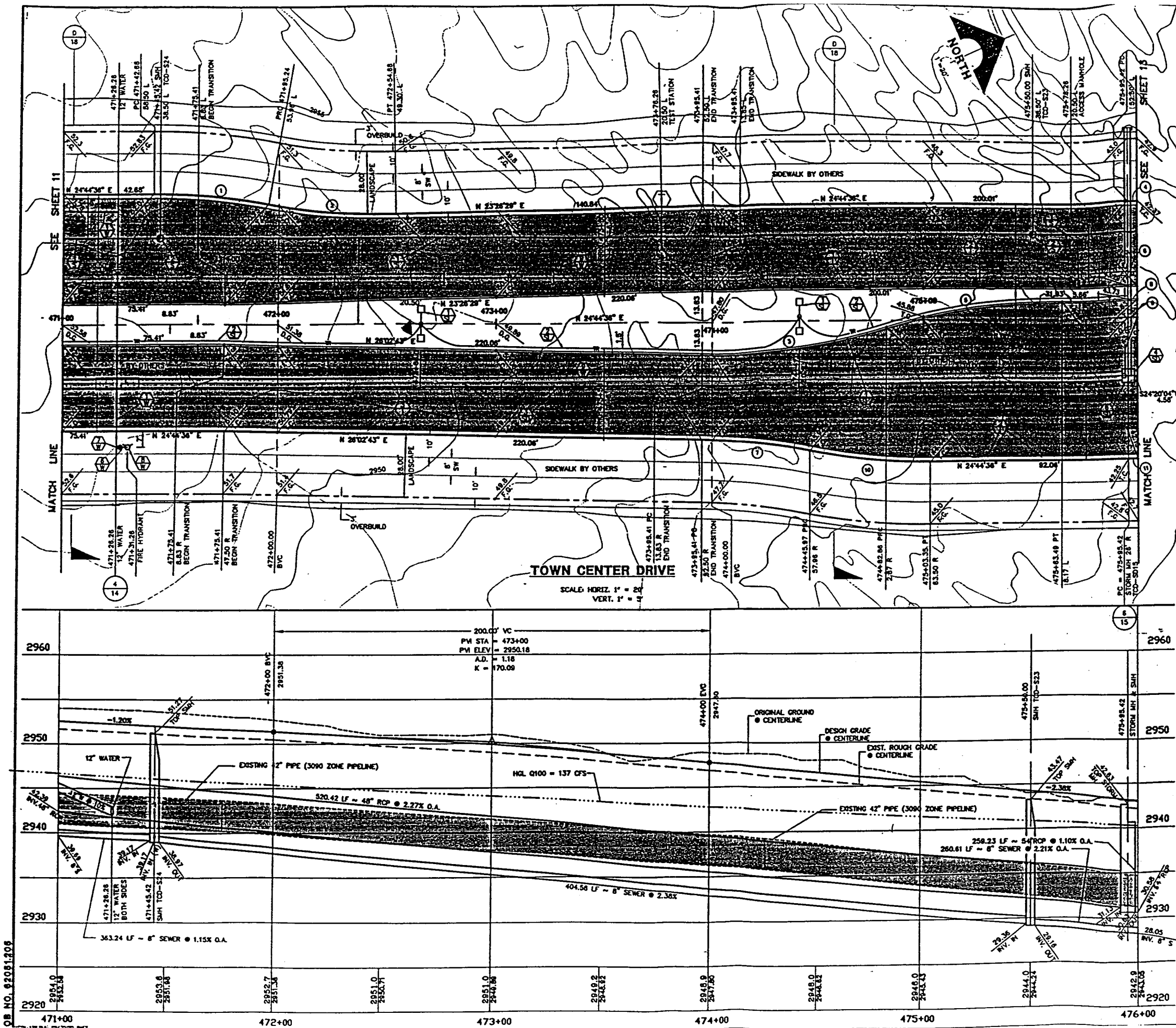
CHECKED BY: _____

DATE: _____

G.C. WALLACE, INC.
Engineering/Architecture

SUMMERLIN
TOWN CENTER DRIVE - ANABAZI TO ALTA
PLAN & PROFILE
STA 457+00 TO 461+00

SHEET 9
SHT. 9 OF 21



CURVE DATA

INDICATES CURVE NUMBER

CURVE	DELTA	RADIUS	LENGTH	TANGENT
1	100.00	100.00	100.00	100.00
2	100.00	100.00	100.00	100.00
3	100.00	100.00	100.00	100.00
4	100.00	100.00	100.00	100.00
5	100.00	100.00	100.00	100.00
6	100.00	100.00	100.00	100.00
7	100.00	100.00	100.00	100.00
8	100.00	100.00	100.00	100.00
9	100.00	100.00	100.00	100.00
10	100.00	100.00	100.00	100.00
11	100.00	100.00	100.00	100.00
12	100.00	100.00	100.00	100.00
13	100.00	100.00	100.00	100.00
14	100.00	100.00	100.00	100.00
15	100.00	100.00	100.00	100.00
16	100.00	100.00	100.00	100.00
17	100.00	100.00	100.00	100.00
18	100.00	100.00	100.00	100.00
19	100.00	100.00	100.00	100.00
20	100.00	100.00	100.00	100.00
21	100.00	100.00	100.00	100.00
22	100.00	100.00	100.00	100.00
23	100.00	100.00	100.00	100.00
24	100.00	100.00	100.00	100.00
25	100.00	100.00	100.00	100.00
26	100.00	100.00	100.00	100.00
27	100.00	100.00	100.00	100.00
28	100.00	100.00	100.00	100.00
29	100.00	100.00	100.00	100.00
30	100.00	100.00	100.00	100.00
31	100.00	100.00	100.00	100.00
32	100.00	100.00	100.00	100.00
33	100.00	100.00	100.00	100.00
34	100.00	100.00	100.00	100.00
35	100.00	100.00	100.00	100.00
36	100.00	100.00	100.00	100.00
37	100.00	100.00	100.00	100.00
38	100.00	100.00	100.00	100.00
39	100.00	100.00	100.00	100.00
40	100.00	100.00	100.00	100.00
41	100.00	100.00	100.00	100.00
42	100.00	100.00	100.00	100.00
43	100.00	100.00	100.00	100.00
44	100.00	100.00	100.00	100.00
45	100.00	100.00	100.00	100.00
46	100.00	100.00	100.00	100.00
47	100.00	100.00	100.00	100.00
48	100.00	100.00	100.00	100.00
49	100.00	100.00	100.00	100.00
50	100.00	100.00	100.00	100.00
51	100.00	100.00	100.00	100.00
52	100.00	100.00	100.00	100.00
53	100.00	100.00	100.00	100.00
54	100.00	100.00	100.00	100.00
55	100.00	100.00	100.00	100.00
56	100.00	100.00	100.00	100.00
57	100.00	100.00	100.00	100.00
58	100.00	100.00	100.00	100.00
59	100.00	100.00	100.00	100.00
60	100.00	100.00	100.00	100.00
61	100.00	100.00	100.00	100.00
62	100.00	100.00	100.00	100.00
63	100.00	100.00	100.00	100.00
64	100.00	100.00	100.00	100.00
65	100.00	100.00	100.00	100.00
66	100.00	100.00	100.00	100.00
67	100.00	100.00	100.00	100.00
68	100.00	100.00	100.00	100.00
69	100.00	100.00	100.00	100.00
70	100.00	100.00	100.00	100.00
71	100.00	100.00	100.00	100.00
72	100.00	100.00	100.00	100.00
73	100.00	100.00	100.00	100.00
74	100.00	100.00	100.00	100.00
75	100.00	100.00	100.00	100.00
76	100.00	100.00	100.00	100.00
77	100.00	100.00	100.00	100.00
78	100.00	100.00	100.00	100.00
79	100.00	100.00	100.00	100.00
80	100.00	100.00	100.00	100.00
81	100.00	100.00	100.00	100.00
82	100.00	100.00	100.00	100.00
83	100.00	100.00	100.00	100.00
84	100.00	100.00	100.00	100.00
85	100.00	100.00	100.00	100.00
86	100.00	100.00	100.00	100.00
87	100.00	100.00	100.00	100.00
88	100.00	100.00	100.00	100.00
89	100.00	100.00	100.00	100.00
90	100.00	100.00	100.00	100.00
91	100.00	100.00	100.00	100.00
92	100.00	100.00	100.00	100.00
93	100.00	100.00	100.00	100.00
94	100.00	100.00	100.00	100.00
95	100.00	100.00	100.00	100.00
96	100.00	100.00	100.00	100.00
97	100.00	100.00	100.00	100.00
98	100.00	100.00	100.00	100.00
99	100.00	100.00	100.00	100.00
100	100.00	100.00	100.00	100.00

- CONSTRUCTION NOTES
- IMPROVEMENTS
- INSTALL "A" TYPE CURB (S-50)
 - INSTALL "L" TYPE CURB & CUTTER (S-47)
 - INSTALL AC PAVEMENT PER SECTION SHT. 18
 - INSTALL CROSSWALK (S-78)
 - INSTALL DEPRESSED CURB (S-19)

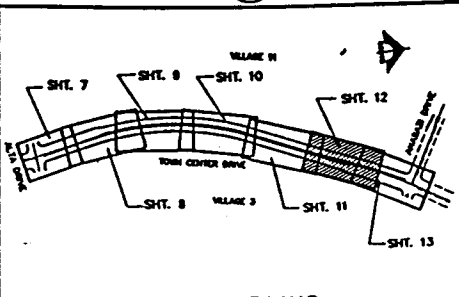
- WATER
- INSTALL 12" DIA. WATER PIPE (U-20)
 - INSTALL 16" DIA. WATER PIPE (U-20)
 - INSTALL 12" DIA. GATE VALVE & BOX (U-34)
 - INSTALL 16" DIA. GATE VALVE & BOX (U-34)
 - INSTALL 2" TEMP. BLOW-OFF (U-32)
 - INSTALL 6" DIA. WATER PIPE (U-20)
 - INSTALL 6" GATE VALVE @ 12"X6" TEE (U-20)
 - INSTALL FIRE HYDRANT (U-33)
 - IRRIGATION SLEEVE (U-18)

- STORM DRAIN
- INSTALL 24" DIA. STORM DRAIN PIPE (U-20)
 - INSTALL 42" DIA. STORM DRAIN PIPE (U-20)
 - INSTALL 48" DIA. STORM DRAIN PIPE (U-20)
 - INSTALL 54" DIA. STORM DRAIN PIPE (U-20)
 - INSTALL 60" DIA. STORM DRAIN PIPE (U-20)
 - INSTALL STORM DRAIN MANHOLE (D-105)
 - INSTALL 6" TYPE "A" DROP INLET (D-12)

- SEWER
- INSTALL 6" DIA. SEWER PIPE (U-20)
 - INSTALL SEWER MANHOLE (D-105)

- STREET LIGHTING
- INSTALL STREET LIGHT, SEE ELECTRICAL PLANS (E-2)
 - STREET LIGHT OR COMMON TRENCH, SEE ELECTRICAL PLANS

- TRAFFIC
- INSTALL 1-3" CONDUIT (E-32)
 - INSTALL NO. 5 PULLBOX (E-32)



APPROVAL:

LAS VEGAS VALLEY WATER DISTRICT

DATE

FINAL SUBMITTAL

RECORDED

ENGINEER

DATE

G.C. WALLACE, INC.

Engineering/Architecture

SUMMERLIN

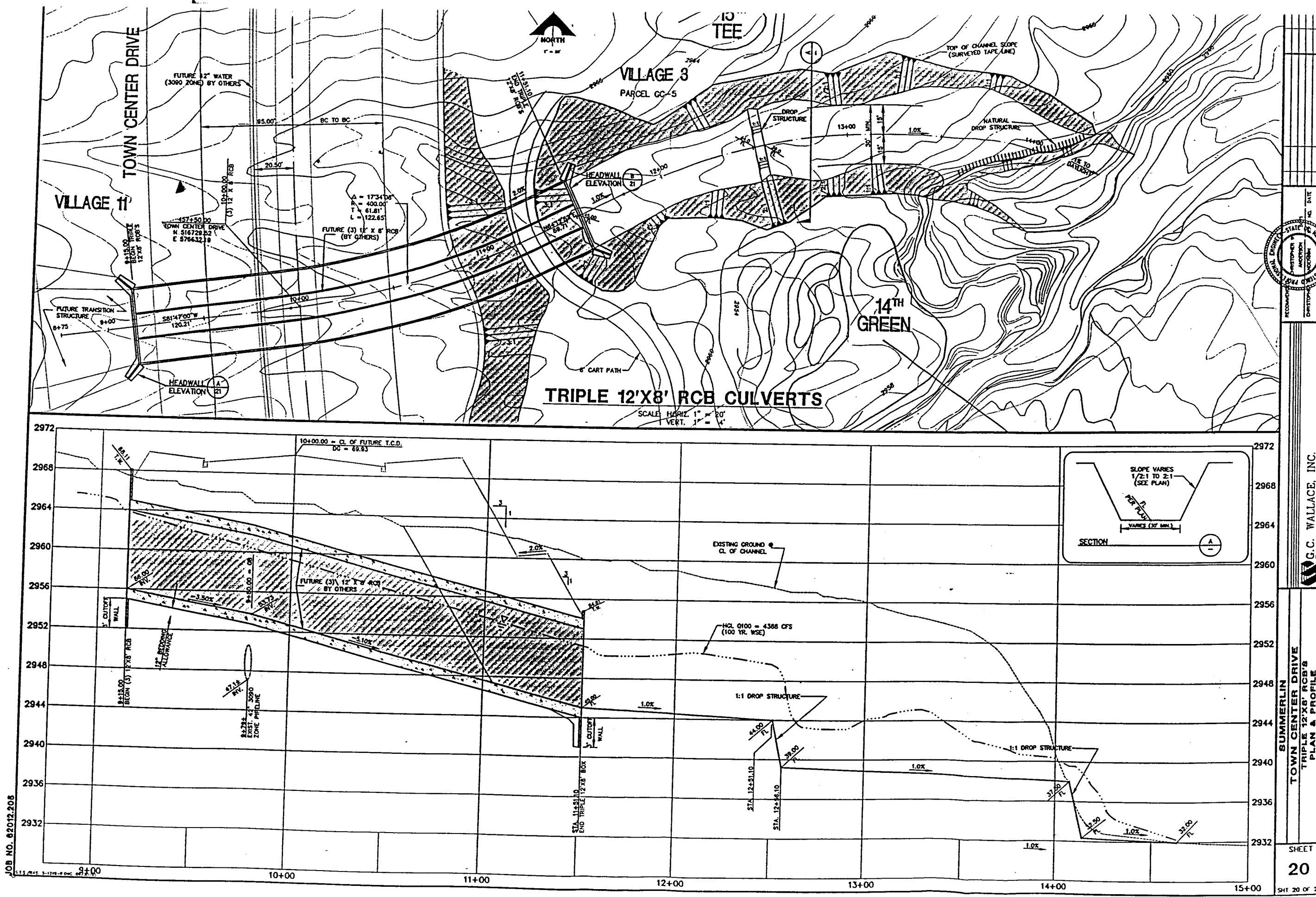
TOWN CENTER DRIVE - ANABAZI TO ALTA

PLAN & PROFILE

STA 471+00 TO 476+00

SHEET 12

SHT 12 OF 21



JOB NO. 02012.205

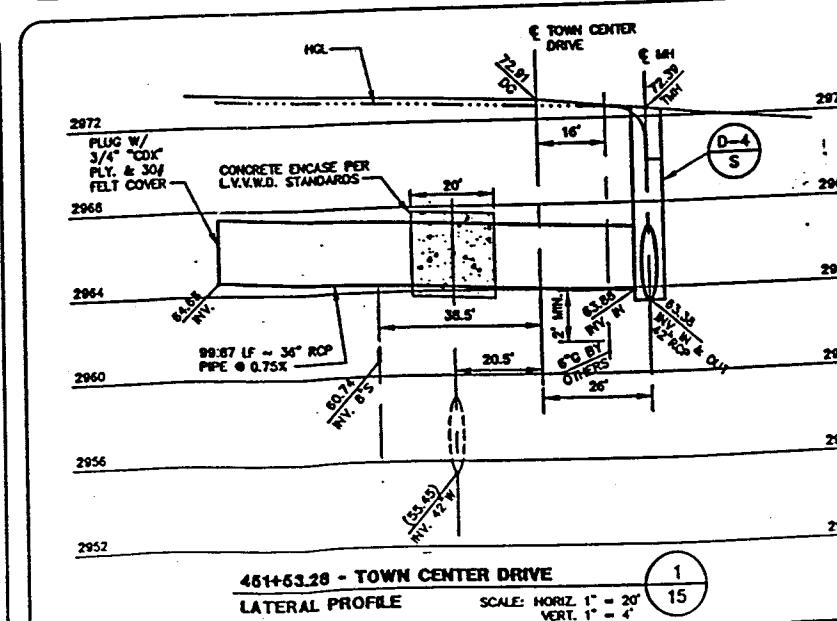
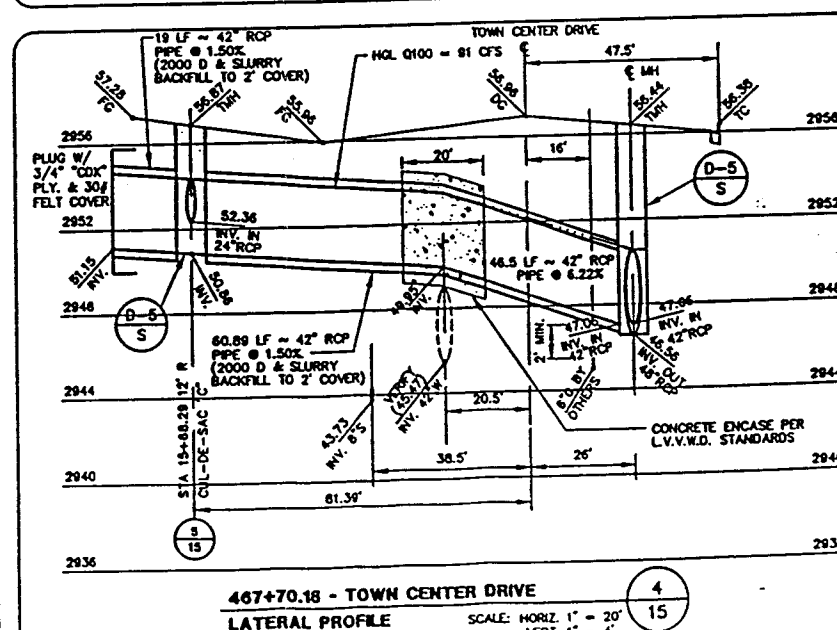
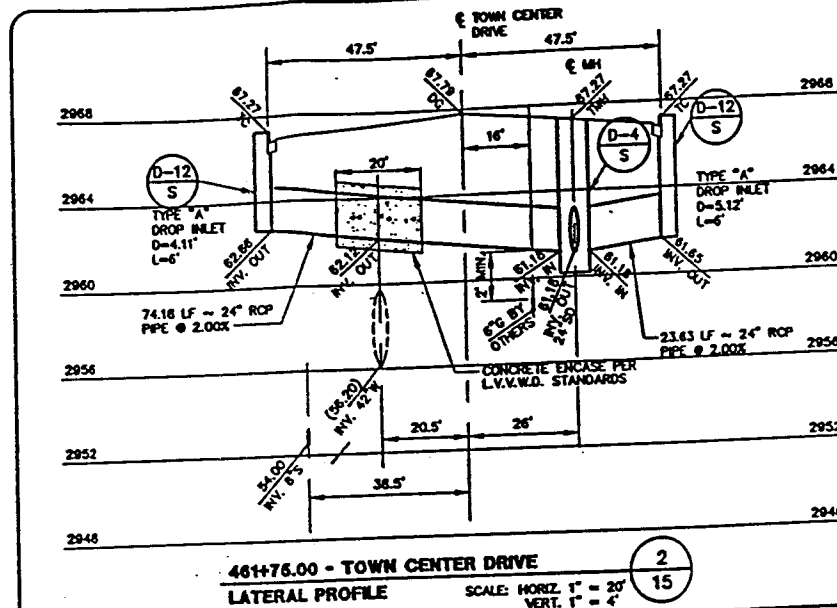
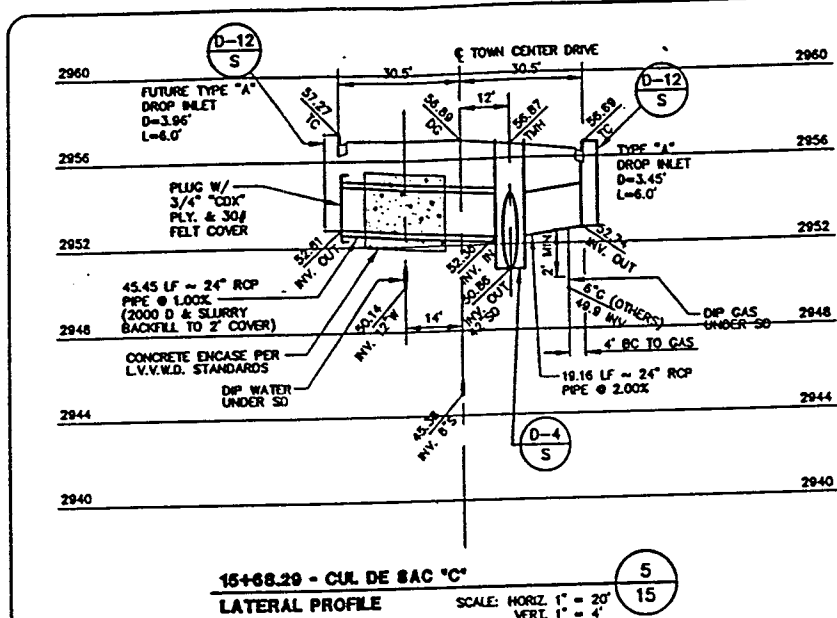
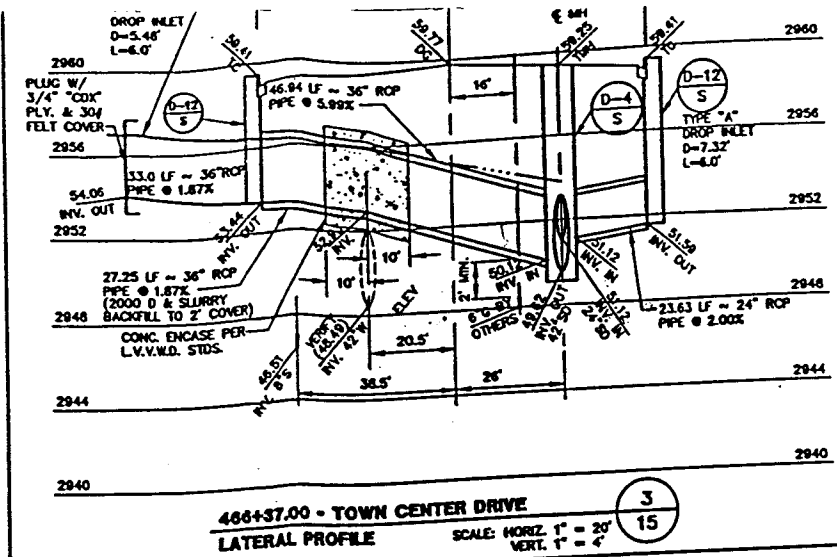
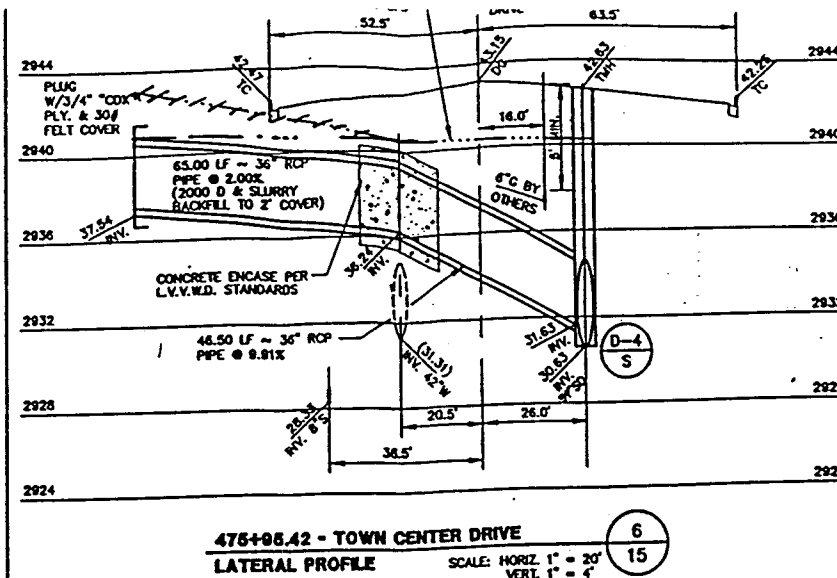
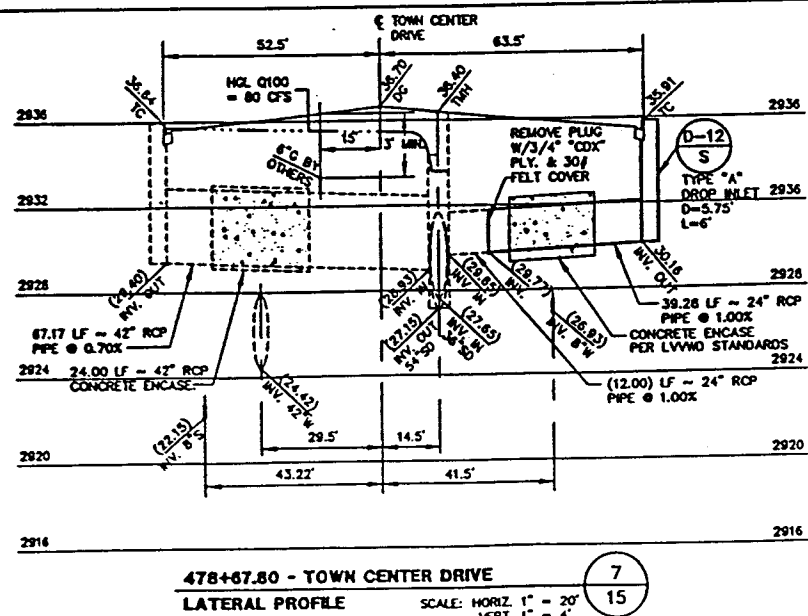
G.C. WALLACE, INC.
Professional/Architectural

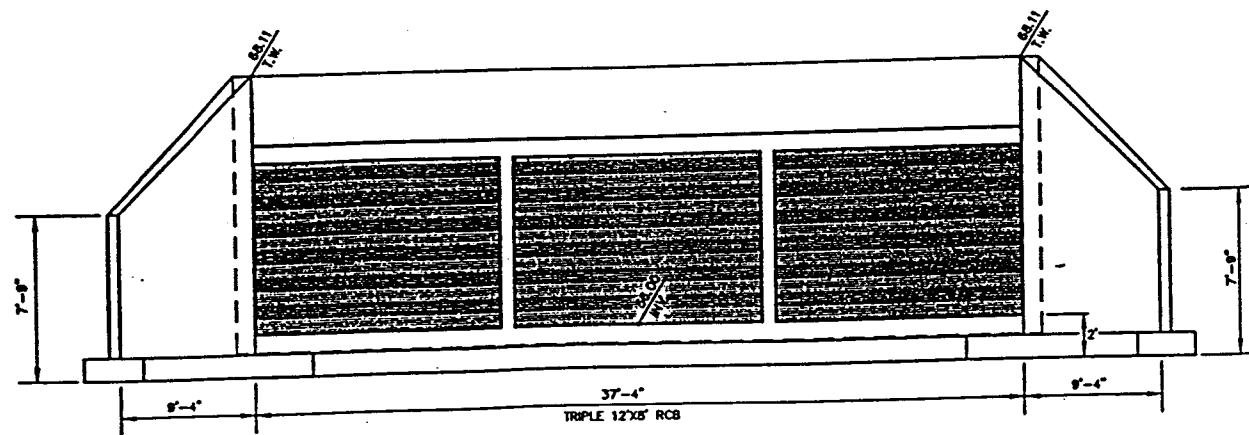
SUMMERLIN
TOWN CENTER DRIVE
TRIPLE 12'X8' RCB'S
PLAN & PROFILE

SHEET
20

SHEET 20 OF 21

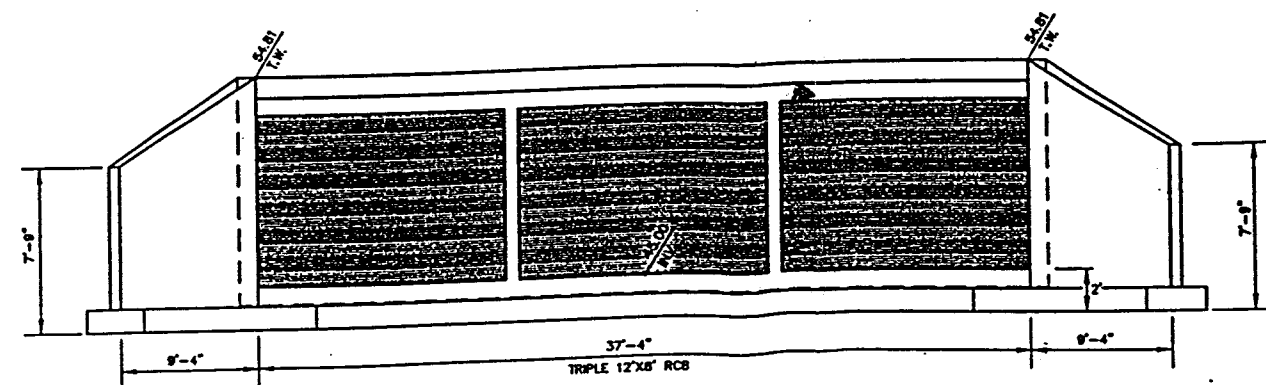
JOB NO. 62051205





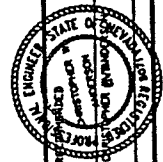
UPSTREAM HEADWALL ELEVATION
SCALE: 1"=4'

TRIPLE 12'x8' RCB CULVERT
USE NDOT STANDARDS B.20.1.1(502), B.20.1.3(502)
& B.20.1.3.1(502) FOR TRIPLE RCB'S
USE NDOT STANDARDS B.20.1.5(502) FOR HEADWALLS
WITH 3' CUTOFF WALL



DOWNSTREAM HEADWALL ELEVATION
SCALE: 1"=4'

TRIPLE 12'x8' RCB CULVERT
USE NDOT STANDARDS B.20.1.1(502), B.20.1.3(502)
& B.20.1.3.1(502) FOR TRIPLE RCB'S
USE NDOT STANDARDS B.20.1.5(502) FOR HEADWALLS
WITH 3' CUTOFF WALL



G.C. WALLACE, INC.
Engineering/Architecture
1555 SOUTH MADISON BLVD. SUITE 200
MADISON, WISCONSIN 53704

SUMMERLIN
TOWN CENTER DRIVE
TOWN CENTER DRIVE
TRIPLE 12'x8' RCB'S
HEADWALL ELEVATIONS

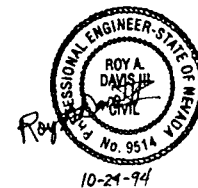
ANASAZI DRIVE
DIVERSION CHANNEL

SUMMERLIN



VILLAGE 8

SUMMERLIN PARKWAY AND ANASAZI DRIVE DIVERSION CHANNEL PHASE 1 1994



DEVELOPER

HOWARD HUGHES PROPERTIES,
LIMITED PARTNERSHIP, a DELAWARE
limited partnership.

BY: SUMMERLIN, a division of
SUMMA CORPORATION, a
DELAWARE corporation, its sole
general partner.

ENGINEER



G.C. WALLACE, INC.
Engineering/Architecture

1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89102

SHEET 1 OF 16

73159A

THE COMPANY HAS THE RIGHT TO DISCONTINUE THE SURVEY AT ANY TIME WITHOUT NOTICE AND WITHOUT LIABILITY TO THE SURVEYOR. THE SURVEYOR SHALL BE RESPONSIBLE FOR THE ACCURACY OF THE DATA OBTAINED AND FOR THE COMPLETION OF THE SURVEY. THE SURVEYOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF THE SURVEY INSTRUMENTS AND EQUIPMENT. THE SURVEYOR SHALL BE RESPONSIBLE FOR THE SAFETY OF THE SURVEY TEAM AND FOR THE PROTECTION OF THE SURVEY AREA. THE SURVEYOR SHALL BE RESPONSIBLE FOR THE OBTAINING OF NECESSARY PERMITS AND FOR THE OBTAINING OF NECESSARY INFORMATION FROM THE LANDOWNER. THE SURVEYOR SHALL BE RESPONSIBLE FOR THE OBTAINING OF NECESSARY INFORMATION FROM THE LANDOWNER. THE SURVEYOR SHALL BE RESPONSIBLE FOR THE OBTAINING OF NECESSARY INFORMATION FROM THE LANDOWNER.

[illegible]

1. A. C. PLUMBING TO BE 1/2" ABOVE UP OF ALL OUTLETS AFTER COMMON LINE, EXCEPT AT SPECIAL RANGES.

2. 1/2" ABOVE UP OF ALL OUTLETS AFTER COMMON LINE, EXCEPT AT SPECIAL RANGES.

3. ALL 1/2" AND 3/4" OUTLETS WITH A GRADE LESS THAN FOUR FEET OR THE PERCENT SHALL BE FOUND TO BE UNACCEPTABLE TO THE CITY SHALL BE REMOVED AND NEW GRADES WATER TESTED AS SOON AS POSSIBLE AFTER CONSTRUCTION. ANY GRADE AND OUTLET FOUND TO BE UNACCEPTABLE TO THE CITY SHALL BE REMOVED AND NEW GRADES.

4. THE EXACT LOCATION OF RANGES MAY BE ADJUSTED IN THE FIELD BY A CITY INSPECTOR.

5. COMMUNICATION SHALL PROVIDE AND MAINTAIN THE NECESSARY HORIZONTAL AND VERTICAL ALIGNMENT AND FLOOR FINISHES AND JOINTS TO PROVIDE THE EXACT OR NEARLY EXACT LOCATION OF RANGES AS DESIGNATED IN THE FIELD BY A CITY INSPECTOR.

3. THE CONTRACTOR SHALL TAKE THE PRECAUTIONARY MEASURES NECESSARY TO PROTECT PEDESTRIAN TRAFFIC, TRUCKS, AND SUCH IMPEDIMENTS OR STRUCTURES DAMAGED BY THE CONTRACTOR'S OPERATIONS OR OWNED UTILITY COMPANY AT THE EXPENSE OF THE CONTRACTOR.
4. ALL CONSTRUCTION SHALL BE AS SHOWN ON THESE PLANS. ANY REVISIONS SHALL HAVE THE PERSON WRITING APPROVAL OF THE CITY ENGINEER.
5. THE CEMENT SHALL BE USED IN ALL 07-31% CONCRETE WORK. CONCRETE TO BE USED IN ALL SHALL BE APPROVED BY THE QUALITY CONTROL DIVISION.
6. A CEMENT SHALL BE USED IN ALL 07-31% CONCRETE WORK. CONCRETE TO BE USED IN ALL SHALL BE APPROVED BY THE QUALITY CONTROL DIVISION.
7. EXHAUSTION MUST BE REQUIRED. AVERAGE EVERY 300,000 CUBIC YARDS OF CONSTRUCTION.

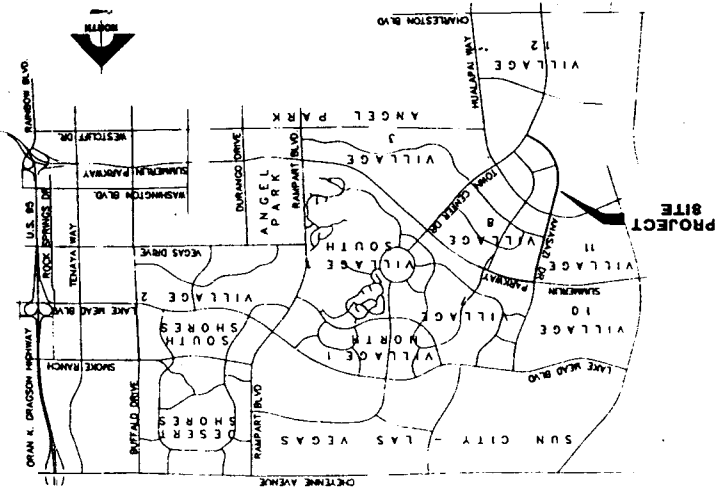
[illegible]

GENERAL NOTES

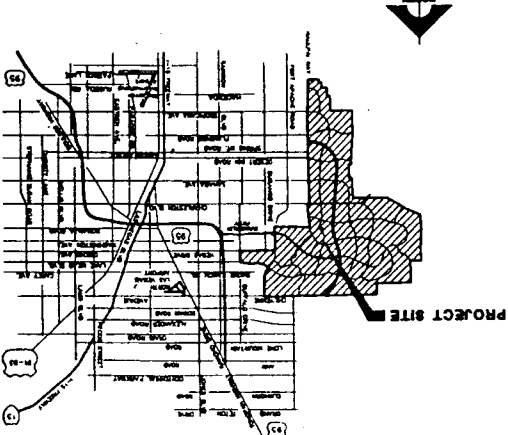
LEGEND & ABBREVIATION

- [illegible]

LOCATION MAP



VICINITY MAP



INDEX OF DRAWINGS

NO.	TITLE & DESCRIPTION
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	...
30	...
31	...
32	...
33	...
34	...
35	...
36	...
37	...
38	...
39	...
40	...
41	...
42	...
43	...
44	...
45	...
46	...
47	...
48	...
49	...
50	...
51	...
52	...
53	...
54	...
55	...
56	...
57	...
58	...
59	...
60	...
61	...
62	...
63	...
64	...
65	...
66	...
67	...
68	...
69	...
70	...
71	...
72	...
73	...
74	...
75	...
76	...
77	...
78	...
79	...
80	...
81	...
82	...
83	...
84	...
85	...
86	...
87	...
88	...
89	...
90	...
91	...
92	...
93	...
94	...
95	...
96	...
97	...
98	...
99	...
100	...

16	WILAGE 8 DIVISION CHANNEL	CHANNEL DETAILS
15	WILAGE 8 DIVISION CHANNEL	CHANNEL SECTIONS AND DETAILS
14	WILAGE 8 DIVISION CHANNEL	CHANNEL SECTIONS
13	SHUMMERIN PARKWAY DRAINAGE CHANNEL PLAN AND PROFILE STA. 97+00 TO 100+86.95	
12	SHUMMERIN PARKWAY DRAINAGE CHANNEL PLAN AND PROFILE STA. 86+00 TO 97+00	
11	SHUMMERIN PARKWAY DRAINAGE CHANNEL PLAN AND PROFILE STA. 76+00 TO 86+00	
10	MASSAD DR DRAINAGE CHANNEL PLAN AND PROFILE STA. 67+00 TO 76+50	
9	MASSAD DR DRAINAGE CHANNEL PLAN AND PROFILE STA. 55+00 TO 67+00	
8	MASSAD DR DRAINAGE CHANNEL PLAN AND PROFILE STA. 37+00 TO 55+00	
7	MASSAD DR DRAINAGE CHANNEL PLAN AND PROFILE STA. 37+00 TO 44+00	
6	MASSAD DR DRAINAGE CHANNEL PLAN AND PROFILE STA. 27+00 TO 37+00	
5	MASSAD DR DRAINAGE CHANNEL PLAN AND PROFILE STA. 19+00 TO 27+00	
4	MASSAD DR DRAINAGE CHANNEL PLAN AND PROFILE STA. 0+00 TO 19+00	

DRAINAGE CERTIFICATION

I CERTIFY THAT THE GRADING PLAN IS IN CONFORMANCE WITH THE APPROVED DRAINAGE STUDY ON FILE AT THE CITY OF LAS VEGAS FOR THIS PROJECT.

ROY A. DAVIS III R.P.C. 9514
9-29-94
DATE

APPROVALS

DATE 10/5/94

DATE 10/25

CITY ENGINEER

SUPERVISOR

APPROVED BY: Bill

GERALD W. ROBBINS

AGENCIES APPROVALS

[illegible]

BASIS OF BEARING

N 017°24'S E IS BASED ON THE NEVADA STATE GRID SYSTEM
(EAST ZONE) AS DETERMINED FROM THE TRIANGULATION
POINTS "RED ROCK" TO "LOVE MOUNTAIN".

BENCHMARK

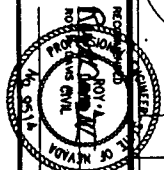
CHISELED "+", IN THE TOP OF CURB AT END OF CURB ON
WEST SIDE OF DURHAM, 250' SOUTH OF WESTCOTT.
ELEV. PER CITY OF LAS VEGAS DATUM = 2810.18

Call before you dig.
1-800-227-2800

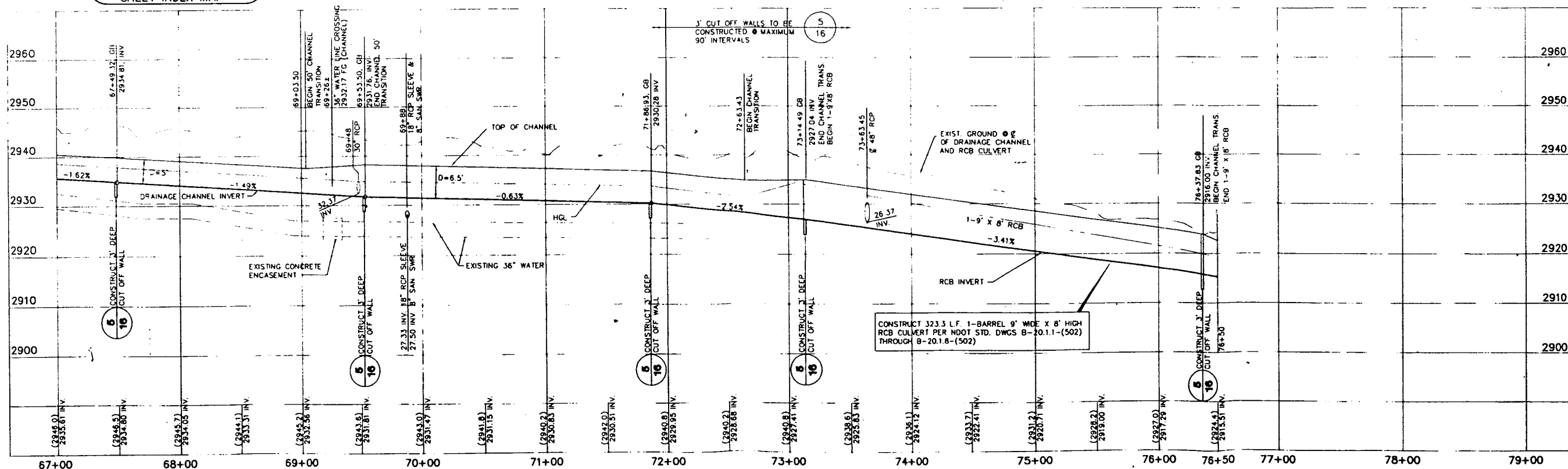
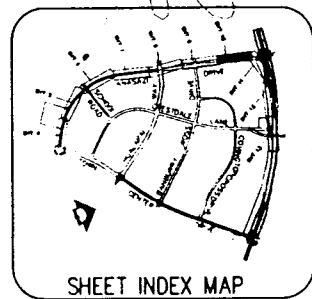
2

SUMMERLIN
VILLAGE B DIVERSION CHANNEL

W
G.C. WALLACE, INC.
Engineering/Architecture 1555 SOUTH RAINBOW BLVD LAS VEGAS NEVADA 89102

[illegible]

STA. 67+00 MATCH LINE SEE SHEET 9



ANASAZI DRIVE DRAINAGE CHANNEL

SCALE: 1" = 40' HORIZONTAL
1" = 10' VERTICAL

LAS VEGAS VALLEY WATER DISTRICT

10-21-91
DATE

JOB NO. 02008.209

DATE: 10/21/91

SUMMERLIN
VILLAGE & DIVERSION CHANNEL PHASE 1
ANASAZI DRIVE DRAINAGE CHANNEL
PLAN & PROFILE
STA. 67+00.00 TO STA. 76+50.00

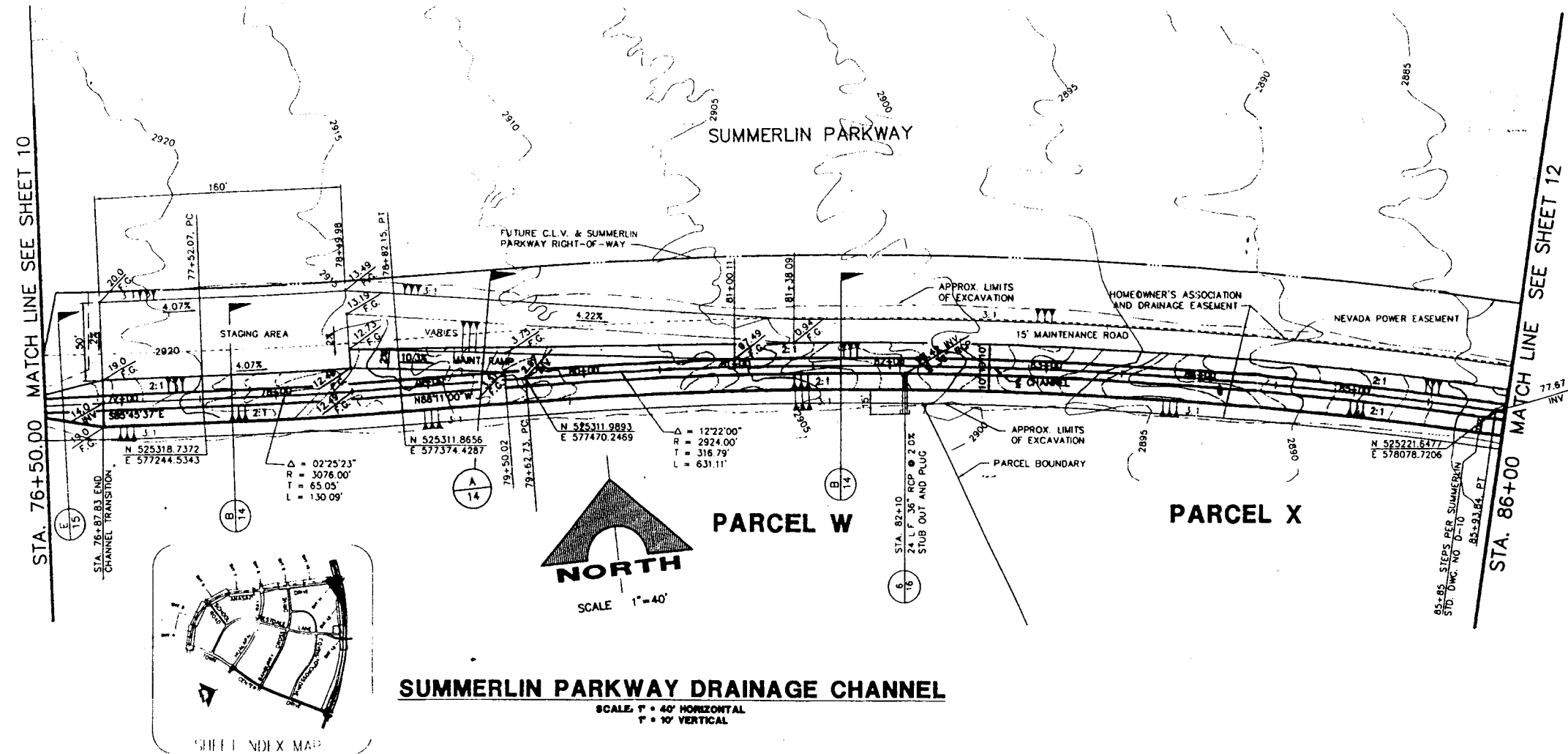
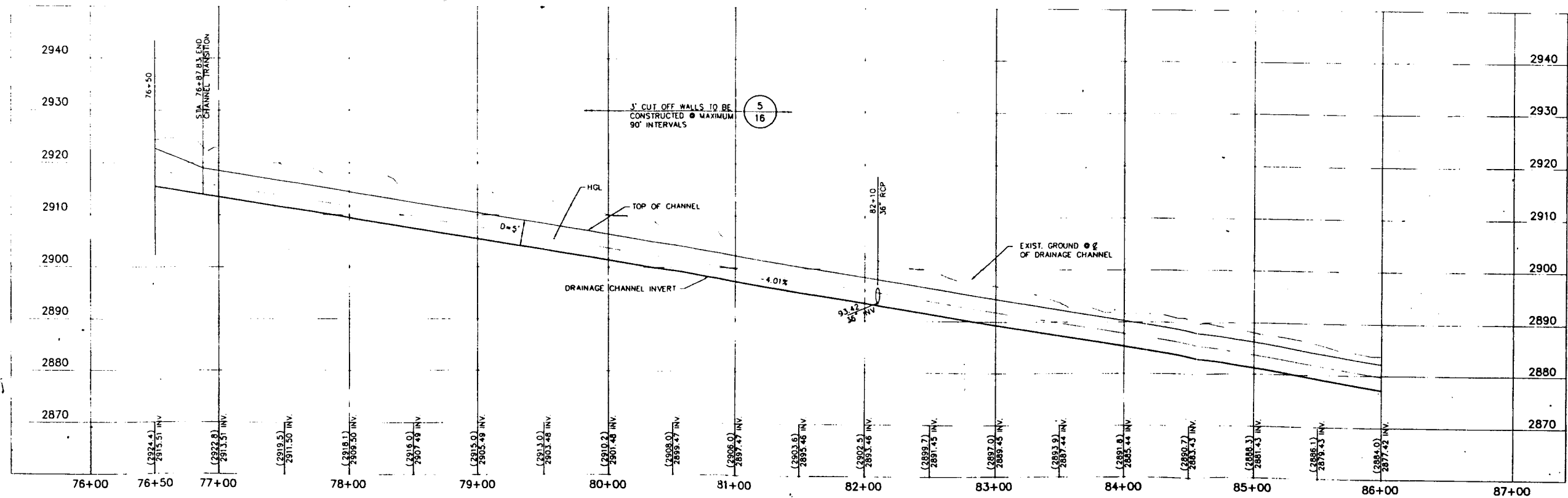
SHEET

10

SHT 10 OF 10

731-59A

JOB NO. 62008.209



RECORD COPY
FOR
PROJECT NO. 62008.209
DATE 05/14/04
BY: [Signature]
G.C. WALLACE, INC.
Engineering/Architecture
1335 SOUTH RAINBOW BLVD. SUITE 100 LAS VEGAS, NEVADA 89102

SUMMERLIN
VILLAGE 8 DIVERSION CHANNEL PHASE 1
SUMMERLIN PARKWAY DRAINAGE CHANNEL
PLAN & PROFILE
STA. 76+50.00 TO STA. 86+00.00

SHEET
11
SHT 11 OF 18

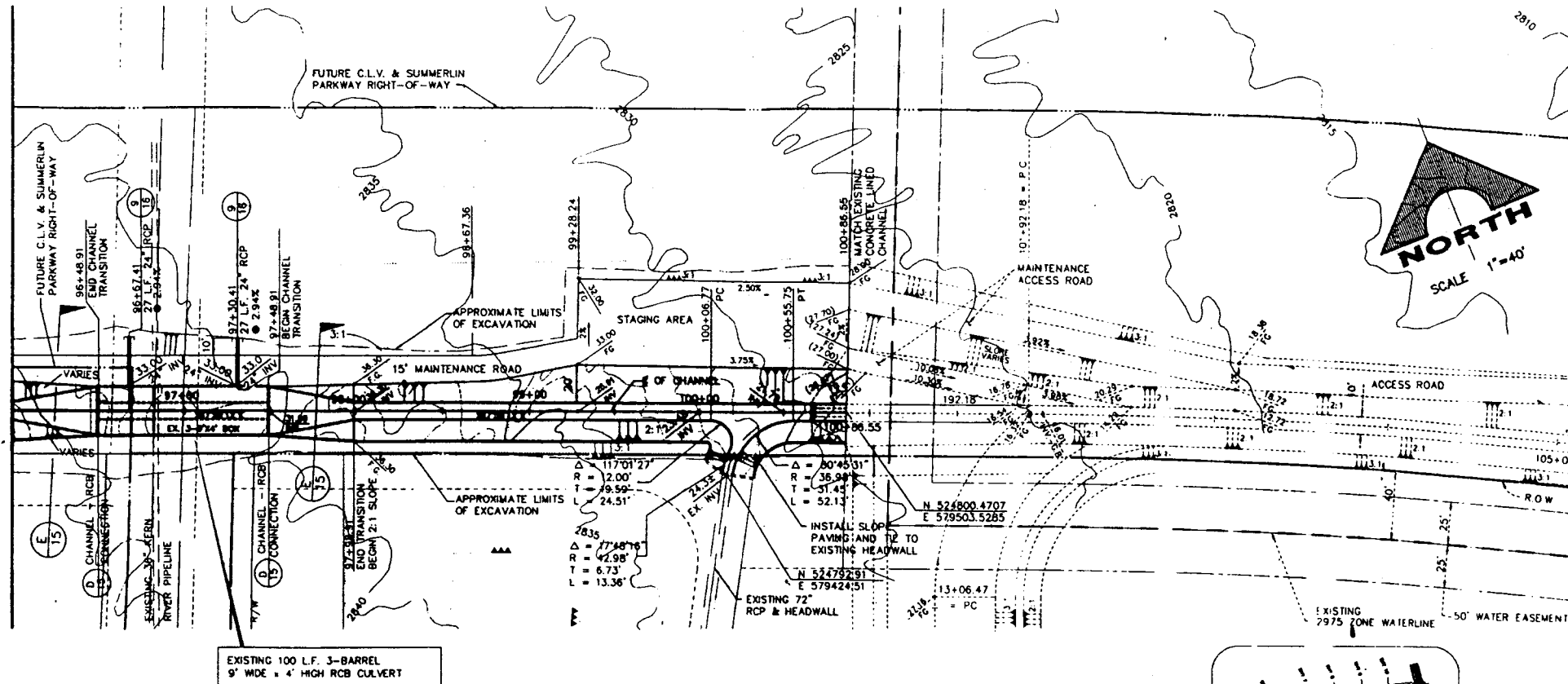
NO.	DATE	DESCRIPTION	BY	DATE	APPROVAL
1	05/14/04	ISSUED FOR PERMIT	[Signature]		
2	05/14/04	ISSUED FOR PERMIT	[Signature]		
3	05/14/04	ISSUED FOR PERMIT	[Signature]		
4	05/14/04	ISSUED FOR PERMIT	[Signature]		
5	05/14/04	ISSUED FOR PERMIT	[Signature]		
6	05/14/04	ISSUED FOR PERMIT	[Signature]		
7	05/14/04	ISSUED FOR PERMIT	[Signature]		
8	05/14/04	ISSUED FOR PERMIT	[Signature]		
9	05/14/04	ISSUED FOR PERMIT	[Signature]		
10	05/14/04	ISSUED FOR PERMIT	[Signature]		
11	05/14/04	ISSUED FOR PERMIT	[Signature]		
12	05/14/04	ISSUED FOR PERMIT	[Signature]		
13	05/14/04	ISSUED FOR PERMIT	[Signature]		
14	05/14/04	ISSUED FOR PERMIT	[Signature]		
15	05/14/04	ISSUED FOR PERMIT	[Signature]		
16	05/14/04	ISSUED FOR PERMIT	[Signature]		
17	05/14/04	ISSUED FOR PERMIT	[Signature]		
18	05/14/04	ISSUED FOR PERMIT	[Signature]		
19	05/14/04	ISSUED FOR PERMIT	[Signature]		
20	05/14/04	ISSUED FOR PERMIT	[Signature]		
21	05/14/04	ISSUED FOR PERMIT	[Signature]		
22	05/14/04	ISSUED FOR PERMIT	[Signature]		
23	05/14/04	ISSUED FOR PERMIT	[Signature]		
24	05/14/04	ISSUED FOR PERMIT	[Signature]		
25	05/14/04	ISSUED FOR PERMIT	[Signature]		
26	05/14/04	ISSUED FOR PERMIT	[Signature]		
27	05/14/04	ISSUED FOR PERMIT	[Signature]		
28	05/14/04	ISSUED FOR PERMIT	[Signature]		
29	05/14/04	ISSUED FOR PERMIT	[Signature]		
30	05/14/04	ISSUED FOR PERMIT	[Signature]		
31	05/14/04	ISSUED FOR PERMIT	[Signature]		
32	05/14/04	ISSUED FOR PERMIT	[Signature]		
33	05/14/04	ISSUED FOR PERMIT	[Signature]		
34	05/14/04	ISSUED FOR PERMIT	[Signature]		
35	05/14/04	ISSUED FOR PERMIT	[Signature]		
36	05/14/04	ISSUED FOR PERMIT	[Signature]		
37	05/14/04	ISSUED FOR PERMIT	[Signature]		
38	05/14/04	ISSUED FOR PERMIT	[Signature]		
39	05/14/04	ISSUED FOR PERMIT	[Signature]		
40	05/14/04	ISSUED FOR PERMIT	[Signature]		
41	05/14/04	ISSUED FOR PERMIT	[Signature]		
42	05/14/04	ISSUED FOR PERMIT	[Signature]		
43	05/14/04	ISSUED FOR PERMIT	[Signature]		
44	05/14/04	ISSUED FOR PERMIT	[Signature]		
45	05/14/04	ISSUED FOR PERMIT	[Signature]		
46	05/14/04	ISSUED FOR PERMIT	[Signature]		
47	05/14/04	ISSUED FOR PERMIT	[Signature]		
48	05/14/04	ISSUED FOR PERMIT	[Signature]		
49	05/14/04	ISSUED FOR PERMIT	[Signature]		
50	05/14/04	ISSUED FOR PERMIT	[Signature]		
51	05/14/04	ISSUED FOR PERMIT	[Signature]		
52	05/14/04	ISSUED FOR PERMIT	[Signature]		
53	05/14/04	ISSUED FOR PERMIT	[Signature]		
54	05/14/04	ISSUED FOR PERMIT	[Signature]		
55	05/14/04	ISSUED FOR PERMIT	[Signature]		
56	05/14/04	ISSUED FOR PERMIT	[Signature]		
57	05/14/04	ISSUED FOR PERMIT	[Signature]		
58	05/14/04	ISSUED FOR PERMIT	[Signature]		
59	05/14/04	ISSUED FOR PERMIT	[Signature]		
60	05/14/04	ISSUED FOR PERMIT	[Signature]		
61	05/14/04	ISSUED FOR PERMIT	[Signature]		
62	05/14/04	ISSUED FOR PERMIT	[Signature]		
63	05/14/04	ISSUED FOR PERMIT	[Signature]		
64	05/14/04	ISSUED FOR PERMIT	[Signature]		
65	05/14/04	ISSUED FOR PERMIT	[Signature]		
66	05/14/04	ISSUED FOR PERMIT	[Signature]		
67	05/14/04	ISSUED FOR PERMIT	[Signature]		
68	05/14/04	ISSUED FOR PERMIT	[Signature]		
69	05/14/04	ISSUED FOR PERMIT	[Signature]		
70	05/14/04	ISSUED FOR PERMIT	[Signature]		
71	05/14/04	ISSUED FOR PERMIT	[Signature]		
72	05/14/04	ISSUED FOR PERMIT	[Signature]		
73	05/14/04	ISSUED FOR PERMIT	[Signature]		
74	05/14/04	ISSUED FOR PERMIT	[Signature]		
75	05/14/04	ISSUED FOR PERMIT	[Signature]		
76	05/14/04	ISSUED FOR PERMIT	[Signature]		
77	05/14/04	ISSUED FOR PERMIT	[Signature]		
78	05/14/04	ISSUED FOR PERMIT	[Signature]		
79	05/14/04	ISSUED FOR PERMIT	[Signature]		
80	05/14/04	ISSUED FOR PERMIT	[Signature]		
81	05/14/04	ISSUED FOR PERMIT	[Signature]		
82	05/14/04	ISSUED FOR PERMIT	[Signature]		
83	05/14/04	ISSUED FOR PERMIT	[Signature]		
84	05/14/04	ISSUED FOR PERMIT	[Signature]		
85	05/14/04	ISSUED FOR PERMIT	[Signature]		
86	05/14/04	ISSUED FOR PERMIT	[Signature]		
87	05/14/04	ISSUED FOR PERMIT	[Signature]		
88	05/14/04	ISSUED FOR PERMIT	[Signature]		
89	05/14/04	ISSUED FOR PERMIT	[Signature]		
90	05/14/04	ISSUED FOR PERMIT	[Signature]		
91	05/14/04	ISSUED FOR PERMIT	[Signature]		
92	05/14/04	ISSUED FOR PERMIT	[Signature]		
93	05/14/04	ISSUED FOR PERMIT	[Signature]		
94	05/14/04	ISSUED FOR PERMIT	[Signature]		
95	05/14/04	ISSUED FOR PERMIT	[Signature]		
96	05/14/04	ISSUED FOR PERMIT	[Signature]		
97	05/14/04	ISSUED FOR PERMIT	[Signature]		
98	05/14/04	ISSUED FOR PERMIT	[Signature]		
99	05/14/04	ISSUED FOR PERMIT	[Signature]		
100	05/14/04	ISSUED FOR PERMIT	[Signature]		

731-99A

JOB NO. 62008.209

DATE: 11/18/2014

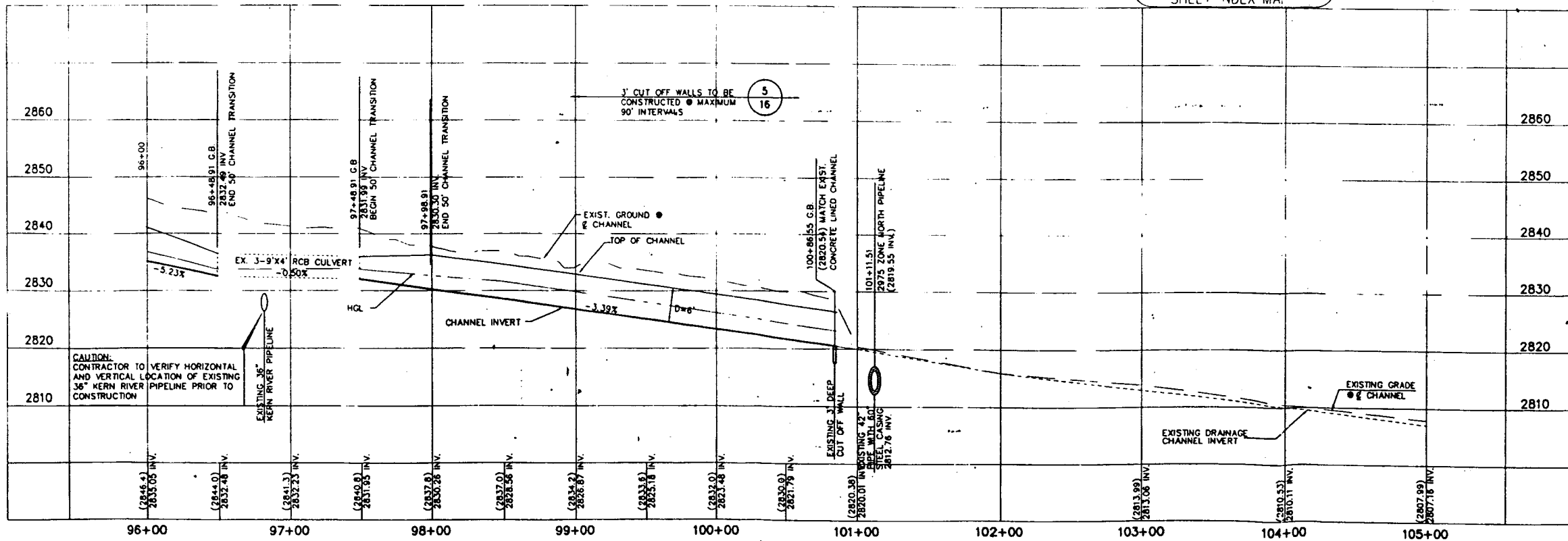
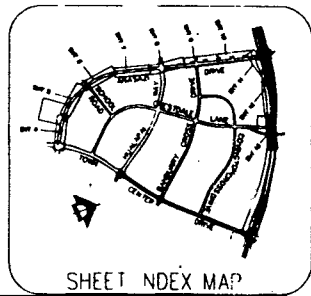
STA. 96+00 MATCH LINE SEE SHEET 12



NOTICE
CONTRACTOR TO OBTAIN ENCROACHMENT
PERMIT FROM KERN RIVER GAS.

SUMMERLIN PARKWAY DRAINAGE CHANNEL

SCALE: H = 40' HORIZONTAL
V = 10' VERTICAL



REVISIONS

NO.	DATE	DESCRIPTION	BY	DATE	APPROVAL
1	11/18/2014	ISSUED FOR PERMIT	WALLACE		

RECORDS

RECEIVED

NOV 19 2014

STATE OF NEVADA

DEPT. OF TRANSPORTATION

DESIGN DIVISION

PROJECT

SUMMERLIN PARKWAY DRAINAGE CHANNEL

CLIENT

KERN RIVER GAS

DESIGNER

G.C. WALLACE, INC.

ENGINEERING/ARCHITECTURE

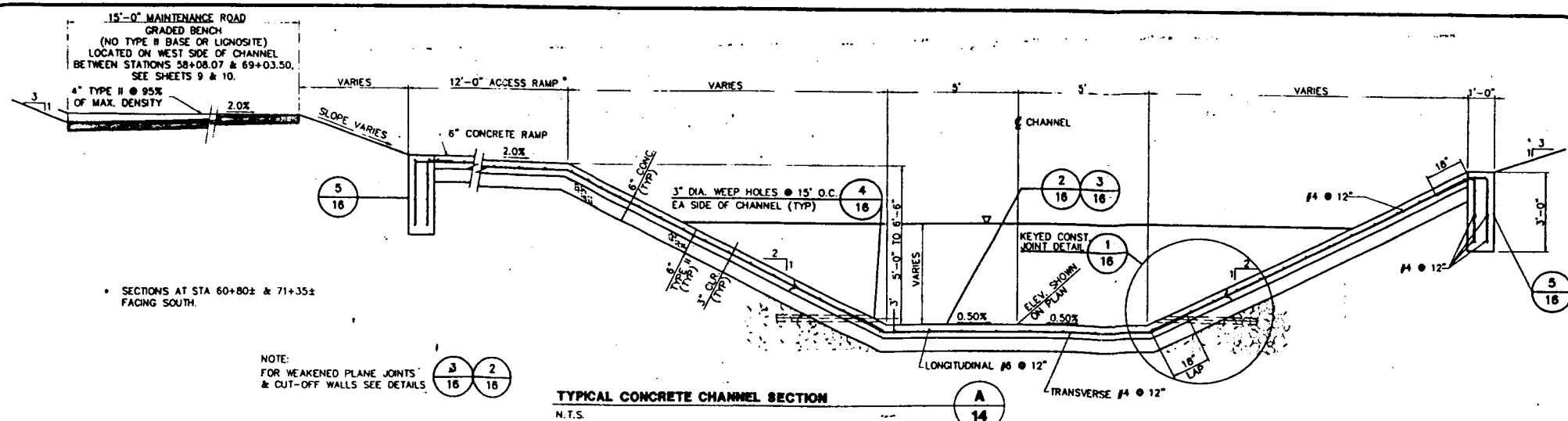
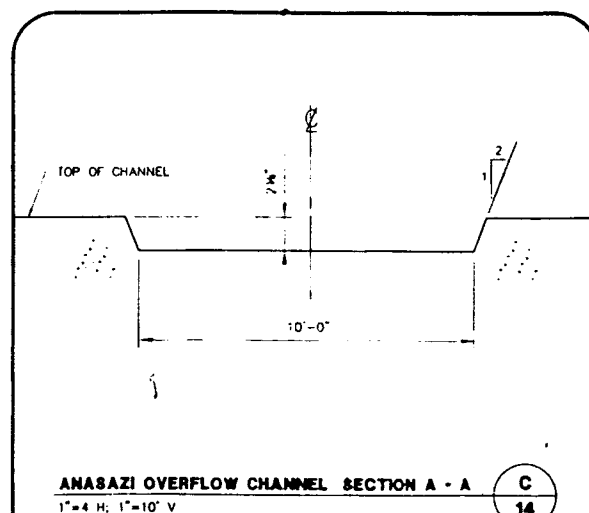
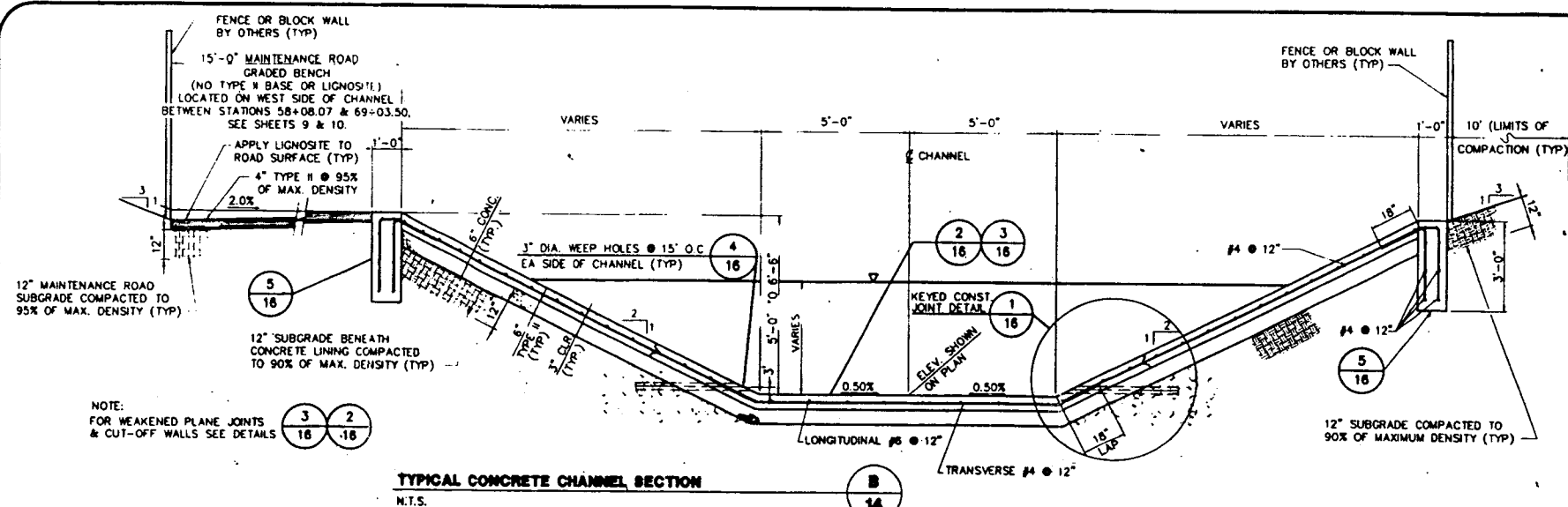
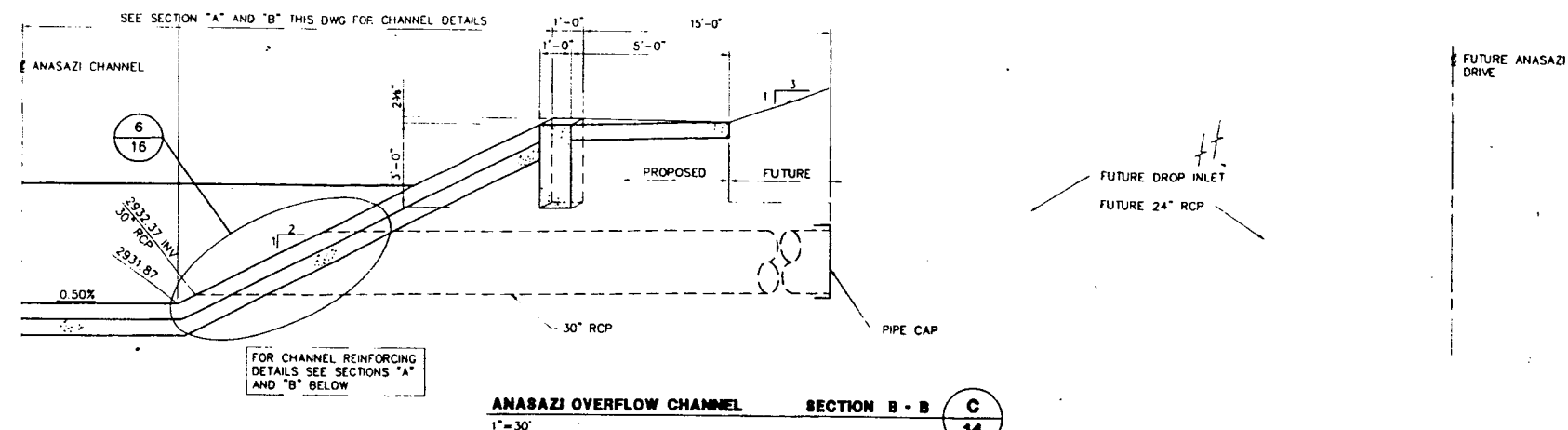
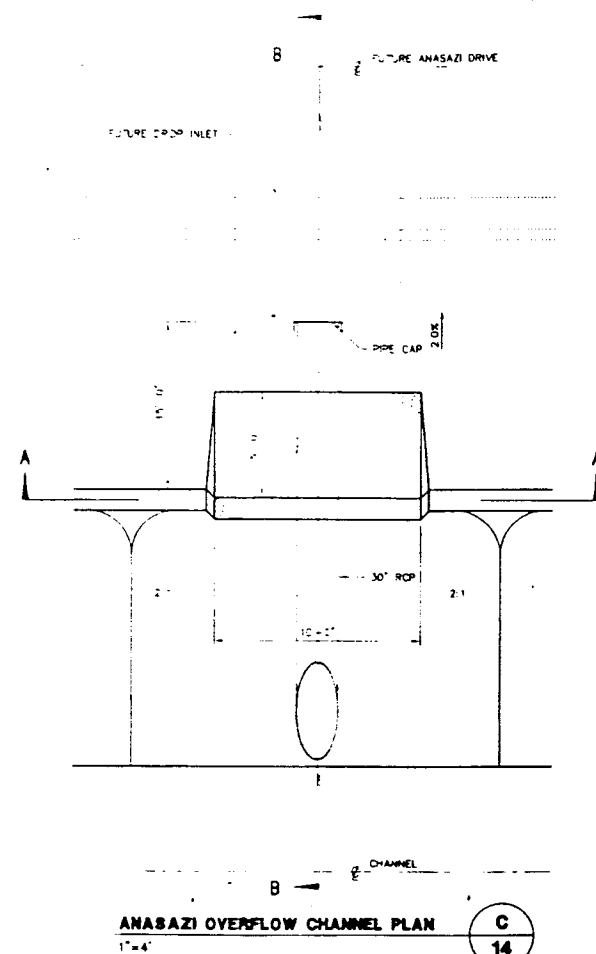
1555 SOUTH HAWKEYE BLVD. SUITE 100 LAS VEGAS, NV 89102

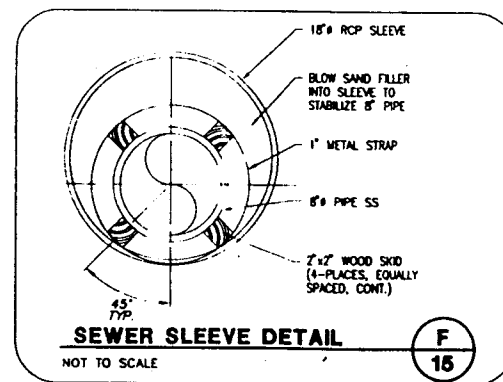
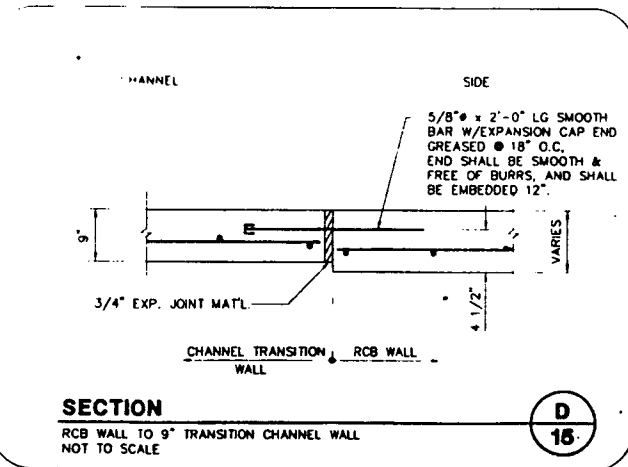
SHEET

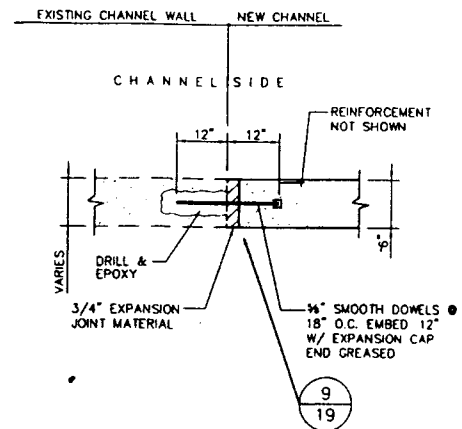
13

SHEET 13 OF 18

731-591A

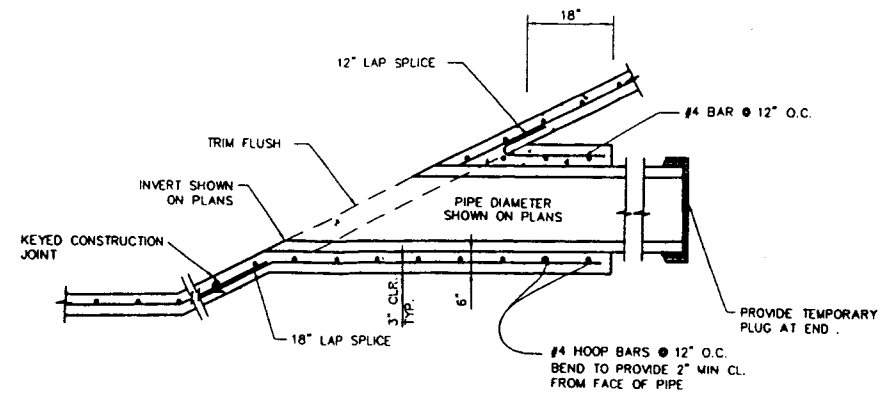






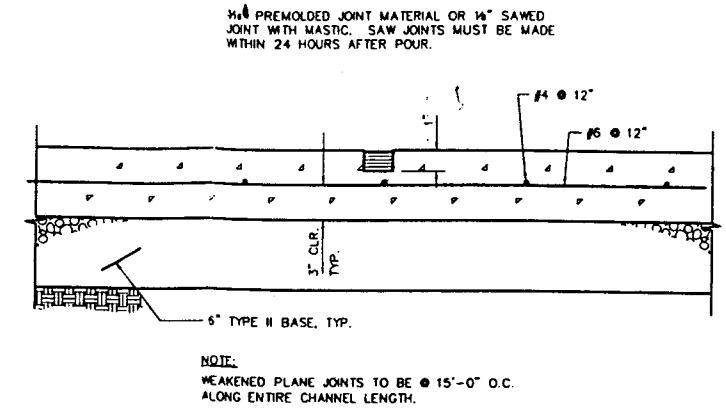
EXISTING CHANNEL JOINT DETAIL
NOT TO SCALE

9
16



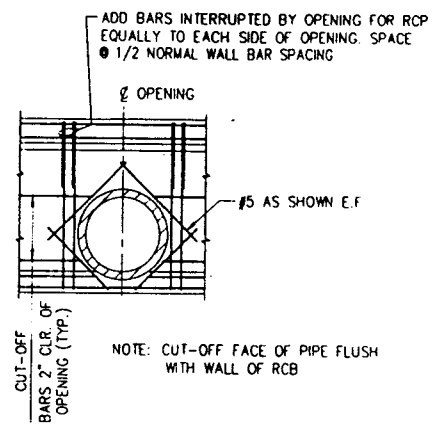
PIPE CONNECTION TO TRAPEZOIDAL CHANNEL
NOT TO SCALE

6
16



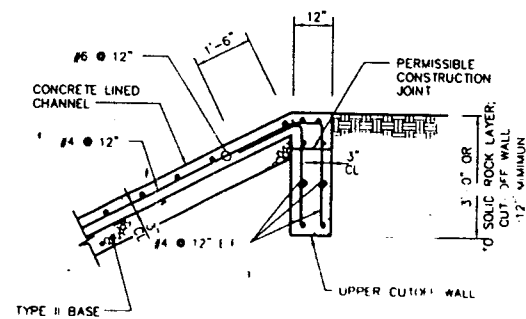
WEAKENED PLANE SECTION
NOT TO SCALE

3
16



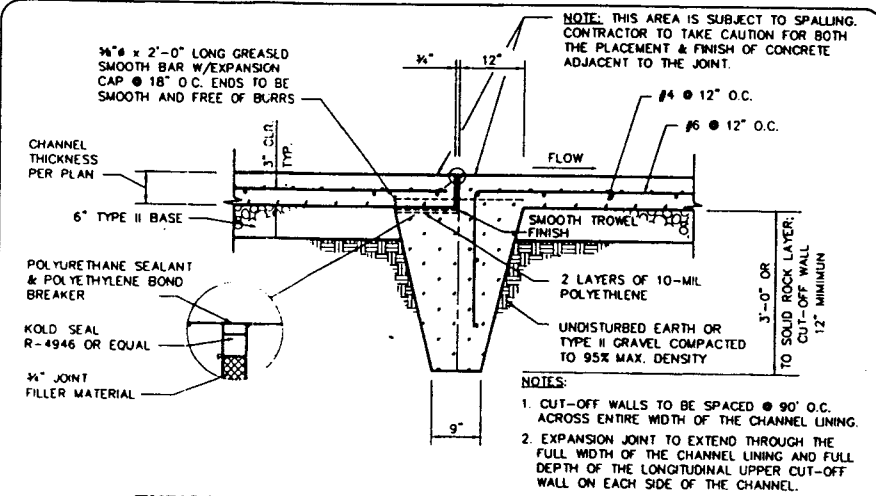
PIPE CONNECTION TO BOX CULVERT
NOT TO SCALE

8
16



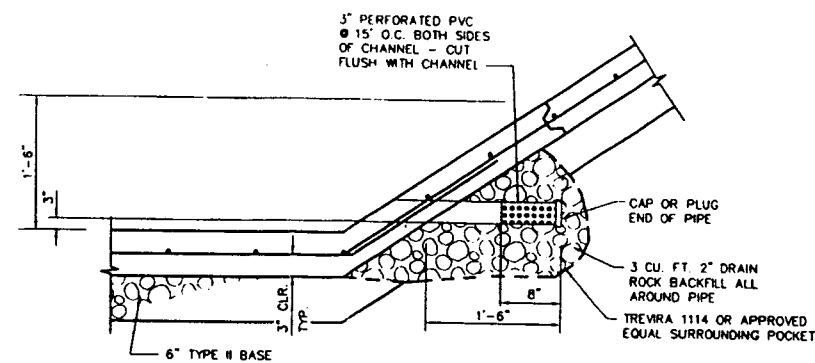
UPPER CUT-OFF WALL
(REVERSE IS APPLICABLE)
NOT TO SCALE

5
16



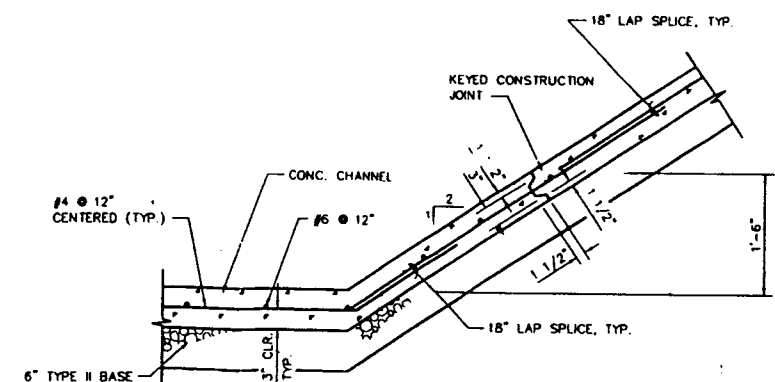
TYPICAL EXPANSION JOINT DETAIL & CUT-OFF WALL DETAIL
NOT TO SCALE

2
16



WEEP PIPE DETAIL
(REVERSE IS APPLICABLE)
NOT TO SCALE

4
16



KEYED CONSTRUCTION JOINT DETAIL
(REVERSE IS APPLICABLE)
NOT TO SCALE

1
16