

DS #: 4571

APN: 137-22-000-015

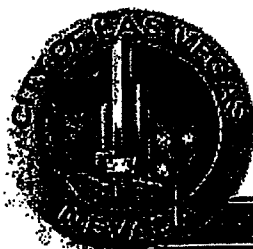
Alta Drive Improvements (Desert foothill to Fox hill)

PROJECT: Summerlin Village 23A/23B -update #3

SUBMITTAL: 1st

SCANNED BY/DATE: _____

CHECKED BY/DATE: _____



CITY OF LAS VEGAS		DATE:
INTER-OFFICE MEMORANDUM		September 25, 2012
TO: Land Development Services Department of Public Works		FROM: Albert Sung, P.E. Flood Control Project Engineer Department of Public Works
SUBJECT:	COPIES TO:	
Drainage Study for:	G. C. Wallace Inc.	
Alta Drive Improvements (Desert Foothill to Fox Hill) Summerlin Village 23A/23B – Update #3		
Cross Streets:	Alta Drive between Desert Foothill & Fox Hill	Howard Hughes Corporation
File Number:	F:\Depot\DSMemos\DS4571A.doc	Bart Anderson, P.E., DevCo
Parcel Number:	137-22-000-015	CCRFCD
Zoning Action:	N/A	
FEMA Flood Zone	YES	NO X
Proposed Storm Drain	YES X	NO

HISTORY	DATE RECEIVED	DATE REVIEWED	COMMENTS	REVIEW FEES	FEES PAID Payment Trn #
1 st Submittal	9/11/2012	9/25/2012	See Comments Below	\$100.00	295587: \$100
			TOTAL FEES (LDDRS):	\$100.00	----

REMARKS:

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

	is approved subject to conformance to all City standards and the following conditions:
X	must be resubmitted or supplemented including the following:
	is conditionally approved subject to Clark County Regional Flood Control District concurrence.
	is conditionally approved subject to Clark County Public Works Department concurrence.

- The site is adjacent to or crosses an existing or proposed *Clark County Regional Flood Control District* (CCRFCD) master planned facility. Therefore, CCRFCD concurrence is required prior to final approval of the drainage study.
- Comparing the subject **Storm Drain Master Plan** (Sheet 7) with reference to **Figure 7U** of the approved **Summerlin Village 23B Conceptual Drainage Study**, two drainage facilities are missing in the subject improvement plan:
 - Facility #11, a 36" stub between Parcel P and Parcel Q;
 - Facility #7, a 42" to serve the ultimate discharge from Parcel U.

These two facilities are also commented in the following plan & profile drawings.
- Sheet 9:** Identify an existing 36" stub between Parcel P and Parcel Q. Review and revise all pertinent plans accordingly.
- Sheet 13:** Identify the 42" stub at the intersection of *Alta Drive* and the future *Fox Hill Drive*.
- All the interim facilities such as but not limited to the openings, berms/channels and laterals etc. are owned and to be privately maintained by *Howard Hughes Corporation*.

6. Add a note in all pertinent sheets for the construction of all storm drain drop inlets per a newly adopted USDCCA Drawing No. 421 (*Stormwater Quality Management Stamp and Sign Detail*).

In an effort to increase administrative efficiency, the City of Las Vegas Public Works Department requires all soil reports, drainage studies and traffic impact analysis submittals to be accompanied by an electronic copy of the submittal. Electronic documents must be submitted with one original hard copy of the study. Electronic documents should be on a universal computer-readable digital output replicating your submittal to be used for archival or display purposes. This may be more than one file if necessary. An Indexed Portable Document Format (PDF) or Print Ready CAD file formats with a minimum of 300dpi are the desired formats, but provided it is a high quality digitized replication of the submittal, other formats may be acceptable. If figures are in color, they must be scanned in color and saved as a separate file. The new submittal requirement is effective on **July 1, 2011**. If there are any questions regarding these new requirements, please contact Albert Sung in the Flood Section at (702) 229-2001 or Rick Schroder in Traffic Engineering at (702) 229-6327.

NOTE: Please be advised that all land surface area disturbances over 1 acre or any area adjacent to a water way must submit to the *Nevada Division of Environmental Protection* a "Notice of Intent" to discharge that certifies a stormwater pollution prevention plan has been developed and is maintained on site; for inclusion in the Stormwater General Permit No. NVR100000. A phased construction unit in a contiguous subdivision is considered under construction until all stripped or disturbed surface areas have been covered by paving, building construction or planting. For more information, including forms and applications see <http://ndep.nv.gov/bwpc/storm01.htm> or call (775) 687-9429.

END OF REMARKS
ays

T/R/S: T20S/R59E/22
AREA K-22

 *** FAX TX REPORT ***

TRANSMISSION OK

JOB NO. 4816
 DESTINATION ADDRESS 8042299
 PSWD/SUBADDRESS
 DESTINATION ID
 ST. TIME 09/25 14:38
 USAGE T 00' 53
 PGS. 2
 RESULT OK

CITY OF LAS VEGAS		DATE:
INTER-OFFICE MEMORANDUM		September 25, 2012
TO: Land Development Services Department of Public Works		FROM: Albert Sung, P.E. Flood Control Project Engineer Department of Public Works
SUBJECT: Drainage Study for: Alta Drive Improvements (Desert Foothill to Fox Hill) Summerlin Village 23A/23B – Update #3		COPIES TO: G. C. Wallace Inc.
Cross Streets:	Alta Drive between Desert Foothill & Fox Hill	Howard Hughes Corporation
File Number:	F:\Depot\DSMemos\DS4571A.doc	Bart Anderson, P.E., DevCo
Parcel Number:	137-22-000-015	CCRFCD
Zoning Action:	N/A	
FEMA Flood Zone	YES NO X	
Proposed Storm Drain	YES X NO	

HISTORY	DATE RECEIVED	DATE REVIEWED	COMMENTS	REVIEW FEES	FEES PAID Payment Trn #
1 st Submittal	9/11/2012	9/25/2012	See Comments Below	\$100.00	295587: \$100
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 - Facility #11, a 36" stub between Parcel P and Parcel Q;

LETTER OF TRANSMITTAL



Project No.: 62023B-202
Date: September 11, 2012

G. C. WALLACE, INC.
G. C. WALLACE OF CALIFORNIA, INC.
G. C. WALLACE HOLDINGS, INC.

To: **City of Las Vegas**
City of Las Vegas - Land Development Services
Department of Public Works
333 N. Rancho Drive
Las Vegas, NV 89106

Writer's Contact Information:

804-2000

Attention: Albert Sung, PE

Subject: **Update #3 to the Technical Drainage Study for Summerlin Village 23A/23B Alta Drive Improvements**

Sent Via: Hand Delivery

Items being sent:

One (1) Copy of Update to the subject TDS
One (1) Copy of Standard Form 1 (bound)
One (1) Copy of Standard Form 2 (bound)
One (1) Copy of Improvement Plans (bound)
CD of the subject TDS.
Check (#101628) for \$100

These items are submitted:

- | | |
|--|---|
| ☐ At your request | ☐ For your action |
| ☐ For your approval | ☐ For your files |
| ☒ For your review and comments | ☐ For your information |

Acknowledgment of receipt:

☒ **Required**

Received by: _____

Date: _____

Time: _____

Remarks:

Please review and comment.

Cordially,

G. C. WALLACE, INC.

Grant Tokumi, PE
Flood Control Division
vlr

Copies to: Calvin Black, GCW
Jerry Pruitt, GCW
Ryan Belsick, GCW
Josh Johnson, GCW
Derick Yoro, GCW

**UPDATE #3 TO THE
TECHNICAL DRAINAGE STUDY
FOR
SUMMERLIN VILLAGE 23A/23B
ALTA DRIVE IMPROVEMENTS**

62023B-202

September 2012

Prepared for:

**The Howard Hughes Corporation
10801 W. Charleston Blvd., 3rd Floor
Las Vegas, Nevada 89135
Phone: (702) 791-4300
Fax: (702) 791-4450**



G. C. WALLACE COMPANIES
ENGINEERS | PLANNERS | SURVEYORS

**UPDATE #3 TO THE
TECHNICAL DRAINAGE STUDY
FOR
SUMMERLIN VILLAGE 23A/23B
ALTA DRIVE IMPROVEMENTS**

62023B-202

September 2012

Prepared for:

**The Howard Hughes Corporation
10801 W. Charleston Blvd., 3rd Floor
Las Vegas, Nevada 89135
Phone: (702) 791-4300
Fax: (702) 791-4450**

Prepared by:

**G. C. Wallace Companies
1555 S. Rainbow Blvd.
Las Vegas, Nevada 89146
Phone: (702) 804-2000
Fax: (702) 804-2299**

HYDROLOGIC CRITERIA AND DRAINAGE MANUAL

DRAINAGE STUDY INFORMATION FORM

Name of Development: Summerlin Village 23A/23B Alta Drive Improvements Date: September 2012

Location of Development a) Descriptive (Cross Streets) North/South: Fox Hill Drive / Desert Foothills Drive

East/West: Alta Drive

b) Section: 22 Township: 20 S Range: 59 E

c) APN: 137-22-000-015

Name of Owner: Howard Hughes Company LLC

Telephone No.: (702) 791-4300 Fax No.: (702) 791-4450 E-Mail Address: Not available

Address: 10801 W. Charleston Blvd, 3rd Floor, Las Vegas, Nevada 89135

Contact Person-Name: Grant Tokumi Telephone No.: (702) 804-2015

* E-Mail Address: gtokumi@gcwallace.com Fax No.: (702) 804-2299

Firm: G. C. WALLACE COMPANIES

Address: 1555 S. Rainbow Blvd, Las Vegas, NV 89146

Type of Land Development/Land Disturbance

☐	Rezoning	☐	Subdivision Map	☐	Clearing and Grading Only
☐	Parcel Map	☐	Planned Unit Development	☒	Other (Please specify below)
☐	Large Parcel Map	☐	Building Permit	Technical Drainage Study Update – Interim Grading	

1. Total Owned Land Area: At Site: +/- 2,700 acres Being Developed/Disturbed: +/- 9 acres

2. Is a portion or all of the subject property located in a designated FEMA Flood Hazard Area? ☐ Yes** ☒ No

3. Is the property bordered or crossed by an existing or proposed Clark County Regional Flood Control District Master Planned Facility? ☒ Yes** ☐ No

4. Proposed type of development (Residential, Commercial, Etc.): Street Improvement Only

5. Approximate upstream land area which drains to the subject site: +/- 69 acres

6. Has the site drainage been evaluated in the past? ☒ Yes ☐ No If yes, please identify documentation: Update to the Technical Drainage Study for Summerlin Village 23A/23B Alta Drive Street Improvements, 2006, GCW; Update #2 to the Technical Drainage Study for Summerlin Village 23B Alta Drive Interim Grading, 2012, GCW; Update to the Conceptual Drainage Study for Summerlin Village 23B, 2012, GCW; Update to the Technical Drainage Study for Summerlin Village 23B Rough Grading, 2006, GCW; Technical Drainage Study for Summerlin Village 23A/23B Alta Drive RCB Regional Drainage Improvements, 2003, GCW.

7. If known, please briefly identify the proposed discharge point(s) of runoff from the site: Existing 10x8 RCB in Alta Drive.

8. Briefly describe your proposed schedule for the subject project: ASAP



Engineer's Seal

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.

*New Required Field

**Review and concurrence of the Clark County Regional Flood Control District is required.

Local Entity File No.	Revision	Date

REFERENCE:

STANDARD FORM 1



CITY OF LAS VEGAS

MINIMUM DRAINAGE STUDY CRITERIA STANDARD FORM 2 CHECKLIST SUPPLEMENT

(Revised 06/06/01)

The following checklist is intended as a supplemental **guide** for the engineer preparing a Technical Drainage Study submittal to the City of Las Vegas. This supplement focuses on requirements specific to the City of Las Vegas. The requirements presented are in addition to the Clark County Regional Flood Control District Manual Standard Form 2. The listed items are the minimum information required prior to the City performing a review. The engineer will remain responsible to ensure the Technical Drainage Study is prepared within the guidelines as set forth in the Clark County Regional Flood Control District (CCRFCD) Hydrologic Criteria and Drainage Design Manual (Design Manual).

If items are not applicable for the subject site, provide N/A.

I. GENERAL REQUIREMENT		
Yes	No	
	N/A	A notarized letter from the adjacent property owner(s) allowing off-site grading. (A copy of the letter must be received prior to final acceptance of the drainage study.)
x		Copies of all conditions of approval for development related to this property. (e.g. zoning, use permit, tentative map, etc.) Verify compliance with conditions.

II. GRADING PLAN INFORMATION		
Yes	No	
x		(1) 24" X 36" copy of the Grading Plan, (including all Detail Sheets) sealed by the engineer.
x		Proposed future and existing spot grades for top of curbs and street crowns at lot lines, grade breaks, and along curb returns on both sides of the street. Note: Proposed top of curb elevations must be provided for both sides of roadways even if only half street construction is required.
x		Label existing topography at a minimum 5 foot elevation interval including adjacent developments, finished floor elevations of existing buildings and top of existing curbs extending 100 feet around the perimeter of the site. (*Measured from the centerline of the adjacent roadway.)
x		Proposed on-site and off-site storm drains and other flood control facilities with plan and profile sheets for public storm drains showing the class of pipe, (Class III, IV, V, etc.), design hydraulic grade line, (HGL) and 100 year storm flow. A public drainage easement must be provided over on-site storm drains conveying off-site flows. An overflow path must be provided over all storm drains.
x		All existing and "to be constructed" walls with cross-sections showing wall type, (e.g. block wall, retaining wall, flood wall, etc.), with limits clearly defined, adjacent ground elevations. Wall heights must meet current ordinances and in no case exceed 14 feet above the adjacent property.
x		Street slopes for both interior and perimeter streets. Note: The minimum slope for a roadway is 0.4 percent, a minimum 18-inch storm drain must be provided where minimum slopes cannot be met.

CITY OF LAS VEGAS MINIMUM DRAINAGE STUDY CRITERIA CHECKLIST

62023-981

II. GRADING PLAN INFORMATION		
Yes	No	
	N/A	Back of lot elevations and lot drainage pattern for all lots including common lots.
	N/A	Sites with a grade difference two feet above or below existing ground are required to have approval from City of Las Vegas Current Planning. Current Planning approval is required prior to final approval of the drainage study.
x		On-site facilities must perpetuate flows through or around the site without significantly impacting adjacent property owners. (The project must pass flows through the site every 600 feet where the project is blocking flow paths.)
	N/A	This project uses a solid grouted stem wall (or approved alternate) at the back of sidewalk to provide erosion protection for landscaped areas where the depth of flow in the roadway exceeds the back of walk elevation. A corresponding cross-section detail is included.
	N/A	Commercial and Common Lot Landscape areas are not allowed to drain over the sidewalk. The grading plans show flow lines with grades and sidewalk under drains for all landscape areas draining to the public ROW.

III. Local Entity Criteria - City of Las Vegas – Manual Section 1600		
Yes	No	
	N/A	Concrete valley gutters are required in parking lots with slopes less than 1 percent. Slopes through cul-de-sac must be at a 1 percent minimum where flow is drained through the cul-de-sac.
	N/A	Ten-foot wide public drainage easements to be privately maintained are allowed for flow less than 20 cfs. The depth of flow entering the easement must be checked using the submerged weir calculation.
	N/A	The limits of the flood zones and the base flood elevations (BFE) must be shown on all grading plans for all developments within a Special Flood Hazard Zone A, AO, AE, etc.
	N/A	Minimum finish floor elevation is 6 inches above highest adjacent top of curb. Finish floor calculations must include allowances for super elevations on curves and velocity head for tee intersections.
	N/A	Finished floor elevations for buildings adjacent to public drainage easements must be a minimum of 18 inches above the Q100 weir of submerged weir elevation, whichever is greater.
	N/A	Lots with "B and C Type Drainage" shall be required to install an underground nuisance drainage system or a 2-foot valley gutter through the lot. 16" x 24" minimum block wall openings are required for both options.
x		Bubblers are required across 80 foot and greater ROW streets. When flows exceed 10 cfs, bubblers larger than 18 inches will be required up to a maximum of 36". Inlets must be sized to match the pipe size provided.

- An appointment must be made to preview this checklist in conjunction with Clark County Regional Flood Control District Manual Standard Form 2 prior to the City accepting a new Drainage Study for review. The engineer may contact the Flood Control Section at 229-6541.

CITY OF LAS VEGAS MINIMUM DRAINAGE STUDY CRITERIA CHECKLIST

62023-981

- Following the acceptance of the Drainage Study (meeting the minimum acceptable information above), there will be a charge of \$250 for each Drainage Study review submittal. These fees are payable at the time the Grading Permit is obtained.
- The Drainage Study must be accepted prior to submitting grading plans to the Land Development Section for review.

This document is intended as an aid in preparing Technical Drainage Studies for the City of Las Vegas. Each study submitted is reviewed for compliance with local and regional criteria. This form is not intended to be all-inclusive and does not limit the extent of the information, calculations or exhibits which may be necessary to properly evaluate the intended land use.

F:\Projects\600\62023B-202\Admin\Forms\120830-CHKLIST7-TDS_UP3-gyt.doc
30-Aug-12

62023B-202

September 4, 2012

Albert Y. Sung, PE
Flood Control Project Manager
City of Las Vegas - Land Development Services
Department of Public Works
333 N. Rancho Drive
Las Vegas, Nevada 89106

Re: Update #3 to the Technical Drainage Study for Summerlin Village 23A/23B Alta Drive Improvements

Dear Mr. Sung:

The purpose of this letter is to serve as Update #3 to the *Technical Drainage Study for Summerlin Villages 23A/23B, Alta Drive Street Improvements* (hereinafter referred to as the Alta Drive Street Study). This study was originally approved by the City of Las Vegas Public Works Department (CLV) on January 9, 2004, with concurrence from the Clark County Regional Flood Control District (CCRFCD) on February 2, 2004. This Update #3 will construct final street improvements for Alta Drive between Fox Hill Drive to Desert Foothills Drive.

The following referenced studies described below are pertinent to this update.

1. *Update #2 to the Technical Drainage Study for Summerlin Village 23B Alta Drive Interim Grading (Villages 23A/23B Alta Drive Street Improvements)*, hereinafter referred to as the Interim Grading Study. The purpose of the Interim Grading Study was to provide interim flood protection for developments south of Alta Drive until the Alta Drive Street improvements are constructed. This study was approved by CLV on June 27, 2012.

This Update #3 will construct the Alta Drive street improvements between Fox Hill Drive, and Desert Foothills Drive south of the interim facilities constructed with Update #2. The offsite hydrology and flow patterns from the Interim Grading Study will be the referenced interim condition hydrology for this Update #3.

2. *Update to the Conceptual Drainage Study for Summerlin Village 23B*, hereinafter referred to as the Conceptual Study. The Conceptual Study presented ultimate conditions onsite drainage patterns and proposed major storm drain facilities within the exterior and interior roadways. The Conceptual Study superseded the originally approved Conceptual Drainage Study to account for revisions to the site plan and drainage design flow patterns for the parcels and proposed storm drain facilities. The Conceptual Study was approved by CLV on August 9, 2012.

The ultimate condition hydrology from the Conceptual Study will be the referenced ultimate condition hydrology for this Update #3. See referenced Figure 6U – Ultimate Conditions Drainage Map in Appendix C.

Copies of pertinent reference material and approval letters have been included in Appendix C.

Interim Conditions

Under interim conditions, the offsite flows impacting Alta Drive will continue to be conveyed by the interim facilities upstream of Alta Drive. Therefore, the only flows impacting the proposed street improvements will

come from onsite basin ST-AL as shown in referenced Figure 6U from the Conceptual Study. ST-AL generates 43 cfs in the 100-year storm event.

Flows tributary to the Alta Drive improvements have been referenced from basin ST-AL in the Conceptual Study and prorated to determine the flow impacting each proposed drop inlet. Prorated basin calculations are included in the Appendix and below:

TABLE 1 PRORATED FLOW SUMMARY			
Onsite Basin			
Subbasin	Q ₁₀₀ (cfs)	Area (acres)	cfs/acre
ST-AL	43	13.0	3.30
Onsite Prorated Basins			
Subbasin	Q ₁₀₀ (cfs)	Area (acres)	cfs/acre
ALTA 2	6	1.7	3.30
ALTA 3	4	1.1	3.30
ALTA 4	8	2.3	3.30
ALTA 5	6	1.9	3.30
ALTA 6	1	0.4	3.30
ALTA 7	3	0.8	3.30
ALTA 8	1	0.5	3.30

The following tables summarize the proposed street flow conditions along Alta Drive. Summerlin criteria requires the 100-year storm flows to be contained without overtopping the street curb. Therefore, in addition to DxV criteria, the depth of flow in the street shall not exceed 0.50-ft.

TABLE 2 STREET FLOW CALCULATIONS					
Section*	Slope (%)	Discharge (cfs)	Depth (ft)	Velocity (fps)	VxD
Section ALTA-2	3.7	10	0.35	4.2	1.5
Section ALTA-3	3.7	7	0.32	3.8	1.2
Section ALTA-4	3.7	10	0.35	4.2	1.5
Section ALTA-5	3.7	9	0.34	4.1	1.4
Section ALTA-6 (North 1/2 Street)	2.7	3	0.32	3.3	1.1
Section ALTA-7 (South 1/2 Street)	2.5	5	0.38	3.7	1.4
Section ALTA-8 (North 1/2 Street)	2.5	1	0.25	2.8	0.7

*See Figure 5R.

TABLE 3 DROP INLET CALCULATIONS						
SECTION*	Depth (ft)	Slope %	Q ₁₀₀ Total (cfs)	Q ₁₀₀ Intercept (cfs)	Q ₁₀₀ Bypass (cfs)	Description of Drop Inlets**
ALTA-2	0.35	3.7	10	7	3	2 -7.5' Type "CM2"
ALTA-3	0.32	3.7	7	5	2	2 -7.5' Type "CM2"
ALTA-4	0.35	3.7	10	7	3	2 -7.5' Type "CM2"
ALTA-5	0.34	3.7	9	6	3	2 -7.5' Type "CM2"
ALTA-6	0.32	2.7	3	3	0	1 -10' Type "CM2"

*See Figure 5R.

Ultimate Conditions

Under ultimate conditions, the offsite parcels upstream of Alta Drive will drain into the stubs provided for each parcel as described in the Conceptual Study and not impact Alta Drive. Since no additional flows will contribute to the street flows in Alta Drive, the interim condition and ultimate condition remains the same and street criteria is met for both scenarios.

Parcel Storm Drain Laterals

The laterals provided with this project for the future parcel developments are as follows:

Parcel T: 36-inch RCP – Q₁₀₀=87 cfs – Second lateral has been provided but future developer has requested an additional lateral located near station 219+50. The existing lateral will remain to collect interim flows and will be plugged and abandoned with development of Parcel T.

Parcel Q2: 36-inch RCP – Q₁₀₀= 40 cfs

The parcel storm drain lateral sizes match the sizes proposed in the Conceptual Study. The slopes of the laterals match or exceed the slopes used in the Conceptual Study. Hydraulic calculations would be required for the laterals with future parcel development.

The proposed drainage design flow patterns for the roadway remains unchanged from the previously approved Alta Drive Street Study. The methodologies and calculations presented in this report are in compliance with the CCRFCD Hydrologic Criteria and Drainage Design Manual (Manual).

In general, the approved drainage patterns remain unchanged and the follows the Conceptual Study. The proposed street improvements and flood control facilities do not pose any negative impacts on downstream facilities and development.

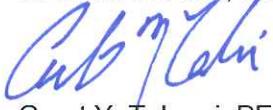
City of Las Vegas – Land Development Services
Department of Public Works
September 4, 2012
Page 4

62023B-202

If you have any questions or require additional information, please contact our office at 804-2000.

Cordially,

G. C. WALLACE, INC.



Grant Y. Tokumi, PE
Project Manager
Flood Control Division

gyt/vlr

c: Jerry Pruitt, GCW
Josh Johnson, GCW
Derick Yoro, GCW
Daniel Kelley, GCW
Ryan Belsick, GCW

**UPDATE#3 TO THE TECHNICAL DRAINAGE STUDY FOR
SUMMERLIN VILLAGE 23A/23B ALTA DRIVE IMPROVEMENTS)
APPENDIX LAYOUT**

Appendix A. Hydrologic Calculations and Information

1. Prorated Flow Calculations

Appendix B. Hydraulic Calculations and Information

1. Street Flow Calculations
2. Drop Inlet Calculations
3. Drop Inlet Lateral Calculations

Appendix C. Referenced Materials

1. Summerlin Villages 23A/23B Alta Drive Street Improvements
2. Update #2 to the Technical Drainage Study for Summerlin Village 23B Alta Drive Interim Grading
3. Update to the Conceptual Drainage Study for Summerlin Village 23B
4. CLV Zoning and Planning Conditions

APPENDIX A

Hydrologic Calculations

**UPDATE #3 TO THE
TECHNICAL DRAINAGE STUDY FOR SUMMERLIN VILLAGE 23A/23B
ALTA DRIVE STREET IMPROVEMENTS**

PRORATED FLOWS

PRORATED FLOW SUMMARY			
Onsite			
Subbasin	Q ₁₀₀ (cfs)	Area (acres)	cfs/acre
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Onsite Prorated Basins			
Subbasin	Q ₁₀₀ (cfs)	Area (acres)	cfs/acre
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ALTA 6	1	0.4	3.30
ALTA 7	3	0.8	3.30
ALTA 8	1	0.5	3.30

APPENDIX B

Hydraulic Calculations

Worksheet for ALTA-2

Project Description

Friction Method Manning Formula
Solve For Normal Depth

Input Data

Channel Slope 0.03700 ft/ft
Discharge 10.00 ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.50
0+00.50	0.50
0+00.50	0.00
0+02.00	0.13
0+02.00	0.17
0+29.20	0.71
0+29.20	1.21
0+46.80	1.21
0+46.80	0.71
0+74.00	0.17
0+74.00	0.13
0+75.50	0.00
0+75.50	0.50
0+76.00	0.50

Roughness Segment Definitions

Start Station & Elevation	End Station & Elevation	Roughness Coefficient
(0+00.00, 0.50)	(0+76.00, 0.50)	0.016

Options

Current Roughness weighted Method Pavlovskii's Method
Open Channel Weighting Method Pavlovskii's Method
Closed Channel Weighting Method Pavlovskii's Method

Worksheet for ALTA-2

Results

Normal Depth		0.35	ft
Elevation Range	0.00 to 1.21	ft	
Flow Area		2.41	ft ²
Wetted Perimeter		21.56	ft
Hydraulic Radius		0.11	ft
Top Width		20.77	ft
Normal Depth		0.35	ft
Critical Depth		0.43	ft
Critical Slope		0.00726	ft/ft
Velocity		4.15	ft/s
Velocity Head		0.27	ft
Specific Energy		0.61	ft
Froude Number		2.15	
Flow Type	Supercritical		

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.35	ft
Critical Depth	0.43	ft
Channel Slope	0.03700	ft/ft
Critical Slope	0.00726	ft/ft

Cross Section for ALTA-2

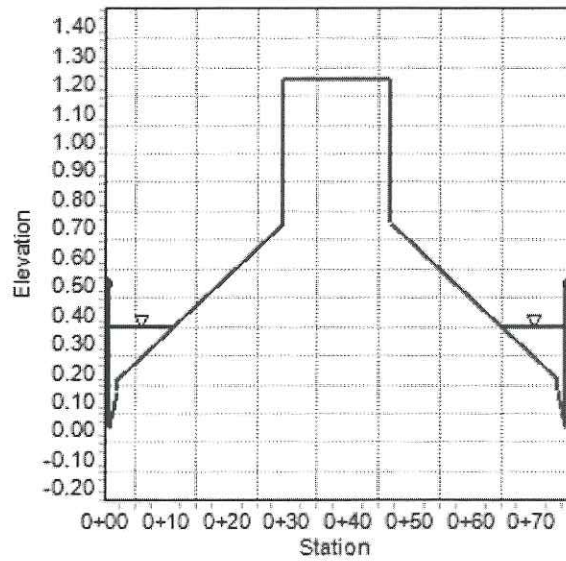
Project Description

Friction Method Manning Formula
Solve For Normal Depth

Input Data

Channel Slope 0.03700 ft/ft
Normal Depth 0.35 ft
Discharge 10.00 ft³/s

Cross Section Image



Worksheet for ALTA-3

Project Description

Friction Method Manning Formula
Solve For Normal Depth

Input Data

Channel Slope 0.03700 ft/ft
Discharge 7.00 ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.50
0+00.50	0.50
0+00.50	0.00
0+02.00	0.13
0+02.00	0.17
0+29.20	0.71
0+29.20	1.21
0+46.80	1.21
0+46.80	0.71
0+74.00	0.17
0+74.00	0.13
0+75.50	0.00
0+75.50	0.50
0+76.00	0.50

Roughness Segment Definitions

Start Station & Elevation	End Station & Elevation	Roughness Coefficient
(0+00.00, 0.50)	(0+76.00, 0.50)	0.016

Options

Current Roughness weighted Pavlovskii's Method
Method
Open Channel Weighting Method Pavlovskii's Method
Closed Channel Weighting Method Pavlovskii's Method

Worksheet for ALTA-3

Results

Normal Depth		0.32	ft
Elevation Range	0.00 to 1.21	ft	
Flow Area		1.83	ft ²
Wetted Perimeter		18.45	ft
Hydraulic Radius		0.10	ft
Top Width		17.72	ft
Normal Depth		0.32	ft
Critical Depth		0.39	ft
Critical Slope		0.00762	ft/ft
Velocity		3.83	ft/s
Velocity Head		0.23	ft
Specific Energy		0.54	ft
Froude Number		2.10	
Flow Type	Supercritical		

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.32	ft
Critical Depth	0.39	ft
Channel Slope	0.03700	ft/ft
Critical Slope	0.00762	ft/ft

Cross Section for ALTA-3

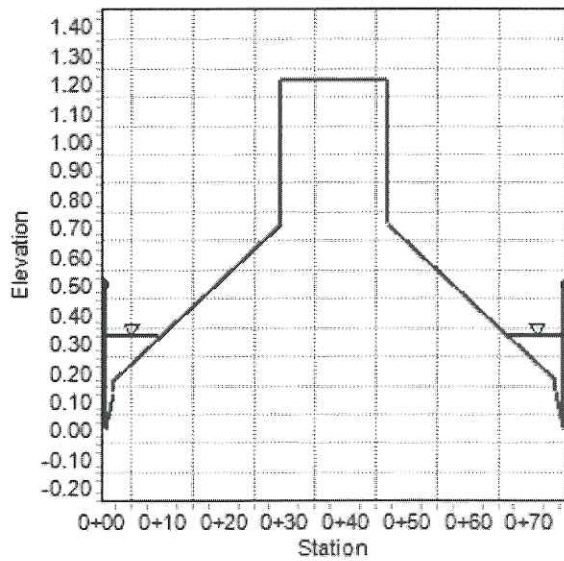
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.03700	ft/ft
Normal Depth	0.32	ft
Discharge	7.00	ft ³ /s

Cross Section Image



Worksheet for ALTA-4

Project Description

Friction Method Manning Formula
Solve For Normal Depth

Input Data

Channel Slope 0.03700 ft/ft
Discharge 10.00 ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.50
0+00.50	0.50
0+00.50	0.00
0+02.00	0.13
0+02.00	0.17
0+29.20	0.71
0+29.20	1.21
0+46.80	1.21
0+46.80	0.71
0+74.00	0.17
0+74.00	0.13
0+75.50	0.00
0+75.50	0.50
0+76.00	0.50

Roughness Segment Definitions

Start Station & Elevation	End Station & Elevation	Roughness Coefficient
(0+00.00, 0.50)	(0+76.00, 0.50)	0.016

Options

Current Roughness weighted Pavlovskii's Method
Method
Open Channel Weighting Method Pavlovskii's Method
Closed Channel Weighting Method Pavlovskii's Method

Worksheet for ALTA-4

Results

Normal Depth		0.35	ft
Elevation Range	0.00 to 1.21	ft	
Flow Area		2.41	ft ²
Wetted Perimeter		21.56	ft
Hydraulic Radius		0.11	ft
Top Width		20.77	ft
Normal Depth		0.35	ft
Critical Depth		0.43	ft
Critical Slope		0.00726	ft/ft
Velocity		4.15	ft/s
Velocity Head		0.27	ft
Specific Energy		0.61	ft
Froude Number		2.15	
Flow Type	Supercritical		

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.35	ft
Critical Depth	0.43	ft
Channel Slope	0.03700	ft/ft
Critical Slope	0.00726	ft/ft

Cross Section for ALTA-4

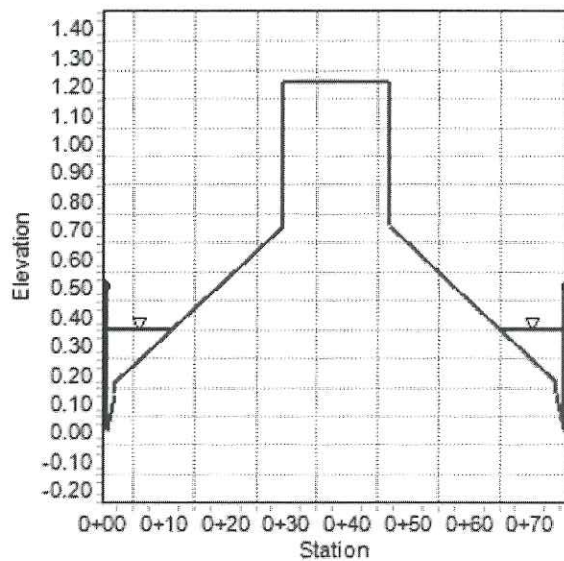
Project Description

Friction Method Manning Formula
Solve For Normal Depth

Input Data

Channel Slope 0.03700 ft/ft
Normal Depth 0.35 ft
Discharge 10.00 ft³/s

Cross Section Image



Worksheet for ALTA-5

Project Description

Friction Method Manning Formula
Solve For Normal Depth

Input Data

Channel Slope 0.03700 ft/ft
Discharge 9.00 ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.50
0+00.50	0.50
0+00.50	0.00
0+02.00	0.13
0+02.00	0.17
0+29.20	0.71
0+29.20	1.21
0+46.80	1.21
0+46.80	0.71
0+74.00	0.17
0+74.00	0.13
0+75.50	0.00
0+75.50	0.50
0+76.00	0.50

Roughness Segment Definitions

Start Station & Elevation	End Station & Elevation	Roughness Coefficient
(0+00.00, 0.50)	(0+76.00, 0.50)	0.016

Options

Current Roughness Weighted Method Pavlovskii's Method
Open Channel Weighting Method Pavlovskii's Method
Closed Channel Weighting Method Pavlovskii's Method

Worksheet for ALTA-5

Results

Normal Depth		0.34	ft
Elevation Range	0.00 to 1.21	ft	
Flow Area		2.22	ft ²
Wetted Perimeter		20.61	ft
Hydraulic Radius		0.11	ft
Top Width		19.84	ft
Normal Depth		0.34	ft
Critical Depth		0.42	ft
Critical Slope		0.00737	ft/ft
Velocity		4.05	ft/s
Velocity Head		0.25	ft
Specific Energy		0.59	ft
Froude Number		2.13	
Flow Type	Supercritical		

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.34	ft
Critical Depth	0.42	ft
Channel Slope	0.03700	ft/ft
Critical Slope	0.00737	ft/ft

Cross Section for ALTA-5

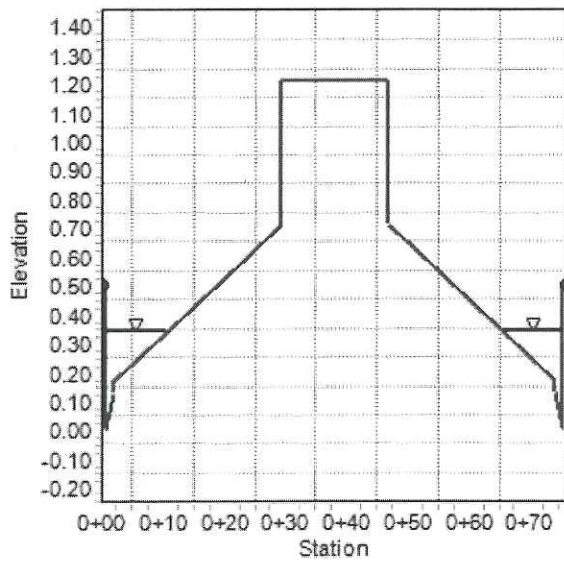
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.03700	ft/ft
Normal Depth	0.34	ft
Discharge	9.00	ft ³ /s

Cross Section Image



Worksheet for ALTA-6 North Half Street

Project Description

Friction Method Manning Formula
Solve For Normal Depth

Input Data

Channel Slope 0.02700 ft/ft
Discharge 3.00 ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.50
0+00.50	0.50
0+00.50	0.00
0+02.00	0.13
0+02.00	0.17
0+29.20	0.71
0+29.20	1.21
0+46.80	1.21

Roughness Segment Definitions

Start Station & Elevation	End Station & Elevation	Roughness Coefficient
(0+00.00, 0.50)	(0+46.80, 1.21)	0.016

Options

Current Roughness weighted Pavlovskii's Method
Method
Open Channel Weighting Method Pavlovskii's Method
Closed Channel Weighting Method Pavlovskii's Method

Results

Normal Depth 0.32 ft
Elevation Range 0.00 to 1.21 ft
Flow Area 0.92 ft²
Wetted Perimeter 9.24 ft
Hydraulic Radius 0.10 ft

Worksheet for ALTA-6 North Half Street

Results

Top Width	8.88	ft
Normal Depth	0.32	ft
Critical Depth	0.37	ft
Critical Slope	0.00777	ft/ft
Velocity	3.27	ft/s
Velocity Head	0.17	ft
Specific Energy	0.48	ft
Froude Number	1.79	
Flow Type	Supercritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.32	ft
Critical Depth	0.37	ft
Channel Slope	0.02700	ft/ft
Critical Slope	0.00777	ft/ft

Cross Section for ALTA-6 North Half Street

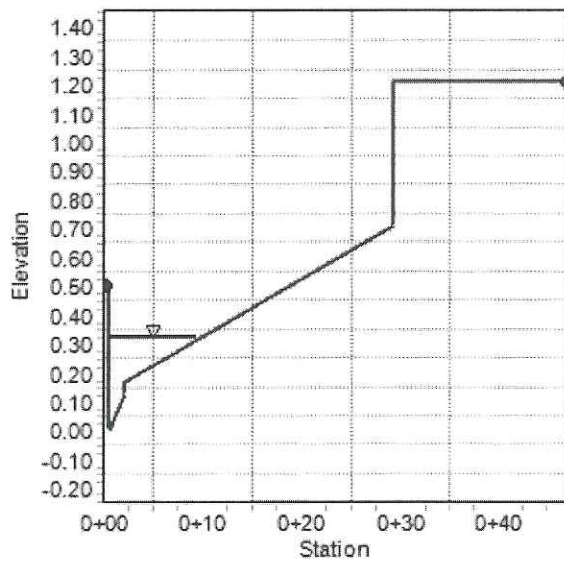
Project Description

Friction Method Manning Formula
Solve For Normal Depth

Input Data

Channel Slope 0.02700 ft/ft
Normal Depth 0.32 ft
Discharge 3.00 ft³/s

Cross Section Image



Worksheet for ALTA-7 South Half Street

Results

Critical Depth	0.45	ft
Critical Slope	0.00712	ft/ft
Velocity	3.74	ft/s
Velocity Head	0.22	ft
Specific Energy	0.59	ft
Froude Number	1.80	
Flow Type	Supercritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.38	ft
Critical Depth	0.45	ft
Channel Slope	0.02500	ft/ft
Critical Slope	0.00712	ft/ft

Cross Section for ALTA-7 South Half Street

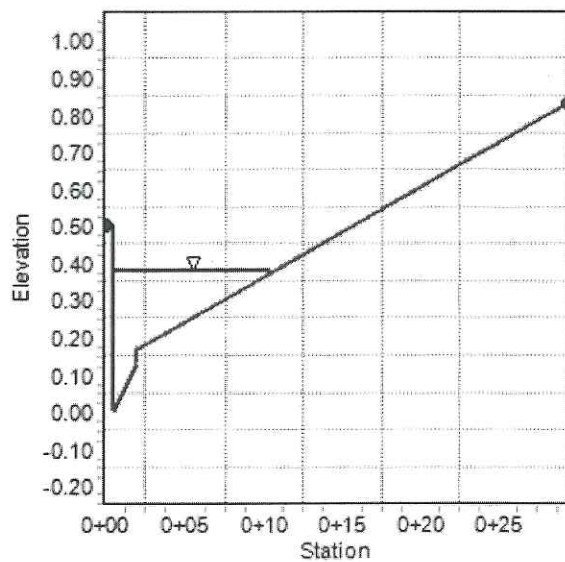
Project Description

Friction Method Manning Formula
Solve For Normal Depth

Input Data

Channel Slope 0.02500 ft/ft
Normal Depth 0.38 ft
Discharge 5.00 ft³/s

Cross Section Image



Worksheet for ALTA-8 North Half Street

Project Description

Friction Method Manning Formula
Solve For Normal Depth

Input Data

Channel Slope 0.02500 ft/ft
Discharge 1.00 ft³/s
Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.50
0+00.50	0.50
0+00.50	0.00
0+02.00	0.13
0+02.00	0.17
0+27.70	-0.54
0+27.70	-0.58
0+29.20	-0.72
0+29.20	-0.22
0+29.70	-0.22

Roughness Segment Definitions

Start Station & Elevation	End Station & Elevation	Roughness Coefficient
(0+00.00, 0.50)	(0+29.70, -0.22)	0.016

Options

Current Roughness Weighted Method Pavlovskii's Method
Open Channel Weighting Method Pavlovskii's Method
Closed Channel Weighting Method Pavlovskii's Method

Results

Normal Depth 0.25 ft
Elevation Range -0.72 to 0.50 ft
Flow Area 0.36 ft²

Worksheet for ALTA-8 North Half Street

Results

Wetted Perimeter	4.34	ft
Hydraulic Radius	0.08	ft
Top Width	4.04	ft
Normal Depth	0.25	ft
Critical Depth	0.29	ft
Critical Slope	0.00868	ft/ft
Velocity	2.78	ft/s
Velocity Head	0.12	ft
Specific Energy	0.37	ft
Froude Number	1.65	
Flow Type	Supercritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.25	ft
Critical Depth	0.29	ft
Channel Slope	0.02500	ft/ft
Critical Slope	0.00868	ft/ft

Cross Section for ALTA-8 North Half Street

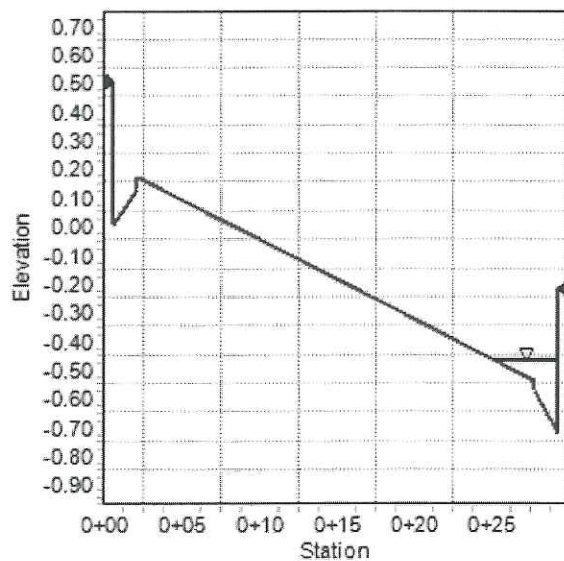
Project Description

Friction Method Manning Formula
Solve For Normal Depth

Input Data

Channel Slope 0.02500 ft/ft
Normal Depth 0.25 ft
Discharge 1.00 ft³/s

Cross Section Image



Type CM Drop Inlet Sizing on a C. G.

7.5-FT Drop Inlet (Section ALTA-2)

Known:

Q_s = Half Street Flow	5	cfs
S_o = Longitudinal Slope	0.037	ft/ft
n = Manning's Roughness Coefficient	0.016	
V_s = Flow Velocity	4.20	fps
D = Flow Depth	0.35	ft
S_x = Street Transverse Slope	0.02	ft/ft
W = Gutter Width	1.5	ft
a = Gutter Depression	2.0	in
L_g = Length of Grate	5.0	ft
L_c = Length of Curb Opening	7.0	ft
C_{fg} = Clogging Factor for Grate	50	%
C_{fc} = Clogging Factor for Curb Opening	50	%

Grate Capacity Calculations:

R_f = Frontal flow factor = $1 - 0.09 \cdot (V_s - V_o)$ if $V_s > V_o$; else $R_f = 1$	1.00
V_o = Splash over velocity = $p + q \cdot L_g - r \cdot L_g^2 + s \cdot L_g^3$ †	7.22 fps
E_o = Grate flow ratio = Q_w / Q_s	0.39
Q_w = Frontal flow = $A_w \cdot V_s$	1.94 cfs
Q_x = Side flow = $Q_s - Q_w$	3.06 cfs
R_s = Side flow factor = $1 / (1 + (0.15 \cdot V_s^{1.8}) / (S_x \cdot L_g^{2.3}))$	0.08
Q_{ig} = Flow intercepted = $[R_f \cdot E_o + R_s \cdot (1 - E_o)] \cdot Q_s$	2.2 cfs
† $p=1.76; q=3.12; r=0.45; s=0.03$ (based on Bar P 1-1/8 grate)	

Curb Opening Capacity Calculations

S_e = Equivalent cross slope = $S_x + S_w \cdot E_o$	0.066 ft/ft
S_w = Gutter cross slope = $(0.137 + a \cdot \text{feet}) / W$	0.119 ft/ft
L_t = Total interception $L = 0.60 \cdot Q_s^{0.42} \cdot S_o^{0.30} \cdot (1/n \cdot S_e)^{0.6}$	26.76 ft
Q_{ic} = Flow intercepted = $(1 - (1 - L_c/L_t)^{1.8}) \cdot Q_s$	1.1 cfs

Total Inlet Calculations

Q_{ti} = Total flow intercepted = $Q_{ig} + Q_{ic}$	3.3 cfs
Q_{tq} = Flow bypass = $Q_s - Q_{ti}$	1.7 cfs
q = Interception per unit ratio = Q_{ti} / L_g	0.47 cfs/ft
E_q = Efficiency = $(Q_{ti} / Q_s) \cdot 100$	66 %

Type CM Drop Inlet Sizing on a C. G.

7.5-FT Drop Inlet (Section ALTA-3)

Known:

Q_s = Half Street Flow	3.5	cfs
S_o = Longitudinal Slope	0.037	ft/ft
n = Manning's Roughness Coefficient	0.016	
V_s = Flow Velocity	3.80	fps
D = Flow Depth	0.32	ft
S_x = Street Transverse Slope	0.02	ft/ft
W = Gutter Width	1.5	ft
a = Gutter Depression	2.0	in
L_g = Length of Grate	5.0	ft
L_c = Length of Curb Opening	7.0	ft
C_{fg} = Clogging Factor for Grate	50	%
C_{fc} = Clogging Factor for Curb Opening	50	%

Grate Capacity Calculations:

R_f = Frontal flow factor = $1 - 0.09(V_s - V_o)$ if $V_s > V_o$; else $R_f = 1$	1.00
V_o = Splash over velocity = $p + q \cdot L_g - r \cdot L_g^2 + s \cdot L_g^3$	7.22 fps
E_o = Grate flow ratio = Q_w / Q_s	0.45
Q_w = Frontal flow = $A_w \cdot V_s$	1.59 cfs
Q_x = Side flow = $Q_s - Q_w$	1.91 cfs
R_s = Side flow factor = $1 / (1 + (0.15 \cdot V_s^{1.8}) / (S_x \cdot L_g^{2.3}))$	0.09
Q_{ig} = Flow intercepted = $[R_f \cdot E_o + R_s \cdot (1 - E_o)] \cdot Q_s$	1.8 cfs
$\dagger p = 1.76; q = 3.12; r = 0.45; s = 0.03$ (based on Bar P 1-1/8 grate)	

Curb Opening Capacity Calculations

S_e = Equivalent cross slope = $S_x + S_w \cdot E_o$	0.074 ft/ft
S_w = Gutter cross slope = $(0.137 + a \cdot \text{feet}) / W$	0.119 ft/ft
L_t = Total interception $L = 0.60 \cdot Q_s^{0.42} \cdot S_o^{0.30} \cdot (1/n \cdot S_e)^{0.6}$	21.57 ft
Q_{ic} = Flow intercepted = $(1 - (1 - L_c/L_t)^{1.8}) \cdot Q_s$	1.0 cfs

Total Inlet Calculations

Q_{ti} = Total flow intercepted = $Q_{ig} + Q_{ic}$	2.7 cfs
Q_{tq} = Flow bypass = $Q_s - Q_{ti}$	0.8 cfs
q = Interception per unit ratio = Q_{ti} / L_g	0.39 cfs/ft
E_q = Efficiency = $(Q_{ti} / Q_s) \cdot 100$	78 %

Type CM Drop Inlet Sizing on a C. G.

7.5-FT Drop Inlet (Section ALTA-4)

Known:

Q_s = Half Street Flow	5	cfs
S_o = Longitudinal Slope	0.037	ft/ft
n = Manning's Roughness Coefficient	0.016	
V_s = Flow Velocity	4.20	fps
D = Flow Depth	0.35	ft
S_x = Street Transverse Slope	0.02	ft/ft
W = Gutter Width	1.5	ft
a = Gutter Depression	2.0	in
L_g = Length of Grate	5.0	ft
L_c = Length of Curb Opening	7.0	ft
C_{fg} = Clogging Factor for Grate	50	%
C_{fc} = Clogging Factor for Curb Opening	50	%

Grate Capacity Calculations:

R_f = Frontal flow factor = $1 - 0.09 \cdot (V_s - V_o)$ if $V_s > V_o$; else $R_f = 1$	1.00
V_o = Splash over velocity = $p + q \cdot L_g - r \cdot L_g^2 + s \cdot L_g^3$	7.22 fps
E_o = Grate flow ratio = Q_w / Q_s	0.39
Q_w = Frontal flow = $A_w \cdot V_s$	1.94 cfs
Q_x = Side flow = $Q_s - Q_w$	3.06 cfs
R_s = Side flow factor = $1 / (1 + (0.15 \cdot V_s^{1.8}) / (S_x \cdot L_g^{2.3}))$	0.08
Q_{ig} = Flow intercepted = $[R_f \cdot E_o + R_s \cdot (1 - E_o)] \cdot Q_s$	2.2 cfs
$\dagger p = 1.76; q = 3.12; r = 0.45; s = 0.03$ (based on Bar P 1-1/8 grate)	

Curb Opening Capacity Calculations

S_e = Equivalent cross slope = $S_x + S_w \cdot E_o$	0.066 ft/ft
S_w = Gutter cross slope = $(0.137 + a \text{ feet}) / W$	0.119 ft/ft
L_t = Total interception $L = 0.60 \cdot Q_s^{0.42} \cdot S_o^{0.30} \cdot (1/n \cdot S_e)^{0.6}$	26.76 ft
Q_{ic} = Flow intercepted = $(1 - (1 - L_c/L_t)^{1.8}) \cdot Q_s$	1.1 cfs

Total Inlet Calculations

Q_{ti} = Total flow intercepted = $Q_{ig} + Q_{ic}$	3.3 cfs
Q_{tq} = Flow bypass = $Q_s - Q_{ti}$	1.7 cfs
q = Interception per unit ratio = Q_{ti} / L_g	0.47 cfs/ft
E_q = Efficiency = $(Q_{ti} / Q_s) \cdot 100$	66 %

Type CM Drop Inlet Sizing on a C. G.

7.5-FT Drop Inlet (Section ALTA-5)

Known:

Q_s = Half Street Flow	4.5	cfs
S_o = Longitudinal Slope	0.037	ft/ft
n = Manning's Roughness Coefficient	0.016	
V_s = Flow Velocity	4.10	fps
D = Flow Depth	0.34	ft
S_x = Street Transverse Slope	0.02	ft/ft
W = Gutter Width	1.5	ft
a = Gutter Depression	2.0	in
L_g = Length of Grate	5.0	ft
L_c = Length of Curb Opening	7.0	ft
C_{fg} = Clogging Factor for Grate	50	%
C_{fc} = Clogging Factor for Curb Opening	50	%

Grate Capacity Calculations:

R_f = Frontal flow factor = $1 - 0.09(V_s - V_o)$ if $V_s > V_o$; else $R_f = 1$	1.00
V_o = Splash over velocity = $p + q \cdot L_g - r \cdot L_g^2 + s \cdot L_g^3$	7.22 fps
E_o = Grate flow ratio = Q_w / Q_s	0.41
Q_w = Frontal flow = $A_w \cdot V_s$	1.83 cfs
Q_x = Side flow = $Q_s - Q_w$	2.67 cfs
R_s = Side flow factor = $1 / (1 + (0.15 \cdot V_s^{1.8}) / (S_x \cdot L_g^{2.3}))$	0.08
Q_{ig} = Flow intercepted = $[R_f \cdot E_o + R_s \cdot (1 - E_o)] \cdot Q_s$	2.0 cfs
$\dagger p = 1.76; q = 3.12; r = 0.45; s = 0.03$ (based on Bar P 1-1/8 grate)	

Curb Opening Capacity Calculations

S_e = Equivalent cross slope = $S_x + S_w \cdot E_o$	0.068 ft/ft
S_w = Gutter cross slope = $(0.137 + a \cdot \text{feet}) / W$	0.119 ft/ft
L_t = Total interception $L = 0.60 \cdot Q_s^{0.42} \cdot S_o^{0.30} \cdot (1/n \cdot S_e)^{0.6}$	25.09 ft
Q_{ic} = Flow intercepted = $(1 - (1 - L_c/L_t)^{1.8}) \cdot Q_s$	1.1 cfs

Total Inlet Calculations

Q_{ti} = Total flow intercepted = $Q_{ig} + Q_{ic}$	3.1 cfs
Q_{tq} = Flow bypass = $Q_s - Q_{ti}$	1.4 cfs
q = Interception per unit ratio = Q_{ti} / L_g	0.44 cfs/ft
E_q = Efficiency = $(Q_{ti} / Q_s) \cdot 100$	69 %

Type CM Drop Inlet Sizing on a C. G.

10-FT Drop Inlet (Section ALTA-6)

Known:

Q_s = Half Street Flow	3	cfs
S_o = Longitudinal Slope	0.027	ft/ft
n = Manning's Roughness Coefficient	0.016	
V_s = Flow Velocity	3.30	fps
D = Flow Depth	0.32	ft
S_x = Street Transverse Slope	0.02	ft/ft
W = Gutter Width	1.5	ft
a = Gutter Depression	2.0	in
L_g = Length of Grate	7.5	ft
L_c = Length of Curb Opening	9.5	ft
C_{tg} = Clogging Factor for Grate	50	%
C_{rc} = Clogging Factor for Curb Opening	50	%

Grate Capacity Calculations:

R_f = Frontal flow factor = $1 - 0.09 \cdot (V_s - V_o)$ if $V_s > V_o$; else $R_f = 1$	1.00
V_o = Splash over velocity = $p + q \cdot L_g - r \cdot L_g^2 + s \cdot L_g^3$ †	8.71 fps
E_o = Grate flow ratio = Q_w / Q_s	0.46
Q_w = Frontal flow = $A_w \cdot V_s$	1.38 cfs
Q_x = Side flow = $Q_s - Q_w$	1.62 cfs
R_s = Side flow factor = $1 / (1 + (0.15 \cdot V_s^{1.8}) / (S_x \cdot L_g^{2.3}))$	0.25
Q_{ig} = Flow intercepted = $[R_f \cdot E_o + R_s \cdot (1 - E_o)] \cdot Q_s$	1.8 cfs
† $p=1.76; q=3.12; r=0.45; s=0.03$ (based on Bar P 1-1/8 grate)	

Curb Opening Capacity Calculations

S_e = Equivalent cross slope = $S_x + S_w \cdot E_o$	0.075 ft/ft
S_w = Gutter cross slope = $(0.137 + a \cdot \text{feet}) / W$	0.119 ft/ft
L_t = Total interception $L = 0.60 \cdot Q_s^{0.42} \cdot S_o^{0.30} \cdot (1/n \cdot S_e)^{0.6}$	18.29 ft
Q_{ic} = Flow intercepted = $(1 - (1 - L_c/L_t)^{1.8}) \cdot Q_s$	1.3 cfs

Total Inlet Calculations

Q_{ti} = Total flow intercepted = $Q_{ig} + Q_{ic}$	3.0 cfs
Q_{tq} = Flow bypass = $Q_s - Q_{ti}$	0.0 cfs
q = Interception per unit ratio = Q_{ti} / L_g	0.32 cfs/ft
E_q = Efficiency = $(Q_{ti} / Q_s) \cdot 100$	100 %

LATERAL CALCULATIONS

Location	Q100 (cfs)	Dia (ft)	Length (ft)	Hydraulic Slope	Δ HGL (ft)	HGL at RCB // (elev)	Add Δ HGL and HGL at RCB (elev)
Alta Sta 203+50	3	2.0	16	0.00018	0.003	3311.1	3311.1
Alta Sta 205+73	3	2.0	44	0.00018	0.008	3316.3	3316.3
Alta Sta 211+41 North	45	3.0	16	0.00455	0.073	3329.4	3329.5
Alta Sta 211+41 South	5	2.0	44	0.00049	0.022	3329.4	3329.4
Alta Sta 219+05	2.5	2.0	41	0.00012	0.005	3356.7	3356.7
Alta Sta 222+45	3.5	2.0	44	0.00024	0.011	3369.3	3369.3
Fox Hill Sta 163+24	nuisance	2.0	N/A	N/A	N/A	N/A	N/A

Elevations are lower than the lateral's upstream invert; HGL=top of pipe
Elevations are lower than the lateral's upstream invert; HGL=top of pipe
Elevations are lower than the lateral's upstream invert; HGL=top of pipe
Elevations are lower than the lateral's upstream invert; HGL=top of pipe

APPENDIX C

Reference Materials

**TECHNICAL DRAINAGE STUDY
FOR
SUMMERLIN VILLAGES 23A/23B
ALTA DRIVE STREET
IMPROVEMENTS**

62023.270

September 2003

Prepared for:

**Howard Hughes Corporation, Inc.
a Delaware Corporation
10000 West Charleston Boulevard, Suite 200
Las Vegas, NV 89135
Phone: (702) 791-4300
Fax: (702) 791-4450**



G. C. WALLACE, INC.
Engineers/Planners/Surveyors

CITY OF LAS VEGAS INTER-OFFICE MEMORANDUM				DATE: January 9, 2004	
TO: Land Development Services Department of Public Works				FROM: Albert J. Jankowiak, P.E. <i>M</i> Flood Control Civil Engineer Department of Public Works	
SUBJECT: Technical Drainage Study for: Summerlin Village 23A/23B Alta Drive Street Improvements				COPIES TO: G.C. Wallace	
Cross Streets: Between Desert Foothills Drive and Collector Road				Howard Hughes Corporation	
File Number: F:\Depot\DSMEMOS\DS3426A.doc				Bart Anderson, P.E., DevCo	
Parcel Number: 137-22-000-010				CCRFC	
Zoning Action:					
FEMA Flood Zone		YES	NO	X	
Proposed Storm Drain		YES	X	NO	
HISTORY	DATE RECEIVED	DATE REVIEWED	COMMENTS	REVIEW FEES	FEES PAID G.R. No.
1 st Submittal, Supplement	9/29/2003, 12/15/2003	10/10/2003, 12/30/2003	See Comments Below	\$250.00	111747: \$250
TOTAL FEES (LDDRS):				\$250.00	

REMARKS:

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

	is approved subject to conformance to all City standards and the following conditions:
	must be resubmitted or supplemented including the following:
X	is conditionally approved subject to Clark County Regional Flood Control District concurrence.

1. This drainage study is acceptable in concept, however, the City of Las Vegas will not formally accept the study until the Clark County Regional Flood Control District (CCRFC) has issued a letter of concurrence. The Engineer should contact the CCRFC to confirm that they have begun their review.
2. The engineer has provided a table on the grading plans that shows a quantity estimate of all on-site and off-site flood control improvements such as solid grouted stem wall, drainage easements, protection berm, riprap, etc. All drainage improvements must be bonded and inspected.
3. This drainage study assumes that the project will be constructed in one phase. If improvement plans are submitted to break the project into separate phases, a drainage study update will be required for each phase addressing the interim condition.

NOTE: All land surface area disturbances over 1 acre require a stormwater discharge permit issued by the Nevada Division of Environmental Protection (NDEP). A phased construction unit in a contiguous subdivision is considered under construction until all stripped or disturbed surface areas have been covered by paving, building construction or planting. A stormwater discharge permit application and associated information may be downloaded from the web site:

<http://www.state.nv.us/ndep/bwpc/storm01.htm>

Projects that disturb more than one acre of land must submit to NDEP a "Notice of Intent" for inclusion under Stormwater Permit No. NVR100000 along with the appropriate filling fee.

END OF REMARKS

ajj

T/R/S: T21S/R60E/04
AREA K-22

Post-it® Fax Note	7671	Date 1/9/04	# of pages 1
To Randy Grenlich	From Al Jankowiak		
Co./Dept. CIV. Eng.	Co./Dept. CIV. Eng.		

CITY OF LAS VEGAS INTER-OFFICE MEMORANDUM			DATE: December 30, 2003		
TO: Land Development Services Department of Public Works			FROM: Albert J. Jankowiak, P.E. Flood Control Civil Engineer Department of Public Works		
SUBJECT: Technical Drainage Study for: Summerlin Village 23A/23B Alta Drive Street Improvements			COPIES TO: G.C. Wallace Howard Hughes Corporation Bart Anderson, P.E., DevCo CCRFC		
Cross Streets: Between Desert Foothills Drive and Collector Road					
File Number: F:\Dept\DSMEMOS\DS3426A.doc					
Parcel Number: 137-22-000-010					
Zoning Action:					
FEMA Flood Zone YES NO X					
Proposed Storm Drain YES X NO					
HISTORY	DATE RECEIVED	DATE REVIEWED	COMMENTS	REVIEW FEES	FEES PAID G.F. No.
1 st Submittal, Supplement	9/29/2003, 12/15/2003	10/10/2003, 12/30/2003	See Comments Below	\$250.00	111747: \$250
TOTAL FEES (LDDRS):				\$250.00	---

REMARKS:

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

	is approved subject to conformance to all City standards and the following conditions:
	must be resubmitted or supplemented including the following:
X	is conditionally approved subject to Clark County Regional Flood Control District concurrence.

1. On Sheet 20 of the Improvement plans, the Modified Type 'C' Drop Inlet Detail specifies the standard grate and frame per Uniform Standard Drawing (USD) Number 417. The detail must call out the grate and frame per the City of Las Vegas Type 'CM2' drop inlet details. Also, provide an additional detail for the curb opening protective face and rod connections. Contact Rosa Cortez at 229-6171 for an AutoCAD detail to be included within the improvement plans if Modified Type CM Inlets are used.

The following comments will repeated until the drainage study is approved:

2. This drainage study is acceptable in concept, however, the City of Las Vegas will not formally accept the study until the Clark County Regional Flood Control District (CCRFC) has issued a letter of concurrence. The Engineer should contact the CCRFC to confirm that they have begun their review.
3. The engineer has provided a table on the grading plans that shows a quantity estimate of all on-site and off-site flood control improvements such as solid grouted stem wall, drainage easements, protection berm, riprap, etc. All drainage improvements must be bonded and inspected.
4. This drainage study assumes that the project will be constructed in one phase. If improvement plans are submitted to break the project into separate phases, a drainage study update will be required for each phase addressing the interim condition.

Post-It® Fax Note	7671	Date	12/31	# of pages	2
To	Randall Greenlich	From	Al Jankowiak		
Co./Dept.	G.C. Wallace	Co.	City Flood		
Phone #		Phone #	229-2142		
Fax #	804-2299	Fax #			

DEC-30-2003 TUE 01:27 PM G C WALLACE INC
DEC-30-2003 TUE 02:17 PM CITY OF LAS VEGAS

FAX NO. 7028042299
FAX NO. 7023828551

P. 02
P. 02

NOTE: All land surface area disturbances over 1 acre require a stormwater discharge permit issued by the Nevada Division of Environmental Protection (NDEP). A phased construction unit in a contiguous subdivision is considered under construction until all stripped or disturbed surface areas have been covered by paving, building construction or planting. A stormwater discharge permit application and associated information may be downloaded from the web site:

<http://www.state.nv.us/ndep/bwpc/storm01.htm>

Projects that disturb more than one acre of land must submit to NDEP a "Notice of Intent" for inclusion under Stormwater Permit No. NVR100000 along with the appropriate filling fee.

END OF REMARKS

ajj

T/R/S: T21S/R60E/04
AREA K-22

The storm flow generated by Alta Drive Improvements will be intercepted by drop inlets and conveyed down Alta Drive via the storm drain system as identified in the Alta Drive RCB Study. The storm drain in Alta Drive was designed to accept flow from the Alta Drive Improvements. Based on the calculated street flow characteristics, the Manual criteria for depth (d) and velocity times depth ($V \cdot d$) for the 100-year storm event for minor streets are met.

TABLE 2 STREET FLOW CALCULATIONS					
Section*	Slope (%)	Discharge (cfs)	Depth (ft)	Velocity (fps)	VxD
Section ALTA-1	4.6	14	0.37	4.9	1.8
Section ALTA-2A	3.0	17	0.41	4.3	1.8
Section ALTA-2B	3.0	8	0.34	3.6	1.2
Section ALTA-3A	3.7	12	0.36	4.3	1.6
Section ALTA-3B	3.7	15	0.39	4.6	1.8
Section ALTA-3C	2.5	7	0.33	3.3	1.1

*See Figure 5.

TABLE 3 DROP INLET CALCULATIONS						
SECTION*	Depth (ft)	Slope %	Q ₁₀₀ Total (cfs)	Q ₁₀₀ Intercept (cfs)	Q ₁₀₀ Bypass (cfs)	Description of Drop Inlets**
ALTA-1	0.37	4.6	14	10	4	2 - 8.5' Type "CM2"
ALTA-2A	0.41	3.0	17	9	8	2 - 5.5' Type "CM2"
ALTA-2B	0.34	3.0	8	6	2	2 - 5.5' Type "CM2"
ALTA-3A	0.36	3.7	12	7	5	2 - 5.5' Type "CM2"
ALTA-3B	0.39	3.7	15	8	7	2 - 5.5' Type "CM2"
ALTA-3C	0.33	2.5	7	7	0	2 - 8.5' Type "CM2"

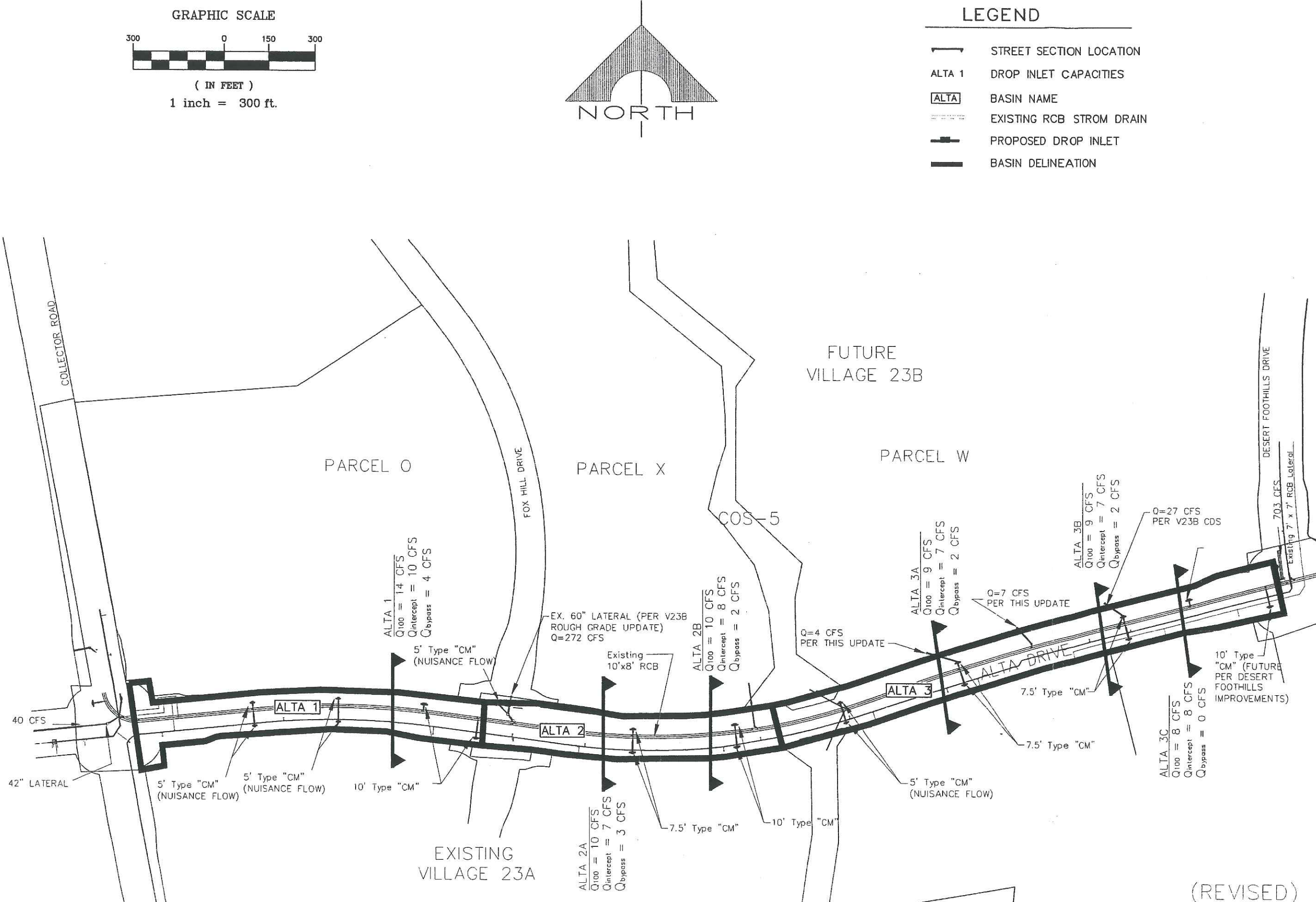
*See Figure 5.

**Summerlin standard Modified Type C drop inlets are equivalent to Type CM2 drop inlets as noted and detailed on the plans.

The drop inlets were sized using the equations from the Manual in a Quattro Pro spreadsheet format. All drop inlet calculations contain a minimum 50 percent clogging factor. The referenced calculations for sizing the drop inlets are included in Appendix C.

The proposed drop inlet and the extension of the 24-inch laterals locations are shown on Figure 5. The Alta Drive RCB storm drain system was designed already taking the street flow intercepted by the drop inlets into account. Hydraulic calculations for the

VILLAGE 28



VILLAGE 23A/23B

ALTA DRIVE STREET IMPROVEMENTS

FIGURE 5 (REVISED)
PROPOSED DRAINAGE FACILITIES MAP

SHEET

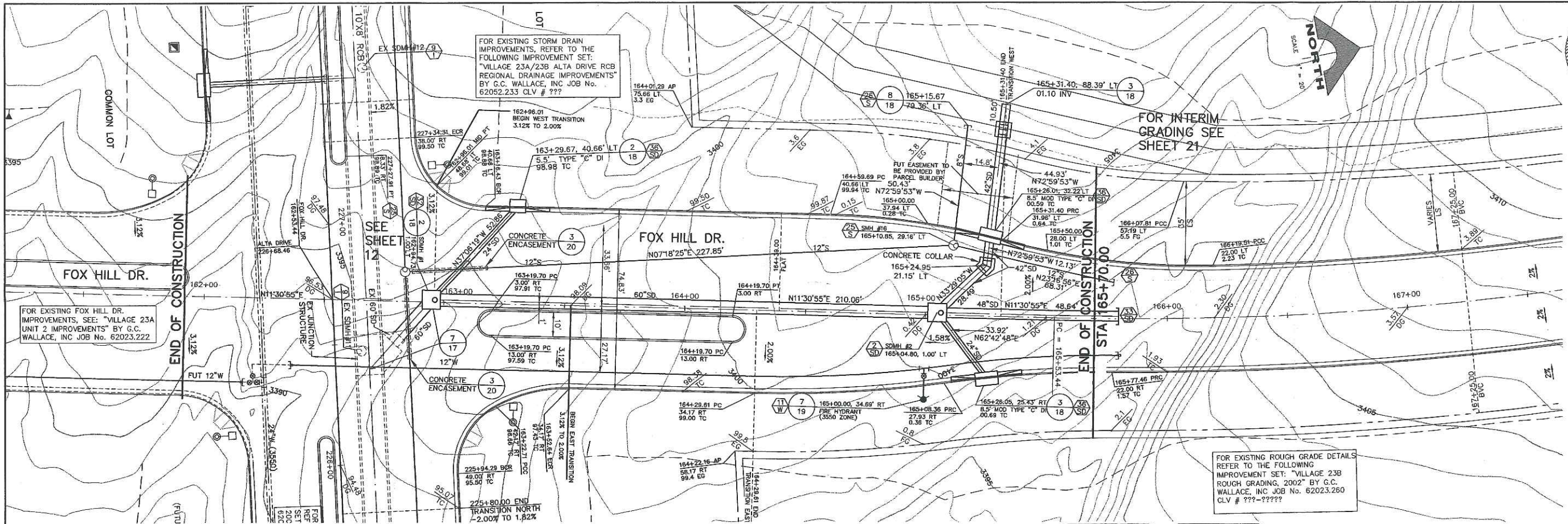
FIG 5

1 OF 1 SHTS



G.C. WALLACE, INC.
Engineers/Planners/Surveyors
1555 SOUTH RAINBOW BLVD./LAS VEGAS, NEVADA 89146
TELEPHONE: (702) 804-2000 • FAX: (702) 804-2299

(REVISED)



BENCHMARK		
BM #	DESC.	NAVD 88 DATUM
CLV BM No. 0368 3	U.S.C. & G.S. BRASS DISC SET IN ROCK ON THE EAST SIDE OF CHARLESTON BOULEVARD AND SOUTH OF THE RED ROCK DETENTION BASIN.	3246.71 (FEET)

BASIS OF BEARINGS		
NORTH 89°45'05\"	EAST BEING THE SOUTH LINE OF THE SOUTHWEST QUARTER (SW 1/4) OF SECTION 35, TOWNSHIP 20 SOUTH, RANGE 59 EAST, M.D.M., AS SHOWN BY MAP ON FILE IN FILE 91, PAGE 28 OF PARCEL MAPS IN THE CLARK COUNTY RECORDER'S OFFICE, CLARK COUNTY, NEVADA	989.599 (METERS)

FOX HILL DRIVE (PUBLIC)

SCALE: HORIZ. 1" = 20'
VERT. 1" = 5'
REFER TO SHEET 2 FOR CONSTRUCTION NOTES

NOTE

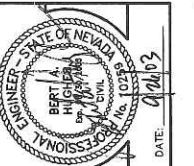
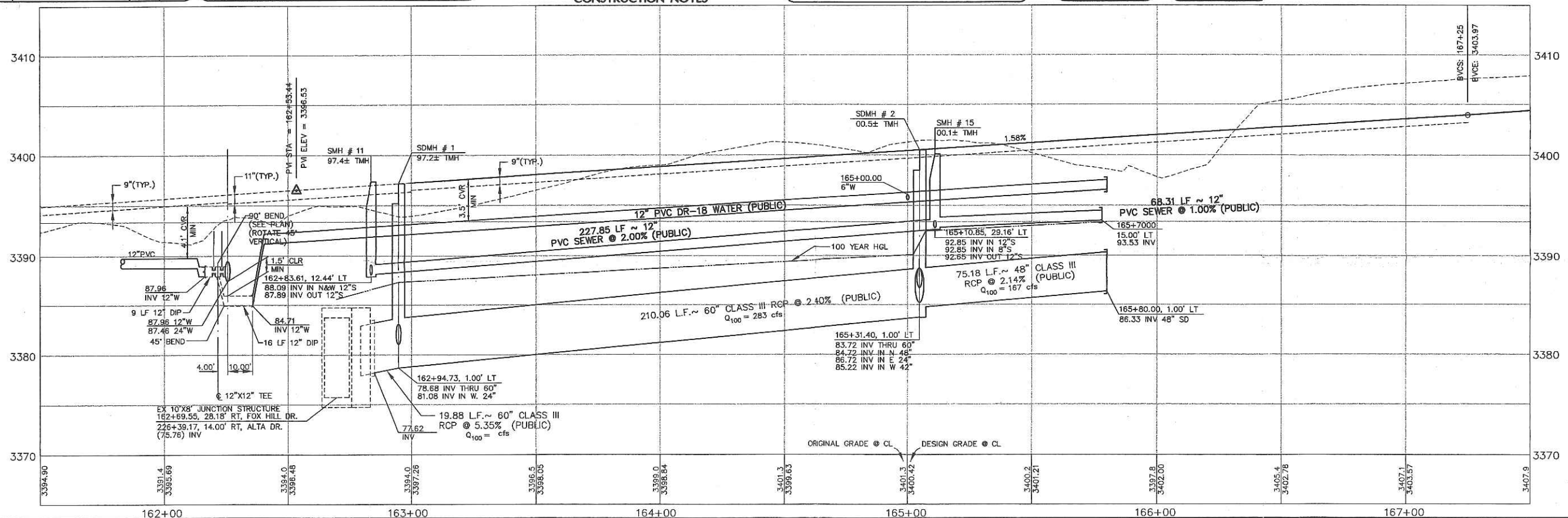
THIS SET OF DRAWINGS IS BASED UPON NAVD 88 DATUM. PREVIOUS DRAWINGS MAY BE BASED ON OTHER DATUM. CARE SHOULD BE OBSERVED WHEN UTILIZING THIS SET OF DRAWINGS.

Call before you Dig.
1-800-227-2600
UNDERGROUND SERVICE ALERT (USA)



APPROVAL:

LAS VEGAS VALLEY WATER DISTRICT DATE



DESIGN: GSW/GTP
DRAW: GTP
CHECK: BMT
ISSUE DATE: 9/26/03
PLOT DATE: 09-26-03
PLOT TIME: 08:03:58

G.C. WALLACE, INC.
Engineers/Planners/Surveyors
1555 SOUTH RANDOLPH BLVD., LAS VEGAS, NEVADA 89146
TELEPHONE: (702) 804-2000 • FAX: (702) 804-2299
E-MAIL: gwallace@wallaceinc.com

SUMMERLIN
VILLAGE 23A/23B ALTA DRIVE IMPROVEMENTS
FOX HILL DRIVE PLAN AND PROFILE
STA 230+00 TO 238+00

SHEET
13
13 OF 26 SHEETS

ISSUE DATE: 9/26/03 ISSUE FOR AGENCY REVIEW - NOT FOR CONSTRUCTION

JOB NO. 62023.270

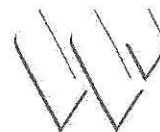
**UPDATE #2 TO THE
TECHNICAL DRAINAGE STUDY
FOR
SUMMERLIN VILLAGE 23B
ALTA DRIVE INTERIM GRADING
(VILLAGES 23A/23B ALTA DRIVE STREET
IMPROVEMENTS)**

62023-140

June 2012

Prepared for:

**The Howard Hughes Corporation
10000 W. Charleston Blvd., Suite 200
Las Vegas, Nevada 89135
Phone: (702) 791-4200
Fax: (702) 791-4450**



G. C. WALLACE COMPANIES
ENGINEERS | PLANNERS | SURVEYORS

CITY OF LAS VEGAS		DATE:
INTER-OFFICE MEMORANDUM		June 27, 2012
TO: Land Development Services Department of Public Works		FROM: Albert Sung, P.E. Flood Control Project Engineer Department of Public Works
SUBJECT:	COPIES TO:	
Drainage Study for:	G.C. Wallace, Inc.	
Summerlin Village 23B – Alta Drive Interim Grading (Summerlin Village 23A/23B Alta Drive Street Imp. – Update #2)	Howard Hughes Corporation	
Cross Streets:	Alta Dr. between Desert Foothill & Sky Vista	Barf Anderson, P.E., DevCo
File Number:	F:\Depot\DSMemos\DS4050D.doc	CCRFGD
Parcel Number:	137-34-299-001; -699-005; -699-006 & more	
Zoning Action:	N/A	
FEMA Flood Zone	YES	NO ☒
Proposed Storm Drain	YES ☒	NO

HISTORY	DATE RECEIVED	DATE REVIEWED	COMMENTS	REVIEW FEES	FEES PAID Transaction #
1 st Submittal	8/9/2006 & 8/31/2006	9/13/2006	Not Approved	\$400.00	Paid: \$400
2 nd Submittal	10/19/2006	11/2/2006	Conditional Approval	\$400.00	56131: \$400
CCRFGD	1/8/2007	1/22/2007	Concurrence	N/C	N/C
3 rd Submittal & Supplement	6/7/2012 & 6/26/2012	6/20/2012 & 6/26/2012	See Comments Below	\$100.00	285773: \$100
TOTAL FEES (LDDRS):				\$900.00	----

REMARKS:

3rd Submittal & Supplement: Update #2 to provide interim flood protection berms/ditches along the north side of the rough graded Alta Drive

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

☒	is approved subject to conformance to all City standards and the following conditions:
	must be resubmitted or supplemented including the following:
	is conditionally approved subject to Clark County Regional Flood Control District concurrence.

Note to Land Development:

A recent site inspection by Flood Control staff revealed that a sump pit at the intersection of Alta and Fox Hill had been backfilled. In order for the proposed ditches to function properly, the sump pit must be re-opened prior to the final acceptance of the improvement plans.

NOTE: 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 of a project.

NOTE: Please be advised that all land surface area disturbances over 1 acre or any area adjacent to a water way must submit to the Nevada Division of Environmental Protection a "Notice of Intent" to discharge that certifies a stormwater pollution prevention plan has been developed and is maintained on site; for inclusion in the Stormwater General Permit No. NVR100000. A phased construction unit in a contiguous subdivision is considered under construction until all stripped or disturbed surface areas have been covered by paving, building construction or planting. For more information, including forms and applications see <http://ndep.nv.gov/bwpc/storm01.htm> or call (775) 687-9429.

END OF REMARKS
ays

T/R/S: T20S/R59E/34
AREA K-34



G. C. WALLACE, INC.
1555 SOUTH RAINBOW BOULEVARD, LAS VEGAS, NV 89146

Writer's Contact Information:

702.804.2248

62023-140

June 6, 2012

Albert Y. Sung, PE
Flood Control Project Manager
City of Las Vegas - Land Development Services
Department of Public Works
333 N. Rancho Drive
Las Vegas, Nevada 89106

Re: Technical Drainage Study for Summerlin Village 23B Alta Drive Interim Grading (Villages 23A/23B Alta Drive Street Improvements)

Dear Mr. Sung:

The purpose of this letter is to serve as the second update to the Technical Drainage Study for the subject project. The *Technical Drainage Study for Summerlin Villages 23A/23B, Alta Drive Street Improvements* (hereinafter referred to as the Alta Drive Street Study), was originally approved by the City of Las Vegas Public Works Department (CLV) on January 9, 2004, with concurrence from the Clark County Regional Flood Control District (CCRFCD) on February 2, 2004. The first update to the Alta Drive Street Study was approved by the CLV on November 7, 2006 with concurrence from the CCRFCD on December 19, 2006. The proposed interim conditions grading north of the alignment for Alta Drive (hereinafter referred to as the Alta Interim Grading) has been revised and included as separate improvement plans to the previously approved Alta Drive Street Study; however the site plan and drainage design flow patterns for the roadways remain unchanged from the previously approved Alta Drive Street Study. The calculations and grading plans provided herewith serve to provide an interim condition for Alta Drive and will precede those of the Alta Drive Street Study and serve to update the previously approved study. Pertinent reference materials from the Alta Drive Street Study have been included in Appendix C. The methodologies and calculations presented in this report are in compliance with the *CCRFCD Hydrologic Criteria and Drainage Design Manual* (Manual). Copies of the approval letters have been included in Appendix C.

Currently, Alta Drive has been rough graded between the existing Sky Vista Drive Collector Channel and Desert Foothills Drive. Storm drain utilities were constructed within Alta Drive with the *Technical Drainage Study for Summerlin Villages 23A/23B, Alta Drive RCB Regional Drainage Improvements* (hereinafter referred to as the Alta Drive RCB Study). The interim improvements for the Alta Drive Street Study included three channels directly north of Alta Drive in the following locations: 1) an unlined trapezoidal channel with a 30-foot wide bottom located between the Sky Vista Drive collector channel and the existing sump in Fox Hill Drive; 2) an unlined v-ditch located between the rough graded Fox Hill Drive and the existing stockpile berm just west of the existing Pedestrian Underpass; and 3) an unlined trapezoidal channel/berm with a 35-foot wide bottom located between the existing Pedestrian Underpass and the existing channel/berm west of Desert Foothills Drive. The three abovementioned interim channels have not been constructed because the street improvements for Alta Drive were put on hold. Now that developments south of Alta Drive are in the design stages, the interim channel grading is needed to provide offsite protection. In order to reduce the amount of interim channel grading, the following revisions have been proposed: 1) a riprap lined channel/berm located between the Sky Vista Drive collector channel and the existing sump in Fox Hill Drive; 2) v-ditch remains unchanged between Fox Hill Drive and the existing stockpile berm; and 3) a riprap lined channel/berm located between the existing Pedestrian Underpass and the existing channel/berm west of Desert Foothills Drive. Facility names for the proposed ditches in the calculations correspond with the cross section shown on the improvement plans. Flows tributary to the proposed ditches have been referenced and prorated from the Alta Drive Street Study Interim Drainage Conditions Figure 6. As shown on the referenced Figure 6: 1) a proposed channel has been provided to direct runoff from Basin EX3-4 (34 cfs) to the exposed 60-inch RCP lateral at the intersection of Fox Hill Drive and Alta Drive; 2) a proposed channel has been provided to direct runoff from Basin EX4-1C (5 cfs) to the exposed 36-inch HDPE lateral at the existing stockpile berm; and 3) a proposed channel has been provided to direct

runoff from Basin EX4-1B (65 cfs) to the existing channel/berm west of Desert Foothills Drive. Normal depth calculations for the ditches have been summarized in Table 1 and included in Appendix B. Pertinent reference materials have been included in Appendix C.

TABLE 1 INTERIM CONDITIONS 100-YEAR DITCH CHARACTERISTICS										
Ditch*	Q ₁₀₀ (cfs)	Slope (%)	Depth of Flow (ft)	Total Ditch Depth (ft)	Total Berm Depth (ft)	Freeboard (ft)	Velocity (ft/s)	Type	Side Slopes	D ₅₀ (in)
1	12**	4.50	0.89	1.0	2.0	1.11	5.06	V	3:1	6
2	17**	2.00	1.18	1.5	2.5	1.32	4.08	V	3:1	6
3	17**	5.70	0.99	1.3	2.5	1.51	5.79	V	3:1	8
4	34	1.00	1.83	2.0	3.0	1.17	3.38	V	3:1	12
5	5***	2.40	0.63	1.8	N/A	1.17	4.14	V	3:1	-
6 (min slope)	65	2.50	1.91	2.0	3.5	1.59	5.94	V	3:1	8
6 (max slope)	65	3.20	1.82	2.0	3.5	1.68	6.52	V	3:1	8
7	17****	2.50	1.13	1.5	2.5	1.37	4.43	V	3:1	6

*See Improvement Plans for location of ditches.

**Prorated flow from Basin EX3-4.

***Basin EX4-1C.

****Prorated flow from Basin EX4-1B.

The proposed ditches consist of an unlined or riprap-lined 3:1 side slope v-ditch and an unlined berm along the south side of the ditch to provide additional freeboard where necessary. The proposed ditches will have a minimum freeboard of 1 foot above the calculated water surface elevation. Flows from the proposed ditches will be conveyed from west to east into existing storm drain systems. The proposed discharge points are consistent with the previously approved referenced drainage studies.

In general, the approved drainage patterns remain unchanged and the proposed Alta Interim Grading does not significantly alter existing peak flows or the character of flows downstream of the development and does not pose any negative impacts on downstream facilities and development.

If you have any questions or require additional information, please contact our office at 804-2000.

Cordially,
 G. C. WALLACE, INC.



Rachael R. Dennis, PE
 Project Manager
 Flood Control Division

rrd/vlr

c: Jerry Pruitt, GCW
 Josh Johnson, GCW
 Derick Yoro, GCW
 Daniel Kelley, GCW
 Ryan Belsick, GCW

**SUMMERLIN
VILLAGE 23B
ALTA DRIVE INTERIM GRADING**

PRORATED FLOWS

INTERIM CONDITIONS PRORATED FLOW SUMMARY			
Onsite			
Subbasin	Q ₁₀₀ (cfs)	Area (acres)	cfs/acre
EX3-4	34	12.1	2.81
EX4-1B	65	54.7	1.19
Onsite Prorated Basins			
Subbasin	Q ₁₀₀ (cfs)	Area (acres)	cfs/acre
EX3-4A	12	4.3	2.81
EX3-4B	5	1.8	2.81
EX3-4C	17	6.0	2.81
TOTAL	34	12.1	NA
Subbasin	Q ₁₀₀ (cfs)	Area (acres)	cfs/acre
EX4-1B1	17	14.3	1.19
EX4-1B2	48	40.4	1.19
TOTAL	65	54.7	NA

HA 6666

**RESPONSE TO COMMENTS
ON THE UPDATE TO THE
TECHNICAL DRAINAGE STUDY
FOR
SUMMERLIN VILLAGE 23A/23B
ALTA DRIVE STREET IMPROVEMENTS**

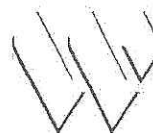
(DS 4050A)

62023.270

October 2006

Prepared for:

**The Howard Hughes Corporation
a Delaware Corporation
10000 West Charleston Blvd., Ste. 200
Las Vegas, Nevada 89135
Phone: (702) 791- 4300
Fax: (702) 791- 4453**



G.C. WALLACE COMPANIES
ENGINEERS | PLANNERS | SURVEYORS

62023.270

October 18, 2006



ENGINEERS PLANNERS SURVEYORS

G. C. WALLACE, INC.

Writer's Contact Information:

804-2041

Albert Sung, PE
City of Las Vegas - Land Development Services
Department of Public Works
731 South Fourth Street
Las Vegas, Nevada 89101

**Re: Update to the Technical Drainage Study for Summerlin Villages 23A/23B
Alta Drive Street Improvements – (DS4050A)**

Dear Mr. Sung:

Comment: "1. The site is adjacent to or crosses an existing or proposed *Clark County Regional Flood Control District (CCRFC)* master planned facility. Therefore, CCRFC concurrence is required prior to final approval of the drainage study."

Response: Comment is noted.

Comment: "2. The proposed interim grading at the intersection of Alta Drive and Fox Hill Drive shown in Sheet 19 does not match the proposed design shown in Sheet 12. Sheet 19 shows the curb on both sides of Fox Hill Drive to be constructed in future while Sheet 12 shows the curbs to be constructed with this improvement plan set. Clarify in the next submittal. If future construction is to be the case, show invert elevation in the proposed sump and provide barricade around the sump."

Response: The curbs on both sides of Fox Hill are to be constructed in the future and are shown on Sheets 12 and 19. Barricades have been provided around the sump and the invert for the sump is shown on Sheet 19. Sump grading is per the Village 23B Rough Grading Update (DS4019).

If you have any questions or need additional information, please contact us at 804-2041.

Very truly yours,

G. C. WALLACE, INC.

Debra M. Yamachika, PE
Project Manager
Flood Control Division

DY/jj

Enclosures

c: Derick Yoro, GCW
Randall K. Gremlich, GCW



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TABLE 2 Drop Inlet Calculations						
Section	Depth (ft)	Slope (%)	Q ₁₀₀ Total (cfs)	Q ₁₀₀ Intercept (cfs)	Q ₁₀₀ Bypass (cfs)	Description of Drop Inlet
ALTA-1	0.39	3.00	14	10	4	2-10' Type "CM"
ALTA-2A	0.35	3.70	10	7	3	2-7.5' Type "CM"
ALTA-2B	0.35	3.70	10	8	2	2-10' Type "CM"
ALTA-3A	0.34	3.70	9	7	2	2-7.5' Type "CM"
ALTA-3B	0.34	3.70	9	7	2	2-7.5' Type "CM"
ALTA-3C	0.34	2.50	8	8	0	2-10' Type "CM"

*See Figure 5 (REVISED).

In addition to the drop inlet revisions, minor lateral revisions at three locations have been made to the storm drain improvements to accommodate the future development of Parcels W and X within Village 23B. At Station 205+73 the proposed 30-inch lateral will now connect to the proposed drop inlet at an angle versus perpendicular. At Station 208+90.6 the proposed 24-inch lateral will connect to the existing 24-inch lateral at an angle via a proposed storm drain manhole. At Station 211+41 an additional 24-inch lateral will connect to the proposed drop inlet. Please refer to the revised plans included in the appendix.

The runoff conveyed via the laterals at Stations 205+73 and 208+90.6 are unchanged with this update and remain consistent with the design flows established in the Summerlin Village 23B Conceptual Drainage Study and the *Addendum to the Technical Drainage Study for Summerlin Village 23A/23B Alta Drive RCB Regional Drainage Improvements* study. Excerpts from these studies are included in the appendix. The runoff conveyed via the additional 24-inch lateral at Station 211+41 is approximately 4 cfs. The future development layout of Parcels W and X was reviewed to estimate the quantity of flow that would drain to this lateral. A preliminary HEC-1 model was prepared for the area, Basin P35, which will drain to the 24-inch lateral. The area of Basin P35 is depicted on Exhibit 1. Please refer to the appendix for the appropriate hydrologic information. The additional 4 cfs added to the existing RCB in Alta Drive is negligible; and, therefore, the hydraulics for the existing storm drain system has not been revised. Future development of Parcels W and X may alter the flows entering the existing RCB storm drain, at which time the existing system may be re-evaluated.

At the northeast corner of the intersection of Fox Hill Drive and Alta Drive, Basin EX4-1C will drain to a proposed v-ditch north of Alta Drive. The v-ditch will convey 5 cfs to the existing berm that starts near Station 221+25. This flow combines with 37 cfs from Basin EX4-1A for a total of 42 cfs at the open 36-inch lateral. This is less than the design flow of 45 cfs for the lateral. EX4-1C is a prorated subbasin. The hydrologic and hydraulic calculations are in the appendix.

East of the pedestrian underpass a proposed trapezoidal channel on the north side of Alta Drive will convey 65 cfs (Q_{100}) to the existing berm that directs runoff to the Desert Foothills channel. The berm currently extends into the rough-graded Alta Drive and intercepts the flow that the proposed channel will convey. The storm flow is from Basin EX4-1B, which is a prorated subbasin. The calculations are in the appendix.

The final revision covered in this update is the removal of the previously proposed storm drain system in Fox Hill Drive due to current field conditions. This storm drain system previously intercepted interim condition flows, west of Fox Hills Drive, from Basin R-RG2 per Figure 6 (appendix), referenced from the *Technical Drainage Study for Summerlin Villages 23A/23B Alta Drive Street Improvements*. Current field conditions reflect the rough graded interior roads within Village 23B as shown on referenced Figure 5R (appendix), referenced from the *Update to the Technical Drainage Study for Summerlin Village 23B Rough Grading* (hereafter referred to as the V23B Rough Grade Update), dated June 2006. Please note that the V23B Rough Grade Update is not approved at this time, but the improvements shall be considered existing in this report. The additional flow from rough graded Fox Hill Drive negatively impacted the original storm drain design; therefore, the storm drain has been removed, and runoff within Fox Hill Drive and the area west of Fox Hill Drive will be intercepted by the exposed 60-inch lateral at the intersection of Fox Hill Drive and Alta Drive as proposed in the V23B Rough Grade Update. As shown on Figure 6 (REVISED), a proposed channel has been provided north of the Alta Drive right-of-way to direct runoff from Basin EX3-4 to the exposed 60-inch lateral at the intersection of Fox Hill Drive and Alta Drive. Approximately 272 cfs will be conveyed to the 60-inch lateral. This is less than the 283 cfs that the lateral was designed to convey; and, therefore, the proposed design does not negatively impact the existing storm drain system in Alta Drive.

If you have any questions or need additional information, please contact us at 804-2000.

Very truly yours,

G. C. WALLACE, INC.



Randall K. Gremlich, PE
Vice President
Flood Control Division

DY/RL/jj

Enclosures

c: Debra M. Yamachika, PE
Derick Yoro, GCW

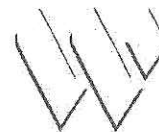
**UPDATE TO THE
CONCEPTUAL DRAINAGE STUDY
FOR
SUMMERLIN VILLAGE 23B**

62023B-100

July 2012

Prepared for:

**The Howard Hughes Corporation
10000 W. Charleston Blvd., Suite 200
Las Vegas, Nevada 89135
Phone: (702) 791-4200
Fax: (702) 791-4450**



G. C. WALLACE COMPANIES
ENGINEERS | PLANNERS | SURVEYORS

CITY OF LAS VEGAS		DATE:
INTER-OFFICE MEMORANDUM		August 9, 2012
TO: Land Development Services Department of Public Works		FROM: Albert Sung, P.E. Flood Control Project Engineer Department of Public Works
SUBJECT:	Conceptual Drainage Study for:	
	Summerlin Village 23B – Update	
Cross Streets:	NWC of Alta Drive & Desert Foothills Drive	COPIES TO:
File Number:	F:\Depot\DSMEMOS\DS3420D.doc	G.C. Wallace Inc.
Parcel Number:	137-22-000-015	Howard Hughes Corp.
Zoning Action:	TMP-46270	Bart Anderson, P.E., DevCo
FEMA Flood Zone	YES	NO X
Proposed Storm Drain	YES X	NO
		CCRFC

HISTORY	DATE RECEIVED	DATE REVIEWED	COMMENTS	REVIEW FEES	FEES PAID Payment Trn #
1 st Submittal	9/15/2003	9/29/2003	Not Approved	\$250.00	110938: \$250
2 nd Submittal	10/10/2003	10/24/2003	Conditionally Approved	\$400.00	112511: \$400
CCRFC	11/25/2003	12/9/2003	Concurrence	N/C	N/C
3 rd Submittal	7/26/2012	8/9/2012	See Comments Below	\$100.00	291144: \$100
			TOTAL FEES (LDDRS):	\$750.00	----

REMARKS:

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

X	is approved subject to conformance to all City standards and the following conditions:
	must be resubmitted or supplemented including the following:
	is conditionally approved subject to Clark County Regional Flood Control District concurrence.

NOTE: Please be advised that all land surface area disturbances over 1 acre or any area adjacent to a water way must submit to the Nevada Division of Environmental Protection a "Notice of Intent" to discharge that certifies a stormwater pollution prevention plan has been developed and is maintained on site; for inclusion in the Stormwater General Permit No. NVR100000. A phased construction unit in a contiguous subdivision is considered under construction until all stripped or disturbed surface areas have been covered by paving, building construction or planting. For more information, including forms and applications see <http://ndep.nv.gov/bwpc/storm01.htm> or call (775) 687-9429.

NOTE: 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 of a project.

END OF REMARKS

B&H/ays

T/R/S: T20S/R59E/22
AREA K-22



G.C. WALLACE, INC.
G.C. WALLACE HOLDINGS, INC.

Writer's Contact Information:

62023B-100

July 25, 2012

702.804.2248

Albert Y. Sung, PE
Flood Control Project Manager
City of Las Vegas - Land Development Services
Department of Public Works
333 N. Rancho Drive
Las Vegas, Nevada 89106

Re: **Conceptual Drainage Study for Summerlin Village 23B**

Dear Mr. Sung:

The purpose of this letter is to serve as the update to the Conceptual Drainage Study for the subject project. The *Conceptual Drainage Study for Summerlin Village 23B* (hereinafter referred to as the Conceptual Study), was originally approved by the City of Las Vegas Public Works Department (CLV) on October 24, 2003, with concurrence from the Clark County Regional Flood Control District (CCRFCDD) on November 20, 2003. The approved Conceptual Study presented ultimate conditions onsite drainage patterns and proposed major storm drain facilities within the exterior and interior roadways. Since approval of the study, the site plan and drainage design flow patterns for the parcels and proposed storm drain facilities have been revised. The calculations provided herewith serve to provide an ultimate condition for Village 23B and will supersede those of the Conceptual Study and serve to update the previously approved study. Pertinent reference materials from the Conceptual Study have been included in Appendix C. The methodologies and calculations presented in this report are in compliance with the *CCRFCDD Hydrologic Criteria and Drainage Design Manual* (Manual). Copies of the approval letters have been included in Appendix C.

Since this is a conceptual study, all that is addressed is the existing and ultimate conditions. The interim conditions will be addressed in individual technical studies. It is not known at this time in what order the area will be developed. However, upon development, each area will be properly protected in the interim and ultimate conditions. It should be noted that several individual technical studies for roadways within Village 23B have been approved and will be updated according to this proposed Conceptual Study.

Existing conditions for the site were addressed in the *Technical Drainage Study for Summerlin Village 23B Rough Grading* (hereinafter referred to as the Rough Grade Study) and the *Technical Drainage Study for Summerlin Village 23A/23B/23C Alta Drive Street Improvements* (hereinafter referred to as the Alta Drive Street Study). A copy of Figure 6 from the Alta Drive Street Study showing the existing conditions drainage patterns has been included in Appendix C. Along the western boundary of the Village 23B site, the Sky Vista Collector Channel has been constructed as part of the Rough Grade Study and currently protects the site from offsite flows. Presently, onsite runoff from Village 23B is directed via existing berms to the existing graded channel in Desert Foothills Drive, discharging to the existing 7-foot wide by 7-foot high lateral off the 10-foot wide by 8-foot high RCB storm drain system in Alta Drive. Alta Drive has also been rough graded between the existing Sky Vista Drive Collector Channel and Desert Foothills Drive. The existing 10-foot wide by 8-foot high RCB storm drain facility was constructed within Alta Drive with the *Technical Drainage Study for Summerlin Villages 23A/23B, Alta Drive RCB Regional Drainage Improvements* (hereinafter referred to as the Alta Drive RCB Study). Per the Alta Drive Street Study, additional stubs were provided to collect existing conditions flows. As shown on the referenced Alta Drive Street Study Figure 6: 1) the exposed 60-inch RCP lateral at the intersection of Fox Hill Drive and Alta Drive collects existing conditions flows generated between the Sky Vista Drive collector channel and Fox Hill Drive; 2) the exposed 36-inch RCP lateral at the existing stockpile berm collects existing conditions flows generated between Fox Hill Drive and the stockpile berm; 3) the exposed 30-inch RCP lateral at the existing pedestrian underpass has not been designed to collect existing conditions flows; 4) an existing channel/berm west of Desert Foothills Drive conveys existing conditions flows generated east of the stockpile berm into the Desert Foothills Channel. Pertinent reference materials have been included in Appendix C.

The portion of the soils map containing Village 23B has been revised and has been included in Appendix A. The landuse and curve numbers for the onsite subbasins are consistent with the 2008 Las Vegas Valley Flood Control Master Plan Update (hereinafter referred to as the 2008 MPU). The onsite ultimate conditions subbasins conservatively assume a landuse of Apartments/Condos/Commercial, Residential, Natural Desert Landscaping, Streets, and Open Space. Weighted curve numbers for ultimate conditions were calculated. Curve numbers ranging from 74 to 95.6 were determined for the ultimate conditions onsite subbasins. Curve number calculations for ultimate conditions as well as a curve number matrix of each soil type for each landuse is included in Appendix A.

The ultimate conditions for this project assumes fully developed parcels within Village 23B, full street improvements of the interior and exterior roadways, and offsites as fully developed. The 2008 MPU subbasins for the offsite drainage area west of Sky Vista Drive and north of Far Hills Avenue have been referenced; however the drainage patterns are generally consistent with the previously approved studies. Pertinent reference material has been included in Appendix C. Per the 2006 Summerlin West Planning Area Flood Control Master Plan (hereinafter referred to as the 2006 Summerlin West MP), the area between the existing Detention Basin 5, Alta Drive and Sky Vista Drive will discharge into the Alta Drive storm drain system during ultimate conditions. The 2008 MPU references the 2006 Summerlin West MP subbasins, but did not include the area shown as Basin 5-9A1 on Figure 6U. Additionally, due to the site plan changes, concentration points have been relocated. Figure 6U depicts the overall subbasins and drainage patterns used in the ultimate conditions hydrologic analysis. Lag time calculations for the onsite drainage basin are included in Appendix A on Standard Form 4. The results of the HEC-1 model have been summarized in Table 1. A copy of the HEC-1 model has been included in Appendix A.

TABLE 1 SUMMARY OF ULTIMATE CONDITIONS HEC-1 MODEL			
SB OR CP*	AREA (AC)	100-YR (CFS)	10-YR (CFS)
5-9A1	38.58	126	60
AA	18.52	63	31
BB	32.03	97	42
C-47	-	676	288
C-47A	-	2750	1699
CC	28.57	83	36
C-CR	-	2233	1602
CCSWFH-7	-	3477	1728
COS-5	8.79	13	3
CP-AL	-	2362	1630
CP-FH	-	765	339
CSWAA-1	-	2220	1593
CSWFH-5	-	679	290
ES-2	13.33	49	24
NP-2	12.54	21	5
P	24.03	67	29
PT0	-	139	61
PT1	-	211	93
PT10	-	409	176
PT11	-	169	70
PT12	-	578	244

TABLE 1 SUMMARY OF ULTIMATE CONDITIONS HEC-1 MODEL			
SB OR CP*	AREA (AC)	100 YR (CFS)	10 YR (CFS)
PT13	-	645	273
PT2	-	282	123
PT3	-	309	136
PT3A	-	2298	1619
PT4	-	2328	1624
PT5	-	2334	1625
PT5A	-	2346	1627
PT6	-	149	66
PT7	-	166	73
PT9A	-	251	107
PT9B	-	107	47
PT9C	-	352	153
PT9D	-	393	170
Q1	14.87	45	19
Q2	13.34	40	17
R	25.54	77	33
S	19.69	60	26
ST1	8.00	26	13
ST2	4.25	17	8
ST3	4.12	17	9
ST4	5.98	21	10
ST-AL	13.03	43	21
ST-CR	16.43	48	24
ST-DF	12.14	33	16
ST-FH	13.14	44	22
SUM5OT	-	2149	1548
SWAA-1	-	326	134
T	29.70	87	38
U	25.15	75	33
V	25.45	77	33
W	23.78	74	32
X	23.31	70	30
Y	24.30	75	33
Z	25.01	80	36

*See Figure 6U.

All proposed flood control facilities have been shown on Figure 7U. Design of the proposed storm drain facilities have been based on normal depth calculations. All proposed facilities have been sized to convey ultimate conditions flowrates. Proposed mainline and lateral pipe sizes were calculated using normal depth and have been upsized by 6 inches in diameter to provide for losses and future design flexibility. Normal depth calculations for the recommended facilities have been included in Appendix B. Note that detailed hydraulic analysis for the proposed facilities will be provided in future technical drainage study submittals upon site development of this project. Drop inlets will be located and sized with individual technical studies for future roadway improvements. A total of six mainline systems

City of Las Vegas – Land Development Services
Department of Public Works
July 25, 2012
Page 4

62023B-100

are existing or have been proposed with this project: 1) Proposed Sky Vista Drive System; 2) Proposed Far Hills System; 3) Proposed Fox Hill Drive System; 4) Existing Alta Drive System; 5) Proposed Antelope Ridge Drive System and 6) Proposed Desert Foothills Drive System. Please refer to Figure 7U for facility flows and sizes.

In general, the approved drainage patterns are consistent with the previously approved referenced drainage studies and the proposed site plan and storm drain facilities do not significantly alter existing peak flows or the character of flows downstream of the development and do not pose any negative impacts on downstream facilities and development.

If you have any questions or require additional information, please contact our office at 804-2000.

Cordially,

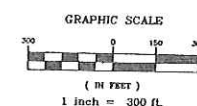
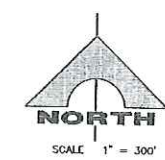
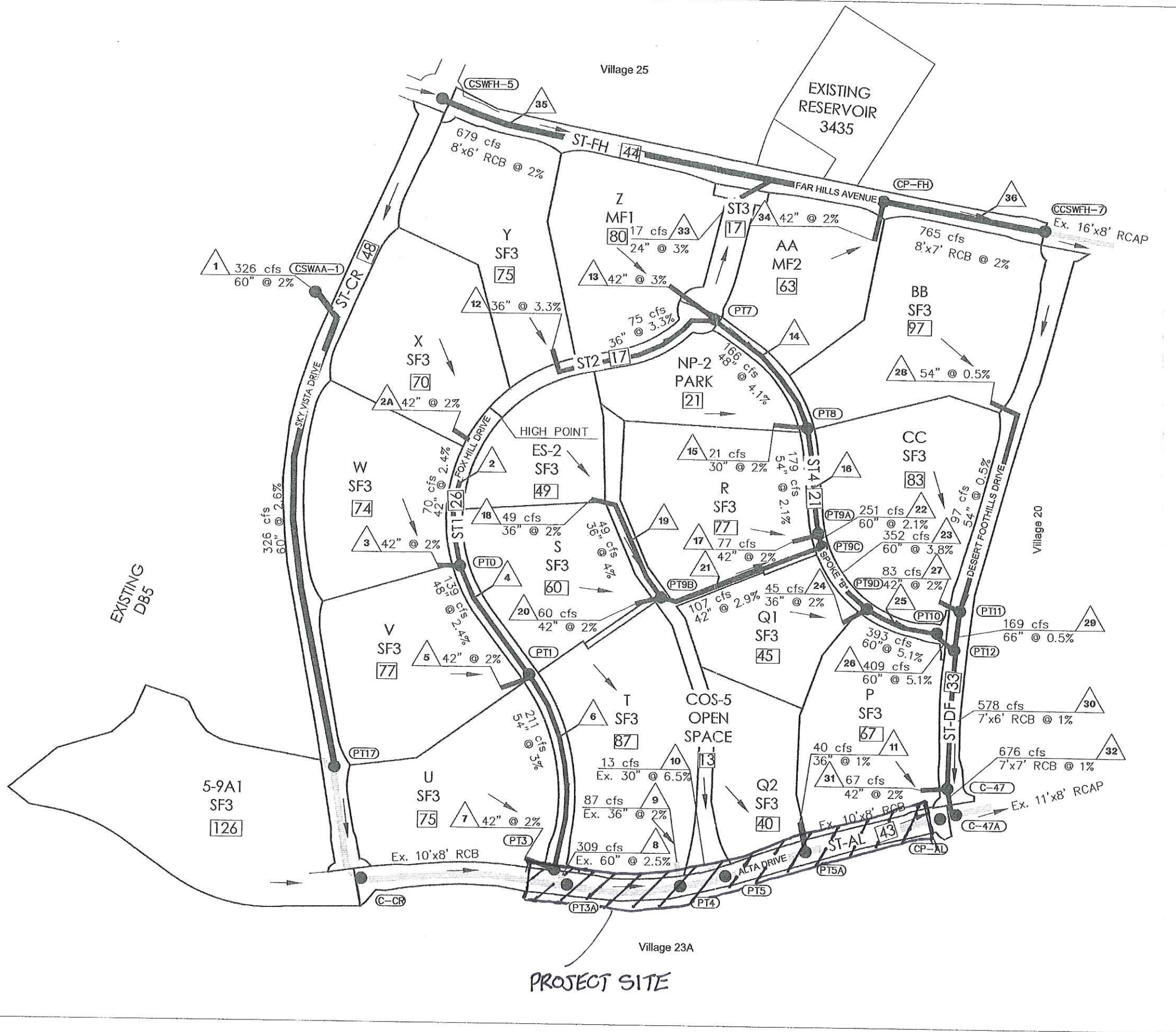
G. C. WALLACE, INC.



Rachael R. Dennis, PE
Project Manager
Flood Control Division

rrd/vlr

c: Jerry Pruitt, GCW
Josh Johnson, GCW
Derick Yoro, GCW
Ryan Belsick, GCW
Daniel Kelley, GCW



- LEGEND**
- A SF3 13
 - PROPOSED STORM DRAIN
 - CONCENTRATION POINT
 - EXISTING STORM DRAIN
 - SUBBASIN BOUNDARY
 - FACILITY IDENTIFIER

G.C. WALLACE, INC.
Engineers/Planners/Surveyors
1555 SOUTH RANCHO BLVD., LAS VEGAS, NEVADA 89103
TELEPHONE: (702) 864-2000 • FAX: (702) 864-2299
F:\Projects\600\620238-100\Division\Fig\Figure 107-up.dwg

TIME OF CONCENTRATION

**SUMMERLIN VILLAGE 23B
ULTIMATE CONDITIONS**

G. C. WALLACE COMPANIES
Engineers/Planners/Surveyors

Project No: 62023B-100
Date: 28-Jun-12
Calculated by:

STANDARD FORM 4


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*****
* FLOOD HYDROGRAPH PACKAGE (HEC-1) *
* JUN 1998 *
* VERSION 4.1 *
* RUN DATE 24JUL12 TIME 14:42:18 *
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* U.S. ARMY CORPS OF ENGINEERS *
* HYDROLOGIC ENGINEERING CENTER *
* 609 SECOND STREET *
* DAVIS, CALIFORNIA 95616 *
* (916) 756-1104 *
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THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE. THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION. NEW OPTIONS: DAMBREAK OUTFLOW SURMERGENCE, 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

1 HEC-1 INPUT PAGE 1

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

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*** FREE ***
1 ID *****
2 ID *
3 ID * SUMMERLIN VILLAGE 23B
4 ID * CONCEPTUAL STUDY UPDATE
5 ID * DEVELOPED ONSITE
6 ID * DEVELOPED OFFSITE
7 ID *
8 ID * RETURN PERIOD 10 & 100-YEAR
9 ID * DISTRIBUTION 6-HOUR SDN3
10 ID * PROJECT NO 620238.100
11 ID * FILENAME V23B-ULT.H1
12 ID * DATE 07/05/12
13 ID * MODELED BY JAM/RRD
14 ID *
15 ID *
16 ID *
17 ID *****
18 ID
19 ID JR CARDS CONTAIN DARF'S BASED ON THE FOLLOWING VALUES:
20 ID
21 ID AREA DARF
22 ID SQ-MI.
23 ID
24 ID 0.0 - 0.5 1.000
25 ID 0.5 - 1.0 0.975
26 ID 1.0 - 2.0 0.950
27 ID 2.0 - 3.0 0.925
28 ID 3.0 - 4.0 0.915
29 ID 4.0 - 5.0 0.908
30 ID 5.0 - 7.0 0.895
31 ID 7.0 - 8.0 0.885
32 ID
33 ID 5 0 0 200
34 ID 5 0
35 ID 5 0
36 ID JR PREC 1.0 0.975 0.95 0.925 0.915 0.908 0.895 0.885 0.55

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* BASIN PARAMETERS FOR OFFSITE BASINS TAKEN
* DIRECTLY FROM 2008 MPU:
* THE FOLLOWING SECTION OF HYDROLOGY WAS DEVELOPED BASED ON G.C. WALLACE'S
* 2006 SUMMERLIN WEST: EXISTING OFFSITE/PROPOSED ONSITE DRAINAGE CONDITION
* HYDROLOGIC MODEL (11-20-06); THE HYDROLOGY WAS REVISED IN ORDER TO
* INCORPORATE ALL EXISTING/PROPOSED MPU FACILITIES

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37 KK DB54-1
38 BA 2.222
39 PB 3.72
40 PC 0.000 .0200 .0570 .0700 .0870 .1080 .1240 .1300 .1300 .1300
41 PC .1300 .1300 .1300 .1330 .1400 .1420 .1480 .1580 .1720 .1810
42 PC .1900 .1970 .1990 .2000 .2010 .2040 .2140 .2290 .2410 .2490
43 PC .2510 .2560 .2700 .2780 .2810 .2830 .2950 .3220 .3520 .4090

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HEC-1 INPUT

PAGE 2

LINE	ID	1	2	3	4	5	6	7	8	9	10
44	PC	.4990	.5900	.7100	.7440	.7810	.8120	.8190	.8350	.8510	.8560
45	PC	.8600	.8680	.8760	.8860	.9100	.9260	.9370	.9500	.9700	.9760
46	PC	.9820	.9850	.9876	.9890	.9900	.9930	.9930	.9940	.9950	.9980
47	PC	.9980	.9990	1.000							
48	LS	0	87.2								
49	UD	0.495									

50. KK RDB54-1
 51. KM ROUTE DB54-1 TO CDB54-5
 52. KM NATURAL WASH
 53. KM TRAVEL LENGTH = 4,500
 54. KM SLOPE = 3.7%
 55. KM N = 0.040
 56. KM HYDRAULIC RADIUS = 1.5
 57. KM VELOCITY = 14.9
 58. RM 1 0.084 0.15

59. KK DB54-5
 60. BA 0.226
 61. PB 3.67
 62. LS 0 85.2
 63. UD 0.089

64. KK CDB54-5
 65. KM COMBINE DB54-5 AND RDB54-1
 66. HC 2

67. KKRCDB54-5
 68. KM ROUTE CDB54-5 TO CRCDB544
 69. KM FACILITY = ANGEL PARK - MIDDLE 5 BRANCH
 70. KM FACILITY # = APMS 0059
 71. KM LINING = CONCRETE
 72. RD 8923 0.07 0.015 0 TRAP 100 2

73. KK DB54-2
 74. BA 0.288
 75. PB 3.66
 76. LS 0 86.9
 77. UD 0.076

78. KK RDB54-2
 79. KM ROUTE DB54-2 TO CDB54-4
 80. KM FACILITY = ANGEL PARK - MIDDLE 5 BRANCH
 81. KM FACILITY # = APMS 0057
 82. KM LINING = CONCRETE
 83. RD 4920 0.068 0.015 0 TRAP 50 2

HEC-1 INPUT

PAGE 3

LINE	ID	1	2	3	4	5	6	7	8	9	10
84	KK DB54-3										
85	BA	0.519									
86	PB	3.67									
87	LS	0	87.2								
88	UD	0.090									

89. KK RDB54-3
 90. KM ROUTE DB54-3 TO CDB54-4
 91. KM NATURAL WASH
 92. KM TRAVEL LENGTH = 5,200
 93. KM SLOPE = 3.0%
 94. KM N = 0.040
 95. KM HYDRAULIC RADIUS = 1.5
 96. KM VELOCITY = 13.5
 97. RM 1 0.107 0.15

98. KK DB54-4
 99. BA 0.203
 100. PB 3.60
 101. LS 0 86.8
 102. UD 0.159

103. KK CDB54-4
 104. KM COMBINE DB54-4, RDB54-3 AND RDB54-2
 105. HC 3

106. KKRCDB54-4
 107. KM ROUTE CDB54-4 TO CRCDB544
 108. KM FACILITY = ANGEL PARK - MIDDLE 5 BRANCH
 109. KM FACILITY # = APMS 0057
 110. KM LINING = CONCRETE

111 RD 5000 0.068 0.015 0 TRAP 50 2
 +
 112 KKRCDB544
 113 KM COMBINE RCDB54-4 AND CDB54-5
 114 HC 2
 +
 115 KKRCDB54
 116 KM ROUTE RCDB544 TO CDB54-6R
 117 KM FACILITY = ANGEL PARK - MIDDLE 5 BRANCH
 118 KM FACILITY # = APM5 0008, 0047, 0056
 119 KM LINING = CONCRETE
 120 RD 3365 0.052 0.015 0 TRAP 50 2
 +

HEC-1 INPUT

PAGE 4

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

121 KK DB54-6R
 122 BA 0.841
 123 PB 3.56
 124 LS 0 85.3
 125 UD 0.337
 +
 126 KKRCDB54-6R
 127 KM COMBINE RCRCDB54 AND DB54-6R
 128 HC 2
 +
 129 KK DB55-1
 130 BA 0.640
 131 PB 3.68
 132 LS 0 87.2
 133 UD 0.185
 +
 134 KK RDB55-1
 135 KM ROUTE DB55-1 TO CDB55-2
 136 KM FACILITY = ANGEL PARK - MIDDLE 5 BRANCH
 137 KM FACILITY # = APM5 0212
 138 KM LINING = CONCRETE
 139 RD 4350 0.075 0.015 0 TRAP 30 2
 +

140 KK DB55-2
 141 BA 0.099
 142 PB 3.56
 143 LS 0 88.3
 144 UD 0.150
 +
 145 KK CDB55-2
 146 KM COMBINE RDB55-1 AND DB55-2
 147 HC 2
 +

148 KK RDB55-2
 149 KM ROUTE CDB55-2 TO CDB55-5
 150 KM FACILITY = ANGEL PARK - MIDDLE 5 BRANCH
 151 KM FACILITY # = APM5 0212
 152 KM LINING = CONCRETE
 153 RD 2345 0.075 0.015 0 TRAP 30 2
 +

154 KK DB55-3
 155 BA 0.260
 156 PB 3.61
 157 LS 0 86.8
 158 UD 0.057
 +

HEC-1 INPUT

PAGE 5

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

159 KK RDB55-3
 160 KM ROUTE DB55-3 TO CDB55-4
 161 KM FACILITY = ANGEL PARK - MIDDLE 5 BRANCH
 162 KM FACILITY # = APM5 0213
 163 KM LINING = CONCRETE
 164 RD 1880 0.073 0.015 0 TRAP 50 2
 +

165 KK DB55-4
 166 BA 0.173
 167 PB 3.58
 168 LS 0 84.7
 169 UD 0.132
 +

170 KK CDB55-4
 171 KM COMBINE RDB55-3 AND DB55-4

172 HC 2
*

173 KK RDB55-4
174 KM ROUTE CDB55-4 TO CDB55-5
175 KM FACILITY = ANGEL PARK - MIDDLE 5 BRANCH
176 KM FACILITY # = APM5 0213
177 KM LINING = CONCRETE
178 RD 4640 0.073 0.015 0 TRAP 50 2
*

179 KK DB55-5
180 BA 0.189
181 PB 3.54
182 LS 0 86.4
183 UD 0.149
*

184 KK CDB55-5
185 KM COMBINE DB55-5 AND RDB55-4
186 HC 2
*

187 KKCCDB55-5
188 KM COMBINE CDB55-5 AND RCD55-2
189 HC 2
*

190 KK RDB55-5
191 KM ROUTE TO SUMMERLIN #5 DETENTION BASIN
192 KM FACILITY = ANGEL PARK - MIDDLE 5 BRANCH
193 KM FACILITY # = APM5 0009
194 KM LINING = CONCRETE
195 RD41800.05 8 0.015 0 TRAP 50 2
*

HEC-1 INPUT

PAGE 6

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

196 KK DB55-7
197 BA 0.444
198 PB 3.54
199 LS 0 89.0
200 UD 0.229
*

201 KK RDB55-7
202 KM ROUTE DB55-7 TO CDB55-8
203 KM NATURAL WASH
204 KM TRAVEL LENGTH = 5,300
205 KM SLOPE = 3.0%
206 KM N = 0.040
207 KM HYDRAULIC RADIUS = 1.5
208 KM VELOCITY = 13.5
209 RM 1 0.109 0.15
*

210 KK DB55-6
211 BA 0.096
212 PB 3.52
213 LS 0 92.0
214 UD 0.110
*

215 KK RDB55-6
216 KM ROUTE DB55-6 TO CDB55-8
217 KM NATURAL WASH
218 KM TRAVEL LENGTH = 10,000
219 KM SLOPE = 3.7%
220 KM N = 0.040
221 KM HYDRAULIC RADIUS = 1.5
222 KM VELOCITY = 14.9
223 RM 2 0.186 0.15
*

224 KK DB55-8
225 BA 0.545
226 PB 3.46
227 LS 0 89.7
228 UD 0.172
*

229 KK CDB55-8
230 KM COMBINE DB55-8, RDB55-6, RCD55-5 AND RDB55-7
231 HC 4
*

232 KK SUM5IN
233 KM COMBINE CDB55-8 AND CDB54-7
234 KM TOTAL INFLOW TO SUMMERLIN #5 DETENTION BASIN
235 KO 1
236 HC 2
*

HEC-1 INPUT

PAGE 7

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

237 KK SUM5DB
 238 KM SUMMERLIN DETENTION BASIN 5
 239 KM FACILITY = ANGEL PARK - MIDDLE 5 BRANCH
 240 KM FACILITY # = APMS 0000
 241 KM STORAGE VOLUME = 384.1 ACRE-FEET
 242 KM OUTLET = 2: 7' x 5.5' RCBS
 243 KM 100-YEAR DISCHARGE = 2,150 CFS
 244 KM SPILLWAY LENGTH = 453.6'
 245 KM SPILLWAY HEIGHT =
 246 KM SPILLWAY CREST ELEVATION = 3563'
 247 KM SPILLWAY TYPE = CONCRETE BROAD CRESTED WEIR
 248 KM PMF DISCHARGE = 12,153 CFS
 249 KM TOP OF EMBANKMENT ELEVATION = 3569'
 250 KM DETENTION BASIN PARAMETERS REFERENCED FROM "DETENTION BASIN NO. 5
 251 KM EXPANSION AND DIVERSION BERM" PLANS BY G.C. WALLACE (5-23-2001)
 252 KM STAGE-STORAGE-DISCHARGE CURVE REFERENCED FROM "2006 SUMMERLIN WEST
 253 KM CONCEPTUAL DRAINAGE STUDY MASTER PLAN AMENDMENT: EXISTING OFFSITE/PROPOSED
 254 KM ONSITE DRAINAGE CONDITION" HYDROLOGIC MODEL DATED 8-7-2006 AND SUBMITTED
 255 KM WITH THE SUPPLEMENT FOR THE 2006 SUMMERLIN WEST PLANNING AREA FLOOD
 256 KM CONTROL MASTER PLAN UPDATE BY G.C. WALLACE (08-2006)
 257 KO 1
 258 RS 1 STOR -1
 259 SV 0 1.73 4.55 8.45 13.08 18.2 23.81 29.96 36.7 43.93
 260 SV 59.55 77.49 99.82 127.17 159.39 196.38 240.07 384.05 405.65 535.25
 261 SQ 0 192 276 391 505 616 725 813 900 982
 262 SQ 1176 1368 1534 1683 1804 1920 2033 2315 3725 23201
 263 SE 3532.5 3535 3536 3537 3538 3539 3540 3541 3542 3543
 264 SE 3543 3547 3549 3551 3553 3555 3557 3563 3564 3569
 265 SS 3563 435.6 3 1.5
 *

266 KK SUM5OT
 267 KM ROUTE SUM5DB TO CSWAA-1
 268 KM FACILITY = ANGEL PARK - ALTA DRIVE
 269 KM FACILITY # = APAD 0203, 0225
 270 KM LINING = RCB
 271 RD 1495 0.0528 0.015 0 TRAP 14 0
 *

272 KK SWAA-1
 273 BA 0.239
 274 PB 3.44
 275 LS 0 88.2
 276 UD 0.315
 *

277 KK CSWAA-1
 278 KM COMBINE SUM5OT AND SWAA-1
 279 HC 2
 *

HEC-1 INPUT

PAGE 8

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

280 KKRCWAA-1
 281 KM ROUTE CSWAA-1 TO CSWAA-2
 282 KM FACILITY = ANGEL PARK - ALTA DRIVE
 283 KM FACILITY # = APAD 0115, 0146
 284 KM LINING = RCB
 285 RD 4640 0.044 0.015 0 TRAP 10 0
 *
 * REVISED VILLAGE 23B SUBBASINS PER NEW LAND PLAN
 *

286 KK ST-CR
 287 KM SKY VISTA
 288 KM COLLECTOR ROAD (NORTH)
 289 KM
 290 KM AREA 16.4 AC
 291 KM Tlag 21.9 MIN
 292 KM CN 95
 293 PB 3.43
 294 BA .02567
 295 LS 0 95.0
 296 UD .219
 *

297 KK 5-9A1
 298 KM AREA REVISED FROM OFFSITE BASIN 5-9A 2006 SUMMERLIN WEST
 299 KM RAINFALL REFERENCED FROM BASIN 5-9A 2006 SUMMERLIN WEST
 300 KM PORTION OF REFERENCED FROM OFFSITE BASIN RD2 2008 MFU
 301 KM
 302 KM AREA 38.6 AC
 303 KM Tlag 12.1 MIN
 304 KM CN 92.2
 305 PB 3.43
 306 BA .06026
 307 LS 0 92.2
 308 UD .121
 *

309 KK C-CR
 310 RM COMBINE COLLECTOR ROAD, DETENTION BASIN OUTFLOW, AND 5-9A1
 311 HC 3
 *
 312 KK X
 313 RM
 314 RM AREA 23.31 AC
 315 RM Tlag 10.5 MIN
 316 RM CN 89.7
 317 BA .03642
 318 PB 3.29
 319 LS 0 89.7
 320 UD .105
 *

HEC-1 INPUT

PAGE 9

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

321 KK R/X
 322 RM ROUTE THROUGH ST1 (FOX HILL) TO PTO
 323 RD 850 0.029 0.016 0 TRAP 0 50
 *
 324 KK W
 325 RM
 326 RM AREA 23.78 AC
 327 RM Tlag 9.9 MIN
 328 RM CN 90.3
 329 BA .03716
 330 LS 0 90.3
 331 UD .099
 *

332 KK PTO
 333 RM COMBINE X AND W
 334 HC 2
 *

335 KK R/PTO
 336 RM ROUTE THROUGH ST1 (FOX HILL) TO PT1
 337 RD 880 0.029 0.016 0 TRAP 0 50
 *

338 KK V
 339 RM
 340 RM AREA 25.45 AC
 341 RM Tlag 10.5 MIN
 342 RM CN 89.8
 343 BA .03977
 344 LS 0 89.8
 345 UD .105
 *

346 KK PT1
 347 RM COMBINE PTO AND V
 348 HC 2
 *

349 KK R/PT1
 350 RM ROUTE THROUGH ST1 (FOX HILL) TO PT2
 351 RD 1270 0.035 0.016 0 TRAP 0 50
 *

352 KK U
 353 RM
 354 RM AREA 25.15 AC
 355 RM Tlag 11.2 MIN
 356 RM CN 90.4
 357 BA .03929
 358 LS 0 90.4
 359 UD .112
 *

HEC-1 INPUT

PAGE 10

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

360 KK PT2
 361 RM COMBINE U AND PT1
 362 HC 2
 *

363 KK ST1
 364 RM FOX HILL
 365 RM AREA 8.00 AC
 366 RM Tlag 13.9 MIN
 367 RM CN 94.5
 368 BA .01250
 369 LS 0 94.5
 370 UD .139
 *

371 KK PT3
372 KM COMBINE PT2 AND ST1
373 HC 2
*

374 KK PT3A
375 KM COMBINE PT3 WITH ALTA BOX
376 HC 2
*

377 KK T
378 KM
379 KM AREA 29.70 AC
380 KM Tlag 12.3 MIN
381 KM CN 89.7
382 BA .04641
383 LS 0 89.7
384 UD .123
*

385 KK PT4
386 KM COMBINE T AND PT3A
387 HC 2
*

388 KK COS-5
389 KM
390 KM AREA 8.79 AC
391 KM Tlag 13.7 MIN
392 KM CN 74
393 BA .01373
394 LS 0 74.0
395 UD .137
*

HEC-1 INPUT

PAGE 11

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

396 KK PT5
397 KM COMBINE COS5 AND PT4
398 HC 2
*

399 KK Q2
400 KM
401 KM AREA 13.34 AC
402 KM Tlag 10.4 MIN
403 KM CN 89.7
404 BA .02084
405 LS 0 89.7
406 UD .104
*

407 KK PT5A
408 KM COMBINE PT5 AND Q2
409 HC 2
*

410 KK ST-AL
411 KM
412 KM ALTA DRIVE
413 KM
414 KM AREA 13.0 AC
415 KM Tlag 13.4 MIN
416 KM CN 94.7
417 BA .02036
418 LS 0 94.7
419 UD .134
*

420 KK CP-AL
421 KM COMBINE PT5A AND ALTA DRIVE
422 HC 2
*

423 KK Y
424 KM
425 KM AREA 24.30 AC
426 KM Tlag 10.6 MIN
427 KM CN 90.7
428 BA .03797
429 LS 0 90.7
430 UD 0.105
*

431 KK R/Y
432 KM ROUTE THROUGH ST2 (FOX HILL) TO ROUND-A-BOU
433 RD 895 0.038 0.016 0 TRAP 0 50
*

HEC-1 INPUT

PAGE 12

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

434 KK Z
 435 KM
 436 KM AREA 25.01 AC
 437 KM Tlag 9.8 MIN
 438 KM CN 91
 439 BA .03908
 440 LS 0 91.0
 441 UD .098
 *

442 KK PT6
 443 KM COMBINE Y AND Z
 444 HC 2
 *

445 KK ST2
 446 KM FOX HILL
 447 KM AREA 4.25 AC
 448 KM Tlag 6.6 MIN
 449 KM CN 94.5
 450 BA .00663
 451 LS 0 94.5
 452 UD .066
 *

453 KK PT7
 454 KM COMBINE PT6 AND ST2
 455 HC 2
 *

456 KK R/PT7
 457 KM ROUTE THROUGH ST4 (SPOKE ROAD) TO PT8
 458 RD 870 0.046 0.016 0 TRAP 0 50
 *

459 KK NP-2
 460 KM
 461 KM AREA 12.5 AC
 462 KM Tlag 8.6 MIN
 463 KM CN 74
 464 BA .01959
 465 LS 0 74.0
 466 UD .086
 *

467 KK PT8
 468 KM COMBINE NP-2 AND PT7
 469 HC 2
 *

HEC-1 INPUT

PAGE 13

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

470 KK R/PT8
 471 KM ROUTE THROUGH ST4 (SPOKE ROAD) TO PT8
 472 RD 800 0.026 0.016 0 TRAP 0 50
 *

473 KK R
 474 KM
 475 KM AREA 25.54 AC
 476 KM Tlag 10.4 MIN
 477 KM CN 89.7
 478 BA .03991
 479 LS 0 89.7
 480 UD .104
 *

481 KK PT9A
 482 KM COMBINE R AND PT8
 483 HC 2
 *

484 KK ES-2
 485 KM
 486 KM AREA 13.33 AC
 487 KM Tlag 7.4 MIN
 488 KM CN 93.1
 489 BA .02083
 490 LS 0 93.1
 491 UD .074
 *

492 KK R/ES-2
 493 KM ROUTE THROUGH COS-5 TO PT9B
 494 RD 690 0.045 0.016 0 TRAP 0 50
 *

495 KK S
 496 KM
 497 KM AREA 19.69 AC
 498 KM Tlag 10.0 MIN
 499 KM CN 89.7
 500 BA .03077

501 LS 0 89.7
 502 UD .100
 *
 503 KK PT9B
 504 KM COMBINE ES-2 WITH S
 505 HC 2
 *

HEC-1 INPUT

PAGE 14

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

506 KK R/PT9B
 507 KM ROUTE THROUGH EASEMENT TO PT9C
 508 RD 1180 0.034 0.016 0 TRAP 0 50
 *

509 KK PT9C
 510 KM COMBINE PT9B AND PT9A
 511 HC 2
 *

512 KK R/PT9C
 513 KM ROUTE THROUGH ST4 (SPOKE B. ROAD) TO PT9D
 514 RD 440 0.043 0.016 0 TRAP 0 50
 *

515 KK Q1
 516 KM
 517 KM AREA 14.87 AC
 518 KM Tlag 10.0 MIN
 519 KM CN 89.7
 520 BA .02323
 521 LS 0 89.7
 522 UD .100
 *

523 KK PT9D
 524 KM COMBINE Q1 AND PT9C
 525 HC 2
 *

526 KK R/PT9D
 527 KM ROUTE THROUGH ST4 (SPOKE ROAD) TO PT10
 528 RD 555 0.056 0.016 0 TRAP 0 50
 *

529 KK ST4
 530 KM
 531 KM AREA 5.98 AC
 532 KM Tlag 9.8 MIN
 533 KM CN 94.5
 534 BA .00934
 535 LS 0 94.5
 536 UD .098
 *

537 KK PT10
 538 KM COMBINE PT9 AND ST4
 539 HC 2
 *

HEC-1 INPUT

PAGE 15

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

540 KK BB
 541 KM
 542 KM AREA 32.03 AC
 543 KM Tlag 10.6 MIN
 544 KM CN 90.2
 545 BA .05005
 546 LS 0 90.2
 547 UD .106
 *

548 KK R/BB
 549 KM ROUTE THROUGH DESERT FOOTHILLS
 550 RD 2505 0.009 0.016 0 TRAP 0 50
 *

551 KK CC
 552 KM
 553 KM AREA 28.57 AC
 554 KM Tlag 12.4 MIN
 555 KM CN 89.7
 556 BA .04464
 557 LS 0 89.7
 558 UD .124
 *

559 KK PT11
 560 KM COMBINE BB AND CC
 561 HC 2

562 KK PT12
 563 KM COMBINE PT11 AND PT10
 564 HC 2
 *

565 KK P
 566 KM
 567 KM AREA 24.03 AC
 568 KM Tlag 16.0 MIN
 569 KM CN 89.7
 570 BA .03754
 571 LS 0 89.7
 572 UD .160
 *

573 KK PT13
 574 KM COMBINE P AND PT12
 575 HC 2
 *

HEC-1 INPUT

PAGE 16

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

576 KK ST-DF
 577 KM
 578 KM DESERT FOOTHILLS DRIVE (NORTH)
 579 KM
 580 KM AREA 12.1 AC
 581 KM Tlag 24.0 MIN
 582 KM CN 94.6
 583 BA .01897
 584 LS 0 94.6
 585 UD .240
 *

586 KK C-47
 587 KM COMBINE PT13 AND ST-DF
 588 HC 2
 *

589 KK C-47A
 590 KM COMBINE C-47 AND CP-AL
 591 HC 2
 *

* BASIN PARAMETERS FOR OFFSITE BASINS TAKEN
 * DIRECTLY FROM 2008 MPU:
 *

592 KK SWFH-1
 593 BA 0.559
 594 PB 3.57
 595 LS 0 86.9
 596 UD 0.218
 *

597 KK RSWFH-1
 598 KM ROUTE SWFH-1 TO CSWFH-2
 599 KM FACILITY = ANGEL PARK - DESERT FOOTHILLS
 600 KM FACILITY # = APDF 0123
 601 KM LINING = RCB
 602 RD 5355 0.0653 0.015 0 TRAP 5 0
 *

603 KK SWFH-2
 604 BA 0.534
 605 PB 3.49
 606 LS 0 91.9
 607 UD 0.245
 *

608 KK CSWFH-2
 609 KM COMBINE RSWFH-1 AND SWFH-2
 610 HC 2
 *

HEC-1 INPUT

PAGE 17

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

611 KK RSWFH-2
 612 KM ROUTE CSWFH-2 TO CSWFH-3
 613 KM FACILITY = ANGEL PARK - DESERT FOOTHILLS
 614 KM FACILITY # = APDF 0073
 615 KM LINING = RCB
 616 RD 2070 0.041 0.015 0 TRAP 10 0
 *

617 KK SWFH-3
 618 BA 0.154
 619 PB 3.44
 620 LS 0 94.7
 621 UD 0.174

```

622      KK CSWFH-3
623      KM COMBINE RCSWFH-2 AND SWFH-3
624      HC      2
*

625      KK RCSWFH-3
626      KM ROUTE CSWFH-3 TO CSWFH-6
627      KM FACILITY = ANGEL PARK - DESERT FOOTHILLS
628      KM FACILITY # = APDF 0026, 0073
629      KM LINING = RCB
630      RD      3100  0.041  0.015      0  TRAP      10      0
*

631      KK SWFH-6
632      BA      0.255
633      PB      3.46
634      LS      0      92.2
635      UD      0.188
*

636      KK RSWFH-6
637      KM ROUTE SWFH-6 TO CSWFH-6
638      KM FACILITY = ANGEL PARK - DESERT FOOTHILLS 6 BRANCH
639      KM FACILITY # = APDF 0000
640      KM LINING = RCB
641      RD      2600  0.0615  0.015      0  TRAP      6      0
*

642      KK SWFH-7
643      BA      0.305
644      PB      3.41
645      LS      0      93.1
646      UD      0.154
*

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HEC-1 INPUT

PAGE 18

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

```

647      KK CSWFH-6
648      KM COMBINE RSWFH-6 AND SWFH-7
649      HC      2
*

650      KK RCSWFH6
651      KM ROUTE CSWFH-6 TO CSWFH-7
652      KM FACILITY = ANGEL PARK - DESERT FOOTHILLS
653      KM FACILITY # = APDF 0000
654      KM LINING = RCB
655      RD      1350  0.022  0.015      0  TRAP      12      0
*

656      KK CSWFH-7
657      KM COMBINE RCSWFH-3 AND RCSWFH6
658      HC      2
*

659      KK SWFH-4
660      BA      0.117
661      PB      3.55
662      LS      0      84.7
663      UD      0.162
*

664      KK RSWFH-4
665      KM ROUTE SWFH-4 TO CSWFH-5
666      KM FACILITY = ANGEL PARK - FAR HILLS DRIVE
667      KM FACILITY # = APFH 0144
668      KM LINING = RCB
669      RD      4392  0.055  0.015      0  TRAP      7      0
*

670      KK SWFH-5
671      BA      0.259
672      PB      3.50
673      LS      0      91.4
674      UD      0.188
*

675      KK CSWFH-5
676      KM COMBINE RSWFH-4 AND SWFH-5
677      HC      2
*

678      KK RCSWFH-5
679      KM ROUTE CSWFH-5 TO CCSWFH-7
680      KM FACILITY = ANGEL PARK - FAR HILLS DRIVE
681      KM FACILITY # = APFH 0061, 0089
682      KM LINING = RCB
683      RD      4120  0.02  0.015      0  TRAP      8      0
*

```

1

HEC-1 INPUT

PAGE 19

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

684 KK ST3
 685 KM FOX HILL
 686 KM AREA 4.12 AC
 687 KM Tlag 5.0 MIN (USE 5.0 MINUTES AS A MINIMUM)
 688 KM CN 95.3
 689 BA .00643
 690 PB 3.29
 691 LS 0 95.3
 692 UD .050
 *

693 KK R/ST3
 694 KM ROUTE THROUGH ST-FH (FAR HILLS) TO CP-FH
 695 RD 1905 0.053 0.016 0 TRAP 0 50
 *

696 KK AA
 697 KM
 698 KM AREA 18.52 AC
 699 KM Tlag 10.0 MIN
 700 KM CN 93.8
 701 BA .02894
 702 LS 0 93.8
 703 UD .100
 *

704 KK R/AA
 705 KM ROUTE THROUGH STFH (FAR HILLS) TO CP-FH
 706 RD 1010 0.042 0.016 0 TRAP 0 50
 *

707 KK ST-FH
 708 KM
 709 KM FAR HILLS AVENUE
 710 KM
 711 KM AREA 13.1 AC
 712 KM Tlag 12.8 MIN
 713 KM CN 95.6
 714 BA .02052
 715 LS 0 95.6
 716 UD .128
 *

717 KK CP-FH
 718 KM COMBINE CSWFH-5, ST3, F, AND ST5 (FAR HILLS DRIVE)
 719 HC 4
 *

720 KKCCSWFH-7
 721 KM COMBINE CP-FH AND CSWFH-7
 722 HC 2
 *
 723 ZZ

1

SCHEMATIC DIAGRAM OF STREAM NETWORK

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

37 DB54-1
 V
 V
 50 RDB54-1
 .
 .
 59 DB54-5
 .
 .
 64 CDB54-5.....
 V
 V
 67 RCDB54-5
 .
 .
 73 DB54-2
 V
 V
 78 RDB54-2
 .
 .
 84 DB54-3
 V
 V
 89 RDB54-3
 .
 .
 98 DB54-4
 .
 .
 103 CDB54-4.....
 V

106	.	.	V	
	.	.	RCDB54-4	
112	.	.	CRCDB544	
	.	.	V	
	.	.	V	
115	.	.	RCRCDB54	
121	.	.	DB54-6R	
126	.	.	CDB54-6R	
129	.	.	DB55-1	
	.	.	V	
	.	.	V	
134	.	.	RDB55-1	
140	.	.	DB55-2	
145	.	.	CDB55-2	
	.	.	V	
	.	.	V	
148	.	.	RDB55-2	
154	.	.	DB55-3	
	.	.	V	
	.	.	V	
159	.	.	RDB55-3	
165	.	.	DB55-4	
170	.	.	CDB55-4	
	.	.	V	
	.	.	V	
173	.	.	RDB55-4	
179	.	.	DB55-5	
184	.	.	CDB55-5	
187	.	.	CCDB55-5	
	.	.	V	
	.	.	V	
190	.	.	RDB55-5	
196	.	.	DB55-7	
	.	.	V	
	.	.	V	
201	.	.	RDB55-7	
210	.	.	DB55-6	
	.	.	V	
	.	.	V	
215	.	.	RDB55-6	
224	.	.	DB55-8	
229	.	.	CDB55-8	
232	.	.	SUM5IN	
	.	.	V	
	.	.	V	
237	.	.	SUM5DB	
	.	.	V	
	.	.	V	
266	.	.	SUM5OT	
272	.	.	SWAA-1	
277	.	.	CSWAA-1	
	.	.	V	
	.	.	V	
280	.	.	RCSWAA-1	
286	.	.	ST-CR	

297		5-9A1
309	C-CR.....	
312	X	
	V	
321	R/X	
324		W
332	PT0.....	
	V	
335	R/PT0	
338		V
346	PT1.....	
	V	
349	R/PT1	
352		U
360	PT2.....	
363		ST1
371	PT3.....	
374	PT3A.....	
377	T	
385	PT4.....	
388	COS-5	
396	PT5.....	
399	Q2	
407	PT5A.....	
410	ST-AL	
420	CP-AL.....	
423	Y	
	V	
431	R/Y	
434		Z
442	PT6.....	
445		ST2
453	PT7.....	
	V	
456	R/PT7	
459		NP-2

467	PT8.....	
	V	
	V	
470	R/PT8	
473		R
481	PT9A.....	
484		ES-2
		V
		V
492		R/ES-2
495		S
503		PT9B.....
		V
		V
506		R/PT9B
509	PT9C.....	
	V	
	V	
512	R/PT9C	
515		Q1
523	PT9D.....	
	V	
	V	
526	R/PT9D	
529		ST4
537	PT10.....	
540		BB
		V
		V
548		R/BB
551		CC
559		PT11.....
562	PT12.....	
565		P
573	PT13.....	
576		ST-DF
586	C-47.....	
589	C-47A.....	
592	SWFH-1	
	V	
	V	
597	RSWFH-1	
603		SWFH-2
608	CSWFH-2.....	
	V	
	V	
611	RCSWFH-2	
617		SWFH-3


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622      CSWEH-3 .....
        V
        V
625      RCSWEH-3
        .
        .
631      SWFH-6
        V
        V
636      RSWFH-6
        .
        .
642      SWFH-7
        .
        .
647      CSWEH-6 .....
        V
        V
650      RCSWEH6
        .
        .
656      CSWEH-7 .....
        .
        .
659      SWFH-4
        V
        V
664      RSWFH-4
        .
        .
670      SWFH-5
        .
        .
675      CSWEH-5 .....
        V
        V
678      RCSWEH-5
        .
        .
684      ST3
        V
        V
693      R/ST3
        .
        .
696      AA
        V
        V
704      R/AA
        .
        .
707      ST-FH
        .
        .
717      CP-FH .....
        .
        .
720      CCSWEH-7 .....

```

(***) RUNOFF ALSO COMPUTED AT THIS LOCATION

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1*****
* FLOOD HYDROGRAPH PACKAGE (HEC-1)
* JUN 1998
* VERSION 4.1
* RUN DATE 24JUL12 TIME 14:42:18
*
*****

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

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*****
* SUMMERLIN VILLAGE 23B
* CONCEPTUAL STUDY UPDATE
* DEVELOPED ONSITE
* DEVELOPED OFFSITE
*
* RETURN PERIOD _10 & 100-YEAR
* DISTRIBUTION _6-HOUR SDN3
* PROJECT NO _620239.100
* FILENAME _V23B-ULT.H1
* DATE _07/05/12
* MODELED BY _JAM/RD
*
*****

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JR CARDS CONTAIN DATA BASED ON THE FOLLOWING VALUES:

AREA	DARF
SQ.MI.	
0.0 - 0.5	1.000
0.5 - 1.0	0.975
1.0 - 2.0	0.950
2.0 - 3.0	0.925
3.0 - 4.0	0.915
4.0 - 5.0	0.908
5.0 - 7.0	0.895
7.0 - 8.0	0.885

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

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

COMPUTATION INTERVAL .08 HOURS
 TOTAL TIME BASE 16.58 HOURS

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

JP MULTI-PLAN OPTION
 NPLAN 1 NUMBER OF PLANS

JR MULTI-RATIO OPTION
 RATIOS OF PRECIPITATION
 1.00 .98 .95 .93 .92 .91 .89 .88 .55

232 KK SUMSIN

235 KO OUTPUT CONTROL VARIABLES
 IPRNT 1 PRINT CONTROL
 IPLOT 0 PLOT CONTROL
 QSCAL 0. HYDROGRAPH PLOT SCALE

236 HC HYDROGRAPH COMBINATION
 ICOMP 2 NUMBER OF HYDROGRAPHS TO COMBINE

HYDROGRAPH AT STATION SUMSIN
 SUM OF 2 HYDROGRAPHS
 PLAN 1, RATIO = 1.00

DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1	0000	1	0.	*	1	0410	51	4653.	*	1	0820	101	1.	*	1	1230	151	0.	
1	0005	2	0.	*	1	0415	52	4038.	*	1	0825	102	0.	*	1	1235	152	0.	
1	0010	3	0.	*	1	0420	53	3459.	*	1	0830	103	0.	*	1	1240	153	0.	
1	0015	4	0.	*	1	0425	54	2997.	*	1	0835	104	0.	*	1	1245	154	0.	
1	0020	5	2.	*	1	0430	55	2699.	*	1	0840	105	0.	*	1	1250	155	0.	
1	0025	6	12.	*	1	0435	56	2602.	*	1	0845	106	0.	*	1	1255	156	0.	
1	0030	7	33.	*	1	0440	57	2646.	*	1	0850	107	0.	*	1	1300	157	0.	
1	0035	8	61.	*	1	0445	58	2661.	*	1	0855	108	0.	*	1	1305	158	0.	
1	0040	9	92.	*	1	0450	59	2587.	*	1	0900	109	0.	*	1	1310	159	0.	
1	0045	10	118.	*	1	0455	60	2515.	*	1	0905	110	0.	*	1	1315	160	0.	
1	0050	11	126.	*	1	0500	61	2442.	*	1	0910	111	0.	*	1	1320	161	0.	
1	0055	12	111.	*	1	0505	62	2277.	*	1	0915	112	0.	*	1	1325	162	0.	
1	0100	13	90.	*	1	0510	63	2017.	*	1	0920	113	0.	*	1	1330	163	0.	
1	0105	14	74.	*	1	0515	64	1748.	*	1	0925	114	0.	*	1	1335	164	0.	
1	0110	15	71.	*	1	0520	65	1496.	*	1	0930	115	0.	*	1	1340	165	0.	
1	0115	16	78.	*	1	0525	66	1275.	*	1	0935	116	0.	*	1	1345	166	0.	
1	0120	17	93.	*	1	0530	67	1091.	*	1	0940	117	0.	*	1	1350	167	0.	
1	0125	18	118.	*	1	0535	68	934.	*	1	0945	118	0.	*	1	1355	168	0.	

1	0315	40	1094.	*	1	0725	90	12.	*	1	1135	140	0.	*	1	1545	190	0.
1	0320	41	1900.	*	1	0730	91	9.	*	1	1140	141	0.	*	1	1550	191	0.
1	0325	42	3350.	*	1	0735	92	7.	*	1	1145	142	0.	*	1	1555	192	0.
1	0330	43	5316.	*	1	0740	93	5.	*	1	1150	143	0.	*	1	1600	193	0.
1	0335	44	7151.	*	1	0745	94	4.	*	1	1155	144	0.	*	1	1605	194	0.
1	0340	45	7992.	*	1	0750	95	3.	*	1	1200	145	0.	*	1	1610	195	0.
1	0345	46	7699.	*	1	0755	96	2.	*	1	1205	146	0.	*	1	1615	196	0.
1	0350	47	7072.	*	1	0800	97	2.	*	1	1210	147	0.	*	1	1620	197	0.
1	0355	48	6379.	*	1	0805	98	1.	*	1	1215	148	0.	*	1	1625	198	0.
1	0400	49	5657.	*	1	0810	99	1.	*	1	1220	149	0.	*	1	1630	199	0.
1	0405	50	5040.	*	1	0815	100	1.	*	1	1225	150	0.	*	1	1635	200	0.

PEAK FLOW	TIME		6-HR	24-HR	72-HR	16.58-HR
+ (CFS)	(HR)	(CFS)				
+ 7992.	3.67		1617.	588.	588.	588.
		(INCHES)	2.229	2.240	2.240	2.240
		(AC-FT)	802.	806.	806.	806.
CUMULATIVE AREA =			6.74 SQ MI			

HYDROGRAPH AT STATION SUMSIN
SUM OF 2 HYDROGRAPHS
PLAN 1, RATIO = .95

DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*
1	0000	1	0.	*	1	0410	51	4350.	*	1	0820	101	1.	*	1	1230	151	0.	1	0000	1	0.	*
1	0005	2	0.	*	1	0415	52	3789.	*	1	0825	102	0.	*	1	1235	152	0.	1	0005	2	0.	*
1	0010	3	0.	*	1	0420	53	3249.	*	1	0830	103	0.	*	1	1240	153	0.	1	0010	3	0.	*
1	0015	4	0.	*	1	0425	54	2811.	*	1	0835	104	0.	*	1	1245	154	0.	1	0015	4	0.	*
1	0020	5	1.	*	1	0430	55	2530.	*	1	0840	105	0.	*	1	1250	155	0.	1	0020	5	1.	*
1	0025	6	8.	*	1	0435	56	2435.	*	1	0845	106	0.	*	1	1255	156	0.	1	0025	6	8.	*
1	0030	7	25.	*	1	0440	57	2483.	*	1	0850	107	0.	*	1	1300	157	0.	1	0030	7	25.	*
1	0035	8	47.	*	1	0445	58	2494.	*	1	0855	108	0.	*	1	1305	158	0.	1	0035	8	47.	*
1	0040	9	69.	*	1	0450	59	2426.	*	1	0900	109	0.	*	1	1310	159	0.	1	0040	9	69.	*
1	0045	10	87.	*	1	0455	60	2359.	*	1	0905	110	0.	*	1	1315	160	0.	1	0045	10	87.	*
1	0050	11	95.	*	1	0500	61	2296.	*	1	0910	111	0.	*	1	1320	161	0.	1	0050	11	95.	*
1	0055	12	86.	*	1	0505	62	2143.	*	1	0915	112	0.	*	1	1325	162	0.	1	0055	12	86.	*
1	0100	13	71.	*	1	0510	63	1903.	*	1	0920	113	0.	*	1	1330	163	0.	1	0100	13	71.	*
1	0105	14	59.	*	1	0515	64	1652.	*	1	0925	114	0.	*	1	1335	164	0.	1	0105	14	59.	*
1	0110	15	56.	*	1	0520	65	1415.	*	1	0930	115	0.	*	1	1340	165	0.	1	0110	15	56.	*
1	0115	16	63.	*	1	0525	66	1206.	*	1	0935	116	0.	*	1	1345	166	0.	1	0115	16	63.	*
1	0120	17	75.	*	1	0530	67	1032.	*	1	0940	117	0.	*	1	1350	167	0.	1	0120	17	75.	*
1	0125	18	97.	*	1	0535	68	884.	*	1	0945	118	0.	*	1	1355	168	0.	1	0125	18	97.	*
1	0130	19	130.	*	1	0540	69	756.	*	1	0950	119	0.	*	1	1400	169	0.	1	0130	19	130.	*
1	0135	20	176.	*	1	0545	70	646.	*	1	0955	120	0.	*	1	1405	170	0.	1	0135	20	176.	*
1	0140	21	236.	*	1	0550	71	557.	*	1	1000	121	0.	*	1	1410	171	0.	1	0140	21	236.	*
1	0145	22	301.	*	1	0555	72	487.	*	1	1005	122	0.	*	1	1415	172	0.	1	0145	22	301.	*
1	0150	23	348.	*	1	0600	73	432.	*	1	1010	123	0.	*	1	1420	173	0.	1	0150	23	348.	*
1	0155	24	362.	*	1	0605	74	379.	*	1	1015	124	0.	*	1	1425	174	0.	1	0155	24	362.	*
1	0200	25	346.	*	1	0610	75	325.	*	1	1020	125	0.	*	1	1430	175	0.	1	0200	25	346.	*
1	0205	26	311.	*	1	0615	76	273.	*	1	1025	126	0.	*	1	1435	176	0.	1	0205	26	311.	*
1	0210	27	281.	*	1	0620	77	225.	*	1	1030	127	0.	*	1	1440	177	0.	1	0210	27	281.	*
1	0215	28	283.	*	1	0625	78	181.	*	1	1035	128	0.	*	1	1445	178	0.	1	0215	28	283.	*
1	0220	29	333.	*	1	0630	79	145.	*	1	1040	129	0.	*	1	1450	179	0.	1	0220	29	333.	*
1	0225	30	427.	*	1	0635	80	117.	*	1	1045	130	0.	*	1	1455	180	0.	1	0225	30	427.	*
1	0230	31	528.	*	1	0640	81	95.	*	1	1050	131	0.	*	1	1500	181	0.	1	0230	31	528.	*
1	0235	32	576.	*	1	0645	82	76.	*	1	1055	132	0.	*	1	1505	182	0.	1	0235	32	576.	*
1	0240	33	573.	*	1	0650	83	61.	*	1	1100	133	0.	*	1	1510	183	0.	1	0240	33	573.	*
1	0245	34	557.	*	1	0655	84	49.	*	1	1105	134	0.	*	1	1515	184	0.	1	0245	34	557.	*
1	0250	35	571.	*	1	0700	85	39.	*	1	1110	135	0.	*	1	1520	185	0.	1	0250	35	571.	*
1	0255	36	609.	*	1	0705	86	30.	*	1	1115	136	0.	*	1	1525	186	0.	1	0255	36	609.	*
1	0300	37	621.	*	1	0710	87	24.	*	1	1120	137	0.	*	1	1530	187	0.	1	0300	37	621.	*
1	0305	38	632.	*	1	0715	88	19.	*	1	1125	138	0.	*	1	1535	188	0.	1	0305	38	632.	*
1	0310	39	726.	*	1	0720	89	15.	*	1	1130	139	0.	*	1	1540	189	0.	1	0310	39	726.	*
1	0315	40	1048.	*	1	0725	90	11.	*	1	1135	140	0.	*	1	1545	190	0.	1	0315	40	1048.	*
1	0320	41	1630.	*	1	0730	91	9.	*	1	1140	141	0.	*	1	1550	191	0.	1	0320	41	1630.	*
1	0325	42	3227.	*	1	0735	92	7.	*	1	1145	142	0.	*	1	1555	192	0.	1	0325	42	3227.	*
1	0330	43	5109.	*	1	0740	93	5.	*	1	1150	143	0.	*	1	1600	193	0.	1	0330	43	5109.	*
1	0335	44	6874.	*	1	0745	94	4.	*	1	1155	144	0.	*	1	1605	194	0.	1	0335	44	6874.	*
1	0340	45	7640.	*	1	0750	95	3.	*	1	1200	145	0.	*	1	1610	195	0.	1	0340	45	7640.	*
1	0345	46	7403.	*	1	0755	96	2.	*	1	1205	146	0.	*	1	1615	196	0.	1	0345	46	7403.	*
1	0350	47	6834.	*	1	0800	97	2.	*	1	1210	147	0.	*	1	1620	197	0.	1	0350	47	6834.	*
1	0355	48	6160.	*	1	0805	98	1.	*	1	1215	148	0.	*	1	1625	198	0.	1	0355	48	6160.	*
1	0400	49	5468.	*	1	0810	99	1.	*	1	1220	149	0.	*	1	1630	199	0.	1	0400	49	5468.	*
1	0405	50	4872.	*	1	0815	100	1.	*	1	1225	150	0.	*	1	1635	200	0.	1	0405	50	4872.	*

PEAK FLOW	TIME		6-HR	24-HR	72-HR	16.58-HR
+ (CFS)	(HR)	(CFS)				
+ 7640.	3.67		1558.	566.	566.	566.
		(INCHES)	2.147	2.157	2.157	2.157
		(AC-FT)	772.	776.	776.	776.

CUMULATIVE AREA = 6.74 SQ MI

HYDROGRAPH AT STATION SUMSIN
SUM OF 2 HYDROGRAPHS
PLAN 1, RATIO = .93

DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1	0000	1	0.	*	1	0410	51	4225.	*	1	0820	101	1.	*	1	1230	151	0.	
1	0005	2	0.	*	1	0415	52	3672.	*	1	0825	102	0.	*	1	1235	152	0.	
1	0010	3	0.	*	1	0420	53	3146.	*	1	0830	103	0.	*	1	1240	153	0.	
1	0015	4	0.	*	1	0425	54	2724.	*	1	0835	104	0.	*	1	1245	154	0.	
1	0020	5	1.	*	1	0430	55	2450.	*	1	0840	105	0.	*	1	1250	155	0.	
1	0025	6	7.	*	1	0435	56	2358.	*	1	0845	106	0.	*	1	1255	156	0.	
1	0030	7	22.	*	1	0440	57	2402.	*	1	0850	107	0.	*	1	1300	157	0.	
1	0035	8	41.	*	1	0445	58	2420.	*	1	0855	108	0.	*	1	1305	158	0.	
1	0040	9	59.	*	1	0450	59	2359.	*	1	0900	109	0.	*	1	1310	159	0.	
1	0045	10	75.	*	1	0455	60	2287.	*	1	0905	110	0.	*	1	1315	160	0.	
1	0050	11	81.	*	1	0500	61	2227.	*	1	0910	111	0.	*	1	1320	161	0.	
1	0055	12	75.	*	1	0505	62	2083.	*	1	0915	112	0.	*	1	1325	162	0.	
1	0100	13	62.	*	1	0510	63	1846.	*	1	0920	113	0.	*	1	1330	163	0.	
1	0105	14	51.	*	1	0515	64	1601.	*	1	0925	114	0.	*	1	1335	164	0.	
1	0110	15	50.	*	1	0520	65	1371.	*	1	0930	115	0.	*	1	1340	165	0.	
1	0115	16	56.	*	1	0525	66	1170.	*	1	0935	116	0.	*	1	1345	166	0.	
1	0120	17	67.	*	1	0530	67	1001.	*	1	0940	117	0.	*	1	1350	167	0.	
1	0125	18	87.	*	1	0535	68	858.	*	1	0945	118	0.	*	1	1355	168	0.	
1	0130	19	118.	*	1	0540	69	735.	*	1	0950	119	0.	*	1	1400	169	0.	
1	0135	20	161.	*	1	0545	70	628.	*	1	0955	120	0.	*	1	1405	170	0.	
1	0140	21	217.	*	1	0550	71	541.	*	1	1000	121	0.	*	1	1410	171	0.	
1	0145	22	277.	*	1	0555	72	473.	*	1	1005	122	0.	*	1	1415	172	0.	
1	0150	23	321.	*	1	0600	73	419.	*	1	1010	123	0.	*	1	1420	173	0.	
1	0155	24	336.	*	1	0605	74	369.	*	1	1015	124	0.	*	1	1425	174	0.	
1	0200	25	322.	*	1	0610	75	316.	*	1	1020	125	0.	*	1	1430	175	0.	
1	0205	26	291.	*	1	0615	76	266.	*	1	1025	126	0.	*	1	1435	176	0.	
1	0210	27	264.	*	1	0620	77	219.	*	1	1030	127	0.	*	1	1440	177	0.	
1	0215	28	268.	*	1	0625	78	177.	*	1	1035	128	0.	*	1	1445	178	0.	
1	0220	29	315.	*	1	0630	79	142.	*	1	1040	129	0.	*	1	1450	179	0.	
1	0225	30	400.	*	1	0635	80	114.	*	1	1045	130	0.	*	1	1455	180	0.	
1	0230	31	493.	*	1	0640	81	92.	*	1	1050	131	0.	*	1	1500	181	0.	
1	0235	32	543.	*	1	0645	82	75.	*	1	1055	132	0.	*	1	1505	182	0.	
1	0240	33	540.	*	1	0650	83	60.	*	1	1100	133	0.	*	1	1510	183	0.	
1	0245	34	529.	*	1	0655	84	48.	*	1	1105	134	0.	*	1	1515	184	0.	
1	0250	35	542.	*	1	0700	85	38.	*	1	1110	135	0.	*	1	1520	185	0.	
1	0255	36	574.	*	1	0705	86	30.	*	1	1115	136	0.	*	1	1525	186	0.	
1	0300	37	590.	*	1	0710	87	23.	*	1	1120	137	0.	*	1	1530	187	0.	
1	0305	38	601.	*	1	0715	88	18.	*	1	1125	138	0.	*	1	1535	188	0.	
1	0310	39	691.	*	1	0720	89	14.	*	1	1130	139	0.	*	1	1540	189	0.	
1	0315	40	991.	*	1	0725	90	11.	*	1	1135	140	0.	*	1	1545	190	0.	
1	0320	41	1715.	*	1	0730	91	9.	*	1	1140	141	0.	*	1	1550	191	0.	
1	0325	42	3033.	*	1	0735	92	7.	*	1	1145	142	0.	*	1	1555	192	0.	
1	0330	43	4864.	*	1	0740	93	5.	*	1	1150	143	0.	*	1	1600	193	0.	
1	0335	44	6576.	*	1	0745	94	4.	*	1	1155	144	0.	*	1	1605	194	0.	
1	0340	45	7331.	*	1	0750	95	3.	*	1	1200	145	0.	*	1	1610	195	0.	
1	0345	46	7137.	*	1	0755	96	2.	*	1	1205	146	0.	*	1	1615	196	0.	
1	0350	47	6595.	*	1	0800	97	2.	*	1	1210	147	0.	*	1	1620	197	0.	
1	0355	48	5969.	*	1	0805	98	1.	*	1	1215	148	0.	*	1	1625	198	0.	
1	0400	49	5304.	*	1	0810	99	1.	*	1	1220	149	0.	*	1	1630	199	0.	
1	0405	50	4742.	*	1	0815	100	1.	*	1	1225	150	0.	*	1	1635	200	0.	

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
+	(CFS)	(HR)	6-HR	24-HR	72-HR	16.58-HR
+	7331.	3.67	(CFS)			
			1499.	545.	545.	545.
			(INCHES)	2.067	2.076	2.076
			(AC-FT)	743.	747.	747.

CUMULATIVE AREA = 6.74 SQ MI

HYDROGRAPH AT STATION SUMSIN
SUM OF 2 HYDROGRAPHS
PLAN 1, RATIO = .92

DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1	0000	1	0.	*	1	0410	51	4145.	*	1	0820	101	1.	*	1	1230	151	0.	
1	0005	2	0.	*	1	0415	52	3616.	*	1	0825	102	0.	*	1	1235	152	0.	
1	0010	3	0.	*	1	0420	53	3107.	*	1	0830	103	0.	*	1	1240	153	0.	
1	0015	4	0.	*	1	0425	54	2694.	*	1	0835	104	0.	*	1	1245	154	0.	
1	0020	5	1.	*	1	0430	55	2422.	*	1	0840	105	0.	*	1	1250	155	0.	
1	0025	6	6.	*	1	0435	56	2328.	*	1	0845	106	0.	*	1	1255	156	0.	
1	0030	7	20.	*	1	0440	57	2364.	*	1	0850	107	0.	*	1	1300	157	0.	

1	0035	8	39.	*	1	0445	58	2385.	*	1	0855	108	0.	*	1	1305	158	0.
1	0040	9	55.	*	1	0450	59	2320.	*	1	0900	109	0.	*	1	1310	159	0.
1	0045	10	70.	*	1	0455	60	2257.	*	1	0905	110	0.	*	1	1315	160	0.
1	0050	11	76.	*	1	0500	61	2195.	*	1	0910	111	0.	*	1	1320	161	0.
1	0055	12	70.	*	1	0505	62	2055.	*	1	0915	112	0.	*	1	1325	162	0.
1	0100	13	58.	*	1	0510	63	1826.	*	1	0920	113	0.	*	1	1330	163	0.
1	0105	14	48.	*	1	0515	64	1583.	*	1	0925	114	0.	*	1	1335	164	0.
1	0110	15	47.	*	1	0520	65	1358.	*	1	0930	115	0.	*	1	1340	165	0.
1	0115	16	53.	*	1	0525	66	1160.	*	1	0935	116	0.	*	1	1345	166	0.
1	0120	17	64.	*	1	0530	67	992.	*	1	0940	117	0.	*	1	1350	167	0.
1	0125	18	83.	*	1	0535	68	849.	*	1	0945	118	0.	*	1	1355	168	0.
1	0130	19	113.	*	1	0540	69	726.	*	1	0950	119	0.	*	1	1400	169	0.
1	0135	20	154.	*	1	0545	70	620.	*	1	0955	120	0.	*	1	1405	170	0.
1	0140	21	208.	*	1	0550	71	534.	*	1	1000	121	0.	*	1	1410	171	0.
1	0145	22	268.	*	1	0555	72	467.	*	1	1005	122	0.	*	1	1415	172	0.
1	0150	23	311.	*	1	0600	73	413.	*	1	1010	123	0.	*	1	1420	173	0.
1	0155	24	326.	*	1	0605	74	363.	*	1	1015	124	0.	*	1	1425	174	0.
1	0200	25	314.	*	1	0610	75	312.	*	1	1020	125	0.	*	1	1430	175	0.
1	0205	26	283.	*	1	0615	76	263.	*	1	1025	126	0.	*	1	1435	176	0.
1	0210	27	257.	*	1	0620	77	216.	*	1	1030	127	0.	*	1	1440	177	0.
1	0215	28	260.	*	1	0625	78	175.	*	1	1035	128	0.	*	1	1445	178	0.
1	0220	29	306.	*	1	0630	79	140.	*	1	1040	129	0.	*	1	1450	179	0.
1	0225	30	391.	*	1	0635	80	113.	*	1	1045	130	0.	*	1	1455	180	0.
1	0230	31	481.	*	1	0640	81	91.	*	1	1050	131	0.	*	1	1500	181	0.
1	0235	32	531.	*	1	0645	82	74.	*	1	1055	132	0.	*	1	1505	182	0.
1	0240	33	530.	*	1	0650	83	59.	*	1	1100	133	0.	*	1	1510	183	0.
1	0245	34	517.	*	1	0655	84	47.	*	1	1105	134	0.	*	1	1515	184	0.
1	0250	35	530.	*	1	0700	85	38.	*	1	1110	135	0.	*	1	1520	185	0.
1	0255	36	562.	*	1	0705	86	30.	*	1	1115	136	0.	*	1	1525	186	0.
1	0300	37	576.	*	1	0710	87	23.	*	1	1120	137	0.	*	1	1530	187	0.
1	0305	38	588.	*	1	0715	88	18.	*	1	1125	138	0.	*	1	1535	188	0.
1	0310	39	674.	*	1	0720	89	14.	*	1	1130	139	0.	*	1	1540	189	0.
1	0315	40	970.	*	1	0725	90	11.	*	1	1135	140	0.	*	1	1545	190	0.
1	0320	41	1691.	*	1	0730	91	9.	*	1	1140	141	0.	*	1	1550	191	0.
1	0325	42	2998.	*	1	0735	92	7.	*	1	1145	142	0.	*	1	1555	192	0.
1	0330	43	4791.	*	1	0740	93	5.	*	1	1150	143	0.	*	1	1600	193	0.
1	0335	44	6498.	*	1	0745	94	4.	*	1	1155	144	0.	*	1	1605	194	0.
1	0340	45	7250.	*	1	0750	95	3.	*	1	1200	145	0.	*	1	1610	195	0.
1	0345	46	7047.	*	1	0755	96	2.	*	1	1205	146	0.	*	1	1615	196	0.
1	0350	47	6505.	*	1	0800	97	2.	*	1	1210	147	0.	*	1	1620	197	0.
1	0355	48	5868.	*	1	0805	98	1.	*	1	1215	148	0.	*	1	1625	198	0.
1	0400	49	5210.	*	1	0810	99	1.	*	1	1220	149	0.	*	1	1630	199	0.
1	0405	50	4642.	*	1	0815	100	1.	*	1	1225	150	0.	*	1	1635	200	0.

PEAK FLOW	TIME		6-HR	24-HR	72-HR	16.58-HR
+	(CFS)	(HR)				
+	7250.	3.67	1477.	537.	537.	537.
			(INCHES)	2.035	2.044	2.044
			(AC-FT)	732.	735.	735.
CUMULATIVE AREA =			6.74 SQ MI			

HYDROGRAPH AT STATION SUM5IN
SUM OF 2 HYDROGRAPHS
PLAN 1, RATIO = .91

DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*
1	0000	1	0.	*	1	0410	51	4096.	*	1	0820	101	1.	*	1	1230	151	0.					
1	0005	2	0.	*	1	0415	52	3577.	*	1	0825	102	0.	*	1	1235	152	0.					
1	0010	3	0.	*	1	0420	53	3072.	*	1	0830	103	0.	*	1	1240	153	0.					
1	0015	4	0.	*	1	0425	54	2667.	*	1	0835	104	0.	*	1	1245	154	0.					
1	0020	5	1.	*	1	0430	55	2403.	*	1	0840	105	0.	*	1	1250	155	0.					
1	0025	6	6.	*	1	0435	56	2307.	*	1	0845	106	0.	*	1	1255	156	0.					
1	0030	7	20.	*	1	0440	57	2343.	*	1	0850	107	0.	*	1	1300	157	0.					
1	0035	8	37.	*	1	0445	58	2371.	*	1	0855	108	0.	*	1	1305	158	0.					
1	0040	9	53.	*	1	0450	59	2309.	*	1	0900	109	0.	*	1	1310	159	0.					
1	0045	10	66.	*	1	0455	60	2240.	*	1	0905	110	0.	*	1	1315	160	0.					
1	0050	11	73.	*	1	0500	61	2177.	*	1	0910	111	0.	*	1	1320	161	0.					
1	0055	12	67.	*	1	0505	62	2036.	*	1	0915	112	0.	*	1	1325	162	0.					
1	0100	13	56.	*	1	0510	63	1811.	*	1	0920	113	0.	*	1	1330	163	0.					
1	0105	14	46.	*	1	0515	64	1568.	*	1	0925	114	0.	*	1	1335	164	0.					
1	0110	15	45.	*	1	0520	65	1343.	*	1	0930	115	0.	*	1	1340	165	0.					
1	0115	16	51.	*	1	0525	66	1148.	*	1	0935	116	0.	*	1	1345	166	0.					
1	0120	17	62.	*	1	0530	67	983.	*	1	0940	117	0.	*	1	1350	167	0.					
1	0125	18	81.	*	1	0535	68	842.	*	1	0945	118	0.	*	1	1355	168	0.					
1	0130	19	109.	*	1	0540	69	720.	*	1	0950	119	0.	*	1	1400	169	0.					
1	0135	20	150.	*	1	0545	70	615.	*	1	0955	120	0.	*	1	1405	170	0.					
1	0140	21	203.	*	1	0550	71	530.	*	1	1000	121	0.	*	1	1410	171	0.					
1	0145	22	262.	*	1	0555	72	464.	*	1	1005	122	0.	*	1	1415	172	0.					
1	0150	23	305.	*	1	0600	73	411.	*	1	1010	123	0.	*	1	1420	173	0.					
1	0155	24	319.	*	1	0605	74	361.	*	1	1015	124	0.	*	1	1425	174	0.					
1	0200	25	307.	*	1	0610	75	310.	*	1	1020	125	0.	*	1	1430	175	0.					
1	0205	26	278.	*	1	0615	76	261.	*	1	1025	126	0.	*	1	1435	176	0.					
1	0210	27	252.	*	1	0620	77	215.	*	1	1030	127	0.	*	1	1440	177	0.					
1	0215	28	254.	*	1	0625	78	173.	*	1	1035	128	0.	*	1	1445	178	0.					

1	0220	29	299.	*	1	0630	79	139.	*	1	1040	129	0.	*	1	1450	179	0.
1	0225	30	393.	*	1	0635	80	112.	*	1	1045	130	0.	*	1	1455	180	0.
1	0230	31	474.	*	1	0640	81	91.	*	1	1050	131	0.	*	1	1500	181	0.
1	0235	32	523.	*	1	0645	82	73.	*	1	1055	132	0.	*	1	1505	182	0.
1	0240	33	523.	*	1	0650	83	59.	*	1	1100	133	0.	*	1	1510	183	0.
1	0245	34	509.	*	1	0655	84	47.	*	1	1105	134	0.	*	1	1515	184	0.
1	0250	35	520.	*	1	0700	85	37.	*	1	1110	135	0.	*	1	1520	185	0.
1	0255	36	553.	*	1	0705	86	29.	*	1	1115	136	0.	*	1	1525	186	0.
1	0300	37	567.	*	1	0710	87	23.	*	1	1120	137	0.	*	1	1530	187	0.
1	0305	38	578.	*	1	0715	88	18.	*	1	1125	138	0.	*	1	1535	188	0.
1	0310	39	661.	*	1	0720	89	14.	*	1	1130	139	0.	*	1	1540	189	0.
1	0315	40	945.	*	1	0725	90	11.	*	1	1135	140	0.	*	1	1545	190	0.
1	0320	41	1653.	*	1	0730	91	8.	*	1	1140	141	0.	*	1	1550	191	0.
1	0325	42	2956.	*	1	0735	92	7.	*	1	1145	142	0.	*	1	1555	192	0.
1	0330	43	4724.	*	1	0740	93	5.	*	1	1150	143	0.	*	1	1600	193	0.
1	0335	44	6415.	*	1	0745	94	4.	*	1	1155	144	0.	*	1	1605	194	0.
1	0340	45	7215.	*	1	0750	95	3.	*	1	1200	145	0.	*	1	1610	195	0.
1	0345	46	7001.	*	1	0755	96	2.	*	1	1205	146	0.	*	1	1615	196	0.
1	0350	47	6434.	*	1	0800	97	2.	*	1	1210	147	0.	*	1	1620	197	0.
1	0355	48	5807.	*	1	0805	98	1.	*	1	1215	148	0.	*	1	1625	198	0.
1	0400	49	5156.	*	1	0810	99	1.	*	1	1220	149	0.	*	1	1630	199	0.
1	0405	50	4594.	*	1	0815	100	1.	*	1	1225	150	0.	*	1	1635	200	0.

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
(CFS)	(HR)	6-HR	24-HR	72-HR	16:58-HR
7215.	3.67	1461.	531.	531.	531.
		(INCHES)	2.014	2.022	2.022
		(AC-FT)	724.	727.	727.
CUMULATIVE AREA =		6.74 SQ MI			

HYDROGRAPH AT STATION SUMSIN
SUM OF 2 HYDROGRAPHS
PLAN 1, RATIO = .89

DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*
1	0000	1	0.	*	1	0410	51	4039.	*	1	0820	101	1.	*	1	1230	151	0.					0.
1	0005	2	0.	*	1	0415	52	3519.	*	1	0825	102	0.	*	1	1235	152	0.					0.
1	0010	3	0.	*	1	0420	53	3021.	*	1	0830	103	0.	*	1	1240	153	0.					0.
1	0015	4	0.	*	1	0425	54	2616.	*	1	0835	104	0.	*	1	1245	154	0.					0.
1	0020	5	1.	*	1	0430	55	2353.	*	1	0840	105	0.	*	1	1250	155	0.					0.
1	0025	6	5.	*	1	0435	56	2262.	*	1	0845	106	0.	*	1	1255	156	0.					0.
1	0030	7	18.	*	1	0440	57	2303.	*	1	0850	107	0.	*	1	1300	157	0.					0.
1	0035	8	34.	*	1	0445	58	2322.	*	1	0855	108	0.	*	1	1305	158	0.					0.
1	0040	9	48.	*	1	0450	59	2262.	*	1	0900	109	0.	*	1	1310	159	0.					0.
1	0045	10	60.	*	1	0455	60	2197.	*	1	0905	110	0.	*	1	1315	160	0.					0.
1	0050	11	66.	*	1	0500	61	2139.	*	1	0910	111	0.	*	1	1320	161	0.					0.
1	0055	12	61.	*	1	0505	62	2006.	*	1	0915	112	0.	*	1	1325	162	0.					0.
1	0100	13	51.	*	1	0510	63	1780.	*	1	0920	113	0.	*	1	1330	163	0.					0.
1	0105	14	43.	*	1	0515	64	1543.	*	1	0925	114	0.	*	1	1335	164	0.					0.
1	0110	15	42.	*	1	0520	65	1323.	*	1	0930	115	0.	*	1	1340	165	0.					0.
1	0115	16	48.	*	1	0525	66	1130.	*	1	0935	116	0.	*	1	1345	166	0.					0.
1	0120	17	58.	*	1	0530	67	966.	*	1	0940	117	0.	*	1	1350	167	0.					0.
1	0125	18	76.	*	1	0535	68	828.	*	1	0945	118	0.	*	1	1355	168	0.					0.
1	0130	19	104.	*	1	0540	69	709.	*	1	0950	119	0.	*	1	1400	169	0.					0.
1	0135	20	143.	*	1	0545	70	606.	*	1	0955	120	0.	*	1	1405	170	0.					0.
1	0140	21	193.	*	1	0550	71	522.	*	1	1000	121	0.	*	1	1410	171	0.					0.
1	0145	22	249.	*	1	0555	72	456.	*	1	1005	122	0.	*	1	1415	172	0.					0.
1	0150	23	291.	*	1	0600	73	404.	*	1	1010	123	0.	*	1	1420	173	0.					0.
1	0155	24	305.	*	1	0605	74	355.	*	1	1015	124	0.	*	1	1425	174	0.					0.
1	0200	25	294.	*	1	0610	75	305.	*	1	1020	125	0.	*	1	1430	175	0.					0.
1	0205	26	268.	*	1	0615	76	257.	*	1	1025	126	0.	*	1	1435	176	0.					0.
1	0210	27	244.	*	1	0620	77	212.	*	1	1030	127	0.	*	1	1440	177	0.					0.
1	0215	28	247.	*	1	0625	78	171.	*	1	1035	128	0.	*	1	1445	178	0.					0.
1	0220	29	289.	*	1	0630	79	138.	*	1	1040	129	0.	*	1	1450	179	0.					0.
1	0225	30	369.	*	1	0635	80	111.	*	1	1045	130	0.	*	1	1455	180	0.					0.
1	0230	31	455.	*	1	0640	81	90.	*	1	1050	131	0.	*	1	1500	181	0.					0.
1	0235	32	501.	*	1	0645	82	73.	*	1	1055	132	0.	*	1	1505	182	0.					0.
1	0240	33	503.	*	1	0650	83	58.	*	1	1100	133	0.	*	1	1510	183	0.					0.
1	0245	34	494.	*	1	0655	84	46.	*	1	1105	134	0.	*	1	1515	184	0.					0.
1	0250	35	503.	*	1	0700	85	37.	*	1	1110	135	0.	*	1	1520	185	0.					0.
1	0255	36	536.	*	1	0705	86	29.	*	1	1115	136	0.	*	1	1525	186	0.					0.
1	0300	37	552.	*	1	0710	87	23.	*	1	1120	137	0.	*	1	1530	187	0.					0.
1	0305	38	563.	*	1	0715	88	18.	*	1	1125	138	0.	*	1	1535	188	0.					0.
1	0310	39	647.	*	1	0720	89	14.	*	1	1130	139	0.	*	1	1540	189	0.					0.
1	0315	40	917.	*	1	0725	90	11.	*	1	1135	140	0.	*	1	1545	190	0.					0.
1	0320	41	1587.	*	1	0730	91	8.	*	1	1140	141	0.	*	1	1550	191	0.					0.
1	0325	42	2843.	*	1	0735	92	6.	*	1	1145	142	0.	*	1	1555	192	0.					0.
1	0330	43	4600.	*	1	0740	93	5.	*	1	1150	143	0.	*	1	1600	193	0.					0.
1	0335	44	6236.	*	1	0745	94	4.	*	1	1155	144	0.	*	1	1605	194	0.					0.
1	0340	45	7001.	*	1	0750	95	3.	*	1	1200	145	0.	*	1	1610	195	0.					0.
1	0345	46	6829.	*	1	0755	96	2.	*	1	1205	146	0.	*	1	1615	196	0.					0.
1	0350	47	6312.	*	1	0800	97	2.	*	1	1210	147	0.	*	1	1620	197	0.					0.
1	0355	48	5708.	*	1	0805	98	1.	*	1	1215	148	0.	*	1	1625	198	0.					0.
1	0400	49	5070.	*	1	0810	99	1.	*	1	1220	149	0.	*	1	1630	199	0.					0.

1 0405 50 4530. * 1 0815 100 1. * 1 1225 150 0. * 1 1635 200 0.

PEAK FLOW TIME MAXIMUM AVERAGE FLOW
+ (CFS) (HR) 6-HR 24-HR 72-HR 16.58-HR
+ 7001. 3.67 (CFS) 1428. 519. 519. 519.
(INCHES) 1.969 1.977 1.977 1.977
(AC-FT) 708. 711. 711. 711.
CUMULATIVE AREA = 6.74 SQ MI

HYDROGRAPH AT STATION SUM5IN
SUM OF 2 HYDROGRAPHS
PLAN 1, RATIO = .88

DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW	DA	MON	HRMN	ORD	FLOW
1	0000	1	0.	*	1	0410	51	3992.	*	1	0820	101	1.	*	1	1230	151	0.	
1	0005	2	0.	*	1	0415	52	3477.	*	1	0825	102	0.	*	1	1235	152	0.	
1	0010	3	0.	*	1	0420	53	2984.	*	1	0830	103	0.	*	1	1240	153	0.	
1	0015	4	0.	*	1	0425	54	2586.	*	1	0835	104	0.	*	1	1245	154	0.	
1	0020	5	1.	*	1	0430	55	2321.	*	1	0840	105	0.	*	1	1250	155	0.	
1	0025	6	5.	*	1	0435	56	2225.	*	1	0845	106	0.	*	1	1255	156	0.	
1	0030	7	17.	*	1	0440	57	2262.	*	1	0850	107	0.	*	1	1300	157	0.	
1	0035	8	32.	*	1	0445	58	2284.	*	1	0855	108	0.	*	1	1305	158	0.	
1	0040	9	45.	*	1	0450	59	2225.	*	1	0900	109	0.	*	1	1310	159	0.	
1	0045	10	56.	*	1	0455	60	2166.	*	1	0905	110	0.	*	1	1315	160	0.	
1	0050	11	61.	*	1	0500	61	2110.	*	1	0910	111	0.	*	1	1320	161	0.	
1	0055	12	57.	*	1	0505	62	1973.	*	1	0915	112	0.	*	1	1325	162	0.	
1	0100	13	48.	*	1	0510	63	1758.	*	1	0920	113	0.	*	1	1330	163	0.	
1	0105	14	40.	*	1	0515	64	1525.	*	1	0925	114	0.	*	1	1335	164	0.	
1	0110	15	40.	*	1	0520	65	1308.	*	1	0930	115	0.	*	1	1340	165	0.	
1	0115	16	45.	*	1	0525	66	1119.	*	1	0935	116	0.	*	1	1345	166	0.	
1	0120	17	55.	*	1	0530	67	958.	*	1	0940	117	0.	*	1	1350	167	0.	
1	0125	18	72.	*	1	0535	68	819.	*	1	0945	118	0.	*	1	1355	168	0.	
1	0130	19	89.	*	1	0540	69	700.	*	1	0950	119	0.	*	1	1400	169	0.	
1	0135	20	137.	*	1	0545	70	598.	*	1	0955	120	0.	*	1	1405	170	0.	
1	0140	21	185.	*	1	0550	71	514.	*	1	1000	121	0.	*	1	1410	171	0.	
1	0145	22	239.	*	1	0555	72	449.	*	1	1005	122	0.	*	1	1415	172	0.	
1	0150	23	281.	*	1	0600	73	399.	*	1	1010	123	0.	*	1	1420	173	0.	
1	0155	24	295.	*	1	0605	74	349.	*	1	1015	124	0.	*	1	1425	174	0.	
1	0200	25	286.	*	1	0610	75	300.	*	1	1020	125	0.	*	1	1430	175	0.	
1	0205	26	260.	*	1	0615	76	254.	*	1	1025	126	0.	*	1	1435	176	0.	
1	0210	27	237.	*	1	0620	77	209.	*	1	1030	127	0.	*	1	1440	177	0.	
1	0215	28	240.	*	1	0625	78	169.	*	1	1035	128	0.	*	1	1445	178	0.	
1	0220	29	281.	*	1	0630	79	136.	*	1	1040	129	0.	*	1	1450	179	0.	
1	0225	30	358.	*	1	0635	80	109.	*	1	1045	130	0.	*	1	1455	180	0.	
1	0230	31	443.	*	1	0640	81	99.	*	1	1050	131	0.	*	1	1500	181	0.	
1	0235	32	490.	*	1	0645	82	72.	*	1	1055	132	0.	*	1	1505	182	0.	
1	0240	33	490.	*	1	0650	83	57.	*	1	1100	133	0.	*	1	1510	183	0.	
1	0245	34	480.	*	1	0655	84	46.	*	1	1105	134	0.	*	1	1515	184	0.	
1	0250	35	490.	*	1	0700	85	36.	*	1	1110	135	0.	*	1	1520	185	0.	
1	0255	36	525.	*	1	0705	86	29.	*	1	1115	136	0.	*	1	1525	186	0.	
1	0300	37	542.	*	1	0710	87	22.	*	1	1120	137	0.	*	1	1530	187	0.	
1	0305	38	549.	*	1	0715	88	18.	*	1	1125	138	0.	*	1	1535	188	0.	
1	0310	39	525.	*	1	0720	89	14.	*	1	1130	139	0.	*	1	1540	189	0.	
1	0315	40	894.	*	1	0725	90	11.	*	1	1135	140	0.	*	1	1545	190	0.	
1	0320	41	1551.	*	1	0730	91	8.	*	1	1140	141	0.	*	1	1550	191	0.	
1	0325	42	2766.	*	1	0735	92	6.	*	1	1145	142	0.	*	1	1555	192	0.	
1	0330	43	4496.	*	1	0740	93	5.	*	1	1150	143	0.	*	1	1600	193	0.	
1	0335	44	6145.	*	1	0745	94	4.	*	1	1155	144	0.	*	1	1605	194	0.	
1	0340	45	6898.	*	1	0750	95	3.	*	1	1200	145	0.	*	1	1610	195	0.	
1	0345	46	6712.	*	1	0755	96	2.	*	1	1205	146	0.	*	1	1615	196	0.	
1	0350	47	6215.	*	1	0800	97	2.	*	1	1210	147	0.	*	1	1620	197	0.	
1	0355	48	5635.	*	1	0805	98	1.	*	1	1215	148	0.	*	1	1625	198	0.	
1	0400	49	5002.	*	1	0810	99	1.	*	1	1220	149	0.	*	1	1630	199	0.	
1	0405	50	4471.	*	1	0815	100	1.	*	1	1225	150	0.	*	1	1635	200	0.	

PEAK FLOW TIME MAXIMUM AVERAGE FLOW
+ (CFS) (HR) 6-HR 24-HR 72-HR 16.58-HR
+ 6898. 3.67 (CFS) 1405. 511. 511. 511.
(INCHES) 1.937 1.945 1.945 1.945
(AC-FT) 697. 700. 700. 700.
CUMULATIVE AREA = 6.74 SQ MI

HYDROGRAPH AT STATION SUM5IN
SUM OF 2 HYDROGRAPHS
PLAN 1, RATIO = .55

DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	DA	MON	HRMN	ORD	FLOW	*	
1	0000	1		0.	*	1	0410	51	2044.	*	1	0820	101	1.	*	1	1230	151	0.				0.	*
1	0005	2		0.	*	1	0415	52	1813.	*	1	0825	102	0.	*	1	1235	152	0.				0.	*
1	0010	3		0.	*	1	0420	53	1579.	*	1	0830	103	0.	*	1	1240	153	0.				0.	*
1	0015	4		0.	*	1	0425	54	1375.	*	1	0835	104	0.	*	1	1245	154	0.				0.	*
1	0020	5		0.	*	1	0430	55	1231.	*	1	0840	105	0.	*	1	1250	155	0.				0.	*
1	0025	6		0.	*	1	0435	56	1162.	*	1	0845	106	0.	*	1	1255	156	0.				0.	*
1	0030	7		0.	*	1	0440	57	1165.	*	1	0850	107	0.	*	1	1300	157	0.				0.	*
1	0035	8		1.	*	1	0445	58	1197.	*	1	0855	108	0.	*	1	1305	158	0.				0.	*
1	0040	9		1.	*	1	0450	59	1201.	*	1	0900	109	0.	*	1	1310	159	0.				0.	*
1	0045	10		1.	*	1	0455	60	1169.	*	1	0905	110	0.	*	1	1315	160	0.				0.	*
1	0050	11		1.	*	1	0500	61	1130.	*	1	0910	111	0.	*	1	1320	161	0.				0.	*
1	0055	12		1.	*	1	0505	62	1081.	*	1	0915	112	0.	*	1	1325	162	0.				0.	*
1	0100	13		0.	*	1	0510	63	984.	*	1	0920	113	0.	*	1	1330	163	0.				0.	*
1	0105	14		0.	*	1	0515	64	861.	*	1	0925	114	0.	*	1	1335	164	0.				0.	*
1	0110	15		1.	*	1	0520	65	744.	*	1	0930	115	0.	*	1	1340	165	0.				0.	*
1	0115	16		2.	*	1	0525	66	642.	*	1	0935	116	0.	*	1	1345	166	0.				0.	*
1	0120	17		2.	*	1	0530	67	551.	*	1	0940	117	0.	*	1	1350	167	0.				0.	*
1	0125	18		4.	*	1	0535	68	473.	*	1	0945	118	0.	*	1	1355	168	0.				0.	*
1	0130	19		7.	*	1	0540	69	405.	*	1	0950	119	0.	*	1	1400	169	0.				0.	*
1	0135	20		12.	*	1	0545	70	349.	*	1	0955	120	0.	*	1	1405	170	0.				0.	*
1	0140	21		17.	*	1	0550	71	302.	*	1	1000	121	0.	*	1	1410	171	0.				0.	*
1	0145	22		22.	*	1	0555	72	262.	*	1	1005	122	0.	*	1	1415	172	0.				0.	*
1	0150	23		27.	*	1	0600	73	230.	*	1	1010	123	0.	*	1	1420	173	0.				0.	*
1	0155	24		31.	*	1	0605	74	204.	*	1	1015	124	0.	*	1	1425	174	0.				0.	*
1	0200	25		34.	*	1	0610	75	178.	*	1	1020	125	0.	*	1	1430	175	0.				0.	*
1	0205	26		35.	*	1	0615	76	152.	*	1	1025	126	0.	*	1	1435	176	0.				0.	*
1	0210	27		37.	*	1	0620	77	129.	*	1	1030	127	0.	*	1	1440	177	0.				0.	*
1	0215	28		43.	*	1	0625	78	107.	*	1	1035	128	0.	*	1	1445	178	0.				0.	*
1	0220	29		55.	*	1	0630	79	88.	*	1	1040	129	0.	*	1	1450	179	0.				0.	*
1	0225	30		72.	*	1	0635	80	73.	*	1	1045	130	0.	*	1	1455	180	0.				0.	*
1	0230	31		90.	*	1	0640	81	59.	*	1	1050	131	0.	*	1	1500	181	0.				0.	*
1	0235	32		108.	*	1	0645	82	49.	*	1	1055	132	0.	*	1	1505	182	0.				0.	*
1	0240	33		125.	*	1	0650	83	40.	*	1	1100	133	0.	*	1	1510	183	0.				0.	*
1	0245	34		136.	*	1	0655	84	32.	*	1	1105	134	0.	*	1	1515	184	0.				0.	*
1	0250	35		140.	*	1	0700	85	26.	*	1	1110	135	0.	*	1	1520	185	0.				0.	*
1	0255	36		144.	*	1	0705	86	21.	*	1	1115	136	0.	*	1	1525	186	0.				0.	*
1	0300	37		155.	*	1	0710	87	17.	*	1	1120	137	0.	*	1	1530	187	0.				0.	*
1	0305	38		177.	*	1	0715	88	13.	*	1	1125	138	0.	*	1	1535	188	0.				0.	*
1	0310	39		211.	*	1	0720	89	10.	*	1	1130	139	0.	*	1	1540	189	0.				0.	*
1	0315	40		283.	*	1	0725	90	8.	*	1	1135	140	0.	*	1	1545	190	0.				0.	*
1	0320	41		462.	*	1	0730	91	6.	*	1	1140	141	0.	*	1	1550	191	0.				0.	*
1	0325	42		862.	*	1	0735	92	5.	*	1	1145	142	0.	*	1	1555	192	0.				0.	*
1	0330	43		1656.	*	1	0740	93	4.	*	1	1150	143	0.	*	1	1600	193	0.				0.	*
1	0335	44		2615.	*	1	0745	94	3.	*	1	1155	144	0.	*	1	1605	194	0.				0.	*
1	0340	45		3237.	*	1	0750	95	2.	*	1	1200	145	0.	*	1	1610	195	0.				0.	*
1	0345	46		3301.	*	1	0755	96	2.	*	1	1205	146	0.	*	1	1615	196	0.				0.	*
1	0350	47		3046.	*	1	0800	97	1.	*	1	1210	147	0.	*	1	1620	197	0.				0.	*
1	0355	48		2807.	*	1	0805	98	1.	*	1	1215	148	0.	*	1	1625	198	0.				0.	*
1	0400	49		2533.	*	1	0810	99	1.	*	1	1220	149	0.	*	1	1630	199	0.				0.	*
1	0405	50		2267.	*	1	0815	100	1.	*	1	1225	150	0.	*	1	1635	200	0.				0.	*

PEAK FLOW TIME MAXIMUM AVERAGE FLOW
+ (CFS) (HR) 6-HR 24-HR 72-HR 16.58-HR
+ 3301. 3.75 (CFS) 665. 241. 241. 241.
 (INCHES) .917 .918 .918 .918
 (AC-FT) 330. 330. 330. 330.
CUMULATIVE AREA = 6.74 SQ MI

237-KK

* SUM5DB *

257-KO

OUTPUT CONTROL VARIABLES

IPRNT 1 PRINT CONTROL
IPLOT 0 PLOT CONTROL
QSCAL 0. HYDROGRAPH PLOT SCALE

HYDROGRAPH ROUTING DATA

258-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

259-SV

STORAGE

.0 1.7 4.6 8.4 13.1 18.2 23.8 30.0 36.7 43.9
59.5 77.5 99.8 127.2 159.4 196.4 240.1 384.0 405.6 535.3

261 SQ	DISCHARGE	0.	192.	276.	391.	505.	616.	725.	813.	900.	982.
		1176.	1368.	1534.	1683.	1804.	1920.	2033.	2315.	3725.	23201.
263 SE	ELEVATION	3532.50	3535.00	3536.00	3537.00	3538.00	3539.00	3540.00	3541.00	3542.00	3543.00
		3543.00	3547.00	3549.00	3551.00	3553.00	3555.00	3557.00	3563.00	3564.00	3569.00

265 SS	SPILLWAY										
	CREL	3553.00	SPILLWAY CREST ELEVATION								
	SPWID	435.60	SPILLWAY WIDTH								
	COEF	3.00	WEIR COEFFICIENT								
	EXPW	1.50	EXPONENT OF HEAD								

COMPUTED STORAGE-OUTFLOW-ELEVATION DATA

STORAGE	.00	1.73	4.55	8.45	13.08	18.20	23.81	29.96	36.70	59.55
OUTFLOW	.00	192.00	276.00	391.00	505.00	616.00	725.00	813.00	900.00	982.00
ELEVATION	3532.50	3535.00	3536.00	3537.00	3538.00	3539.00	3540.00	3541.00	3542.00	3543.00
STORAGE	77.49	99.82	127.17	159.39	196.38	240.07	284.05	405.65	535.25	
OUTFLOW	1368.00	1534.00	1683.00	1804.00	1920.00	2033.00	2315.00	3725.00	23201.00	
ELEVATION	3547.00	3549.00	3551.00	3553.00	3555.00	3557.00	3563.00	3564.00	3569.00	

HYDROGRAPH AT STATION SUM5DB PLAN 1, RATIO = 1.00

DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE
1	0000	1	0.	0	3532.5	*	1	0535	58	2242.	147.0	3561.5	*	1	1110	135	0.	0	3532.5	
1	0005	2	0.	0	3532.5	*	1	0540	69	2224.	337.6	3561.1	*	1	1115	136	0.	0	3532.5	
1	0010	3	0.	0	3532.5	*	1	0545	70	2204.	327.4	3560.6	*	1	1120	137	0.	0	3532.5	
1	0015	4	0.	0	3532.5	*	1	0550	71	2183.	316.7	3560.2	*	1	1125	138	0.	0	3532.5	
1	0020	5	1.	0	3532.5	*	1	0555	72	2161.	305.5	3559.7	*	1	1130	139	0.	0	3532.5	
1	0025	6	4.	0	3532.6	*	1	0600	73	2139.	294.1	3559.3	*	1	1135	140	0.	0	3532.5	
1	0030	7	14.	1	3532.7	*	1	0605	74	2116.	282.4	3558.8	*	1	1140	141	0.	0	3532.5	
1	0035	8	32.	3	3532.9	*	1	0610	75	2092.	270.4	3558.3	*	1	1145	142	0.	0	3532.5	
1	0040	9	57.	5	3533.2	*	1	0615	76	2069.	258.3	3557.8	*	1	1150	143	0.	0	3532.5	
1	0045	10	83.	6	3533.6	*	1	0620	77	2044.	245.9	3557.2	*	1	1155	144	0.	0	3532.5	
1	0050	11	105.	9	3533.9	*	1	0625	78	2016.	233.4	3556.7	*	1	1200	145	0.	0	3532.5	
1	0055	12	112.	10	3534.0	*	1	0630	79	1993.	220.8	3556.1	*	1	1205	146	0.	0	3532.5	
1	0100	13	106.	10	3533.9	*	1	0635	80	1951.	208.2	3555.5	*	1	1210	147	0.	0	3532.5	
1	0105	14	93.	8	3533.7	*	1	0640	81	1918.	195.6	3555.0	*	1	1215	148	0.	0	3532.5	
1	0110	15	82.	7	3533.6	*	1	0645	82	1879.	183.2	3554.3	*	1	1220	149	0.	0	3532.5	
1	0115	16	78.	7	3533.5	*	1	0650	83	1840.	170.9	3553.6	*	1	1225	150	0.	0	3532.5	
1	0120	17	72.	7	3533.6	*	1	0655	84	1802.	158.7	3553.0	*	1	1230	151	0.	0	3532.5	
1	0125	18	95.	9	3533.7	*	1	0700	85	1757.	146.8	3552.2	*	1	1235	152	0.	0	3532.5	
1	0130	19	119.	11	3534.0	*	1	0705	86	1713.	135.1	3551.5	*	1	1240	153	0.	0	3532.5	
1	0135	20	153.	14	3534.5	*	1	0710	87	1664.	123.7	3550.7	*	1	1245	154	0.	0	3532.5	
1	0140	21	195.	18	3535.0	*	1	0715	88	1603.	112.6	3549.9	*	1	1250	155	0.	0	3532.5	
1	0145	22	218.	26	3535.3	*	1	0720	89	1545.	101.8	3549.1	*	1	1255	156	0.	0	3532.5	
1	0150	23	247.	36	3535.7	*	1	0725	90	1472.	91.5	3548.3	*	1	1300	157	0.	0	3532.5	
1	0155	24	277.	46	3536.0	*	1	0730	91	1399.	81.7	3547.4	*	1	1305	158	0.	0	3532.5	
1	0200	25	300.	54	3536.2	*	1	0735	92	1263.	72.6	3545.9	*	1	1310	159	0.	0	3532.5	
1	0205	26	314.	58	3536.3	*	1	0740	93	1090.	64.5	3544.1	*	1	1315	160	0.	0	3532.5	
1	0210	27	317.	60	3536.4	*	1	0745	94	975.	57.5	3542.9	*	1	1320	161	0.	0	3532.5	
1	0215	28	318.	60	3536.4	*	1	0750	95	951.	50.9	3542.6	*	1	1325	162	0.	0	3532.5	
1	0220	29	323.	62	3536.4	*	1	0755	96	928.	44.4	3542.3	*	1	1330	163	0.	0	3532.5	
1	0225	30	343.	68	3536.6	*	1	0800	97	905.	38.1	3542.1	*	1	1335	164	0.	0	3532.5	
1	0230	31	379.	81	3536.9	*	1	0805	98	841.	32.1	3541.3	*	1	1340	165	0.	0	3532.5	
1	0235	32	419.	96	3537.2	*	1	0810	99	765.	26.6	3540.5	*	1	1345	166	0.	0	3532.5	
1	0240	33	453.	110	3537.5	*	1	0815	100	682.	21.6	3539.6	*	1	1350	167	0.	0	3532.5	
1	0245	34	480.	121	3537.8	*	1	0820	101	595.	17.2	3538.8	*	1	1355	168	0.	0	3532.5	
1	0250	35	502.	130	3538.0	*	1	0825	102	512.	13.4	3538.1	*	1	1400	169	0.	0	3532.5	
1	0255	36	524.	139	3538.2	*	1	0830	103	433.	10.2	3537.4	*	1	1405	170	0.	0	3532.5	
1	0300	37	545.	149	3538.4	*	1	0835	104	361.	7.4	3536.7	*	1	1410	171	0.	0	3532.5	
1	0305	38	566.	159	3538.5	*	1	0840	105	294.	5.2	3536.2	*	1	1415	172	0.	0	3532.5	
1	0310	39	591.	170	3538.8	*	1	0845	106	240.	3.3	3535.6	*	1	1420	173	0.	0	3532.5	
1	0315	40	643.	196	3539.2	*	1	0850	107	195.	1.8	3535.0	*	1	1425	174	0.	0	3532.5	
1	0320	41	752.	257	3540.3	*	1	0855	108	94.	.8	3533.7	*	1	1430	175	0.	0	3532.5	
1	0325	42	909.	381	3542.1	*	1	0900	109	42.	.4	3533.0	*	1	1435	176	0.	0	3532.5	
1	0330	43	1067.	635	3543.9	*	1	0905	110	19.	.2	3532.7	*	1	1440	177	0.	0	3532.5	
1	0335	44	1530.	992	3548.9	*	1	0910	111	8.	.1	3532.6	*	1	1445	178	0.	0	3532.5	
1	0340	45	1738.	1417	3551.9	*	1	0915	112	4.	.0	3532.5	*	1	1450	179	0.	0	3532.5	
1	0345	46	1884.	1849	3554.4	*	1	0920	113	2.	.0	3532.5	*	1	1455	180	0.	0	3532.5	
1	0350	47	1992.	2241	3556.3	*	1	0925	114	1.	.0	3532.5	*	1	1500	181	0.	0	3532.5	
1	0355	48	2068.	2581	3557.7	*	1	0930	115	0.	.0	3532.5	*	1	1505	182	0.	0	3532.5	
1	0400	49	2124.	2866	3558.9	*	1	0935	116	0.	.0	3532.5	*	1	1510	183	0.	0	3532.5	
1	0405	50	2170.	3100	3559.9	*	1	0940	117	0.	.0	3532.5	*	1	1515	184	0.	0	3532.5	
1	0410	51	2207.	3290	3560.7	*	1	0945	118	0.	.0	3532.5	*	1	1520	185	0.	0	3532.5	
1	0415	52	2236.	3437	3561.3	*	1	0950	119	0.	.0	3532.5	*	1	1525	186	0.	0	3532.5	
1	0420	53	2256.	3540	3561.7	*	1	0955	120	0.	.0	3532.5	*	1	1530	187	0.	0	3532.5	
1	0425	54	2269.	3607	3562.0	*	1	1000	121	0.	.0	3532.5	*	1	1535	188	0.	0	3532.5	
1	0430	55	2277.	3646	3562.2	*	1	1005	122	0.	.0	3532.5	*	1	1540	189	0.	0	3532.5	
1	0435	56	2282.	3672	3562.3	*	1	1010	123	0.	.0	3532.5	*	1	1545	190	0.	0	3532.5	
1	0440	57	2287.	3695	3562.4	*	1	1015	124	0.	.0	3532.5	*	1	1550	191	0.	0	3532.5	
1	0445	58	2291.	3720	3562.5	*	1	1020	125	0.	.0	3532.5	*	1	1555	192	0.	0	3532.5	
1	0450	59	2296.	3743	3562.6	*	1	1025	126	0.	.0	3532.5	*	1	1600	193	0.	0	3532.5	
1	0455	60	2299.	3760	3562.7	*	1	1030	127	0.	.0	3532.5	*	1	1605	194	0.	0	3532.5	
1	0500	61	2302.	3773	3562.7	*	1	1035	128	0.	.0	3532.5	*	1	1610	195	0.	0	3532.5	
1	0505	62	2303.	3777	3562.7	*	1	1040	129	0.	.0	3532.5	*	1	1615	196	0.	0	3532.5	

1	0510	63	2300.	376.6	3562.7	*	1	1045	130	0.	.0	3532.5	*	1	1620	197	0.	.0	3532.5
1	0515	64	2295.	373.7	3562.6	*	1	1050	131	0.	.0	3532.5	*	1	1625	198	0.	.0	3532.5
1	0520	65	2286.	369.1	3562.4	*	1	1055	132	0.	.0	3532.5	*	1	1630	199	0.	.0	3532.5
1	0525	66	2274.	363.0	3562.1	*	1	1100	133	0.	.0	3532.5	*	1	1635	200	0.	.0	3532.5
1	0530	67	2259.	355.5	3561.8	*	1	1105	134	0.	.0	3532.5	*						

PEAK FLOW		TIME	MAXIMUM AVERAGE FLOW				
+	(CFS)	(HR)	6-HR	24-HR	72-HR	16.58-HR	
+	2303.	5.08	(CFS)	1606.	610.	610.	610.
			(INCHES)	2.213	2.323	2.323	2.323
			(AC-FT)	796.	836.	836.	836.

PEAK STORAGE		TIME	MAXIMUM AVERAGE STORAGE			
+	(AC-FT)	(HR)	6-HR	24-HR	72-HR	16.58-HR
+	378.	5.08	188.	69.	69.	69.

PEAK STAGE		TIME	MAXIMUM AVERAGE STAGE			
+	(FEET)	(HR)	6-HR	24-HR	72-HR	16.58-HR
+	3562.73	5.08	3551.93	3539.89	3539.89	3539.89

CIRCULATIVE AREA = 6.74 SQ MI

HYDROGRAPH AT STATION SUM5DB PLAN 1, RATIO = .98

DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE
1	0000	1	0.	.0	3532.5	*	1	0535	68	2205.	328.0	3560.7	*	1	1110	135	0.	.0	3532.5	
1	0005	2	0.	.0	3532.5	*	1	0540	69	2187.	318.7	3560.3	*	1	1115	136	0.	.0	3532.5	
1	0010	3	0.	.0	3532.5	*	1	0545	70	2167.	308.7	3559.9	*	1	1120	137	0.	.0	3532.5	
1	0015	4	0.	.0	3532.5	*	1	0550	71	2147.	298.1	3559.4	*	1	1125	138	0.	.0	3532.5	
1	0020	5	1.	.0	3532.5	*	1	0555	72	2125.	287.0	3559.0	*	1	1130	139	0.	.0	3532.5	
1	0025	6	4.	.0	3532.5	*	1	0600	73	2103.	275.7	3558.5	*	1	1135	140	0.	.0	3532.5	
1	0030	7	12.	.1	3532.7	*	1	0605	74	2080.	264.2	3558.0	*	1	1140	141	0.	.0	3532.5	
1	0035	8	28.	.3	3532.9	*	1	0610	75	2057.	252.5	3557.5	*	1	1145	142	0.	.0	3532.5	
1	0040	9	50.	.4	3533.1	*	1	0615	76	2034.	240.5	3557.0	*	1	1150	143	0.	.0	3532.5	
1	0045	10	72.	.7	3533.4	*	1	0620	77	2003.	228.3	3556.5	*	1	1155	144	0.	.0	3532.5	
1	0050	11	91.	.8	3533.7	*	1	0625	78	1971.	216.1	3555.9	*	1	1200	145	0.	.0	3532.5	
1	0055	12	98.	.9	3533.8	*	1	0630	79	1939.	203.8	3555.3	*	1	1205	146	0.	.0	3532.5	
1	0100	13	93.	.8	3533.7	*	1	0635	80	1905.	191.5	3554.7	*	1	1210	147	0.	.0	3532.5	
1	0105	14	82.	.7	3533.6	*	1	0640	81	1866.	179.2	3554.1	*	1	1215	148	0.	.0	3532.5	
1	0110	15	73.	.7	3533.4	*	1	0645	82	1828.	167.1	3553.4	*	1	1220	149	0.	.0	3532.5	
1	0115	16	69.	.6	3533.4	*	1	0650	83	1788.	155.1	3552.7	*	1	1225	150	0.	.0	3532.5	
1	0120	17	74.	.7	3533.5	*	1	0655	84	1744.	143.4	3552.0	*	1	1230	151	0.	.0	3532.5	
1	0125	18	86.	.8	3533.6	*	1	0700	85	1700.	131.8	3551.3	*	1	1235	152	0.	.0	3532.5	
1	0130	19	107.	1.0	3533.9	*	1	0705	86	1647.	120.5	3550.5	*	1	1240	153	0.	.0	3532.5	
1	0135	20	140.	1.3	3534.3	*	1	0710	87	1587.	109.6	3549.7	*	1	1245	154	0.	.0	3532.5	
1	0140	21	186.	1.7	3534.9	*	1	0715	88	1528.	99.0	3548.9	*	1	1250	155	0.	.0	3532.5	
1	0145	22	209.	2.3	3535.2	*	1	0720	89	1452.	88.8	3548.0	*	1	1255	156	0.	.0	3532.5	
1	0150	23	236.	3.2	3535.5	*	1	0725	90	1381.	79.2	3547.2	*	1	1300	157	0.	.0	3532.5	
1	0155	24	262.	4.1	3535.8	*	1	0730	91	1214.	70.3	3545.4	*	1	1305	158	0.	.0	3532.5	
1	0200	25	284.	4.8	3536.1	*	1	0735	92	1047.	62.6	3543.7	*	1	1310	159	0.	.0	3532.5	
1	0205	26	296.	5.2	3536.2	*	1	0740	93	968.	55.7	3542.8	*	1	1315	160	0.	.0	3532.5	
1	0210	27	299.	5.3	3536.2	*	1	0745	94	945.	49.1	3542.5	*	1	1320	161	0.	.0	3532.5	
1	0215	28	300.	5.4	3536.2	*	1	0750	95	922.	42.7	3542.3	*	1	1325	162	0.	.0	3532.5	
1	0220	29	305.	5.5	3536.3	*	1	0755	96	897.	36.5	3542.0	*	1	1330	163	0.	.0	3532.5	
1	0225	30	323.	6.2	3536.4	*	1	0800	97	821.	30.6	3541.1	*	1	1335	164	0.	.0	3532.5	
1	0230	31	357.	7.3	3536.7	*	1	0805	98	745.	25.2	3540.2	*	1	1340	165	0.	.0	3532.5	
1	0235	32	398.	8.7	3537.1	*	1	0810	99	658.	20.4	3539.4	*	1	1345	166	0.	.0	3532.5	
1	0240	33	431.	10.1	3537.4	*	1	0815	100	572.	16.1	3538.6	*	1	1350	167	0.	.0	3532.5	
1	0245	34	457.	11.1	3537.6	*	1	0820	101	491.	12.5	3537.9	*	1	1355	168	0.	.0	3532.5	
1	0250	35	478.	12.0	3537.8	*	1	0825	102	414.	9.4	3537.2	*	1	1400	169	0.	.0	3532.5	
1	0255	36	501.	12.9	3538.0	*	1	0830	103	342.	6.8	3536.6	*	1	1405	170	0.	.0	3532.5	
1	0300	37	521.	13.8	3538.1	*	1	0835	104	279.	4.6	3536.0	*	1	1410	171	0.	.0	3532.5	
1	0305	38	540.	14.7	3538.3	*	1	0840	105	227.	2.9	3535.4	*	1	1415	172	0.	.0	3532.5	
1	0310	39	564.	15.8	3538.5	*	1	0845	106	171.	1.5	3534.7	*	1	1420	173	0.	.0	3532.5	
1	0315	40	615.	18.1	3539.0	*	1	0850	107	76.	.7	3533.5	*	1	1425	174	0.	.0	3532.5	
1	0320	41	725.	23.8	3540.0	*	1	0855	108	34.	.3	3532.9	*	1	1430	175	0.	.0	3532.5	
1	0325	42	895.	36.3	3541.9	*	1	0900	109	15.	.1	3532.7	*	1	1435	176	0.	.0	3532.5	
1	0330	43	985.	59.7	3543.0	*	1	0905	110	7.	.1	3532.6	*	1	1440	177	0.	.0	3532.5	
1	0335	44	1492.	94.1	3548.5	*	1	0910	111	3.	.0	3532.5	*	1	1445	178	0.	.0	3532.5	
1	0340	45	1713.	135.2	3551.5	*	1	0915	112	1.	.0	3532.5	*	1	1450	179	0.	.0	3532.5	
1	0345	46	1859.	176.9	3553.9	*	1	0920	113	1.	.0	3532.5	*	1	1455	180	0.	.0	3532.5	
1	0350	47	1967.	214.6	3555.8	*	1	0925	114	0.	.0	3532.5	*	1	1500	181	0.	.0	3532.5	
1	0355	48	2047.	247.1	3557.3	*	1	0930	115	0.	.0	3532.5	*	1	1505	182	0.	.0	3532.5	
1	0400	49	2100.	274.3	3558.4	*	1	0935	116	0.	.0	3532.5	*	1	1510	183	0.	.0	3532.5	
1	0405	50	2144.	296.5	3559.4	*	1	0940	117	0.	.0	3532.5	*	1	1515	184	0.	.0	3532.5	
1	0410	51	2179.	314.5	3560.1	*	1	0945	118	0.	.0	3532.5	*	1	1520	185	0.	.0	3532.5	
1	0415	52	2206.	328.3	3560.7	*	1	0950	119	0.	.0	3532.5	*	1	1525	186	0.	.0	3532.5	
1	0420	53	2225.	338.0	3561.1	*	1	0955	120	0.	.0	3532.5	*	1	1530	187	0.	.0	3532.5	
1	0425	54	2237.	344.3	3561.3	*	1	1000	121	0.	.0	3532.5	*	1	1535	188	0.	.0	3532.5	
1	0430	55	2244.	347.9	3561.5	*	1	1005	122	0.	.0	3532.5	*	1	1540	189	0.	.0	3532.5	
1	0435	56	2248.	350.1	3561.6	*	1	1010	123	0.	.0	3532.5	*	1	1545	190	0.	.0	3532.5	
1	0440	57	2252.	352.1	3561.7	*	1	1015	124	0.	.0	3532.5	*	1	1550	191	0.	.0	3532.5	

1	0445	58	2257.	354.3	3561.0	*	1	1020	125	0.	.0	3532.5	*	1	1555	192	0.	.0	3532.5
1	0450	59	2261.	356.3	3561.0	*	1	1025	126	0.	.0	3532.5	*	1	1600	193	0.	.0	3532.5
1	0455	60	2264.	357.8	3561.9	*	1	1030	127	0.	.0	3532.5	*	1	1605	194	0.	.0	3532.5
1	0500	61	2265.	358.7	3561.9	*	1	1035	128	0.	.0	3532.5	*	1	1610	195	0.	.0	3532.5
1	0505	62	2266.	358.9	3562.0	*	1	1040	129	0.	.0	3532.5	*	1	1615	196	0.	.0	3532.5
1	0510	63	2263.	357.7	3561.9	*	1	1045	130	0.	.0	3532.5	*	1	1620	197	0.	.0	3532.5
1	0515	64	2257.	354.7	3561.9	*	1	1050	131	0.	.0	3532.5	*	1	1625	198	0.	.0	3532.5
1	0520	65	2248.	350.0	3561.6	*	1	1055	132	0.	.0	3532.5	*	1	1630	199	0.	.0	3532.5
1	0525	66	2236.	343.9	3561.3	*	1	1100	133	0.	.0	3532.5	*	1	1635	200	0.	.0	3532.5
1	0530	67	2222.	336.5	3561.0	*	1	1105	134	0.	.0	3532.5	*	1					

PEAK FLOW	TIME		6-HR	24-HR	72-HR	16.58-HR
+	(CFS)	(HR)				
+	2266.	5.08	1556.	588.	588.	588.
			2.145	2.240	2.240	2.240
		(INCHES)				
		(AC-FT)	772.	806.	806.	806.

PEAK STORAGE	TIME		6-HR	24-HR	72-HR	16.58-HR
+	(AC-FT)	(HR)				
	359.	5.08	176.	64.	64.	64.

PEAK STAGE	TIME		6-HR	24-HR	72-HR	16.58-HR
+	(FEET)	(HR)				
	3561.95	5.08	3551.20	3539.58	3539.58	3539.58

CUMULATIVE AREA = 6.74 SQ MI

HYDROGRAPH AT STATION SUMSDB PLAN 1, RATIO = .95

DA	MON	HR	MIN	ORD	OUTFLOW	STORAGE	STAGE	+	DA	MON	HR	MIN	ORD	OUTFLOW	STORAGE	STAGE	+	DA	MON	HR	MIN	ORD	OUTFLOW	STORAGE	STAGE
1	0000	1	0.	0.	.0	3532.5	*	1	0535	68	2167.	308.7	3559.9	*	1	1110	135	0.	.0	3532.5					
1	0005	2	0.	0.	.0	3532.5	*	1	0540	69	2149.	299.5	3559.5	*	1	1115	136	0.	.0	3532.5					
1	0010	3	0.	0.	.0	3532.5	*	1	0545	70	2130.	289.6	3559.1	*	1	1120	137	0.	.0	3532.5					
1	0015	4	0.	0.	.0	3532.5	*	1	0550	71	2109.	279.1	3558.6	*	1	1125	138	0.	.0	3532.5					
1	0020	5	0.	0.	.0	3532.5	*	1	0555	72	2088.	268.2	3558.2	*	1	1130	139	0.	.0	3532.5					
1	0025	6	3.	0.	.0	3532.5	*	1	0600	73	2066.	257.1	3557.7	*	1	1135	140	0.	.0	3532.5					
1	0030	7	11.	.1	.1	3532.6	*	1	0605	74	2044.	245.7	3557.2	*	1	1140	141	0.	.0	3532.5					
1	0035	8	25.	.2	.2	3532.8	*	1	0610	75	2018.	234.2	3556.7	*	1	1145	142	0.	.0	3532.5					
1	0040	9	43.	.4	.4	3533.1	*	1	0615	76	1987.	222.4	3556.2	*	1	1150	143	0.	.0	3532.5					
1	0045	10	62.	.6	.6	3533.3	*	1	0620	77	1957.	210.6	3555.6	*	1	1155	144	0.	.0	3532.5					
1	0050	11	78.	.7	.7	3533.5	*	1	0625	78	1926.	198.6	3555.1	*	1	1200	145	0.	.0	3532.5					
1	0055	12	85.	.8	.8	3533.6	*	1	0630	79	1889.	186.6	3554.5	*	1	1205	146	0.	.0	3532.5					
1	0100	13	81.	.7	.7	3533.6	*	1	0635	80	1852.	174.6	3553.8	*	1	1210	147	0.	.0	3532.5					
1	0105	14	72.	.6	.6	3533.4	*	1	0640	81	1814.	162.7	3553.2	*	1	1215	148	0.	.0	3532.5					
1	0110	15	64.	.6	.6	3533.3	*	1	0645	82	1772.	150.9	3552.5	*	1	1220	149	0.	.0	3532.5					
1	0115	16	62.	.6	.6	3533.3	*	1	0650	83	1729.	139.4	3551.8	*	1	1225	150	0.	.0	3532.5					
1	0120	17	66.	.6	.6	3533.4	*	1	0655	84	1686.	128.0	3551.1	*	1	1230	151	0.	.0	3532.5					
1	0125	18	77.	.7	.7	3533.5	*	1	0700	85	1627.	116.9	3550.2	*	1	1235	152	0.	.0	3532.5					
1	0130	19	97.	.9	.9	3533.8	*	1	0705	86	1568.	106.1	3549.5	*	1	1240	153	0.	.0	3532.5					
1	0135	20	128.	1.2	1.2	3534.2	*	1	0710	87	1504.	95.7	3548.6	*	1	1245	154	0.	.0	3532.5					
1	0140	21	171.	1.5	1.5	3534.7	*	1	0715	88	1430.	85.8	3547.7	*	1	1250	155	0.	.0	3532.5					
1	0145	22	203.	2.1	2.1	3535.1	*	1	0720	89	1343.	76.3	3546.7	*	1	1255	156	0.	.0	3532.5					
1	0150	23	226.	2.9	2.9	3535.4	*	1	0725	90	1160.	67.8	3544.8	*	1	1300	157	0.	.0	3532.5					
1	0155	24	250.	3.7	3.7	3535.7	*	1	0730	91	1001.	60.4	3543.2	*	1	1305	158	0.	.0	3532.5					
1	0200	25	269.	4.3	4.3	3535.9	*	1	0735	92	961.	53.7	3542.7	*	1	1310	159	0.	.0	3532.5					
1	0205	26	280.	4.7	4.7	3536.0	*	1	0740	93	938.	47.2	3542.5	*	1	1315	160	0.	.0	3532.5					
1	0210	27	283.	4.8	4.8	3536.1	*	1	0745	94	915.	40.9	3542.2	*	1	1320	161	0.	.0	3532.5					
1	0215	28	283.	4.8	4.8	3536.1	*	1	0750	95	875.	34.7	3541.7	*	1	1325	162	0.	.0	3532.5					
1	0220	29	287.	4.9	4.9	3536.1	*	1	0755	96	799.	29.0	3540.8	*	1	1330	163	0.	.0	3532.5					
1	0225	30	305.	5.5	5.5	3536.2	*	1	0800	97	724.	23.8	3540.0	*	1	1335	164	0.	.0	3532.5					
1	0230	31	336.	6.6	6.6	3536.5	*	1	0805	98	633.	19.1	3539.2	*	1	1340	165	0.	.0	3532.5					
1	0235	32	376.	7.9	7.9	3536.9	*	1	0810	99	548.	15.0	3538.4	*	1	1345	166	0.	.0	3532.5					
1	0240	33	409.	9.2	9.2	3537.2	*	1	0815	100	467.	11.6	3537.7	*	1	1350	167	0.	.0	3532.5					
1	0245	34	434.	10.2	10.2	3537.4	*	1	0820	101	394.	8.6	3537.0	*	1	1355	168	0.	.0	3532.5					
1	0250	35	454.	11.0	11.0	3537.6	*	1	0825	102	322.	6.1	3536.4	*	1	1400	169	0.	.0	3532.5					
1	0255	36	475.	11.9	11.9	3537.7	*	1	0830	103	263.	4.1	3535.8	*	1	1405	170	0.	.0	3532.5					
1	0300	37	497.	12.8	12.8	3537.9	*	1	0835	104	214.	2.5	3535.3	*	1	1410	171	0.	.0	3532.5					
1	0305	38	516.	13.6	13.6	3538.1	*	1	0840	105	139.	1.3	3534.3	*	1	1415	172	0.	.0	3532.5					
1	0310	39	539.	14.6	14.6	3538.3	*	1	0845	106	62.	.6	3533.3	*	1	1420	173	0.	.0	3532.5					
1	0315	40	587.	16.9	16.9	3538.7	*	1	0850	107	28.	.3	3532.9	*	1	1425	174	0.	.0	3532.5					
1	0320	41	697.	22.4	22.4	3539.7	*	1	0855	108	13.	.1	3532.7	*	1	1430	175	0.	.0	3532.5					
1	0325	42	870.	34.4	34.4	3541.7	*	1	0900	109	6.	.1	3532.6	*	1	1435	176	0.	.0	3532.5					
1	0330	43	972.	56.7	56.7	3542.9	*	1	0905	110	3.	.0	3532.5	*	1	1440	177	0.	.0	3532.5					
1	0335	44	1458.	89.6	89.6	3548.1	*	1	0910	111	1.	.0	3532.5	*	1	1445	178	0.	.0	3532.5					
1	0340	45	1689.	128.8	128.8	3551.1	*	1	0915	112	1.	.0	3532.5	*	1	1450	179	0.	.0	3532.5					
1	0345	46	1832.	168.4	168.4	3553.5	*	1	0920	113	0.	.0	3532.5	*	1	1455	180	0.	.0	3532.5					
1	0350	47	1941.	204.5	204.5	3555.4	*	1	0925	114	0.	.0	3532.5	*	1	1500	181	0.	.0	3532.5					
1	0355	48	2021.	235.6	235.6	3556.8	*	1	0930	115	0.	.0	3532.5	*	1	1505	182	0.	.0	3532.5					
1	0400	49	2075.	261.5	261.5	3557.9	*	1	0935	116	0.	.0	3532.5	*	1	1510	183	0.	.0	3532.5					
1	0405	50	2116.	282.7	282.7	3558.8	*	1	0940	117	0.	.0	3532.5	*	1	1515	184	0.	.0	3532.5					
1	0410	51	2150.	299.7	299.7	3559.5	*	1	0945	118	0.	.0	3532.5	*	1	1520	185	0.	.0	3532.5					
1	0415	52	2176.	312.9	312.9	3560.0	*	1	0950	119	0.	.0	3532.5	*	1	1525	186	0.	.0	3532.5					

1	0420	53	2194.	322.1	3560.4	*	1	0955	120	0.	.0	3532.5	*	1	1530	187	0.	.0	3532.5
1	0425	54	2205.	327.8	3560.7	*	1	1000	121	0.	.0	3532.5	*	1	1535	188	0.	.0	3532.5
1	0430	55	2211.	331.0	3560.8	*	1	1005	122	0.	.0	3532.5	*	1	1540	189	0.	.0	3532.5
1	0435	56	2215.	332.8	3560.9	*	1	1010	123	0.	.0	3532.5	*	1	1545	190	0.	.0	3532.5
1	0440	57	2218.	334.5	3560.9	*	1	1015	124	0.	.0	3532.5	*	1	1550	191	0.	.0	3532.5
1	0445	58	2222.	336.4	3561.0	*	1	1020	125	0.	.0	3532.5	*	1	1555	192	0.	.0	3532.5
1	0450	59	2225.	338.0	3561.1	*	1	1025	126	0.	.0	3532.5	*	1	1600	193	0.	.0	3532.5
1	0455	60	2227.	339.1	3561.1	*	1	1030	127	0.	.0	3532.5	*	1	1605	194	0.	.0	3532.5
1	0500	61	2228.	339.8	3561.2	*	1	1035	128	0.	.0	3532.5	*	1	1610	195	0.	.0	3532.5
1	0505	62	2228.	339.8	3561.2	*	1	1040	129	0.	.0	3532.5	*	1	1615	196	0.	.0	3532.5
1	0510	63	2225.	338.4	3561.1	*	1	1045	130	0.	.0	3532.5	*	1	1620	197	0.	.0	3532.5
1	0515	64	2219.	335.3	3561.0	*	1	1050	131	0.	.0	3532.5	*	1	1625	198	0.	.0	3532.5
1	0520	65	2210.	330.6	3560.8	*	1	1055	132	0.	.0	3532.5	*	1	1630	199	0.	.0	3532.5
1	0525	66	2198.	324.4	3560.5	*	1	1100	133	0.	.0	3532.5	*	1	1635	200	0.	.0	3532.5
1	0530	67	2184.	317.1	3560.2	*	1	1105	134	0.	.0	3532.5	*	1					

PEAK FLOW	TIME		6-HR	24-HR	72-HR	16.58-HR
+	(CFS)	(HR)				
+	2228.	5.00	1506.	566.	566.	566.
		(INCHES)	2.076	2.157	2.157	2.157
		(AC-FT)	747.	776.	776.	776.

PEAK STORAGE	TIME		6-HR	24-HR	72-HR	16.58-HR
+	(AC-FT)	(HR)				
+	340.	5.00	165.	60.	60.	60.

PEAK STAGE	TIME		6-HR	24-HR	72-HR	16.58-HR
+	(FEET)	(HR)				
+	3561.16	5.00	3550.48	3539.28	3539.28	3539.28

CUMULATIVE AREA = 6.74 SQ MI

HYDROGRAPH AT STATION SUM5DB
PLAN 1, RATIO = .93

DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	*	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	*	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE
1		0000	1	0.	.0	3532.5	*	1		0535	68	2131.	290.1	3559.1	*	1		1110	135	0.	.0	3532.5
1		0005	2	0.	.0	3532.5	*	1		0540	69	2113.	281.0	3558.7	*	1		1115	136	0.	.0	3532.5
1		0010	3	0.	.0	3532.5	*	1		0545	70	2094.	271.2	3558.3	*	1		1120	137	0.	.0	3532.5
1		0015	4	0.	.0	3532.5	*	1		0550	71	2074.	260.8	3557.9	*	1		1125	138	0.	.0	3532.5
1		0020	5	0.	.0	3532.5	*	1		0555	72	2053.	250.1	3557.4	*	1		1130	139	0.	.0	3532.5
1		0025	6	2.	.0	3532.5	*	1		0600	73	2031.	239.1	3557.0	*	1		1135	140	0.	.0	3532.5
1		0030	7	9.	.1	3532.6	*	1		0605	74	2002.	228.0	3556.4	*	1		1140	141	0.	.0	3532.5
1		0035	8	21.	.2	3532.8	*	1		0610	75	1972.	216.6	3555.9	*	1		1145	142	0.	.0	3532.5
1		0040	9	37.	.3	3533.0	*	1		0615	76	1943.	205.1	3555.4	*	1		1150	143	0.	.0	3532.5
1		0045	10	53.	.5	3533.2	*	1		0620	77	1911.	193.5	3554.8	*	1		1155	144	0.	.0	3532.5
1		0050	11	67.	.6	3533.4	*	1		0625	78	1875.	181.9	3554.2	*	1		1200	145	0.	.0	3532.5
1		0055	12	73.	.7	3533.4	*	1		0630	79	1838.	170.2	3553.6	*	1		1205	146	0.	.0	3532.5
1		0100	13	70.	.6	3533.4	*	1		0635	80	1801.	158.5	3552.9	*	1		1210	147	0.	.0	3532.5
1		0105	14	63.	.6	3533.3	*	1		0640	81	1757.	147.0	3552.2	*	1		1215	148	0.	.0	3532.5
1		0110	15	56.	.5	3533.2	*	1		0645	82	1715.	135.6	3551.5	*	1		1220	149	0.	.0	3532.5
1		0115	16	54.	.5	3533.2	*	1		0650	83	1668.	124.4	3550.8	*	1		1225	150	0.	.0	3532.5
1		0120	17	58.	.5	3533.3	*	1		0655	84	1609.	113.5	3550.0	*	1		1230	151	0.	.0	3532.5
1		0125	18	69.	.6	3533.4	*	1		0700	85	1551.	102.9	3549.2	*	1		1235	152	0.	.0	3532.5
1		0130	19	87.	.8	3533.6	*	1		0705	86	1481.	92.7	3548.4	*	1		1240	153	0.	.0	3532.5
1		0135	20	116.	1.0	3534.0	*	1		0710	87	1409.	83.0	3547.5	*	1		1245	154	0.	.0	3532.5
1		0140	21	156.	1.4	3534.5	*	1		0715	88	1289.	73.8	3546.2	*	1		1250	155	0.	.0	3532.5
1		0145	22	197.	1.9	3535.1	*	1		0720	89	1113.	65.7	3544.4	*	1		1255	156	0.	.0	3532.5
1		0150	23	216.	2.5	3535.3	*	1		0725	90	978.	58.5	3543.0	*	1		1300	157	0.	.0	3532.5
1		0155	24	237.	3.2	3535.5	*	1		0730	91	955.	52.0	3542.7	*	1		1305	158	0.	.0	3532.5
1		0200	25	254.	3.8	3535.7	*	1		0735	92	932.	45.5	3542.4	*	1		1310	159	0.	.0	3532.5
1		0205	26	264.	4.1	3535.9	*	1		0740	93	909.	39.2	3542.1	*	1		1315	160	0.	.0	3532.5
1		0210	27	266.	4.2	3535.9	*	1		0745	94	854.	33.2	3541.5	*	1		1320	161	0.	.0	3532.5
1		0215	28	266.	4.2	3535.9	*	1		0750	95	779.	27.6	3540.6	*	1		1325	162	0.	.0	3532.5
1		0220	29	271.	4.4	3535.9	*	1		0755	96	699.	22.5	3539.8	*	1		1330	163	0.	.0	3532.5
1		0225	30	287.	4.9	3536.1	*	1		0800	97	612.	18.0	3539.0	*	1		1335	164	0.	.0	3532.5
1		0230	31	316.	5.9	3536.4	*	1		0805	98	527.	14.1	3538.2	*	1		1340	165	0.	.0	3532.5
1		0235	32	353.	7.2	3536.7	*	1		0810	99	447.	10.7	3537.5	*	1		1345	166	0.	.0	3532.5
1		0240	33	388.	8.4	3537.0	*	1		0815	100	375.	7.9	3536.9	*	1		1350	167	0.	.0	3532.5
1		0245	34	411.	9.3	3537.2	*	1		0820	101	306.	5.6	3536.3	*	1		1355	168	0.	.0	3532.5
1		0250	35	431.	10.1	3537.3	*	1		0825	102	250.	3.7	3535.7	*	1		1400	169	0.	.0	3532.5
1		0255	36	451.	10.9	3537.5	*	1		0830	103	203.	2.1	3535.1	*	1		1405	170	0.	.0	3532.5
1		0300	37	471.	11.7	3537.7	*	1		0835	104	113.	1.0	3534.0	*	1		1410	171	0.	.0	3532.5
1		0305	38	491.	12.5	3537.9	*	1		0840	105	51.	.5	3533.2	*	1		1415	172	0.	.0	3532.5
1		0310	39	514.	13.5	3538.1	*	1		0845	106	23.	.2	3532.8	*	1		1420	173	0.	.0	3532.5
1		0315	40	559.	15.6	3538.5	*	1		0850	107	10.	.1	3532.6	*	1		1425	174	0.	.0	3532.5
1		0320	41	664.	20.7	3539.4	*	1		0855	108	5.	.0	3532.6	*	1		1430	175	0.	.0	3532.5
1		0325	42	838.	31.9	3541.3	*	1		0900	109	2.	.0	3532.5	*	1		1435	176	0.	.0	3532.5
1		0330	43	958.	52.9	3542.7	*	1		0905	110	1.	.0	3532.5	*	1		1440	177	0.	.0	3532.5
1		0335	44	1417.	84.1	3547.6	*	1		0910	111	0.	.0	3532.5	*	1		1445	178	0.	.0	3532.5
1		0340	45	1652.	121.4	3550.6	*	1		0915	112	0.	.0	3532.5	*	1		1450	179	0.	.0	3532.5
1		0345	46	1804.	159.3	3553.0	*	1		0920	113	0.	.0	3532.5	*	1		1455	180	0.	.0	3532.5
1		0350	47	1912.	193.8	3554.9	*	1		0925	114	0.	.0	3532.5	*	1		1500	181	0.	.0	3532.5

1	0355	48	1991.	223.6	3556.2 *	1	0930	115	0.	.0	3532.5 *	1	1505	182	0.	.0	3532.5
1	0400	49	2050.	248.5	3557.4 *	1	0935	116	0.	.0	3532.5 *	1	1510	183	0.	.0	3532.5
1	0405	50	2089.	268.9	3558.2 *	1	0940	117	0.	.0	3532.5 *	1	1515	184	0.	.0	3532.5
1	0410	51	2122.	285.3	3558.9 *	1	0945	118	0.	.0	3532.5 *	1	1520	185	0.	.0	3532.5
1	0415	52	2146.	297.8	3559.4 *	1	0950	119	0.	.0	3532.5 *	1	1525	186	0.	.0	3532.5
1	0420	53	2163.	306.4	3559.8 *	1	0955	120	0.	.0	3532.5 *	1	1530	187	0.	.0	3532.5
1	0425	54	2173.	311.7	3560.0 *	1	1000	121	0.	.0	3532.5 *	1	1535	188	0.	.0	3532.5
1	0430	55	2179.	314.5	3560.1 *	1	1005	122	0.	.0	3532.5 *	1	1540	189	0.	.0	3532.5
1	0435	56	2182.	316.1	3560.2 *	1	1010	123	0.	.0	3532.5 *	1	1545	190	0.	.0	3532.5
1	0440	57	2184.	317.4	3560.2 *	1	1015	124	0.	.0	3532.5 *	1	1550	191	0.	.0	3532.5
1	0445	58	2188.	319.0	3560.3 *	1	1020	125	0.	.0	3532.5 *	1	1555	192	0.	.0	3532.5
1	0450	59	2190.	320.4	3560.3 *	1	1025	126	0.	.0	3532.5 *	1	1600	193	0.	.0	3532.5
1	0455	60	2192.	321.3	3560.4 *	1	1030	127	0.	.0	3532.5 *	1	1605	194	0.	.0	3532.5
1	0500	61	2193.	321.7	3560.4 *	1	1035	128	0.	.0	3532.5 *	1	1610	195	0.	.0	3532.5
1	0505	62	2192.	321.5	3560.4 *	1	1040	129	0.	.0	3532.5 *	1	1615	196	0.	.0	3532.5
1	0510	63	2189.	319.9	3560.3 *	1	1045	130	0.	.0	3532.5 *	1	1620	197	0.	.0	3532.5
1	0515	64	2183.	316.7	3560.2 *	1	1050	131	0.	.0	3532.5 *	1	1625	198	0.	.0	3532.5
1	0520	65	2174.	312.0	3560.0 *	1	1055	132	0.	.0	3532.5 *	1	1630	199	0.	.0	3532.5
1	0525	66	2162.	305.8	3559.7 *	1	1100	133	0.	.0	3532.5 *	1	1635	200	0.	.0	3532.5
1	0530	67	2147.	298.4	3559.4 *	1	1105	134	0.	.0	3532.5 *	1			0.	.0	3532.5

PEAK FLOW	TIME		6-HR	24-HR	72-HR	16.58-HR
+	(CFS)	(HR)				
+	2193.	5.00	1455.	545.	545.	545.
			(INCHES)	2.076	2.076	2.076
			(AC-FT)	747.	747.	747.

PEAK STORAGE	TIME		6-HR	24-HR	72-HR	16.58-HR
+	(AC-FT)	(HR)				
+	322.	5.00	153.	56.	56.	56.

PEAK STAGE	TIME		6-HR	24-HR	72-HR	16.58-HR
+	(FEET)	(HR)				
+	3560.40	5.00	3549.76	3538.98	3538.98	3538.98

CUMULATIVE AREA = 6.74 SQ MI

HYDROGRAPH AT STATION SUM5DB
PLAN 1, RATIO = .92

DA	MON	HR	MIN	ORD	OUTFLOW	STORAGE	STAGE	+	DA	MON	HR	MIN	ORD	OUTFLOW	STORAGE	STAGE	+	DA	MON	HR	MIN	ORD	OUTFLOW	STORAGE	STAGE
1	0000	1	0.	0.	.0	3532.5 *	1	0535	68	2117.	282.8	3558.8 *	1	1110	135	0.	.0	3532.5							
1	0905	2	0.	0.	.0	3532.5 *	1	0540	69	2099.	273.7	3558.4 *	1	1115	136	0.	.0	3532.5							
1	0910	3	0.	0.	.0	3532.5 *	1	0545	70	2080.	263.9	3558.0 *	1	1120	137	0.	.0	3532.5							
1	0915	4	0.	0.	.0	3532.5 *	1	0550	71	2060.	253.6	3557.6 *	1	1125	138	0.	.0	3532.5							
1	0920	5	0.	0.	.0	3532.5 *	1	0555	72	2039.	243.0	3557.1 *	1	1130	139	0.	.0	3532.5							
1	0925	6	2.	0.	.0	3532.5 *	1	0600	73	2012.	232.1	3556.6 *	1	1135	140	0.	.0	3532.5							
1	0930	7	8.	.1	.1	3532.6 *	1	0605	74	1984.	221.0	3556.1 *	1	1140	141	0.	.0	3532.5							
1	0935	8	20.	.2	.2	3532.8 *	1	0610	75	1955.	209.7	3555.6 *	1	1145	142	0.	.0	3532.5							
1	0940	9	35.	.3	.3	3533.0 *	1	0615	76	1925.	198.3	3555.1 *	1	1150	143	0.	.0	3532.5							
1	0945	10	50.	.5	.5	3533.2 *	1	0620	77	1890.	186.9	3554.5 *	1	1155	144	0.	.0	3532.5							
1	0950	11	63.	.6	.6	3533.3 *	1	0625	78	1854.	175.3	3553.9 *	1	1200	145	0.	.0	3532.5							
1	0955	12	68.	.6	.6	3533.4 *	1	0630	79	1818.	163.7	3553.2 *	1	1205	146	0.	.0	3532.5							
1	1000	13	66.	.6	.6	3533.4 *	1	0635	80	1777.	152.2	3552.6 *	1	1210	147	0.	.0	3532.5							
1	1005	14	59.	.5	.5	3533.3 *	1	0640	81	1734.	140.9	3551.8 *	1	1215	148	0.	.0	3532.5							
1	1010	15	53.	.5	.5	3533.2 *	1	0645	82	1692.	129.6	3551.2 *	1	1220	149	0.	.0	3532.5							
1	1015	16	51.	.5	.5	3533.2 *	1	0650	83	1636.	118.6	3550.4 *	1	1225	150	0.	.0	3532.5							
1	1020	17	55.	.5	.5	3533.2 *	1	0655	84	1578.	107.9	3549.6 *	1	1230	151	0.	.0	3532.5							
1	1025	18	65.	.6	.6	3533.4 *	1	0700	85	1517.	97.5	3548.8 *	1	1235	152	0.	.0	3532.5							
1	1030	19	83.	.8	.8	3533.6 *	1	0705	86	1443.	87.6	3547.9 *	1	1240	153	0.	.0	3532.5							
1	1035	20	111.	1.0	1.0	3533.9 *	1	0710	87	1372.	78.1	3547.1 *	1	1245	154	0.	.0	3532.5							
1	1040	21	150.	1.4	1.4	3534.5 *	1	0715	88	1194.	69.4	3545.2 *	1	1250	155	0.	.0	3532.5							
1	1045	22	194.	1.8	1.8	3535.0 *	1	0720	89	1031.	61.8	3543.5 *	1	1255	156	0.	.0	3532.5							
1	1050	23	212.	2.4	2.4	3535.2 *	1	0725	90	966.	55.0	3542.8 *	1	1300	157	0.	.0	3532.5							
1	1055	24	232.	3.1	3.1	3535.5 *	1	0730	91	942.	48.5	3542.5 *	1	1305	158	0.	.0	3532.5							
1	0200	25	248.	3.6	3.6	3535.7 *	1	0735	92	920.	42.2	3542.2 *	1	1310	159	0.	.0	3532.5							
1	0205	26	258.	3.9	3.9	3535.8 *	1	0740	93	891.	36.0	3541.9 *	1	1315	160	0.	.0	3532.5							
1	0210	27	260.	4.0	4.0	3535.8 *	1	0745	94	815.	30.1	3541.0 *	1	1320	161	0.	.0	3532.5							
1	0215	28	260.	4.0	4.0	3535.8 *	1	0750	95	739.	24.8	3540.2 *	1	1325	162	0.	.0	3532.5							
1	0220	29	264.	4.1	4.1	3535.9 *	1	0755	96	652.	20.0	3539.3 *	1	1330	163	0.	.0	3532.5							
1	0225	30	280.	4.7	4.7	3536.0 *	1	0800	97	565.	15.9	3538.5 *	1	1335	164	0.	.0	3532.5							
1	0230	31	308.	5.6	5.6	3536.3 *	1	0805	98	485.	12.3	3537.8 *	1	1340	165	0.	.0	3532.5							
1	0235	32	345.	6.9	6.9	3536.6 *	1	0810	99	409.	9.2	3537.2 *	1	1345	166	0.	.0	3532.5							
1	0240	33	379.	8.0	8.0	3536.9 *	1	0815	100	337.	6.6	3536.5 *	1	1350	167	0.	.0	3532.5							
1	0245	34	404.	9.0	9.0	3537.1 *	1	0820	101	275.	4.5	3536.0 *	1	1355	168	0.	.0	3532.5							
1	0250	35	422.	9.7	9.7	3537.3 *	1	0825	102	224.	2.8	3535.4 *	1	1400	169	0.	.0	3532.5							
1	0255	36	442.	10.5	10.5	3537.4 *	1	0830	103	163.	1.5	3534.6 *	1	1405	170	0.	.0	3532.5							
1	0300	37	462.	11.3	11.3	3537.6 *	1	0835	104	73.	.7	3533.5 *	1	1410	171	0.	.0	3532.5							
1	0305	38	480.	12.1	12.1	3537.8 *	1	0840	105	33.	.3	3532.9 *	1	1415	172	0.	.0	3532.5							
1	0310	39	504.	13.0	13.0	3538.0 *	1	0845	106	15.	.1	3532.7 *	1	1420	173	0.	.0	3532.5							
1	0315	40	548.	15.1	15.1	3538.4 *	1	0850	107	7.	.1	3532.6 *	1	1425	174	0.	.0	3532.5							
1	0320	41	653.	20.1	20.1	3539.3 *	1	0855	108	3.	.0	3532.5 *	1	1430	175	0.	.0	3532.5							
1	0325	42	828.	31.1	31.1	3541.2 *	1	0900	109	1.	.0	3532.5 *	1	1435	176	0.	.0	3532.5							

1	0330	43	954.	51.8	3542.7	*	1	0905	110	1.	.0	3532.5	*	1	1440	177	0.	.0	3532.5
1	0335	44	1406.	62.6	3547.5	*	1	0910	111	0.	.0	3532.5	*	1	1445	178	0.	.0	3532.5
1	0340	45	1641.	119.4	3550.4	*	1	0915	112	0.	.0	3532.5	*	1	1450	179	0.	.0	3532.5
1	0345	46	1794.	156.3	3552.8	*	1	0920	113	0.	.0	3532.5	*	1	1455	180	0.	.0	3532.5
1	0350	47	1902.	190.8	3554.7	*	1	0925	114	0.	.0	3532.5	*	1	1500	181	0.	.0	3532.5
1	0355	48	1981.	220.0	3556.1	*	1	0930	115	0.	.0	3532.5	*	1	1505	182	0.	.0	3532.5
1	0400	49	2041.	244.3	3557.2	*	1	0935	116	0.	.0	3532.5	*	1	1510	183	0.	.0	3532.5
1	0405	50	2080.	264.0	3558.0	*	1	0940	117	0.	.0	3532.5	*	1	1515	184	0.	.0	3532.5
1	0410	51	2111.	279.9	3558.7	*	1	0945	118	0.	.0	3532.5	*	1	1520	185	0.	.0	3532.5
1	0415	52	2135.	292.0	3559.2	*	1	0950	119	0.	.0	3532.5	*	1	1525	186	0.	.0	3532.5
1	0420	53	2151.	300.4	3559.5	*	1	0955	120	0.	.0	3532.5	*	1	1530	187	0.	.0	3532.5
1	0425	54	2161.	305.5	3559.7	*	1	1000	121	0.	.0	3532.5	*	1	1535	188	0.	.0	3532.5
1	0430	55	2166.	308.2	3559.8	*	1	1005	122	0.	.0	3532.5	*	1	1540	189	0.	.0	3532.5
1	0435	56	2169.	309.6	3559.9	*	1	1010	123	0.	.0	3532.5	*	1	1545	190	0.	.0	3532.5
1	0440	57	2172.	310.8	3559.9	*	1	1015	124	0.	.0	3532.5	*	1	1550	191	0.	.0	3532.5
1	0445	58	2174.	312.2	3560.0	*	1	1020	125	0.	.0	3532.5	*	1	1555	192	0.	.0	3532.5
1	0450	59	2177.	313.4	3560.1	*	1	1025	126	0.	.0	3532.5	*	1	1560	193	0.	.0	3532.5
1	0455	60	2178.	314.2	3560.1	*	1	1030	127	0.	.0	3532.5	*	1	1605	194	0.	.0	3532.5
1	0500	61	2179.	314.5	3560.1	*	1	1035	128	0.	.0	3532.5	*	1	1610	195	0.	.0	3532.5
1	0505	62	2178.	314.2	3560.1	*	1	1040	129	0.	.0	3532.5	*	1	1615	196	0.	.0	3532.5
1	0510	63	2175.	312.5	3560.0	*	1	1045	130	0.	.0	3532.5	*	1	1620	197	0.	.0	3532.5
1	0515	64	2169.	309.3	3559.9	*	1	1050	131	0.	.0	3532.5	*	1	1625	198	0.	.0	3532.5
1	0520	65	2159.	304.6	3559.7	*	1	1055	132	0.	.0	3532.5	*	1	1630	199	0.	.0	3532.5
1	0525	66	2147.	298.4	3559.4	*	1	1100	133	0.	.0	3532.5	*	1	1635	200	0.	.0	3532.5
1	0530	67	2133.	291.1	3559.1	*	1	1105	134	0.	.0	3532.5	*	1					

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
(CFS)	(HR)	(CFS)	6-HR	24-HR	72-HR	16.58-HR
+	2179.	5.00	1436.	537.	537.	537.
		(INCHES)	1.979	2.044	2.044	2.044
		(AC-FT)	712.	735.	735.	735.

PEAK STORAGE	TIME		MAXIMUM AVERAGE STORAGE			
(AC-FT)	(HR)		6-HR	24-HR	72-HR	16.58-HR
+	315.	5.00	149.	54.	54.	54.

PEAK STAGE	TIME		MAXIMUM AVERAGE STAGE			
(FEET)	(HR)		6-HR	24-HR	72-HR	16.58-HR
+	3560.10	5.00	3549.49	3538.87	3538.87	3538.87
CUMULATIVE AREA =			6.74 SQ MI			

HYDROGRAPH AT STATION SUM5DB
PLAN 1, RATIO = .91

DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE
1	0000	1	0.	.0	3532.5	*	1	0535	68	2107.	277.7	3558.6	*	1	1110	135	0.	.0	3532.5	
1	0005	2	0.	.0	3532.5	*	1	0540	69	2089.	268.7	3558.2	*	1	1115	136	0.	.0	3532.5	
1	0010	3	0.	.0	3532.5	*	1	0545	70	2070.	258.9	3557.8	*	1	1120	137	0.	.0	3532.5	
1	0015	4	0.	.0	3532.5	*	1	0550	71	2050.	248.7	3557.4	*	1	1125	138	0.	.0	3532.5	
1	0020	5	0.	.0	3532.5	*	1	0555	72	2028.	238.1	3556.9	*	1	1130	139	0.	.0	3532.5	
1	0025	6	2.	.0	3532.5	*	1	0600	73	2000.	227.2	3556.4	*	1	1135	140	0.	.0	3532.5	
1	0030	7	8.	.1	3532.6	*	1	0605	74	1971.	216.2	3555.9	*	1	1140	141	0.	.0	3532.5	
1	0035	8	19.	.2	3532.8	*	1	0610	75	1942.	205.0	3555.4	*	1	1145	142	0.	.0	3532.5	
1	0040	9	33.	.3	3532.9	*	1	0615	76	1912.	193.7	3554.9	*	1	1150	143	0.	.0	3532.5	
1	0045	10	48.	.4	3533.1	*	1	0620	77	1876.	182.3	3554.2	*	1	1155	144	0.	.0	3532.5	
1	0050	11	60.	.5	3533.3	*	1	0625	78	1840.	170.9	3553.6	*	1	1200	145	0.	.0	3532.5	
1	0055	12	65.	.6	3533.4	*	1	0630	79	1804.	159.4	3553.0	*	1	1205	146	0.	.0	3532.5	
1	0100	13	63.	.6	3533.3	*	1	0635	80	1761.	148.0	3552.3	*	1	1210	147	0.	.0	3532.5	
1	0105	14	56.	.5	3533.2	*	1	0640	81	1719.	136.7	3551.6	*	1	1215	148	0.	.0	3532.5	
1	0110	15	50.	.5	3533.2	*	1	0645	82	1674.	125.6	3550.9	*	1	1220	149	0.	.0	3532.5	
1	0115	16	49.	.4	3533.1	*	1	0650	83	1615.	114.7	3550.1	*	1	1225	150	0.	.0	3532.5	
1	0120	17	53.	.5	3533.2	*	1	0655	84	1558.	104.1	3549.3	*	1	1230	151	0.	.0	3532.5	
1	0125	18	63.	.6	3533.3	*	1	0700	85	1490.	93.9	3548.5	*	1	1235	152	0.	.0	3532.5	
1	0130	19	81.	.7	3533.6	*	1	0705	86	1418.	84.2	3547.6	*	1	1240	153	0.	.0	3532.5	
1	0135	20	108.	1.0	3533.9	*	1	0710	87	1313.	74.9	3546.4	*	1	1245	154	0.	.0	3532.5	
1	0140	21	146.	1.3	3534.4	*	1	0715	88	1135.	66.6	3544.6	*	1	1250	155	0.	.0	3532.5	
1	0145	22	193.	1.7	3535.0	*	1	0720	89	982.	59.5	3543.0	*	1	1255	156	0.	.0	3532.5	
1	0150	23	209.	2.3	3535.2	*	1	0725	90	958.	52.9	3542.7	*	1	1300	157	0.	.0	3532.5	
1	0155	24	228.	3.0	3535.4	*	1	0730	91	935.	46.4	3542.4	*	1	1305	158	0.	.0	3532.5	
1	0200	25	244.	3.5	3535.6	*	1	0735	92	912.	40.1	3542.1	*	1	1310	159	0.	.0	3532.5	
1	0205	26	253.	3.8	3535.7	*	1	0740	93	866.	34.0	3541.6	*	1	1315	160	0.	.0	3532.5	
1	0210	27	255.	3.9	3535.8	*	1	0745	94	790.	28.4	3540.7	*	1	1320	161	0.	.0	3532.5	
1	0215	28	255.	3.8	3535.7	*	1	0750	95	713.	23.2	3539.9	*	1	1325	162	0.	.0	3532.5	
1	0220	29	259.	4.0	3535.8	*	1	0755	96	624.	18.6	3539.1	*	1	1330	163	0.	.0	3532.5	
1	0225	30	274.	4.5	3536.0	*	1	0800	97	539.	14.6	3538.3	*	1	1335	164	0.	.0	3532.5	
1	0230	31	303.	5.5	3536.2	*	1	0805	98	459.	11.2	3537.6	*	1	1340	165	0.	.0	3532.5	
1	0235	32	339.	6.7	3536.5	*	1	0810	99	387.	8.3	3537.0	*	1	1345	166	0.	.0	3532.5	
1	0240	33	373.	7.8	3536.8	*	1	0815	100	315.	5.9	3536.3	*	1	1350	167	0.	.0	3532.5	
1	0245	34	398.	8.7	3537.1	*	1	0820	101	257.	3.9	3535.8	*	1	1355	168	0.	.0	3532.5	
1	0250	35	416.	9.5	3537.2	*	1	0825	102	210.	2.3	3535.2	*	1	1400	169	0.	.0	3532.5	
1	0255	36	435.	10.2	3537.4	*	1	0830	103	128.	1.2	3534.2	*	1	1405	170	0.	.0	3532.5	
1	0300	37	454.	11.0	3537.6	*	1	0835	104	58.	.5	3533.2	*	1	1410	171	0.	.0	3532.5	

1	0305	38	473.	11.8	3537.7	*	1	0840	105	26.	.2	3532.8	*	1	1415	172	0.	.0	3532.5
1	0310	39	496.	12.7	3537.9	*	1	0845	106	12.	.1	3532.7	*	1	1420	173	0.	.0	3532.5
1	0315	40	540.	14.7	3538.3	*	1	0850	107	5.	.0	3532.6	*	1	1425	174	0.	.0	3532.5
1	0320	41	642.	19.6	3539.2	*	1	0855	108	2.	.0	3532.5	*	1	1430	175	0.	.0	3532.5
1	0325	42	819.	30.4	3541.1	*	1	0900	109	1.	.0	3532.5	*	1	1435	176	0.	.0	3532.5
1	0330	43	950.	50.7	3542.6	*	1	0905	110	0.	.0	3532.5	*	1	1440	177	0.	.0	3532.5
1	0335	44	1394.	81.0	3547.3	*	1	0910	111	0.	.0	3532.5	*	1	1445	178	0.	.0	3532.5
1	0340	45	1631.	117.5	3550.3	*	1	0915	112	0.	.0	3532.5	*	1	1450	179	0.	.0	3532.5
1	0345	46	1787.	154.7	3552.7	*	1	0920	113	0.	.0	3532.5	*	1	1455	180	0.	.0	3532.5
1	0350	47	1895.	188.3	3554.6	*	1	0925	114	0.	.0	3532.5	*	1	1500	181	0.	.0	3532.5
1	0355	48	1974.	217.2	3556.0	*	1	0930	115	0.	.0	3532.5	*	1	1505	182	0.	.0	3532.5
1	0400	49	2035.	241.1	3557.0	*	1	0935	116	0.	.0	3532.5	*	1	1510	183	0.	.0	3532.5
1	0405	50	2073.	260.5	3557.9	*	1	0940	117	0.	.0	3532.5	*	1	1515	184	0.	.0	3532.5
1	0410	51	2104.	276.1	3558.5	*	1	0945	118	0.	.0	3532.5	*	1	1520	185	0.	.0	3532.5
1	0415	52	2127.	287.9	3559.0	*	1	0950	119	0.	.0	3532.5	*	1	1525	186	0.	.0	3532.5
1	0420	53	2143.	296.1	3559.3	*	1	0955	120	0.	.0	3532.5	*	1	1530	187	0.	.0	3532.5
1	0425	54	2153.	301.1	3559.5	*	1	1000	121	0.	.0	3532.5	*	1	1535	188	0.	.0	3532.5
1	0430	55	2158.	303.7	3559.7	*	1	1005	122	0.	.0	3532.5	*	1	1540	189	0.	.0	3532.5
1	0435	56	2160.	305.1	3559.7	*	1	1010	123	0.	.0	3532.5	*	1	1545	190	0.	.0	3532.5
1	0440	57	2162.	306.2	3559.8	*	1	1015	124	0.	.0	3532.5	*	1	1550	191	0.	.0	3532.5
1	0445	58	2165.	307.5	3559.8	*	1	1020	125	0.	.0	3532.5	*	1	1555	192	0.	.0	3532.5
1	0450	59	2167.	308.7	3559.9	*	1	1025	126	0.	.0	3532.5	*	1	1600	193	0.	.0	3532.5
1	0455	60	2169.	309.4	3559.9	*	1	1030	127	0.	.0	3532.5	*	1	1605	194	0.	.0	3532.5
1	0500	61	2169.	309.7	3559.9	*	1	1035	128	0.	.0	3532.5	*	1	1610	195	0.	.0	3532.5
1	0505	62	2169.	309.3	3559.9	*	1	1040	129	0.	.0	3532.5	*	1	1615	196	0.	.0	3532.5
1	0510	63	2165.	307.6	3559.8	*	1	1045	130	0.	.0	3532.5	*	1	1620	197	0.	.0	3532.5
1	0515	64	2159.	304.4	3559.7	*	1	1050	131	0.	.0	3532.5	*	1	1625	198	0.	.0	3532.5
1	0520	65	2149.	299.5	3559.5	*	1	1055	132	0.	.0	3532.5	*	1	1630	199	0.	.0	3532.5
1	0525	66	2137.	293.4	3559.2	*	1	1100	133	0.	.0	3532.5	*	1	1635	200	0.	.0	3532.5
1	0530	67	2123.	286.0	3558.9	*	1	1105	134	0.	.0	3532.5	*	1			0.	.0	3532.5

PEAK FLOW	TIME		6-HR	MAXIMUM AVERAGE FLOW		
(CFS)	(HR)			24-HR	72-HR	16.58-HR
		(CFS)				
2169.	5.00		1422.	531.	531.	531.
		(INCHES)	1.960	2.022	2.022	2.022
		(AC-FT)	705.	727.	727.	727.

PEAK STORAGE	TIME		6-HR	24-HR	72-HR	16.58-HR
+	(AC-FT)	(HR)				
+	310.	5.00	146.	53.	53.	53.

PEAK STAGE	TIME		6-HR	24-HR	72-HR	16.58-HR
+	(FEET)	(HR)				
+	3559.90	5.00	3549.30	3538.79	3538.79	3538.79

CUMULATIVE AREA = 6.74 SQ MI

HYDROGRAPH AT STATION SUM5DB
PLAN 1, RATIO = .89

DA	MON	HR:MIN	ORD	OUTFLOW	STORAGE	STAGE	*	DA	MON	HR:MIN	ORD	OUTFLOW	STORAGE	STAGE	*	DA	MON	HR:MIN	ORD	OUTFLOW	STORAGE	STAGE
1	0000	1	0.	0.	3532.5	*	1	0535	68	2087.	267.4	3558.1	*	1	1110	135	0.	.0	3532.5			
1	0005	2	0.	0.	3532.5	*	1	0540	69	2069.	258.4	3557.8	*	1	1115	136	0.	.0	3532.5			
1	0010	3	0.	0.	3532.5	*	1	0545	70	2050.	248.7	3557.4	*	1	1120	137	0.	.0	3532.5			
1	0015	4	0.	0.	3532.5	*	1	0550	71	2029.	238.5	3556.9	*	1	1125	138	0.	.0	3532.5			
1	0020	5	0.	0.	3532.5	*	1	0555	72	2002.	228.0	3556.4	*	1	1130	139	0.	.0	3532.5			
1	0025	6	2.	0.	3532.5	*	1	0600	73	1974.	217.3	3556.0	*	1	1135	140	0.	.0	3532.5			
1	0030	7	7.	1.	3532.6	*	1	0605	74	1946.	206.4	3555.5	*	1	1140	141	0.	.0	3532.5			
1	0035	8	18.	2.	3532.7	*	1	0610	75	1917.	195.4	3554.9	*	1	1145	142	0.	.0	3532.5			
1	0040	9	31.	3.	3532.9	*	1	0615	76	1882.	184.3	3554.3	*	1	1150	143	0.	.0	3532.5			
1	0045	10	44.	4.	3533.1	*	1	0620	77	1847.	173.0	3553.7	*	1	1155	144	0.	.0	3532.5			
1	0050	11	54.	5.	3533.2	*	1	0625	78	1811.	161.7	3553.1	*	1	1200	145	0.	.0	3532.5			
1	0055	12	59.	5.	3533.3	*	1	0630	79	1771.	150.5	3552.4	*	1	1205	146	0.	.0	3532.5			
1	0100	13	58.	5.	3533.3	*	1	0635	80	1728.	139.3	3551.8	*	1	1210	147	0.	.0	3532.5			
1	0105	14	52.	5.	3533.2	*	1	0640	81	1687.	128.2	3551.1	*	1	1215	148	0.	.0	3532.5			
1	0110	15	47.	4.	3533.1	*	1	0645	82	1630.	117.4	3550.3	*	1	1220	149	0.	.0	3532.5			
1	0115	16	46.	4.	3533.1	*	1	0650	83	1572.	106.8	3549.5	*	1	1225	150	0.	.0	3532.5			
1	0120	17	50.	4.	3533.1	*	1	0655	84	1510.	96.5	3548.7	*	1	1230	151	0.	.0	3532.5			
1	0125	18	59.	5.	3533.3	*	1	0700	85	1436.	86.7	3547.8	*	1	1235	152	0.	.0	3532.5			
1	0130	19	76.	7.	3533.5	*	1	0705	86	1363.	77.3	3546.9	*	1	1240	153	0.	.0	3532.5			
1	0135	20	102.	9.	3533.8	*	1	0710	87	1179.	68.7	3545.0	*	1	1245	154	0.	.0	3532.5			
1	0140	21	138.	1.2	3534.3	*	1	0715	88	1019.	61.3	3543.4	*	1	1250	155	0.	.0	3532.5			
1	0145	22	194.	1.7	3534.9	*	1	0720	89	964.	54.5	3542.8	*	1	1255	156	0.	.0	3532.5			
1	0150	23	205.	2.2	3535.2	*	1	0725	90	941.	48.1	3542.5	*	1	1300	157	0.	.0	3532.5			
1	0155	24	222.	2.8	3535.4	*	1	0730	91	918.	41.7	3542.2	*	1	1305	158	0.	.0	3532.5			
1	0200	25	237.	3.2	3535.5	*	1	0735	92	885.	35.6	3541.8	*	1	1310	159	0.	.0	3532.5			
1	0205	26	245.	3.5	3535.6	*	1	0740	93	810.	29.8	3541.0	*	1	1315	160	0.	.0	3532.5			
1	0210	27	247.	3.6	3535.7	*	1	0745	94	735.	24.5	3540.1	*	1	1320	161	0.	.0	3532.5			
1	0215	28	247.	3.6	3535.7	*	1	0750	95	646.	19.8	3539.3	*	1	1325	162	0.	.0	3532.5			
1	0220	29	251.	3.7	3535.7	*	1	0755	96	560.	15.6	3538.5	*	1	1330	163	0.	.0	3532.5			
1	0225	30	265.	4.2	3535.9	*	1	0800	97	480.	12.1	3537.8	*	1	1335	164	0.	.0	3532.5			
1	0230	31	292.	5.1	3536.1	*	1	0805	98	405.	9.0	3537.1	*	1	1340	165	0.	.0	3532.5			
1	0235	32	327.	6.3	3536.4	*	1	0810	99	333.	6.5	3536.5	*	1	1345	166	0.	.0	3532.5			

1	0240	33	359.	7.4	3536.7	*	1	0815	100	272.	4.4	3535.9	*	1	1350	167	0.	.0	3532.5
1	0245	34	385.	8.2	3536.9	*	1	0820	101	221.	2.7	3535.3	*	1	1355	168	0.	.0	3532.5
1	0250	35	404.	9.0	3537.1	*	1	0825	102	157.	1.4	3534.5	*	1	1400	169	0.	.0	3532.5
1	0255	36	422.	9.7	3537.3	*	1	0830	103	70.	.6	3533.4	*	1	1405	170	0.	.0	3532.5
1	0300	37	441.	10.5	3537.4	*	1	0835	104	32.	.3	3532.9	*	1	1410	171	0.	.0	3532.5
1	0305	38	459.	11.2	3537.6	*	1	0840	105	14.	.1	3532.7	*	1	1415	172	0.	.0	3532.5
1	0310	39	482.	12.1	3537.9	*	1	0845	106	6.	.1	3532.6	*	1	1420	173	0.	.0	3532.5
1	0315	40	526.	14.1	3538.2	*	1	0850	107	3.	.0	3532.5	*	1	1425	174	0.	.0	3532.5
1	0320	41	626.	18.7	3539.1	*	1	0855	108	1.	.0	3532.5	*	1	1430	175	0.	.0	3532.5
1	0325	42	800.	29.1	3540.9	*	1	0900	109	1.	.0	3532.5	*	1	1435	176	0.	.0	3532.5
1	0330	43	943.	48.7	3542.5	*	1	0905	110	0.	.0	3532.5	*	1	1440	177	0.	.0	3532.5
1	0335	44	1372.	78.0	3547.0	*	1	0910	111	0.	.0	3532.5	*	1	1445	178	0.	.0	3532.5
1	0340	45	1608.	113.3	3550.0	*	1	0915	112	0.	.0	3532.5	*	1	1450	179	0.	.0	3532.5
1	0345	46	1766.	149.3	3552.4	*	1	0920	113	0.	.0	3532.5	*	1	1455	180	0.	.0	3532.5
1	0350	47	1875.	182.1	3554.2	*	1	0925	114	0.	.0	3532.5	*	1	1500	181	0.	.0	3532.5
1	0355	48	1956.	210.2	3555.6	*	1	0930	115	0.	.0	3532.5	*	1	1505	182	0.	.0	3532.5
1	0400	49	2016.	233.7	3556.7	*	1	0935	116	0.	.0	3532.5	*	1	1510	183	0.	.0	3532.5
1	0405	50	2058.	252.7	3557.5	*	1	0940	117	0.	.0	3532.5	*	1	1515	184	0.	.0	3532.5
1	0410	51	2088.	267.9	3558.2	*	1	0945	118	0.	.0	3532.5	*	1	1520	185	0.	.0	3532.5
1	0415	52	2110.	279.5	3558.6	*	1	0950	119	0.	.0	3532.5	*	1	1525	186	0.	.0	3532.5
1	0420	53	2126.	287.5	3559.0	*	1	0955	120	0.	.0	3532.5	*	1	1530	187	0.	.0	3532.5
1	0425	54	2135.	292.2	3559.2	*	1	1000	121	0.	.0	3532.5	*	1	1535	188	0.	.0	3532.5
1	0430	55	2140.	294.6	3559.3	*	1	1005	122	0.	.0	3532.5	*	1	1540	189	0.	.0	3532.5
1	0435	56	2142.	295.7	3559.3	*	1	1010	123	0.	.0	3532.5	*	1	1545	190	0.	.0	3532.5
1	0440	57	2144.	296.7	3559.4	*	1	1015	124	0.	.0	3532.5	*	1	1550	191	0.	.0	3532.5
1	0445	58	2146.	297.8	3559.4	*	1	1020	125	0.	.0	3532.5	*	1	1555	192	0.	.0	3532.5
1	0450	59	2148.	298.8	3559.4	*	1	1025	126	0.	.0	3532.5	*	1	1600	193	0.	.0	3532.5
1	0455	60	2149.	299.4	3559.5	*	1	1030	127	0.	.0	3532.5	*	1	1605	194	0.	.0	3532.5
1	0500	61	2149.	299.5	3559.5	*	1	1035	128	0.	.0	3532.5	*	1	1610	195	0.	.0	3532.5
1	0505	62	2148.	299.0	3559.5	*	1	1040	129	0.	.0	3532.5	*	1	1615	196	0.	.0	3532.5
1	0510	63	2145.	297.3	3559.4	*	1	1045	130	0.	.0	3532.5	*	1	1620	197	0.	.0	3532.5
1	0515	64	2139.	293.9	3559.2	*	1	1050	131	0.	.0	3532.5	*	1	1625	198	0.	.0	3532.5
1	0520	65	2129.	289.1	3559.0	*	1	1055	132	0.	.0	3532.5	*	1	1630	199	0.	.0	3532.5
1	0525	66	2117.	282.9	3558.8	*	1	1100	133	0.	.0	3532.5	*	1	1635	200	0.	.0	3532.5
1	0530	67	2103.	275.6	3558.5	*	1	1105	134	0.	.0	3532.5	*	1			0.	.0	3532.5

PEAK FLOW	TIME		6-HR	24-HR	72-HR	16.58-HR
+	(CFS)	(HR)				
+	2149.	5.00	1394.	519.	519.	519.
		(INCHES)	1.921	1.977	1.977	1.977
		(AC-FT)	691.	711.	711.	711.
PEAK STORAGE	TIME		6-HR	24-HR	72-HR	16.58-HR
+	(AC-FT)	(HR)				
+	300.	5.00	140.	51.	51.	51.
PEAK STAGE	TIME		6-HR	24-HR	72-HR	16.58-HR
+	(FEET)	(HR)				
+	3559.48	5.00	3548.90	3538.62	3538.62	3538.62
CUMULATIVE AREA =			6.74 SQ. MI.			

HYDROGRAPH AT STATION SUM5DB
PLAN 1, RATIO = .98

DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	*	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	*	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	*
1	0000	1	0.	.0	3532.5	*	1	0535	68	2072.	260.2	3557.8	*	1	1110	135	0.	.0	3532.5				
1	0005	2	0.	.0	3532.5	*	1	0540	69	2055.	251.2	3557.5	*	1	1115	136	0.	.0	3532.5				
1	0010	3	0.	.0	3532.5	*	1	0545	70	2036.	241.6	3557.1	*	1	1120	137	0.	.0	3532.5				
1	0015	4	0.	.0	3532.5	*	1	0550	71	2011.	231.5	3556.6	*	1	1125	138	0.	.0	3532.5				
1	0020	5	0.	.0	3532.5	*	1	0555	72	1984.	221.0	3556.1	*	1	1130	139	0.	.0	3532.5				
1	0025	6	2.	.0	3532.5	*	1	0600	73	1956.	210.4	3555.6	*	1	1135	140	0.	.0	3532.5				
1	0030	7	7.	.1	3532.6	*	1	0605	74	1928.	199.6	3555.1	*	1	1140	141	0.	.0	3532.5				
1	0035	8	17.	.2	3532.7	*	1	0610	75	1896.	188.6	3554.6	*	1	1145	142	0.	.0	3532.5				
1	0040	9	29.	.3	3532.9	*	1	0615	76	1861.	177.6	3554.0	*	1	1150	143	0.	.0	3532.5				
1	0045	10	41.	.4	3533.0	*	1	0620	77	1826.	166.5	3553.4	*	1	1155	144	0.	.0	3532.5				
1	0050	11	51.	.5	3533.2	*	1	0625	78	1789.	155.4	3552.7	*	1	1200	145	0.	.0	3532.5				
1	0055	12	55.	.5	3533.2	*	1	0630	79	1747.	144.2	3552.1	*	1	1205	146	0.	.0	3532.5				
1	0100	13	54.	.5	3533.2	*	1	0635	80	1706.	133.2	3551.4	*	1	1210	147	0.	.0	3532.5				
1	0105	14	48.	.4	3533.1	*	1	0640	81	1656.	122.3	3550.6	*	1	1215	148	0.	.0	3532.5				
1	0110	15	44.	.4	3533.1	*	1	0645	82	1598.	111.6	3549.9	*	1	1220	149	0.	.0	3532.5				
1	0115	16	43.	.4	3533.1	*	1	0650	83	1542.	101.3	3549.1	*	1	1225	150	0.	.0	3532.5				
1	0120	17	47.	.4	3533.1	*	1	0655	84	1470.	91.2	3548.2	*	1	1230	151	0.	.0	3532.5				
1	0125	18	56.	.5	3533.2	*	1	0700	85	1399.	81.6	3547.4	*	1	1235	152	0.	.0	3532.5				
1	0130	19	72.	.7	3533.4	*	1	0705	86	1265.	72.7	3546.9	*	1	1240	153	0.	.0	3532.5				
1	0135	20	98.	.9	3533.8	*	1	0710	87	1094.	64.7	3544.2	*	1	1245	154	0.	.0	3532.5				
1	0140	21	133.	1.2	3534.2	*	1	0715	88	976.	57.8	3542.9	*	1	1250	155	0.	.0	3532.5				
1	0145	22	177.	1.6	3534.8	*	1	0720	89	952.	51.2	3542.6	*	1	1255	156	0.	.0	3532.5				
1	0150	23	202.	2.1	3535.1	*	1	0725	90	929.	44.8	3542.4	*	1	1300	157	0.	.0	3532.5				
1	0155	24	218.	2.6	3535.3	*	1	0730	91	907.	38.6	3542.1	*	1	1305	158	0.	.0	3532.5				
1	0200	25	232.	3.1	3535.5	*	1	0735	92	847.	32.6	3541.4	*	1	1310	159	0.	.0	3532.5				
1	0205	26	239.	3.3	3535.6	*	1	0740	93	771.	27.1	3540.5	*	1	1315	160	0.	.0	3532.5				
1	0210	27	241.	3.4	3535.6	*	1	0745	94	691.	22.0	3539.7	*	1	1320	161	0.	.0	3532.5				

1	0215	28	241.	3.4	3535.6	*	1	0750	95	603.	17.6	3538.9	*	1	1325	162	0.	0	3532.5
1	0220	29	244.	3.5	3535.6	*	1	0755	96	520.	13.8	3538.1	*	1	1330	163	0.	0	3532.5
1	0225	30	258.	4.0	3535.4	*	1	0800	97	441.	10.5	3537.4	*	1	1335	164	0.	0	3532.5
1	0230	31	285.	4.8	3536.1	*	1	0805	98	369.	7.7	3536.8	*	1	1340	165	0.	0	3532.5
1	0235	32	318.	6.0	3536.4	*	1	0810	99	301.	5.4	3536.2	*	1	1345	166	0.	0	3532.5
1	0240	33	350.	7.1	3536.6	*	1	0815	100	243.	3.5	3535.6	*	1	1350	167	0.	0	3532.5
1	0245	34	375.	7.9	3536.9	*	1	0820	101	200.	2.0	3535.1	*	1	1355	168	0.	0	3532.5
1	0250	35	395.	8.6	3537.0	*	1	0825	102	105.	.9	3533.9	*	1	1400	169	0.	0	3532.5
1	0255	36	412.	9.3	3537.2	*	1	0830	103	47.	.4	3533.1	*	1	1405	170	0.	0	3532.5
1	0300	37	431.	10.1	3537.4	*	1	0835	104	21.	.2	3532.8	*	1	1410	171	0.	0	3532.5
1	0305	38	449.	10.8	3537.5	*	1	0840	105	10.	.1	3532.6	*	1	1415	172	0.	0	3532.5
1	0310	39	471.	11.7	3537.7	*	1	0845	106	4.	.0	3532.6	*	1	1420	173	0.	0	3532.5
1	0315	40	515.	13.5	3538.1	*	1	0850	107	2.	.0	3532.5	*	1	1425	174	0.	0	3532.5
1	0320	41	613.	18.1	3539.0	*	1	0855	108	1.	.0	3532.5	*	1	1430	175	0.	0	3532.5
1	0325	42	786.	28.1	3540.7	*	1	0900	109	0.	.0	3532.5	*	1	1435	176	0.	0	3532.5
1	0330	43	938.	47.2	3542.5	*	1	0905	110	0.	.0	3532.5	*	1	1440	177	0.	0	3532.5
1	0335	44	1336.	76.0	3546.7	*	1	0910	111	0.	.0	3532.5	*	1	1445	178	0.	0	3532.5
1	0340	45	1594.	110.8	3549.8	*	1	0915	112	0.	.0	3532.5	*	1	1450	179	0.	0	3532.5
1	0345	46	1754.	146.2	3552.2	*	1	0920	113	0.	.0	3532.5	*	1	1455	180	0.	0	3532.5
1	0350	47	1863.	178.2	3554.0	*	1	0925	114	0.	.0	3532.5	*	1	1500	181	0.	0	3532.5
1	0355	48	1945.	205.9	3555.4	*	1	0930	115	0.	.0	3532.5	*	1	1505	182	0.	0	3532.5
1	0400	49	2004.	228.9	3556.5	*	1	0935	116	0.	.0	3532.5	*	1	1510	183	0.	0	3532.5
1	0405	50	2048.	247.6	3557.3	*	1	0940	117	0.	.0	3532.5	*	1	1515	184	0.	0	3532.5
1	0410	51	2077.	262.6	3557.9	*	1	0945	118	0.	.0	3532.5	*	1	1520	185	0.	0	3532.5
1	0415	52	2099.	273.9	3558.4	*	1	0950	119	0.	.0	3532.5	*	1	1525	186	0.	0	3532.5
1	0420	53	2114.	281.6	3558.7	*	1	0955	120	0.	.0	3532.5	*	1	1530	187	0.	0	3532.5
1	0425	54	2123.	286.2	3558.9	*	1	1000	121	0.	.0	3532.5	*	1	1535	188	0.	0	3532.5
1	0430	55	2128.	288.5	3559.0	*	1	1005	122	0.	.0	3532.5	*	1	1540	189	0.	0	3532.5
1	0435	56	2130.	289.5	3559.1	*	1	1010	123	0.	.0	3532.5	*	1	1545	190	0.	0	3532.5
1	0440	57	2131.	290.3	3559.1	*	1	1015	124	0.	.0	3532.5	*	1	1550	191	0.	0	3532.5
1	0445	58	2133.	291.2	3559.1	*	1	1020	125	0.	.0	3532.5	*	1	1555	192	0.	0	3532.5
1	0450	59	2135.	292.1	3559.2	*	1	1025	126	0.	.0	3532.5	*	1	1600	193	0.	0	3532.5
1	0455	60	2136.	292.5	3559.2	*	1	1030	127	0.	.0	3532.5	*	1	1605	194	0.	0	3532.5
1	0500	61	2136.	292.5	3559.2	*	1	1035	128	0.	.0	3532.5	*	1	1610	195	0.	0	3532.5
1	0505	62	2134.	291.8	3559.2	*	1	1040	129	0.	.0	3532.5	*	1	1615	196	0.	0	3532.5
1	0510	63	2131.	290.0	3559.1	*	1	1045	130	0.	.0	3532.5	*	1	1620	197	0.	0	3532.5
1	0515	64	2124.	286.7	3558.9	*	1	1050	131	0.	.0	3532.5	*	1	1625	198	0.	0	3532.5
1	0520	65	2115.	281.8	3558.7	*	1	1055	132	0.	.0	3532.5	*	1	1630	199	0.	0	3532.5
1	0525	66	2103.	275.6	3558.5	*	1	1100	133	0.	.0	3532.5	*	1	1635	200	0.	0	3532.5
1	0530	67	2088.	268.4	3558.2	*	1	1105	134	0.	.0	3532.5	*	1					

PEAK FLOW	TIME	6-HR	24-HR	72-HR	16.58-HR
+	(CFS)	(HR)			
+	2136.	5.00			
	(CFS)				
	(INCHES)				
	(AC-FT)				
		1373.	511.	511.	511.
		1.893	1.945	1.945	1.945
		681.	700.	700.	700.
PEAK STORAGE	TIME	6-HR	24-HR	72-HR	16.58-HR
+	(AC-FT)	(HR)			
+	292.	5.00			
		136.	49.	49.	49.
PEAK STAGE	TIME	6-HR	24-HR	72-HR	16.58-HR
+	(FEET)	(HR)			
+	3559.18	5.00			
		3548.62	3538.51	3538.51	3538.51
CUMULATIVE AREA =		6.74 SQ MI			

HYDROGRAPH AT STATION SUMSDB
PLAN 1, RATIO = .55

DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE
1	0000	1	0.	0.	0	3532.5	*	1	0535	68	1063.	63.3	3543.8	*	1	1110	135	0.	0	3532.5
1	0005	2	0.	0.	0	3532.5	*	1	0540	69	981.	59.3	3543.0	*	1	1115	136	0.	0	3532.5
1	0010	3	0.	0.	0	3532.5	*	1	0545	70	966.	55.2	3542.8	*	1	1120	137	0.	0	3532.5
1	0015	4	0.	0.	0	3532.5	*	1	0550	71	951.	50.8	3542.6	*	1	1125	138	0.	0	3532.5
1	0020	5	0.	0.	0	3532.5	*	1	0555	72	934.	46.3	3542.4	*	1	1130	139	0.	0	3532.5
1	0025	6	0.	0.	0	3532.5	*	1	0600	73	918.	41.6	3542.2	*	1	1135	140	0.	0	3532.5
1	0030	7	0.	0.	0	3532.5	*	1	0605	74	900.	36.8	3542.0	*	1	1140	141	0.	0	3532.5
1	0035	8	0.	0.	0	3532.5	*	1	0610	75	841.	32.1	3541.3	*	1	1145	142	0.	0	3532.5
1	0040	9	1.	0.	0	3532.5	*	1	0615	76	781.	27.7	3540.6	*	1	1150	143	0.	0	3532.5
1	0045	10	1.	0.	0	3532.5	*	1	0620	77	719.	23.5	3539.9	*	1	1155	144	0.	0	3532.5
1	0050	11	1.	0.	0	3532.5	*	1	0625	78	644.	19.6	3539.3	*	1	1200	145	0.	0	3532.5
1	0055	12	1.	0.	0	3532.5	*	1	0630	79	571.	16.1	3538.6	*	1	1205	146	0.	0	3532.5
1	0100	13	1.	0.	0	3532.5	*	1	0635	80	502.	13.0	3538.0	*	1	1210	147	0.	0	3532.5
1	0105	14	1.	0.	0	3532.5	*	1	0640	81	434.	10.2	3537.4	*	1	1215	148	0.	0	3532.5
1	0110	15	1.	0.	0	3532.5	*	1	0645	82	372.	7.9	3536.8	*	1	1220	149	0.	0	3532.5
1	0115	16	1.	0.	0	3532.5	*	1	0650	83	311.	5.8	3536.3	*	1	1225	150	0.	0	3532.5
1	0120	17	1.	0.	0	3532.5	*	1	0655	84	260.	4.0	3535.8	*	1	1230	151	0.	0	3532.5
1	0125	18	2.	0.	0	3532.5	*	1	0700	85	217.	2.6	3535.3	*	1	1235	152	0.	0	3532.5
1	0130	19	4.	0.	0	3532.6	*	1	0705	86	160.	1.4	3534.6	*	1	1240	153	0.	0	3532.5
1	0135	20	7.	1.	0	3532.6	*	1	0710	87	82.	.7	3533.6	*	1	1245	154	0.	0	3532.5
1	0140	21	11.	1.	0	3532.6	*	1	0715	88	45.	.4	3533.1	*	1	1250	155	0.	0	3532.5
1	0145	22	16.	1.	0	3532.7	*	1	0720	89	27.	.2	3532.8	*	1	1255	156	0.	0	3532.5

1	0150	23	21.	.2	3532.8	*	1	0725	90	17.	.2	3532.7	*	1	1300	157	0.	.0	3532.5
1	0155	24	25.	.2	3532.8	*	1	0730	91	12.	.1	3532.7	*	1	1305	158	0.	.0	3532.5
1	0200	25	29.	.3	3532.9	*	1	0735	92	8.	.1	3532.6	*	1	1310	159	0.	.0	3532.5
1	0205	26	32.	.3	3532.9	*	1	0740	93	6.	.1	3532.5	*	1	1315	160	0.	.0	3532.5
1	0210	27	34.	.3	3532.9	*	1	0745	94	5.	.0	3532.6	*	1	1320	161	0.	.0	3532.5
1	0215	28	37.	.3	3533.0	*	1	0750	95	4.	.0	3532.5	*	1	1325	162	0.	.0	3532.5
1	0220	29	44.	.4	3533.1	*	1	0755	96	3.	.0	3532.5	*	1	1330	163	0.	.0	3532.5
1	0225	30	55.	.5	3533.2	*	1	0800	97	2.	.0	3532.5	*	1	1335	164	0.	.0	3532.5
1	0230	31	69.	.6	3533.4	*	1	0805	98	2.	.0	3532.5	*	1	1340	165	0.	.0	3532.5
1	0235	32	86.	.8	3533.6	*	1	0810	99	1.	.0	3532.5	*	1	1345	166	0.	.0	3532.5
1	0240	33	103.	.9	3533.8	*	1	0815	100	1.	.0	3532.5	*	1	1350	167	0.	.0	3532.5
1	0245	34	118.	1.1	3534.0	*	1	0820	101	1.	.0	3532.5	*	1	1355	168	0.	.0	3532.5
1	0250	35	129.	1.2	3534.2	*	1	0825	102	1.	.0	3532.5	*	1	1400	169	0.	.0	3532.5
1	0255	36	136.	1.2	3534.3	*	1	0830	103	0.	.0	3532.5	*	1	1405	170	0.	.0	3532.5
1	0300	37	143.	1.3	3534.4	*	1	0835	104	0.	.0	3532.5	*	1	1410	171	0.	.0	3532.5
1	0305	38	156.	1.4	3534.5	*	1	0840	105	0.	.0	3532.5	*	1	1415	172	0.	.0	3532.5
1	0310	39	177.	1.6	3534.6	*	1	0845	106	0.	.0	3532.5	*	1	1420	173	0.	.0	3532.5
1	0315	40	200.	2.0	3535.1	*	1	0850	107	0.	.0	3532.5	*	1	1425	174	0.	.0	3532.5
1	0320	41	232.	3.1	3535.5	*	1	0855	108	0.	.0	3532.5	*	1	1430	175	0.	.0	3532.5
1	0325	42	312.	5.6	3536.3	*	1	0900	109	0.	.0	3532.5	*	1	1435	176	0.	.0	3532.5
1	0330	43	472.	11.7	3537.7	*	1	0905	110	0.	.0	3532.5	*	1	1440	177	0.	.0	3532.5
1	0335	44	698.	22.4	3539.8	*	1	0910	111	0.	.0	3532.5	*	1	1445	178	0.	.0	3532.5
1	0340	45	901.	37.1	3542.0	*	1	0915	112	0.	.0	3532.5	*	1	1450	179	0.	.0	3532.5
1	0345	46	959.	53.2	3542.7	*	1	0920	113	0.	.0	3532.5	*	1	1455	180	0.	.0	3532.5
1	0350	47	1158.	67.7	3544.8	*	1	0925	114	0.	.0	3532.5	*	1	1500	181	0.	.0	3532.5
1	0355	48	1380.	79.1	3547.1	*	1	0930	115	0.	.0	3532.5	*	1	1505	182	0.	.0	3532.5
1	0400	49	1445.	87.8	3547.9	*	1	0935	116	0.	.0	3532.5	*	1	1510	183	0.	.0	3532

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
+ (CFS)	(HR)	6-HR	24-HR	72-HR	16.58-HR
+ 1548.	4.33	(CFS) 665.	241.	241.	241.
		(INCHES) .917	.918	.918	.918
		(AC-FT) 330.	330.	330.	330.
PEAK STORAGE	TIME	MAXIMUM AVERAGE STORAGE			
+ (AC-FT)	(HR)	6-HR	24-HR	72-HR	16.58-HR
+ 102.	4.33	35.	13.	13.	13.
PEAK STAGE	TIME	MAXIMUM AVERAGE STAGE			
+ (FEET)	(HR)	6-HR	24-HR	72-HR	16.58-HR
+ 3549.19	4.33	3539.70	3535.11	3535.11	3535.11
		CUMULATIVE AREA =		6.74 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 1.00	RATIO 2 .98	RATIO 3 .95	RATIO 4 .93	RATIO 5 .92	RATIO 6 .91	RATIO 7 .89	RATIO 8 .88	RATIO 9 .85	
HYDROGRAPH AT +	DB54-1	2.22	1	FLOW TIME	2586. 3.92	2499. 3.92	2412. 3.92	2325. 3.92	2290. 3.92	2265. 3.92	2220. 3.92	2186. 3.92	1052. 3.92
ROUTED TO +	RDB54-1	2.22	1	FLOW TIME	2594. 4.00	2449. 4.00	2363. 4.00	2278. 4.00	2244. 4.00	2220. 4.00	2176. 4.00	2142. 4.00	1031. 4.00
HYDROGRAPH AT +	DB54-5	.23	1	FLOW TIME	464. 3.50	448. 3.50	431. 3.50	415. 3.50	409. 3.50	404. 3.50	396. 3.50	389. 3.50	180. 3.50
2 COMBINED AT +	CDB54-5	2.45	1	FLOW TIME	2622. 4.00	2534. 4.00	2446. 4.00	2358. 4.00	2322. 4.00	2298. 4.00	2252. 4.00	2217. 4.00	1069. 4.00

ROUTED TO													
+	RCDB54-5	2.45	1	FLOW TIME	2615. 4.08	2500. 4.08	2416. 4.08	2358. 4.08	2295. 4.08	2264. 4.08	2237. 4.08	2220. 4.08	1066. 4.17
HYDROGRAPH AT													
+	DB54-2	.29	1	FLOW TIME	652. 3.50	631. 3.50	609. 3.50	587. 3.50	579. 3.50	573. 3.50	561. 3.50	553. 3.50	269. 3.50
ROUTED TO													
+	RDB54-2	.29	1	FLOW TIME	606. 3.58	587. 3.58	555. 3.58	548. 3.58	540. 3.58	534. 3.58	524. 3.58	516. 3.58	252. 3.58
HYDROGRAPH AT													
+	DB54-3	.52	1	FLOW TIME	1129. 3.50	1091. 3.50	1054. 3.50	1016. 3.50	1001. 3.50	991. 3.50	971. 3.50	956. 3.50	465. 3.50
ROUTED TO													
+	RDB54-3	.52	1	FLOW TIME	984. 3.58	951. 3.58	918. 3.58	885. 3.58	872. 3.58	862. 3.58	845. 3.58	832. 3.58	401. 3.58
HYDROGRAPH AT													
+	DB54-4	.20	1	FLOW TIME	374. 3.58	361. 3.58	348. 3.58	336. 3.58	331. 3.58	327. 3.58	320. 3.58	315. 3.58	151. 3.58
3 COMBINED AT													
+	CDB54-4	1.01	1	FLOW TIME	1964. 3.58	1899. 3.58	1821. 3.58	1768. 3.58	1742. 3.58	1724. 3.58	1690. 3.58	1664. 3.58	804. 3.58
ROUTED TO													
+	RCDB54-4	1.01	1	FLOW TIME	1867. 3.58	1808. 3.58	1717. 3.58	1664. 3.58	1640. 3.58	1629. 3.58	1587. 3.58	1565. 3.58	776. 3.67
2 COMBINED AT													
+	CRCDB544	3.46	1	FLOW TIME	3243. 3.67	3152. 3.67	2959. 3.67	2909. 3.67	2851. 3.67	2831. 3.67	2768. 3.67	2741. 3.67	1320. 3.92
ROUTED TO													
+	RCRCDB54	3.46	1	FLOW TIME	3224. 3.92	3100. 3.92	2987. 3.92	2899. 3.92	2837. 3.92	2803. 3.75	2760. 3.92	2730. 3.92	1310. 4.00
HYDROGRAPH AT													
+	DB54-6R	.84	1	FLOW TIME	1062. 3.75	1024. 3.75	986. 3.75	948. 3.75	933. 3.75	922. 3.75	902. 3.75	887. 3.75	401. 3.75
2 COMBINED AT													
+	CDB54-6R	4.30	1	FLOW TIME	4265. 3.75	4121. 3.75	3961. 3.75	3809. 3.75	3760. 3.75	3725. 3.75	3628. 3.75	3570. 3.75	1661. 3.92
HYDROGRAPH AT													
+	DB55-1	.64	1	FLOW TIME	1157. 3.58	1118. 3.58	1079. 3.58	1040. 3.58	1025. 3.58	1014. 3.58	994. 3.58	979. 3.58	471. 3.58
ROUTED TO													
+	RDB55-1	.64	1	FLOW TIME	1114. 3.67	1083. 3.67	1046. 3.67	1004. 3.67	997. 3.67	980. 3.67	968. 3.67	946. 3.67	465. 3.67
HYDROGRAPH AT													
+	DB55-2	.10	1	FLOW TIME	191. 3.58	185. 3.58	178. 3.58	172. 3.58	170. 3.58	168. 3.58	165. 3.58	162. 3.58	81. 3.58
2 COMBINED AT													
+	CDB55-2	.74	1	FLOW TIME	1282. 3.58	1238. 3.67	1197. 3.67	1149. 3.67	1140. 3.67	1122. 3.67	1107. 3.67	1083. 3.67	535. 3.67
ROUTED TO													
+	RDB55-2	.74	1	FLOW TIME	1276. 3.67	1237. 3.67	1196. 3.67	1147. 3.67	1139. 3.67	1121. 3.67	1107. 3.67	1080. 3.67	525. 3.67
HYDROGRAPH AT													
+	DB55-3	.26	1	FLOW TIME	623. 3.50	602. 3.50	581. 3.50	561. 3.50	553. 3.50	547. 3.50	536. 3.50	528. 3.50	258. 3.50
ROUTED TO													
+	RDB55-3	.26	1	FLOW TIME	588. 3.50	567. 3.50	547. 3.50	527. 3.50	518. 3.50	514. 3.50	503. 3.50	497. 3.50	235. 3.50
HYDROGRAPH AT													
+	DB55-4	.17	1	FLOW TIME	308. 3.58	297. 3.58	286. 3.58	275. 3.58	271. 3.58	268. 3.58	262. 3.58	258. 3.58	118. 3.58
2 COMBINED AT													
+	CDB55-4	.43	1	FLOW TIME	871. 3.50	839. 3.50	809. 3.50	778. 3.50	765. 3.50	758. 3.50	742. 3.50	732. 3.50	338. 3.50
ROUTED TO													
+	RDB55-4	.43	1	FLOW TIME	825. 3.58	795. 3.58	766. 3.58	738. 3.58	723. 3.58	720. 3.58	702. 3.58	694. 3.58	333. 3.58
HYDROGRAPH AT													
+	DB55-5	.19	1	FLOW TIME	342. 3.58	330. 3.58	318. 3.58	307. 3.58	302. 3.58	299. 3.58	293. 3.58	288. 3.58	136. 3.58
2 COMBINED AT													
+	CDB55-5	.62	1	FLOW TIME	1167. 3.58	1125. 3.58	1085. 3.58	1045. 3.58	1025. 3.58	1019. 3.58	995. 3.58	982. 3.58	469. 3.58

2 COMBINED AT													
+	CCDB55-5	1.36	1	FLOW	2401.	2317.	2229.	2146.	2111.	2089.	2046.	2014.	942.
				TIME	3.58	3.58	3.58	3.58	3.58	3.58	3.58	3.58	3.58
ROUTED TO													
+	RDB55-5	1.36	1	FLOW	2307.	2284.	2173.	2057.	2063.	2071.	1967.	1943.	945.
				TIME	3.67	3.67	3.67	3.67	3.67	3.67	3.67	3.67	3.67
HYDROGRAPH AT													
+	DB55-7	.44	1	FLOW	740.	716.	692.	668.	659.	652.	640.	630.	317.
				TIME	3.67	3.67	3.67	3.67	3.67	3.67	3.67	3.67	3.67
ROUTED TO													
+	RDB55-7	.44	1	FLOW	688.	666.	643.	621.	612.	606.	594.	585.	292.
				TIME	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75
HYDROGRAPH AT													
+	DB55-6	.10	1	FLOW	210.	204.	198.	191.	189.	187.	184.	181.	98.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50
ROUTED TO													
+	RDB55-6	.10	1	FLOW	179.	174.	168.	163.	161.	159.	157.	155.	83.
				TIME	3.67	3.67	3.67	3.67	3.67	3.67	3.67	3.67	3.67
HYDROGRAPH AT													
+	DB55-8	.55	1	FLOW	1012.	980.	948.	916.	903.	894.	877.	864.	439.
				TIME	3.58	3.58	3.58	3.58	3.58	3.58	3.58	3.58	3.58
4 COMBINED AT													
+	CDB55-8	2.45	1	FLOW	4039.	3960.	3795.	3624.	3608.	3600.	3468.	3421.	1698.
				TIME	3.67	3.67	3.67	3.67	3.67	3.67	3.67	3.67	3.67
2 COMBINED AT													
+	SUM5IN	6.74	1	FLOW	8198.	7992.	7640.	7331.	7250.	7215.	7001.	6998.	3301.
				TIME	3.67	3.67	3.67	3.67	3.67	3.67	3.67	3.67	3.75
ROUTED TO													
+	SUM5DB	6.74	1	FLOW	2303.	2266.	2228.	2193.	2179.	2169.	2149.	2136.	1548.
				TIME	5.08	5.08	5.00	5.00	5.00	5.00	5.00	5.00	4.33
** PEAK STAGES IN FEET **													
	1	STAGE	3562.73	3561.95	3561.16	3560.40	3560.10	3559.90	3559.48	3559.18	3549.19		
		TIME	5.08	5.08	5.00	5.00	5.00	5.00	5.00	5.00	5.00	4.33	
ROUTED TO													
+	SUM50T	6.74	1	FLOW	2302.	2266.	2228.	2193.	2179.	2169.	2149.	2136.	1548.
				TIME	5.08	5.08	5.00	5.00	5.00	5.00	5.00	5.00	4.33
HYDROGRAPH AT													
+	SWAA-1	.24	1	FLOW	326.	318.	304.	293.	289.	286.	280.	276.	134.
				TIME	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75
2 COMBINED AT													
+	CSWAA-1	6.98	1	FLOW	2381.	2342.	2303.	2266.	2251.	2241.	2220.	2205.	1593.
				TIME	5.00	5.00	4.92	4.92	4.92	4.92	4.92	4.92	4.25
ROUTED TO													
+	RCSWAA-1	6.98	1	FLOW	2380.	2342.	2303.	2265.	2250.	2240.	2220.	2205.	1591.
				TIME	5.00	5.00	5.00	4.92	4.92	4.92	4.92	4.92	4.25
HYDROGRAPH AT													
+	ST-CR	.03	1	FLOW	48.	47.	46.	44.	44.	43.	43.	42.	24.
				TIME	3.67	3.67	3.67	3.67	3.67	3.67	3.67	3.67	3.67
HYDROGRAPH AT													
+	S-9A1	.06	1	FLOW	126.	122.	119.	115.	114.	113.	111.	109.	60.
				TIME	3.58	3.58	3.58	3.58	3.58	3.58	3.58	3.58	3.58
3 COMBINED AT													
+	C-CR	7.07	1	FLOW	2411.	2372.	2332.	2294.	2279.	2269.	2248.	2233.	1602.
				TIME	4.92	4.92	4.92	4.92	4.92	4.92	4.92	4.92	4.25
HYDROGRAPH AT													
+	X	.04	1	FLOW	70.	68.	65.	63.	62.	62.	60.	60.	30.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50
ROUTED TO													
+	R/X	.04	1	FLOW	68.	66.	64.	62.	61.	60.	59.	59.	30.
				TIME	3.58	3.58	3.58	3.58	3.58	3.58	3.58	3.58	3.58
HYDROGRAPH AT													
+	W	.04	1	FLOW	74.	72.	70.	67.	66.	66.	65.	64.	32.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50
2 COMBINED AT													
+	P/O	.07	1	FLOW	139.	134.	130.	125.	123.	122.	120.	118.	61.
				TIME	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.58
ROUTED TO													
+	R/P/O	.07	1	FLOW	137.	133.	129.	124.	122.	121.	119.	117.	60.
				TIME	3.58	3.58	3.58	3.58	3.58	3.58	3.58	3.58	3.58
HYDROGRAPH AT													
+	V	.04	1	FLOW	77.	74.	72.	69.	68.	68.	66.	65.	33.

				TIME	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50
2 COMBINED AT													
+	PT1	.11	1	FLOW TIME	211.3.58	204.3.58	198.3.58	191.3.58	188.3.58	186.3.58	183.3.58	180.3.58	93.3.58
ROUTED TO													
+	R/PT1	.11	1	FLOW TIME	208.3.58	201.3.58	196.3.58	190.3.58	185.3.58	183.3.58	182.3.58	178.3.58	89.3.58
HYDROGRAPH AT													
+	U	.04	1	FLOW TIME	75.3.50	73.3.50	70.3.50	68.3.50	67.3.50	66.3.50	65.3.50	64.3.50	33.3.58
2 COMBINED AT													
+	PT2	.15	1	FLOW TIME	282.3.58	274.3.58	266.3.58	257.3.58	252.3.58	249.3.58	247.3.58	241.3.58	123.3.58
HYDROGRAPH AT													
+	ST1	.01	1	FLOW TIME	26.3.58	25.3.58	25.3.58	24.3.58	24.3.58	23.3.58	23.3.58	23.3.58	13.3.58
2 COMBINED AT													
+	PT3	.17	1	FLOW TIME	309.3.58	299.3.58	290.3.58	281.3.58	276.3.58	273.3.58	270.3.58	264.3.58	136.3.58
2 COMBINED AT													
+	PT3A	7.23	1	FLOW TIME	2503.3.83	2462.3.83	2418.3.83	2373.3.83	2356.3.83	2344.3.83	2315.3.83	2298.3.83	1619.4.17
HYDROGRAPH AT													
+	T	.05	1	FLOW TIME	87.3.58	84.3.58	81.3.58	78.3.58	77.3.58	76.3.58	75.3.58	74.3.58	38.3.58
2 COMBINED AT													
+	PT4	7.28	1	FLOW TIME	2538.3.83	2497.3.83	2452.3.83	2405.3.83	2388.3.83	2376.3.83	2346.3.83	2328.3.83	1624.4.17
HYDROGRAPH AT													
+	COS-5	.01	1	FLOW TIME	13.3.58	13.3.58	12.3.58	11.3.58	11.3.58	11.3.58	11.3.58	10.3.58	3.3.58
2 COMBINED AT													
+	PT5	7.29	1	FLOW TIME	2545.3.83	2503.3.83	2458.3.83	2411.3.83	2394.3.83	2382.3.83	2352.3.83	2334.3.83	1625.4.17
HYDROGRAPH AT													
+	Q2	.02	1	FLOW TIME	40.3.50	39.3.50	38.3.50	36.3.50	36.3.50	35.3.50	35.3.50	34.3.50	17.3.50
2 COMBINED AT													
+	PT5A	7.32	1	FLOW TIME	2559.3.83	2517.3.83	2471.3.83	2424.3.83	2407.3.83	2394.3.83	2364.3.83	2346.3.83	1627.4.17
HYDROGRAPH AT													
+	ST-AL	.02	1	FLOW TIME	43.3.58	42.3.58	40.3.58	39.3.58	39.3.58	38.3.58	38.3.58	37.3.58	21.3.58
2 COMBINED AT													
+	CP-AL	7.34	1	FLOW TIME	2580.3.75	2534.3.83	2488.3.83	2441.3.83	2423.3.83	2411.3.83	2380.3.83	2362.3.83	1630.4.17
HYDROGRAPH AT													
+	Y	.04	1	FLOW TIME	75.3.50	73.3.50	70.3.50	68.3.50	67.3.50	66.3.50	65.3.50	64.3.50	33.3.50
ROUTED TO													
+	R/Y	.04	1	FLOW TIME	73.3.58	71.3.58	68.3.58	66.3.58	65.3.58	65.3.58	63.3.58	63.3.58	33.3.58
HYDROGRAPH AT													
+	Z	.04	1	FLOW TIME	80.3.50	78.3.50	75.3.50	73.3.50	72.3.50	71.3.50	70.3.50	69.3.50	36.3.50
2 COMBINED AT													
+	PT6	.08	1	FLOW TIME	149.3.50	145.3.50	140.3.50	135.3.50	133.3.50	132.3.50	130.3.50	128.3.50	66.3.58
HYDROGRAPH AT													
+	ST2	.01	1	FLOW TIME	17.3.50	16.3.50	16.3.50	15.3.50	15.3.50	15.3.50	15.3.50	14.3.50	8.3.50
2 COMBINED AT													
+	PT7	.08	1	FLOW TIME	166.3.50	161.3.50	156.3.50	151.3.50	148.3.50	147.3.50	144.3.50	142.3.50	73.3.50
ROUTED TO													
+	R/PT7	.08	1	FLOW TIME	159.3.58	155.3.58	150.3.58	144.3.58	143.3.58	141.3.58	139.3.58	137.3.58	72.3.58
HYDROGRAPH AT													
+	NP-2	.02	1	FLOW TIME	21.3.50	20.3.50	19.3.50	18.3.50	18.3.50	17.3.50	17.3.50	16.3.50	5.3.58
2 COMBINED AT													

+	PT8	.10	1	FLOW TIME	179. 3.58	173. 3.58	167. 3.58	161. 3.58	159. 3.58	157. 3.58	155. 3.58	152. 3.58	77. 3.58
ROUTED TO													
+	R/PT8	.10	1	FLOW TIME	177. 3.58	171. 3.58	165. 3.58	160. 3.58	158. 3.58	155. 3.58	153. 3.58	150. 3.58	75. 3.58
HYDROGRAPH AT													
+	R	.04	1	FLOW TIME	77. 3.50	74. 3.50	72. 3.50	69. 3.50	68. 3.50	68. 3.50	67. 3.50	66. 3.50	33. 3.50
2 COMBINED AT													
+	PT9A	.14	1	FLOW TIME	251. 3.58	243. 3.58	234. 3.58	226. 3.58	224. 3.58	220. 3.58	217. 3.58	213. 3.58	107. 3.58
HYDROGRAPH AT													
+	ES-2	.02	1	FLOW TIME	49. 3.50	48. 3.50	46. 3.50	45. 3.50	44. 3.50	44. 3.50	43. 3.50	43. 3.50	24. 3.50
ROUTED TO													
+	R/ES-2	.02	1	FLOW TIME	46. 3.50	45. 3.50	44. 3.50	42. 3.50	42. 3.50	41. 3.50	41. 3.50	40. 3.50	22. 3.50
HYDROGRAPH AT													
+	S	.03	1	FLOW TIME	60. 3.50	58. 3.50	56. 3.50	54. 3.50	54. 3.50	53. 3.50	52. 3.50	51. 3.50	26. 3.50
2 COMBINED AT													
+	PT9B	.05	1	FLOW TIME	107. 3.50	103. 3.50	100. 3.50	97. 3.50	95. 3.50	94. 3.50	93. 3.50	91. 3.50	47. 3.50
ROUTED TO													
+	R/PT9B	.05	1	FLOW TIME	101. 3.58	98. 3.58	97. 3.58	92. 3.58	92. 3.58	90. 3.58	88. 3.58	88. 3.58	46. 3.58
2 COMBINED AT													
+	PT9C	.19	1	FLOW TIME	352. 3.58	341. 3.58	331. 3.58	319. 3.58	316. 3.58	311. 3.58	305. 3.58	302. 3.58	153. 3.58
ROUTED TO													
+	R/PT9C	.19	1	FLOW TIME	350. 3.58	339. 3.58	329. 3.58	317. 3.58	314. 3.58	309. 3.58	303. 3.58	300. 3.58	151. 3.58
HYDROGRAPH AT													
+	Q1	.02	1	FLOW TIME	45. 3.50	44. 3.50	43. 3.50	41. 3.50	41. 3.50	40. 3.50	39. 3.50	39. 3.50	19. 3.50
2 COMBINED AT													
+	PT9D	.22	1	FLOW TIME	393. 3.58	380. 3.58	369. 3.58	355. 3.58	352. 3.58	346. 3.58	340. 3.58	336. 3.58	170. 3.58
ROUTED TO													
+	R/PT9D	.22	1	FLOW TIME	390. 3.58	377. 3.58	366. 3.58	352. 3.58	349. 3.58	344. 3.58	338. 3.58	334. 3.58	167. 3.58
HYDROGRAPH AT													
+	ST4	.01	1	FLOW TIME	21. 3.50	20. 3.50	20. 3.50	19. 3.50	19. 3.50	19. 3.50	19. 3.50	18. 3.50	10. 3.50
2 COMBINED AT													
+	PT10	.23	1	FLOW TIME	409. 3.58	396. 3.58	384. 3.58	370. 3.58	366. 3.58	361. 3.58	355. 3.58	350. 3.58	176. 3.58
HYDROGRAPH AT													
+	BB	.05	1	FLOW TIME	97. 3.50	94. 3.50	91. 3.50	88. 3.50	87. 3.50	86. 3.50	84. 3.50	83. 3.50	42. 3.50
ROUTED TO													
+	R/BB	.05	1	FLOW TIME	95. 3.67	92. 3.67	89. 3.67	87. 3.67	86. 3.67	85. 3.67	84. 3.67	82. 3.67	42. 3.67
HYDROGRAPH AT													
+	CC	.04	1	FLOW TIME	83. 3.58	81. 3.58	78. 3.58	75. 3.58	74. 3.58	74. 3.58	72. 3.58	71. 3.58	36. 3.58
2 COMBINED AT													
+	PT11	.09	1	FLOW TIME	169. 3.58	163. 3.58	157. 3.58	151. 3.58	149. 3.58	148. 3.58	145. 3.58	142. 3.58	70. 3.67
2 COMBINED AT													
+	PT12	.32	1	FLOW TIME	578. 3.58	559. 3.58	542. 3.58	521. 3.58	515. 3.58	508. 3.58	499. 3.58	493. 3.58	244. 3.58
HYDROGRAPH AT													
+	P	.04	1	FLOW TIME	67. 3.58	65. 3.58	63. 3.58	61. 3.58	60. 3.58	59. 3.58	58. 3.58	57. 3.58	29. 3.58
2 COMBINED AT													
+	PT13	.36	1	FLOW TIME	645. 3.58	624. 3.58	604. 3.58	582. 3.58	575. 3.58	568. 3.58	557. 3.58	550. 3.58	273. 3.58
HYDROGRAPH AT													
+	ST-DF	.02	1	FLOW TIME	33. 3.67	32. 3.67	31. 3.67	30. 3.67	30. 3.67	30. 3.67	29. 3.67	29. 3.67	16. 3.67

+	2 COMBINED AT													
	C-47	.38	1	FLOW TIME	676. 3.58	654. 3.58	634. 3.58	611. 3.58	604. 3.58	596. 3.58	585. 3.58	577. 3.58	288. 3.58	
+	2 COMBINED AT													
	C-47A	7.71	1	FLOW TIME	3109. 3.67	3038. 3.67	2966. 3.67	2884. 3.67	2858. 3.67	2830. 3.67	2787. 3.67	2750. 3.67	1699. 4.08	
+	HYDROGRAPH AT													
	SWFH-1	.56	1	FLOW TIME	893. 3.67	863. 3.67	833. 3.67	803. 3.67	791. 3.67	782. 3.67	766. 3.67	754. 3.67	362. 3.67	
+	ROUTED TO													
	RSWFH-1	.56	1	FLOW TIME	887. 3.67	859. 3.67	828. 3.67	796. 3.67	784. 3.67	776. 3.67	760. 3.67	748. 3.67	355. 3.67	
+	HYDROGRAPH AT													
	SWFH-2	.53	1	FLOW TIME	929. 3.67	901. 3.67	873. 3.67	846. 3.67	835. 3.67	827. 3.67	812. 3.67	801. 3.67	430. 3.67	
+	2 COMBINED AT													
	CSWFH-2	1.09	1	FLOW TIME	1816. 3.67	1760. 3.67	1701. 3.67	1642. 3.67	1619. 3.67	1603. 3.67	1572. 3.67	1549. 3.67	785. 3.67	
+	ROUTED TO													
	RCSWFH-2	1.09	1	FLOW TIME	1805. 3.67	1749. 3.67	1690. 3.67	1632. 3.67	1609. 3.67	1592. 3.67	1562. 3.67	1538. 3.67	775. 3.67	
+	HYDROGRAPH AT													
	SWFH-3	.15	1	FLOW TIME	321. 3.58	312. 3.58	303. 3.58	294. 3.58	291. 3.58	288. 3.58	284. 3.58	280. 3.58	160. 3.58	
+	2 COMBINED AT													
	CSWFH-3	1.25	1	FLOW TIME	2092. 3.67	2029. 3.67	1962. 3.67	1896. 3.67	1870. 3.67	1851. 3.67	1816. 3.67	1790. 3.67	921. 3.67	
+	ROUTED TO													
	RCSWFH-3	1.25	1	FLOW TIME	2080. 3.67	2014. 3.67	1950. 3.67	1881. 3.67	1857. 3.67	1837. 3.67	1804. 3.67	1775. 3.67	907. 3.67	
+	HYDROGRAPH AT													
	SWFH-6	.25	1	FLOW TIME	489. 3.58	475. 3.58	460. 3.58	446. 3.58	440. 3.58	436. 3.58	428. 3.58	422. 3.58	227. 3.58	
+	ROUTED TO													
	RSWFH-6	.25	1	FLOW TIME	479. 3.58	464. 3.58	450. 3.58	436. 3.58	430. 3.58	426. 3.58	418. 3.58	413. 3.50	219. 3.58	
+	HYDROGRAPH AT													
	SWFH-7	.31	1	FLOW TIME	629. 3.58	611. 3.58	593. 3.58	575. 3.58	568. 3.58	563. 3.58	553. 3.58	546. 3.58	302. 3.58	
+	2 COMBINED AT													
	CSWFH-6	.56	1	FLOW TIME	1108. 3.58	1076. 3.58	1043. 3.58	1011. 3.58	998. 3.58	989. 3.58	971. 3.58	959. 3.58	521. 3.58	
+	ROUTED TO													
	RCSWFH6	.56	1	FLOW TIME	1094. 3.58	1062. 3.58	1029. 3.58	998. 3.58	984. 3.58	976. 3.58	958. 3.58	946. 3.58	512. 3.58	
+	2 COMBINED AT													
	CSWFH-7	1.81	1	FLOW TIME	3085. 3.67	2989. 3.67	2897. 3.67	2798. 3.67	2763. 3.67	2735. 3.67	2686. 3.67	2646. 3.67	1389. 3.67	
+	HYDROGRAPH AT													
	SWFH-4	.12	1	FLOW TIME	196. 3.58	189. 3.58	182. 3.58	175. 3.58	172. 3.58	170. 3.58	166. 3.58	163. 3.58	73. 3.58	
+	ROUTED TO													
	RSWFH-4	.12	1	FLOW TIME	186. 3.58	178. 3.58	171. 3.58	165. 3.58	162. 3.58	160. 3.67	157. 3.67	153. 3.67	71. 3.67	
+	HYDROGRAPH AT													
	SWFH-5	.26	1	FLOW TIME	493. 3.58	478. 3.58	463. 3.58	448. 3.58	442. 3.58	438. 3.58	430. 3.58	424. 3.58	224. 3.58	
+	2 COMBINED AT													
	CSWFH-5	.38	1	FLOW TIME	679. 3.58	656. 3.58	634. 3.58	613. 3.58	604. 3.58	598. 3.58	587. 3.58	577. 3.58	290. 3.58	
+	ROUTED TO													
	RCSWFH-5	.38	1	FLOW TIME	653. 3.67	634. 3.67	612. 3.67	594. 3.67	585. 3.67	580. 3.67	570. 3.67	560. 3.67	291. 3.67	
+	HYDROGRAPH AT													
	ST3	.01	1	FLOW TIME	17. 3.50	17. 3.50	16. 3.50	16. 3.50	16. 3.50	15. 3.50	15. 3.50	15. 3.50	9. 3.50	
+	ROUTED TO													
	R/ST3	.01	1	FLOW TIME	16. 3.58	15. 3.58	15. 3.58	15. 3.58	14. 3.58	14. 3.58	14. 3.58	14. 3.58	8. 3.58	
+	HYDROGRAPH AT													
	AA	.03	1	FLOW TIME	63. 3.50	62. 3.50	60. 3.50	58. 3.50	57. 3.50	57. 3.50	56. 3.50	55. 3.50	31. 3.50	

ROUTED TO	R/AA	.03	1	FLOW TIME	61. 3.58	58. 3.58	57. 3.58	56. 3.58	55. 3.58	54. 3.58	54. 3.58	53. 3.58	30. 3.58
HYDROGRAPH AT	ST-FH	.02	1	FLOW TIME	44. 3.58	43. 3.58	42. 3.58	40. 3.58	40. 3.58	40. 3.58	39. 3.58	38. 3.58	22. 3.58
4 COMBINED AT	CP-FH	.43	1	FLOW TIME	765. 3.58	737. 3.58	715. 3.58	688. 3.58	679. 3.58	671. 3.58	659. 3.58	650. 3.58	339. 3.67
2 COMBINED AT	CCSWFH-7	2.24	1	FLOW TIME	3829. 3.67	3712. 3.67	3596. 3.67	3477. 3.67	3431. 3.67	3397. 3.67	3338. 3.67	3288. 3.67	1728. 3.67

1

SUMMARY OF KINEMATIC WAVE - MUSKINGUM-CUNGE ROUTING
(FLOW IS DIRECT RUNOFF WITHOUT BASE FLOW)

ISTAQ	ELEMENT	DT (MIN)	PEAK (CFS)	TIME TO PEAK (MIN)	VOLUME (IN)	DT (MIN)	INTERPOLATED TO COMPUTATION INTERVAL		VOLUME (IN)
							PEAK (CFS)	TIME TO PEAK (MIN)	
FOR PLAN = 1	RATIO=	.00							
RCDB54-5	MANE	4.70	2621.58	244.61	2.30	5.00	2614.97	245.00	2.30
CONTINUITY SUMMARY (AC-FT) - INFLOW= .3109E+03 EXCESS= .0000E+00 OUTFLOW= .3110E+03 BASIN STORAGE= .1245E-01 PERCENT ERROR= .0									
FOR PLAN = 1	RATIO=	.00							
RCDB54-5	MANE	4.77	2512.38	243.06	2.29	5.00	2499.95	245.00	2.29
CONTINUITY SUMMARY (AC-FT) - INFLOW= .2994E+03 EXCESS= .0000E+00 OUTFLOW= .2995E+03 BASIN STORAGE= .9871E-02 PERCENT ERROR= .0									
FOR PLAN = 1	RATIO=	.00							
RCDB54-5	MANE	4.83	2421.93	246.37	2.21	5.00	2415.79	245.00	2.21
CONTINUITY SUMMARY (AC-FT) - INFLOW= .2886E+03 EXCESS= .0000E+00 OUTFLOW= .2886E+03 BASIN STORAGE= .1267E-01 PERCENT ERROR= .0									
FOR PLAN = 1	RATIO=	.00							
RCDB54-5	MANE	4.90	2359.22	244.95	2.13	5.00	2358.38	245.00	2.13
CONTINUITY SUMMARY (AC-FT) - INFLOW= .2780E+03 EXCESS= .0000E+00 OUTFLOW= .2780E+03 BASIN STORAGE= .9866E-02 PERCENT ERROR= .0									
FOR PLAN = 1	RATIO=	.00							
RCDB54-5	MANE	4.93	2302.63	246.36	2.09	5.00	2294.92	245.00	2.09
CONTINUITY SUMMARY (AC-FT) - INFLOW= .2734E+03 EXCESS= .0000E+00 OUTFLOW= .2735E+03 BASIN STORAGE= .1213E-01 PERCENT ERROR= .0									
FOR PLAN = 1	RATIO=	.00							
RCDB54-5	MANE	4.95	2264.31	242.41	2.07	5.00	2263.73	245.00	2.07
CONTINUITY SUMMARY (AC-FT) - INFLOW= .2703E+03 EXCESS= .0000E+00 OUTFLOW= .2704E+03 BASIN STORAGE= .9679E-02 PERCENT ERROR= .0									
FOR PLAN = 1	RATIO=	.00							
RCDB54-5	MANE	4.99	2245.13	244.28	2.03	5.00	2237.27	245.00	2.03
CONTINUITY SUMMARY (AC-FT) - INFLOW= .2648E+03 EXCESS= .0000E+00 OUTFLOW= .2648E+03 BASIN STORAGE= .1113E-01 PERCENT ERROR= .0									
FOR PLAN = 1	RATIO=	.00							
RCDB54-5	MANE	5.00	2220.05	245.00	2.00	5.00	2220.05	245.00	2.00
CONTINUITY SUMMARY (AC-FT) - INFLOW= .2604E+03 EXCESS= .0000E+00 OUTFLOW= .2605E+03 BASIN STORAGE= .1369E-01 PERCENT ERROR= .0									
FOR PLAN = 1	RATIO=	.00							
RCDB54-5	MANE	5.00	1066.07	250.00	.94	5.00	1066.07	250.00	.94
CONTINUITY SUMMARY (AC-FT) - INFLOW= .1229E+03 EXCESS= .0000E+00 OUTFLOW= .1229E+03 BASIN STORAGE= .1286E-01 PERCENT ERROR= -.1									
FOR PLAN = 1	RATIO=	.00							
RDB54-2	MANE	3.50	639.46	213.50	2.33	5.00	605.93	215.00	2.32
CONTINUITY SUMMARY (AC-FT) - INFLOW= .3569E+02 EXCESS= .0000E+00 OUTFLOW= .3575E+02 BASIN STORAGE= .4009E-02 PERCENT ERROR= -.2									

FOR PLAN = 1	RATIO=	.00							
R/ST3	MANE	3.00	14.08	216.00	2.40	5.00	13.86	215.00	2.40
CONTINUITY SUMMARY (AC-FT) - INFLOW= .8241E+00 EXCESS= .0000E+00 OUTFLOW= .8247E+00 BASIN STORAGE= .5454E-03 PERCENT ERROR= -.1									
FOR PLAN = 1	RATIO=	.00							
R/ST3	MANE	3.50	7.95	217.00	1.34	5.00	7.85	215.00	1.33
CONTINUITY SUMMARY (AC-FT) - INFLOW= .4578E+00 EXCESS= .0000E+00 OUTFLOW= .4582E+00 BASIN STORAGE= .7546E-03 PERCENT ERROR= -.3									
FOR PLAN = 1	RATIO=	.00							
R/AA	MANE	2.19	62.94	212.30	2.61	5.00	60.66	215.00	2.61
CONTINUITY SUMMARY (AC-FT) - INFLOW= .4032E+01 EXCESS= .0000E+00 OUTFLOW= .4032E+01 BASIN STORAGE= .3066E-03 PERCENT ERROR= .0									
FOR PLAN = 1	RATIO=	.00							
R/AA	MANE	2.20	60.54	213.84	2.53	5.00	58.50	215.00	2.53
CONTINUITY SUMMARY (AC-FT) - INFLOW= .3907E+01 EXCESS= .0000E+00 OUTFLOW= .3908E+01 BASIN STORAGE= .3901E-03 PERCENT ERROR= .0									
FOR PLAN = 1	RATIO=	.00							
R/AA	MANE	2.22	59.02	213.22	2.45	5.00	56.96	215.00	2.45
CONTINUITY SUMMARY (AC-FT) - INFLOW= .3783E+01 EXCESS= .0000E+00 OUTFLOW= .3783E+01 BASIN STORAGE= .3431E-03 PERCENT ERROR= .0									
FOR PLAN = 1	RATIO=	.00							
R/AA	MANE	2.24	57.46	212.62	2.37	5.00	55.78	215.00	2.37
CONTINUITY SUMMARY (AC-FT) - INFLOW= .3662E+01 EXCESS= .0000E+00 OUTFLOW= .3663E+01 BASIN STORAGE= .4197E-03 PERCENT ERROR= .0									
FOR PLAN = 1	RATIO=	.00							
R/AA	MANE	2.25	56.51	213.29	2.34	5.00	54.57	215.00	2.34
CONTINUITY SUMMARY (AC-FT) - INFLOW= .3610E+01 EXCESS= .0000E+00 OUTFLOW= .3610E+01 BASIN STORAGE= .3549E-03 PERCENT ERROR= .0									
FOR PLAN = 1	RATIO=	.00							
R/AA	MANE	2.25	55.65	213.76	2.32	5.00	53.99	215.00	2.31
CONTINUITY SUMMARY (AC-FT) - INFLOW= .3578E+01 EXCESS= .0000E+00 OUTFLOW= .3578E+01 BASIN STORAGE= .3035E-03 PERCENT ERROR= .0									
FOR PLAN = 1	RATIO=	.00							
R/AA	MANE	2.26	55.40	212.40	2.28	5.00	53.72	215.00	2.28
CONTINUITY SUMMARY (AC-FT) - INFLOW= .3517E+01 EXCESS= .0000E+00 OUTFLOW= .3517E+01 BASIN STORAGE= .3335E-03 PERCENT ERROR= .0									
FOR PLAN = 1	RATIO=	.00							
R/AA	MANE	2.27	54.45	213.09	2.25	5.00	52.70	215.00	2.25
CONTINUITY SUMMARY (AC-FT) - INFLOW= .3465E+01 EXCESS= .0000E+00 OUTFLOW= .3466E+01 BASIN STORAGE= .3854E-03 PERCENT ERROR= .0									
FOR PLAN = 1	RATIO=	.00							
R/AA	MANE	2.62	30.39	212.49	1.20	5.00	30.21	215.00	1.21
CONTINUITY SUMMARY (AC-FT) - INFLOW= .1859E+01 EXCESS= .0000E+00 OUTFLOW= .1860E+01 BASIN STORAGE= .3820E-03 PERCENT ERROR= .0									

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

PARCEL T STUB

Worksheet for Facility 9

Project Description

Friction Method Manning Formula
Solve For Full Flow Diameter

Input Data

Roughness Coefficient	0.013
Channel Slope	2.00 %
Normal Depth	2.91 ft
Diameter	34.93 in
Discharge	87.00 ft ³ /s

Results

Diameter	34.93 in
Normal Depth	2.91 ft
Flow Area	6.65 ft ²
Wetted Perimeter	9.14 ft
Top Width	0.00 ft
Critical Depth	2.78 ft
Percent Full	100.0 %
Critical Slope	1.73718 %
Velocity	13.08 ft/s
Velocity Head	2.66 ft
Specific Energy	5.57 ft
Froude Number	0.00
Maximum Discharge	93.59 ft ³ /s
Discharge Full	87.00 ft ³ /s
Slope Full	2.00 %
Flow Type	SubCritical

GVF Input Data

Downstream Depth	0.00 ft
Length	0.00 ft
Number Of Steps	0

GVF Output Data

Upstream Depth	0.00 ft
Profile Description	
Profile Headloss	0.00 ft
Average End Depth Over Rise	0.00 %
Normal Depth Over Rise	100.00 %

Worksheet for Facility 9

GVF Output Data

Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	2.91	ft
Critical Depth	2.78	ft
Channel Slope	2.00	%
Critical Slope	1.73718	%

PARCEL Q2 STUB

Worksheet for Facility 11

Project Description

Friction Method Manning Formula
Solve For Full Flow Diameter

Input Data

Roughness Coefficient	0.013
Channel Slope	1.00 %
Normal Depth	2.48 ft
Diameter	29.72 in
Discharge	40.00 ft ³ /s

Results

Diameter	29.72 in
Normal Depth	2.48 ft
Flow Area	4.82 ft ²
Wetted Perimeter	7.78 ft
Top Width	0.00 ft
Critical Depth	2.13 ft
Percent Full	100.0 %
Critical Slope	0.92654 %
Velocity	8.30 ft/s
Velocity Head	1.07 ft
Specific Energy	3.55 ft
Froude Number	0.00
Maximum Discharge	43.03 ft ³ /s
Discharge Full	40.00 ft ³ /s
Slope Full	1.00 %
Flow Type	SubCritical

GVF Input Data

Downstream Depth	0.00 ft
Length	0.00 ft
Number Of Steps	0

GVF Output Data

Upstream Depth	0.00 ft
Profile Description	
Profile Headloss	0.00 ft
Average End Depth Over Rise	0.00 %
Normal Depth Over Rise	100.00 %

Worksheet for Facility 11

GVF Output Data

Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	2.48	ft
Critical Depth	2.13	ft
Channel Slope	1.00	%
Critical Slope	0.92654	%



MAYOR
OSCAR B. GOODMAN

CITY COUNCIL
GARY REESE
(MAYOR PRO-TEM)
MICHAEL J. McDONALD
LARRY BROWN
LYNETTE B. McDONALD
LAWRENCE WEEKLY
MICHAEL MACK

CITY MANAGER
VIRGINIA VALENTINE

May 7, 2002

John R. Tobin, P.E.
G. C. Wallace, Inc.
1555 South Rainbow Boulevard
Las Vegas, Nevada 89102

RE: Master Traffic Study and Addendum for Summerlin Villages 23A & 23B
TM-0006-02

Dear Mr. Tobin:

The Traffic Engineering Division has reviewed the master traffic study and addendum for Summerlin Villages 23A and 23B, to be located on the northwest corner of Charleston Boulevard and Desert Foothills Drive. This project consists of 3,107 single family detached dwelling units, 733 single family attached dwelling units, 924 multi-family dwelling units, three church sites, two elementary school sites and two park sites. The amended study is approved, with the following conditions:

1. The Nevada Department of Transportation (NDOT) and Clark County must approve all improvements on Charleston Boulevard.
2. The West Collector Road is not being constructed with this Village. This approval does not constitute approval of any character or cross-section for this street.
3. The four proposed roundabouts (at the four Loop Road/Spine Road intersections) must comply with FHWA guidelines unless an alternative design is approved by the City Traffic Engineer.
4. Corner channelizing islands may not be installed without the approval of the City Traffic Engineer. At this time, the proposed channelizing islands at the three Desert Foothills Drive intersections are not approved.
5. The proposed curb return flaring at 2-lane collector intersections in accordance with Figure 4 is acceptable.
6. Bus turnouts in accordance with Clark County Area Standard Drawing #234.1 are required on the downstream legs of the following intersections: Far Hills/West Collector, Far Hills/Desert Foothills, Alta/West Collector, Alta/Desert Foothills and Charleston/Desert Foothills. Easements in accordance with Clark County Area Standard Drawing #234.2 must be granted to the Regional Transportation Commission (RTC) at each of these turnouts at a location acceptable to the RTC for each bus stop prior to the installation of a bus stop at that location.

CITY OF LAS VEGAS
400 STEWART AVENUE
LAS VEGAS, NEVADA 89101

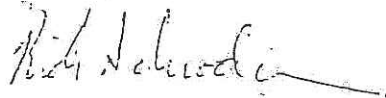
VOICE 702.229.5011
TDD 702.386.9103

7. At the intersection of Far Hills Avenue and Spine Road, additional right-of-way is required for an exclusive right turn lane on the south leg in accordance with Clark County Area Standard Drawing #201.1.
8. At the intersection of Far Hills Avenue and Link Road, additional right-of-way is required in accordance with Clark County Area Standard Drawing #201.1 for an exclusive right turn lane on the south leg and for a second left turn lane on the east and west legs.
9. At the intersection of Far Hills Avenue and Desert Foothills Drive, additional right-of-way is required in accordance with Clark County Area Standard Drawing #201.1 for an exclusive right turn lane on the south leg and for a second left turn lane on all legs.
10. At the intersection of Alta Drive and Spine Road, additional right-of-way is required for an exclusive right turn lane on the south and east legs in accordance with Clark County Area Standard Drawing #201.1.
11. At the intersection of Desert Sunrise Road and Desert Foothills Drive, additional right-of-way is required in accordance with Clark County Area Standard Drawing #201.1 for exclusive right turn lanes on the north, south and west legs and for a second left turn lane on the north and south legs. An acceptable transition may be proposed in lieu of a second left turn lane on the north leg.
12. At the intersection of Desert Sunrise Road (Spine Road) and Desert Foothills Drive, additional right-of-way is required in accordance with Clark County Area Standard Drawing #201.1 for exclusive right turn lanes on the north, south and west legs and for a second left turn lane on the north and south legs.
13. At the intersection of Charleston Boulevard and Desert Foothills Drive, additional right-of-way is required in accordance with Clark County Area Standard Drawing #201.1 for an exclusive right turn lane on the east leg and for a second left turn lane on the north leg. Comply with the requirements of NDOT and Clark County regarding additional right-of-way for turn lanes on the south side of Charleston Boulevard. If NDOT approves dropping a through lane westbound on Charleston Boulevard at Desert Foothills Drive, additional right-of-way may not be required for an exclusive right turn lane. The City of Las Vegas Traffic Engineering recommends right-of-way for a second left turn lane on the south leg to permit the opposing left turn lanes to align.
14. Underground conduit with appropriate pullboxes must be installed for the proposed school flashers on Spine Road near Loop Roads A and B.

15. The following intersections are anticipated to be signalized: Far Hills/West Collector, Far Hills/Spine, Far Hills/Link, Far Hills/Desert Foothills, Alta/West Collector, Alta/Spine, Alta/Desert Foothills, Desert Sunrise (Spine)/Desert Foothills, Charleston/West Collector, and Charleston/Desert Foothills. Appropriate underground improvements must be installed prior to or concurrent with the construction of any street improvements that would conflict.
16. A minimum of two lanes of pavement along Desert Foothills Drive to the existing pavement on Far Hills Avenue shall be completed prior to the issuance of building permits for more than 1150 dwelling units in Village 23A. When Desert Foothills Drive is completed from Charleston Boulevard to the Beltway, this limit may be raised to 1750 dwelling units.
17. Spine Road must be reevaluated if the number of proposed dwelling units in Village 23A exceeds 3250 or if the number of proposed dwelling units in Village 23B exceeds 3300.

This condition of approval does not supersede or eliminate conditions of approval imposed by the Planning Commission and/or the City Council. An addendum to this traffic study is required if the development of the site occurs in a manner not in keeping with the land use assumptions contained in the report. Please contact me at 229-2452 if you have any questions.

Sincerely,

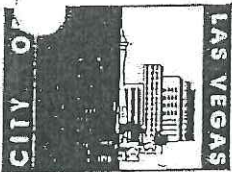


Rick Schroder, P.E.
Transportation Planning

RES

cc: O. C. White, P.E.
Wayne Dowdey, P.E.
Qiong Liu, P.E.
Cheri Edelman, P.E.
Gary Phillips
Kent Sears, P.E., NDOT
Denise LeMoine, P.E., CCTMD
David Yancey, RTC
file

PLANNING &
DEVELOPMENT



Development
Services Center

731 S. Fourth Street
Las Vegas, NV 89101

TDD 702-386-9108

Voice:

Administration 229-6353

Comp Planning 229-6022

Current Planning 229-6301

www.ci.las-vegas.nv.us

March 15, 2002

Mr. Gerald M. Robbins

The Howard Hughes Corporation, a Delaware Corporation
10000 West Charleston Boulevard, Suite #200
Las Vegas, Nevada 89135

RECEIVED

MAR 19 2002

G.C. WALLACE, INC.
SUMMERLIN

RE: *TENTATIVE MAP - SUMMERLIN VILLAGE-23A - TM-0006-02*

Dear Mr. Robbins:

Your request for a Tentative Map on 389.40 acres adjacent to the northwest corner of Charleston Boulevard and Desert Foothills Drive, PC (Planned Community) Zone, Ward 2 (L.B. McDonald), was considered by the Planning Commission on March 14, 2002.

The Planning Commission voted to *APPROVE* your request, subject to the following:

Planning and Development

1. Approval of the Tentative Map shall be for no more than two (2) years. If a Final Map is not recorded on all or a portion of the area embraced by the Tentative Map within two (2) years of the approval of the Tentative Map, a new Tentative Map must be filed.
2. All development shall conform to the Conditions of Approval for Rezoning (Z-0119-96), Summerlin Development Plan Review (SV-0018-01) and the Summerlin Development Standards.
3. Street names must be provided in accordance with the City's street naming regulations.
4. All development is subject to the conditions of City departments and State Subdivision Statutes.
5. A fully operational fire protection system, including fire apparatus roads, fire hydrants and water supply, shall be installed and shall be functioning prior to construction of any combustible structures.

Mayor
Oscar B. Goodman

City Council
Gary Reese
Mayor Pro-Tem:
Michael J. McDonald
Larry Brown
Lynette Boggs McDonald
Lawrence Weekly
Michael Mack

City Manager
Virginia Valentine



Mr. Gerald M. Robbins
TM-0006-02 - Page Two
March 15, 2002

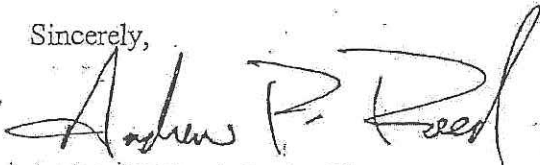
Public Works

6. Dedicate appropriate public street right-of-ways and construct public and private streets in accordance with Summerlin Development and Improvement Standards.
7. The location and design of all proposed roadway intersections with Charleston Boulevard shall meet the approval of the Nevada Department of Transportation.
8. A minimum of two lanes of pavement along Desert Foothills Drive to the existing pavement on Far Hills Avenue shall be completed prior to the development causing the intersection of Desert Foothills/Charleston Boulevard to exceed design capacity, as established in the Village Master Traffic Study.
9. The construction of the collector road on the western edge of this village may be deferred; final determination of construction requirements shall be determined at the time of approval of the Traffic Study for the future villages adjacent to the west edge of this site of at the time of approval of a Tentative Map for such future villages, whichever is first.
10. A Master Streetlight Plan for Summerlin Village 23 must be approved prior to the submittal of any improvement plans.
11. A Master Drainage Plan and Technical Drainage Study and a Master Traffic Impact Analysis must be approved by the Department of Public Works prior to the recordation of any Final Map creating any development pod sites anywhere on the overall tentative map subdivision site.
12. Site development to comply with all applicable conditions of approval for SV-18-01, Z-119-96, and all applicable Summerlin Standards.
13. The approval of all Public Works related improvements shown on this Tentative Map is in concept only. Specific design and construction details relating to size, type and/or alignment of public improvements, including but not limited to street, sewer and drainage improvements, shall be resolved prior to approval of the construction plans by the City. No deviations from adopted City Standards shall be allowed unless specific written approval for such is received from the City Engineer prior to the recordation of a Final Map or the approval of subdivision-related construction plans, whichever may occur first.

Mr. Gerald M. Robbins
TM-0006-02 - Page Three
March 15, 2002

This action by the Planning Commission on March 14, 2002 is final unless a written appeal is filed with the City Clerk within seven days of the date of the Planning Commission's decision or there is a review action filed by the City Council within the same time period.

Sincerely,

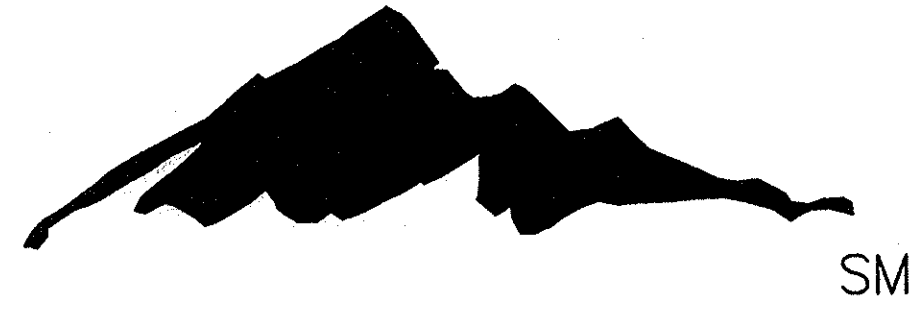
A handwritten signature in dark ink, appearing to read "Andrew P. Reed". The signature is fluid and cursive, with the first name "Andrew" and last name "Reed" clearly legible.

Andrew P. Reed, Senior Planner
Planning and Development Department
Current Planning Division

APR:clb

cc: Mr. Bert Hughes
G.C. Wallace, Inc.
10000 West Charleston Boulevard, Suite #130
Las Vegas, Nevada 89135

SUMMERLIN



VILLAGE 23A/23B ALTA DRIVE IMPROVEMENTS FOX HILL DRIVE TO DESERT FOOTHILLS DRIVE

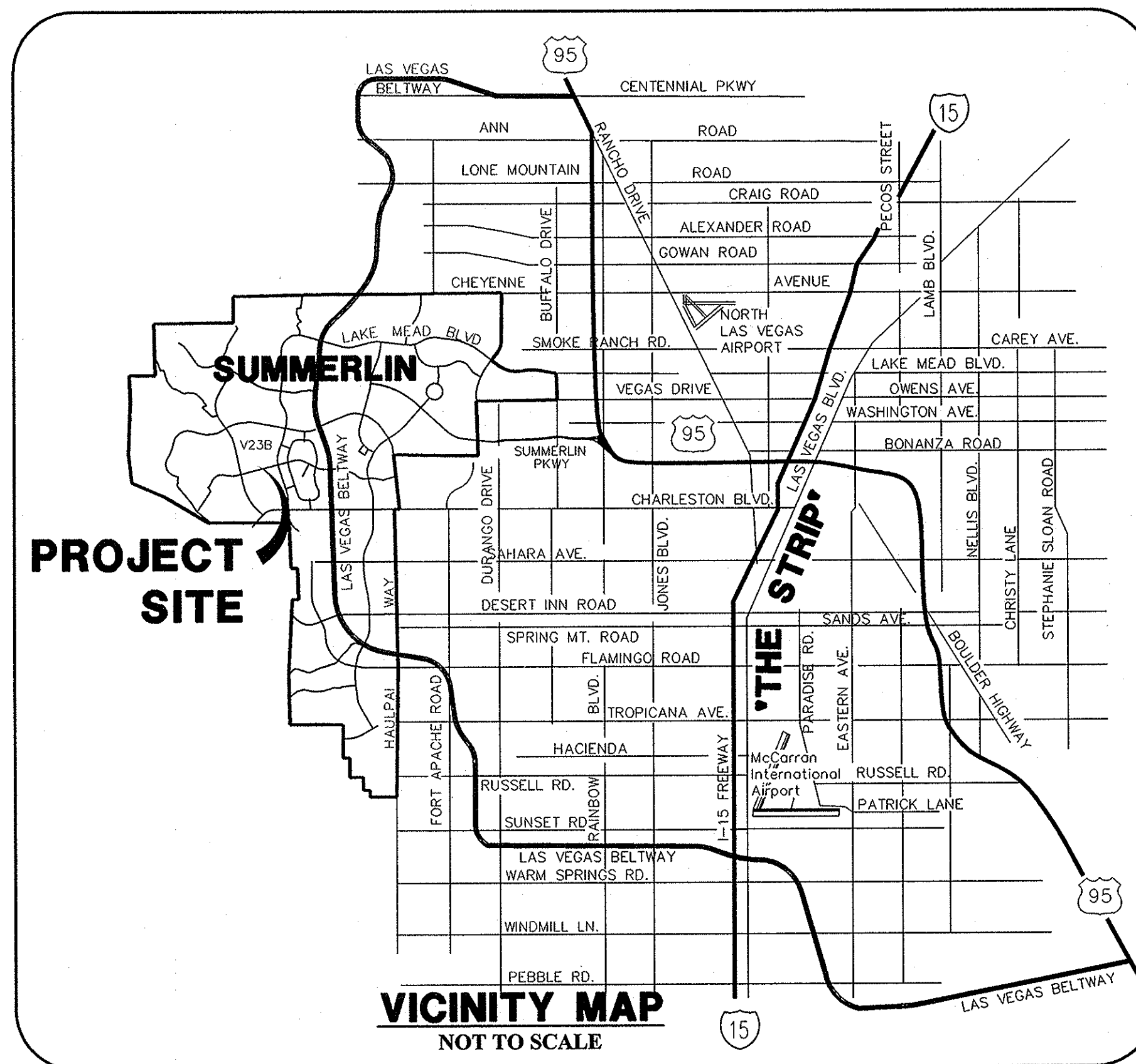
APN NUMBERS:

137-34-299-001, 137-34-517-001, 137-34-599-012, 137-34-599-013

SID #810 PROJECTS 6A, 6B AND 6C

SID #809 PROJECTS 8A, 8B AND 8C

2012

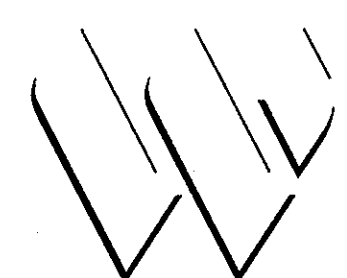


DEVELOPER

Howard Hughes
THE HOWARD HUGHES CORPORATION

10801 W. CHARLESTON BLVD., 3RD FLOOR
LAS VEGAS, NEVADA 89135
OFFICE PHONE NO. (702) 791-4300
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ENGINEER



G.C. WALLACE COMPANIES
ENGINEERS | PLANNERS | SURVEYORS
1555 S. RAINBOW BLVD. LAS VEGAS, NV 89146
T: 702.804.2000 • F: 702.804.2299 • GCWALLACE.COM

DAVID BOWERS, PE, PTOE, PE# 16736
CITY ENGINEER
CITY OF LAS VEGAS, NEVADA

APPROVAL OF THESE PLANS IS LIMITED TO THOSE IMPROVEMENTS CONSTRUCTED IN THE DEDICATED RIGHTS-OF-WAY AND/OR DEDICATED EASEMENTS. THIS APPROVAL DOES NOT AUTHORIZE THE CONSTRUCTION OF ANY IMPROVEMENTS THAT DEVIATE FROM ADOPTED STANDARDS AND/OR SPECIFICATIONS, EXCEPT THOSE SPECIFICALLY LISTED UNDER "DEVIATIONS FROM STANDARDS". THE ENGINEER SHALL RESOLVE ANY DEVIATION OTHER THAN THOSE LISTED IN "DEVIATIONS FROM STANDARDS" IN FAVOR OF THE UNIFORM STANDARD DRAWINGS AND SPECIFICATIONS CLARK COUNTY AREA NEVADA.

THE HOWARD HUGHES CORPORATION,
a Delaware corporation

By: KEVIN ORROCK
Title: VICE PRESIDENT

CLV PLANNING DEPARTMENT
THIS PLAN MEETS THE APPLICABLE STANDARDS IF THE PLANNING AND DEVELOPMENT DEPARTMENT

DOUG RANKIN, AICP, PLANNING MANAGER

UTILITY/AGENCY APPROVALS

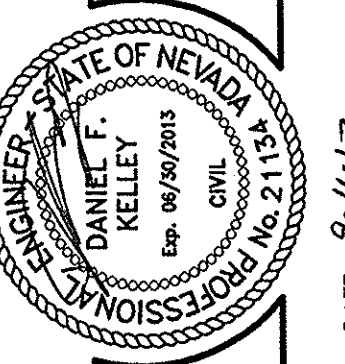
COX COMMUNICATIONS LAS VEGAS, INC. DATE

CENTURYLINK
THE AFFIXED CENTURYLINK APPROVAL DOES NOT ASSUME OR GUARANTEE LIABILITY FOR KNOWN OR UNKNOWN CONFLICTS WITH EXISTING OR PROPOSED IMPROVEMENTS. RESOLUTION OF ANY CONFLICT WILL BE ACCOMPLISHED PURSUANT TO LOCAL ORDINANCES, NEVADA REVISED STATUTES AND/OR PUBLIC UTILITY COMMISSION RULES AND REGULATIONS.

NV ENERGY
NEVADA POWER COMPANY ACKNOWLEDGES THAT WE HAVE RECEIVED YOUR PLANS AND WILL PROVIDE SERVICE TO ALL ELECTRICAL NEEDS ASSOCIATED WITH THIS PROJECT. NEVADA POWER COMPANY RESERVES THE RIGHT TO ADDRESS ANY EXISTING OR FUTURE CONFLICTS ONCE THE FINAL DESIGN IS COMPLETED. THE NEW SERVICE AND THE RESOLUTION OF ANY CONFLICTS WILL BE ACCOMPLISHED PURSUANT TO THE NEVADA PUBLIC UTILITY COMMISSION'S RULES AND REGULATIONS.

NV ENERGY - TRANSMISSION ENGINEERING DATE

SOUTHWEST GAS CORP. DATE



G.C. WALLACE COMPANIES
ENGINEERS | PLANNERS | SURVEYORS
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THE HOWARD HUGHES COMPANY, LLC
VILLAGE 23A/23B ALTA DRIVE IMPROVEMENTS

COVER SHEET

DRAWING

1

1 OF 28 SHTS

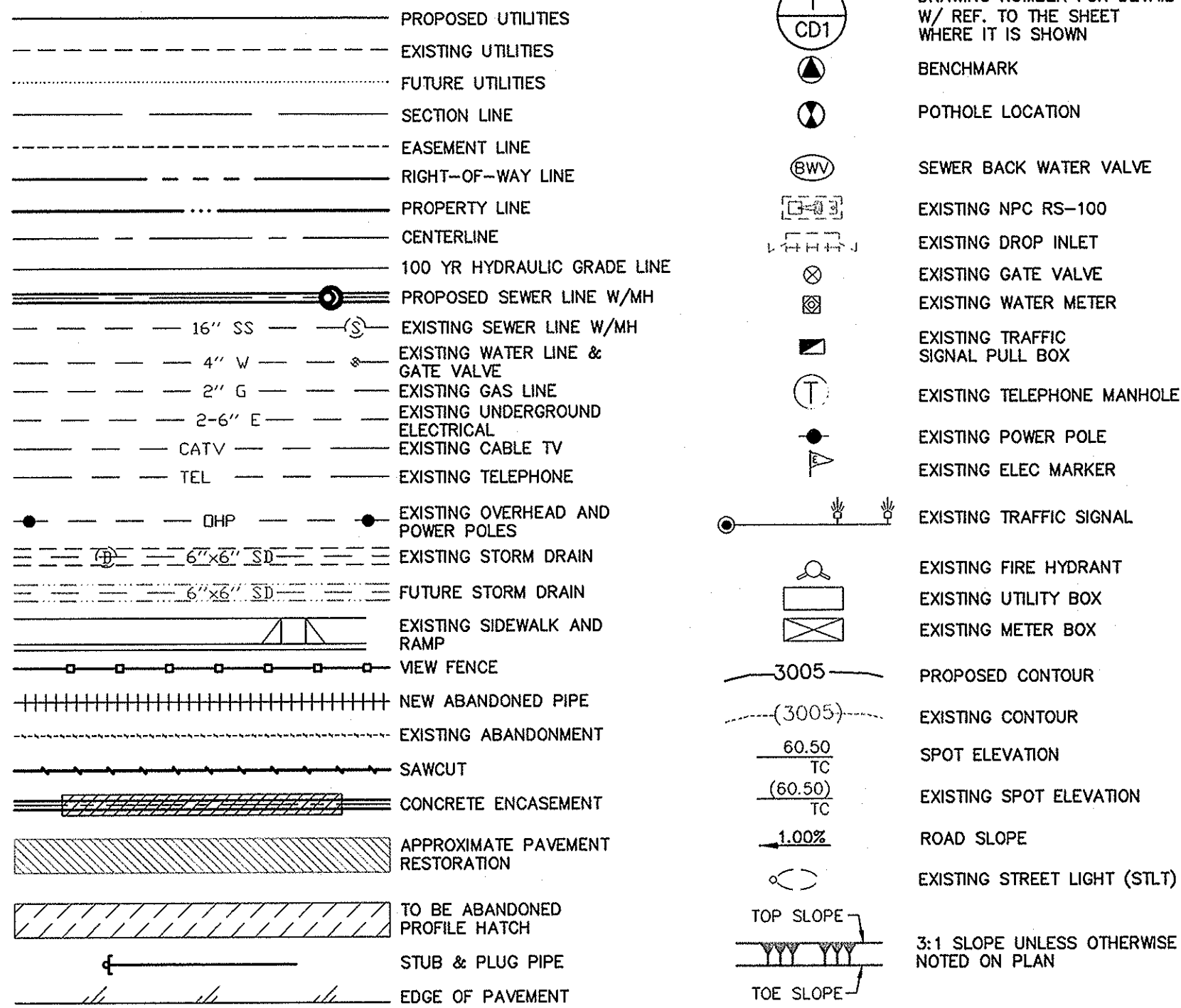
CLV DRAWING NO.

JOB NO. 62023B-202

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LEGEND



ABBREVIATIONS

A	AIR	FG	FINISH GRADE	R	RAD	RADIAL, RADIUS
AC	ASPHALT CONCRETE, ACRE	FL	FIRE HYDRANT	R, RT	RIGHT	RIGHT
ACP	ASBESTOS CEMENT PIPE	FL	FLOW LINE	ROB	REINFORCED CONCRETE BOX	REINFORCED CONCRETE BOX
ADD'L	ADDITIONAL	FO	FIBER OPTIC	ROP	REINFORCED CONCRETE PIPE	REINFORCED CONCRETE PIPE
AP	ANGLE POINT	FRP	FIBERGLASS REINFORCED PLASTIC	RD	ROAD	ROAD
APN	ASSESSOR'S PARCEL NUMBER	FS	FINISH SURFACE	RDWY	ROADWAY	ROADWAY
APPROX	APPROXIMATELY	FT	FOOT/FEET	REC	RECTANGULAR	RECTANGULAR
AASHTO	AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS	FUT	FUTURE	REF	REFERENCE	REFERENCE
		G	GAS	REINF	REINFORCED	REINFORCED
ASTM	AMERICAN SOCIETY FOR TESTING AND MATERIALS	GA	GAGE, GUY ANCHOR	REQD	REQUIRED	REQUIRED
		GB	GRADE BREAK	RIM	TOP OF RIM ELEVATION	TOP OF RIM ELEVATION
AVE	AVENUE	GND	GROUND	RND	ROUND	ROUND
AVAR	AIR VALVE, AIR RELEASE	GRD	GRADE, GROUND	ROW, R/W	RIGHT OF WAY	RIGHT OF WAY
		H, HGT	HEIGHT	RP	RADIUS POINT	RADIUS POINT
AWWA	AMERICAN WATER WORKS ASSOCIATION	HDWL	HEADWALL	RPM	RAISED PAVEMENT MARKERS	RAISED PAVEMENT MARKERS
BC	BACK OF CURB	HGL	HYDRAULIC GRADE LINE	RSVG	RESILIENT SEAT GATE VALVE	RESILIENT SEAT GATE VALVE
BCR	BEGIN CURB RETURN	HORIZ	HORIZONTAL	S	SCHEDULE	SCHEDULE
BLM	BUREAU OF LAND MANAGEMENT	HP	HIGH POINT, HIGH PRESSURE	SD	STORM DRAIN	STORM DRAIN
BLVD	BOULEVARD	HPS	HIGH PRESSURE SODIUM	SDMH	STORM DRAIN MANHOLE	STORM DRAIN MANHOLE
BM	BENCHMARK	IBC	INTERNATIONAL BUILDING CODE	SECT	SECTION	SECTION
BO	BLOW-OFF	INV	INVERT	SE	SQUARE FOOT/FEET	SQUARE FOOT/FEET
BVCE	BEGIN VERTICAL CURVE ELEVATION	JOINT	JOINT	SHLDR	SHOULDER	SHOULDER
BVCS	BEGIN VERTICAL CURVE STATION	LT	LENGTH	SHT	SHEET	SHEET
BW	BACK OF SIDEWALK	L, LT	LEFT	SHT	STREET LIGHT	STREET LIGHT
C, I	CENTERLINE	LF	LINEAR FEET	SP	SERVICE POINT	SERVICE POINT
C&G	CURB AND GUTTER	LIP	LIP OF GUTTER	SS	SQUARE	SQUARE
CATV	UNDERGROUND CABLE TV	LN	LANE	SR	SEWER RECLAIM MAIN	SEWER RECLAIM MAIN
CCBM	CLARK COUNTY BENCH MARK	LP	LIGHT POLE	SS	SANITARY SEWER	SANITARY SEWER
CCPW	CLARK COUNTY PUBLIC WORKS	LSCP	LANDSCAPE	SSMH	SANITARY SEWER MANHOLE	SANITARY SEWER MANHOLE
CCTV	CLOSED-CIRCUIT TELEVISION	LWVD	LAS VEGAS VALLEY WATER DISTRICT	STA	STATION	STATION
CCWRD	CLARK COUNTY WATER RECLAMATION DISTRICT	MAX	MAXIMUM	ST	STREET	STREET
		MH	MANHOLE	STD	STANDARD	STANDARD
CFS	CUBIC FEET PER SECOND	MIN	MINIMUM	STL	STEEL	STEEL
CIP	CAPITAL IMPROVEMENTS PROJECT	MLCP	MORTAR LINED AND COATED PIPE	STRUCT	STRUCTURE	STRUCTURE
CIPM	CURED-IN-PLACE MANHOLE	MOD	MODIFY/MODIFIED	SVZ	SIGHT VISIBILITY ZONE	SIGHT VISIBILITY ZONE
CIPP	CURED-IN-PLACE PIPE	MON	MONUMENT	SW	SOUTHWEST GAS	SOUTHWEST GAS
CIR	CIRCLE	MPH	MILES PER HOUR	SWG	TELEPHONE OR TOP	TELEPHONE OR TOP
CLR	CLEAR OR CLEARANCE	N	NORTH	T	TANGENT	TANGENT
CLSM	CONTROLLED LOW STRENGTH MATERIAL	NDOT	NEVADA DEPARTMENT OF TRANSPORTATION	TB	TOP OF BERM	TOP OF BERM
		NO	NUMBER	TC	TOP OF CURB	TOP OF CURB
		NOSHA	STATE OF NEVADA OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION	TC	TOP OF PIPE	TOP OF PIPE
CLV	CITY OF LAS VEGAS	NPC	NEVADA POWER COMPANY	TCE	TEMPORARY CONSTRUCTION ESMT	TEMPORARY CONSTRUCTION ESMT
CMP	CORRUGATED METAL PIPE	NTS	NOT TO SCALE	TELE	TELEPHONE	TELEPHONE
CMU	CONCRETE MASONRY UNIT	OHC	OVERHEAD COX COMMUNICATION	TEMP	TEMPORARY	TEMPORARY
CNVLV	CITY OF NORTH LAS VEGAS	OH	OVERHEAD	TF	TOP OF FOOTING	TOP OF FOOTING
CONC	CONCRETE	OH	OVERHEAD	TG	TOP OF GRATE	TOP OF GRATE
COND	CONDUIT	OP	OVERHEAD POWER LINE	TMH	TOP OF MANHOLE	TOP OF MANHOLE
CONST	CONSTRUCT OR CONSTRUCTION	P	POWER LINE	TP	TOP OF PIPE	TOP OF PIPE
COORD	COORDINATE	PB	PULL BOX	TP	TELEPHONE POLE	TELEPHONE POLE
COR	CORNER	PBS	PLANTBOX BITUMINOUS SURFACE	TRANS	TRANSITION	TRANSITION
CP	CORRUGATED POLYETHYLENE PIPE	PC	POINT OF CURVE, PRESSURE	TRW	TOP OF RETAINING WALL	TOP OF RETAINING WALL
CT	COURT	PE	POINT OF BEGINNING	TS	TRAFFIC SIGNAL	TRAFFIC SIGNAL
CY	CUBIC YARD(S)	PCC	POINT OF COMPOUND CURVE	TW	TOP OF WALL	TOP OF WALL
DELTA	DELTA	PE	PROJECT ENGINEER OR	TYP, (TYP)	TYPICAL	TYPICAL
DBL	DOUBLE	PE	PROJECT ENGINEER OR	UDACS	UNIFORM DESIGN AND CONSTRUCTION STANDARDS FOR WATER DISTRIBUTION SYSTEMS (LATEST EDITION)	UNIFORM DESIGN AND CONSTRUCTION STANDARDS FOR WATER DISTRIBUTION SYSTEMS (LATEST EDITION)
DCS	DESIGN AND CONSTRUCTION STANDARDS FOR WASTEWATER COLLECTION SYSTEM (LATEST EDITION)	PED	PEDESTRIAN	UG	UNDERGROUND	UNDERGROUND
		PGL	PROFILE GRADE LINE	USD	UNIFORM STD. DRAWING	UNIFORM STD. DRAWING
DIA, Ø	DIAMETER	PH	POT HOLE	USDCA	UNIFORM STD. DRAWINGS FOR PUBLIC WORKS CONSTRUCTION	UNIFORM STD. DRAWINGS FOR PUBLIC WORKS CONSTRUCTION
DIP	DUCTILE IRON PIPE	PI	POINT OF INTERSECTION		OFF-SITE IMPROVEMENTS CLARK COUNTY AREA, NEVADA (LATEST EDITION)	OFF-SITE IMPROVEMENTS CLARK COUNTY AREA, NEVADA (LATEST EDITION)
DIST	DISTANCE	PV	POST INDICATOR VALVE	UT	UNDERGROUND TELEPHONE	UNDERGROUND TELEPHONE
DR	DRIVE	PV	POST INDICATOR VALVE	VAR	VARIABLE/VARIABLES	VARIABLE/VARIABLES
DS	DOWNSPOUT	PV	POINT OF BEGINNING	VC	VERTICAL CURVE	VERTICAL CURVE
DW	DRIVEWAY	POC	POINT ON CURVE	VCP	VITRIFIED CLAY PIPE	VITRIFIED CLAY PIPE
DWG	DRAWING	P.O.C.	POINT OF CONNECTION	VERT	VERTICAL	VERTICAL
EAST	EAST	POT	POINT ON TANGENT	VAL	VALLEY CUTTER	VALLEY CUTTER
EOR	END CURB RETURN	PP	POWER POLE	VOL	VOLUME	VOLUME
ELE, ELEC	ELECTRICAL	PROP	PROPOSED	W	WATER, WEST	WATER, WEST
EP, EOP	EDGE OF PAVEMENT	PRC	POINT OF REVERSE CURVE	WS	WATER SUPPLY	WATER SUPPLY
ESMT	EASEMENT	PRVC	POINT OF REVERSE VERTICAL CURVE	WT	WEIGHT	WEIGHT
EVC	END VERTICAL CURVE	PSI	POUNDS PER SQUARE INCH	WTR	WATER	WATER
EX, EX	EXISTING	PVC	POLYVINYL CHLORIDE	XING	CROSSING	CROSSING
EXP	EXPANSION JOINT	PVI	POINT OF VERTICAL INTERSECTION	YD	YARD, YARD DRAIN	YARD, YARD DRAIN
FC	FACE OF CURB	PVMT	PAVEMENT			
FF, FFE	FINISH FLOOR ELEVATION	PZ	PRESSURE ZONE			

NOTE: LEGEND AND ABBREVIATIONS IN THE "SUMMERLIN IMPROVEMENT STANDARDS", LATEST EDITION WILL BE UTILIZED FOR ANY LEGEND OR ABBREVIATION REQUIRED WHICH ARE NOT SHOWN.

STREET QUANTITIES (PUBLIC)

STREETS			
5" A.C. PAVEMENT	20,230	S.Y.	
TYPE II BASE	3,605	C.Y.	
6" TYPE "L" C & G	5,115	L.F.	
TYPE "A" CURBS	5,110	L.F.	

IRRIGATION			
IRRIGATION SLEEVES	240	L.F.	

STREET LIGHTS			
SINGLE ARM ST.	8	EA.	
SINGLE ARM ST. LT. / W	4	EA.	
FUT. TRAFFIC SIGNAL	15	EA.	
DOUBLE ARM ST. LT.	2	EA.	
SERVICE PEDESTAL	3,900	L.F.	
CONDUIT			

BENCHMARK

DESC.	NAVD 88 DATUM	NAVD 88 DATUM
U.S.C. & G.S. BRASS DISC SET IN ROCK ON THE EAST SIDE OF CHARLESTON BOULEVARD AND SOUTH OF THE RED ROCK DETENTION BASIN.	3246.71 (FEET)	988.599 (METERS)
(CLV BM No. D368 3)		

CONSTRUCTION NOTES

- IMPROVEMENTS**
- INSTALL A.C. PAVEMENT PER STREET SECTIONS, SEE SHEET 23
 - INSTALL 6" "L" TYPE CURB & GUTTER, SEE SUMMERLIN IMP. STDS. (S-47) UDACS
 - INSTALL "A" TYPE ISLAND CURB, SEE SUMMERLIN IMP. STDS. (S-50) UDACS
 - INSTALL CURB DEPRESSION FOR FUTURE HANDICAP RAMP, BY OTHERS
 - INSTALL CONCRETE ENCASEMENT (3/16) UDACS
 - INSTALL CONCRETE BUS TURNOUT (234.1) UDACS
 - VERIFY LOCATION AND ELEVATION OF EX ROADWAY IMP. & MATCH TO EX. CONDITION

WATER

- INSTALL 3" TURBINE METER WITH BYPASS (C-475) UDACS
- INSTALL FIRE HYDRANT ASSEMBLY (PL 40) UDACS
- INSTALL 12" GATE VALVE & BOX W/ CONCRETE COLLAR (PL 30) UDACS
- INSTALL 8" GATE VALVE & BOX W/ CONCRETE COLLAR (PL 30) UDACS
- REMOVE CAP & CONNECT TO EXISTING WATER LINE (CONTRACTOR TO VERIFY SIZE, INVERT, AND LOCATION OF EXISTING WATER LINE) (PL 36) UDACS (NOTE 1)
- INSTALL CAP W/ 2" BLOW-OFF ASSEMBLY (PL 31) UDACS
- INSTALL 45° BEND AND THRUST BLOCK (PL 31) UDACS
- INSTALL 90° BEND AND THRUST BLOCK (PL 31) UDACS
- INSTALL TEE AND THRUST BLOCK (PL 31) UDACS
- INSTALL 3" RPPA (UDACS)
- INSTALL 6" GATE VALVE & BOX W/ 1" RADIUS CONCRETE COLLAR (PL 30) UDACS
- INSTALL WATER QUALITY SLEEVE (PL 22) UDACS
- ADJUST TO FG (PL 39) UDACS

SEWER

- INSTALL 60" DIA. SEWER MANHOLE (90-1A) UDACS
- INSTALL SEWER PLUG AND CAP PER DETAIL 4, SHEET 18
- REMOVE PLUG & CONNECT TO EX. SEWER LINE (CONTRACTOR TO VERIFY SIZE, INVERT, AND LOCATION OF EXISTING SEWER LINE) PRIOR TO CONSTRUCTION
- ADJUST TO FG (UDACS)
- INSTALL 4" CONCRETE SLURRY ENCASEMENT OR USE C-900 PIPE 10' ON EACH SIDE OF CROSS POINT PER DSWCS SEC.2.2.22
- INSTALL 48" DIA. SEWER MANHOLE (90-1A) UDACS

STORM DRAIN

- INSTALL TYPE II STORM DRAIN MANHOLE (405) UDACS
- INSTALL TYPE III STORM DRAIN MANHOLE (405) UDACS
- INSTALL TEMPORARY PLUG AND CAP (405) UDACS
- ADJUST TO FG (405) UDACS
- INSTALL TYPE "CM" DROP INLET (412.1) UDACS
- INSTALL CONCRETE COLLAR (2/18) UDACS
- INSTALL MODIFIED STORM DRAIN MANHOLE
- CONNECT TO EXISTING STORM DRAIN LINE (CONTRACTOR TO VERIFY SIZE, INVERT, AND LOCATION OF EXISTING STORM DRAIN LINE)
- CONNECT TO EXISTING RCB (1/18) UDACS

IRRIGATION

- BANK "A": 1-6" & 2-4" SCH40 PVC (U-18) UDACS
- BANK "B": 2-4" SCH40 PVC (U-18) UDACS

NOTE TO CONTRACTOR:

- ALL EXISTING UTILITY CROSSINGS MUST BE VERIFIED PRIOR TO CONSTRUCTION OF ANY MAIN LINES OR LATERALS THAT MAY BE ADVERSELY AFFECTED. ANY DISCREPANCIES IN LOCATION AND/OR ELEVATION MUST BE PROVIDED TO THE ENGINEER FOR ACCEPTANCE PRIOR TO CONSTRUCTION.
- TOPOGRAPHY SHOWN HEREIN REFLECTS ORIGINAL EXISTING TOPOGRAPHY. ACTUAL FIELD CONDITIONS MAY INCLUDE ADDITIONAL SITE ROUGH GRADING.
- ALL COMMON LOTS SHOWN HEREIN TO BE PRIVATELY MAINTAINED BY THE SUMMERLIN H.O.A. A FUTURE WEANDERING SIDEWALK WILL BE INSTALLED BY SUMMERLIN AS REQUIRED TO SERVICE THE DEVELOPMENT OF EACH PARCEL.
- ALL WATER LINE GATE VALVES, SERVICE GATE VALVES, AND FIRE HYDRANT GATE VALVES ARE TO BE CONSTRUCTED UNDER A.C. PAVEMENT. IT IS THE CONTRACTORS RESPONSIBILITY TO VERIFY THAT ALL WATER VALVE CHANS DO NOT CREATE CONFLICTS WITH THE PROPOSED CURB LINE PRIOR TO PLACEMENT OF CONCRETE. ALL WATER FACILITIES SHOWN IN THESE DRAWINGS HAVE BEEN "SCALED-UP" FOR CLARITY ONLY.

NOTE: FOR ELECTRICAL CONSTRUCTION NOTES SEE SHEET 26

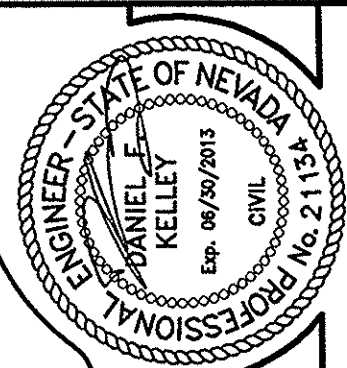
BASIS OF BEARING

NORTH 89°45'05" EAST BEING THE SOUTH LINE OF THE SOUTHWEST QUARTER (SW 1/4) OF SECTION 35, TOWNSHIP 20, RANGE 59 EAST, M.D.M., AS SHOWN BY MAP ON FILE IN FILE 91, PAGE 28 OF PARCEL MAPS IN THE CLARK COUNTY RECORDER'S OFFICE, CLARK COUNTY, NEVADA.

APPROVED FOR CONSTRUCTION

LAS VEGAS VALLEY WATER DISTRICT LVWD PROJECT #— DATE

CLV DRAWING NO.



G.C. WALLACE COMPANIES
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THE HOWARD HUGHES COMPANY, LLC
VILLAGE 23A/23B ALTA DRIVE IMPROVEMENTS
PROJECT DATA SHEET

SHEET

2

2 OF 28 SHTS

JOB NO. 62023B-202

1. ALL CONSTRUCTION AND MATERIALS SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE DESIGN AND CONSTRUCTION STANDARDS FOR WASTEWATER COLLECTION SYSTEMS AND THE UNITED STANDARD SPECIFICATIONS FOR PUBLIC WORKS' CONSTRUCTION OFFICE IMPROVEMENTS, CLARK COUNTY AREA, NEVADA, AS AMENDED. IT WILL BE THE RESPONSIBILITY OF THE CONTRACTOR TO BE AWARE OF THE CONTENTS OF THE ABOVE SPECIFICATIONS.
2. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO PERFORM CONSTRUCTION AS PER PLANS, ANY ADDITIONS, DELETIONS, OR CHANGES SHALL FIRST MEET WITH THE APPROVAL OF THE CITY ENGINEER.
3. CHISEL "S" OR "G" IN CURBS WHERE SEWER OR GAS LATERALS PASS UNDER THE CURB.
4. POLYVINYL (PVC) SEWER PIPE SHALL MEET ASTM D-3034 SDR 35 SPECIFICATIONS, INSTALLED WITH SAND BEDDING AND BACKFILL OF TYPE II AGGREGATE BASE.
5. ALL MANHOLES PAVED IN STREETS EIGHTY (80') FOOT R/W AND LARGER SHALL HAVE CONCRETE CURBS. STREETS LESS THAN EIGHTY (80') FOOT R/W WILL REQUIRE RETROFIT IF PAVING DOES NOT CONFORM TO CITY STANDARD AT THE MANHOLE.
6. TEE SADDLES SHALL BE USED TO CONNECT SEWER LATERALS TO EXISTING MAIN LINES UP TO TWELVE INCH (12") DIAMETER. CONNECTIONS TO FIFTEEN INCH (15") OR LARGER MAINS SHALL REQUIRE SPECIAL PROCEDURES. IN LINE "Y" SHALL BE USED ON LINES TWELVE INCHES (12") OR ABOVE.
7. WATER MAINS SHALL BE PROTECTED IN ACCORDANCE WITH LVWD STANDARDS WHENEVER A SEWER MAIN CROSSES OVER A WATER MAIN OR THE SEWER IS LESS THAN EIGHTEEN INCH (18") UNDER A WATER MAIN.
8. ALL CONTRACTORS INSTALLING SEWER MAINS THAT WILL BE UNDER THE JURISDICTION OF THE CITY OF LAS VEGAS MUST BE STATE OF NEVADA CLASS "A" CONTRACTORS.
9. THE CITY OF LAS VEGAS WILL NOT ACCEPT ANY SEWER MAINS WHICH HAVE A VERTICAL DEFLECTION OF MORE THAN ONE TENTH (0.1) OF A FOOT FROM THE APPROVED CONSTRUCTION PLANS AT ANY LOCATION. SEWER MAINS FOUND TO EXCEED THIS DEFLECTION WILL HAVE TO BE REPAIRED OR REMOVED OR REPLACED TO THE SATISFACTION OF THE CITY ENGINEER PRIOR TO ACCEPTANCE BY THE CITY OF LAS VEGAS.
10. INSTALLATION OF CURVED SEWER REQUIRES THE USE OF C-900 PIPE WHICH ALLOWS FOR PIPE DEFLECTION AT THE JOINTS.

NO PORTION OF THE SITE FALLS WITHIN A FEMA DESIGNATED SPECIAL FLOOD HAZARD AREA. SITE LOCATED ON PANEL 320033C2150E, DATED SEPTEMBER 27, 2002, TO REFLECT A LOMR. THIS PANEL SHOWS THAT THE PROJECT IS LOCATED WITHIN A ZONE X AND NOT LOCATED WITHIN A FEMA DESIGNATED 100-YEAR ZONE A OR SPECIAL FLOOD HAZARD AREA.

1. IN THE EVENT THAT ANY UNFORESEEN CONDITIONS NOT COVERED BY THESE NOTES ARE ENCOUNTERED DURING GRADING OPERATIONS, THE OWNER/ENGINEER SHALL BE IMMEDIATELY NOTIFIED FOR DIRECTION.
2. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO PERFORM ALL NECESSARY CUTS AND FILLS WITHIN THE LIMITS OF THIS PROJECT AND THE RELATED OFF-SITE WORK, SO AS TO GENERATE THE DESIRED SUBGRADE, FINISH GRADES AND SLOPES SHOWN.
3. CONTRACTOR SHALL TAKE FULL RESPONSIBILITY FOR ALL EXCAVATION, ADEQUATE SHORING SHALL BE DESIGNED AND PROVIDED BY THE CONTRACTOR TO PREVENT UNDERMINING OF ANY ADJACENT FEATURES OR FACILITIES AND/OR CAVING OF THE EXCAVATION.
4. THE CONTRACTOR IS WARNED THAT AN EARTHWORK BALANCE WAS NOT NECESSARILY THE INTENT OF THIS PROJECT. ANY ADDITIONAL MATERIAL REQUIRED OR LEFTOVER WILL BE FOLLOWING EARTHWORK OPERATIONS BECOMES THE RESPONSIBILITY OF THE CONTRACTOR.
5. THE GRADING CONTRACTOR IS RESPONSIBLE TO COORDINATE WITH THE OWNER TO PROVIDE FOR THE REQUIREMENTS OF THE PROJECT STORM WATER POLLUTION PREVENTION PLAN (SWPPP) AND ASSOCIATED PERMIT.
6. CONTRACTOR SHALL GRADE TO THE LINES AND ELEVATIONS SHOWN ON THE PLANS WITHIN THE FOLLOWING HORIZONTAL AND VERTICAL TOLERANCES AND DEGREES OF COMPACTION, IN THE AREAS INDICATED:

	HORIZONTAL	VERTICAL	COMPACTION
A. PAVEMENT AREA SUBGRADE	0.1"	+0.0' TO -0.1'	SEE SOILS REPORT
B. ENGINEERED FILL	0.5"	+0.1' TO -0.1'	SEE SOILS REPORT

COMPACTION TESTING WILL BE PERFORMED BY THE OWNER OR HIS REPRESENTATIVE. COMPACTION SHALL COMPLY WITH THE REQUIREMENTS OF THE ENGINEER.
7. ALL CUT AND FILL SLOPES SHALL BE PROTECTED UNTIL EFFECTIVE EROSION CONTROL HAS BEEN ESTABLISHED.
8. THE USE OF POTABLE WATER WITHOUT A SPECIAL PERMIT FOR BUILDING OR CONSTRUCTION PURPOSES INCLUDING CONSOLIDATION OF BACKFILL OR DUST CONTROL IS PROHIBITED. THE CONTRACTOR SHALL OBTAIN ALL NECESSARY PERMITS FOR CONSTRUCTION WATER.
9. THE CONTRACTOR SHALL MAINTAIN THE STREETS, SIDEWALKS AND ALL OTHER PUBLIC RIGHT-OF-WAY IN A CLEAN, SAFE AND USABLE CONDITION. ALL SPILLS OF SOIL, ROCK OR CONSTRUCTION DEBRIS SHALL BE PROMPTLY REMOVED FROM ALL TEMPORARILY OWNED PROPERTY DURING CONSTRUCTION AND UPON COMPLETION OF THE PROJECT. ALL ADJACENT PROPERTY, PRIVATE OR PUBLIC SHALL BE MAINTAINED IN A CLEAN, SAFE AND USABLE CONDITION.
10. IN THE EVENT THAT ANY TEMPORARY CONSTRUCTION ITEM IS REQUIRED THAT IS NOT SHOWN ON THESE DRAWINGS, SUCH ITEM SHALL BE PROVIDED, AS DIRECTED BY THE OWNER, ENGINEER, OR CITY OF LAS VEGAS. TEMPORARY CONSTRUCTION INCLUDES DITCHES, BERMS, ROAD SIGNS AND BARRICADES, ETC.

1. THE OWNER, SITE DEVELOPER, CONTRACTOR AND/OR THEIR AUTHORIZED AGENTS SHALL EACH DAY REMOVE ALL SEDIMENT, MUD, CONSTRUCTION DEBRIS, OR OTHER POTENTIAL POLLUTANTS THAT MAY HAVE BEEN DISCHARGED TO, OR ACCUMULATE IN, THE PUBLIC RIGHT-OF-WAY IN THE CITY OF LAS VEGAS AS A RESULT OF CONSTRUCTION ACTIVITIES ASSOCIATED WITH THIS SITE DEVELOPMENT OR CONSTRUCTION PROJECT, SUCH MATERIALS SHALL BE PREVENTED FROM ENTERING THE STORM SEWER SYSTEM.
2. ADDITIONAL CONSTRUCTION SITE DISCHARGE BEST MANAGEMENT PRACTICES MAY BE REQUIRED OF THE OWNER AND HIS OR HER AGENTS DUE TO UNFORESEEN EROSION PROBLEMS OR IF THE SUBMITTED PLAN DOES NOT MEET THE PERFORMANCE STANDARDS SET FORTH IN THE CITY OF LAS VEGAS AND THE LAS VEGAS VALLEY CONSTRUCTION SITE BEST MANAGEMENT PRACTICES MANUAL.
3. TEMPORARY OR PERMANENT STABILIZATION PRACTICES WILL BE INSTALLED ON DISTURBED AREAS AS SOON AS PRACTICABLE AND NO LATER THAN 14 DAYS AFTER THE CONSTRUCTION ACTIVITY IN THAT PORTION OF THE SITE HAS TEMPORARILY OR PERMANENTLY CEASED. SOME EXCEPTIONS MAY APPLY; REFER TO NEVADA STORMWATER GENERAL PERMIT FOR CONSTRUCTION ACTIVITY NVRI00000, SECTION III.A.5.
4. AT A MINIMUM, THE CONTRACTOR OR HIS AGENT SHALL INSPECT ALL DISTURBED AREAS, INCLUDING ALL EXPOSED SOILS, EXPOSED ROCK, EXPOSED BEDROCK, EXPOSED TO PRECIPITATION, VEHICLE ENTRANCE AND EXIT LOCATIONS AND ALL BMPs WEEKLY, AND WITHIN 24 HOURS AFTER ANY ACTUAL RAIN EVENT OF 0.5 INCHES OR MORE. THE CONTRACTOR OR HIS AGENT SHALL UPDATE AND RE-DEFINE THE CONSTRUCTION DISTURBED AREA MAPS AND PLAN. SOME EXCEPTIONS TO WEEKLY INSPECTIONS MAY APPLY, SUCH AS SUSPENSION OF LAND DISTURBANCE ACTIVITIES. REFER TO NEVADA STORMWATER GENERAL PERMIT FOR CONSTRUCTION ACTIVITY NVRI000000, SECTION III.A.12.
5. ACCUMULATED SEDIMENT IN BMPs SHALL BE REMOVED WITHIN SEVEN DAYS AFTER A STORMWATER RUNOFF EVENT PRIOR TO THE NEXT ANTICIPATED STORM EVENT. IF 25 PERCENT SEDIMENT HAS BEEN REMOVED WITHIN BMP DESIGN CAPACITY HAS BEEN REDUCED BY 50 PERCENT OR MORE.

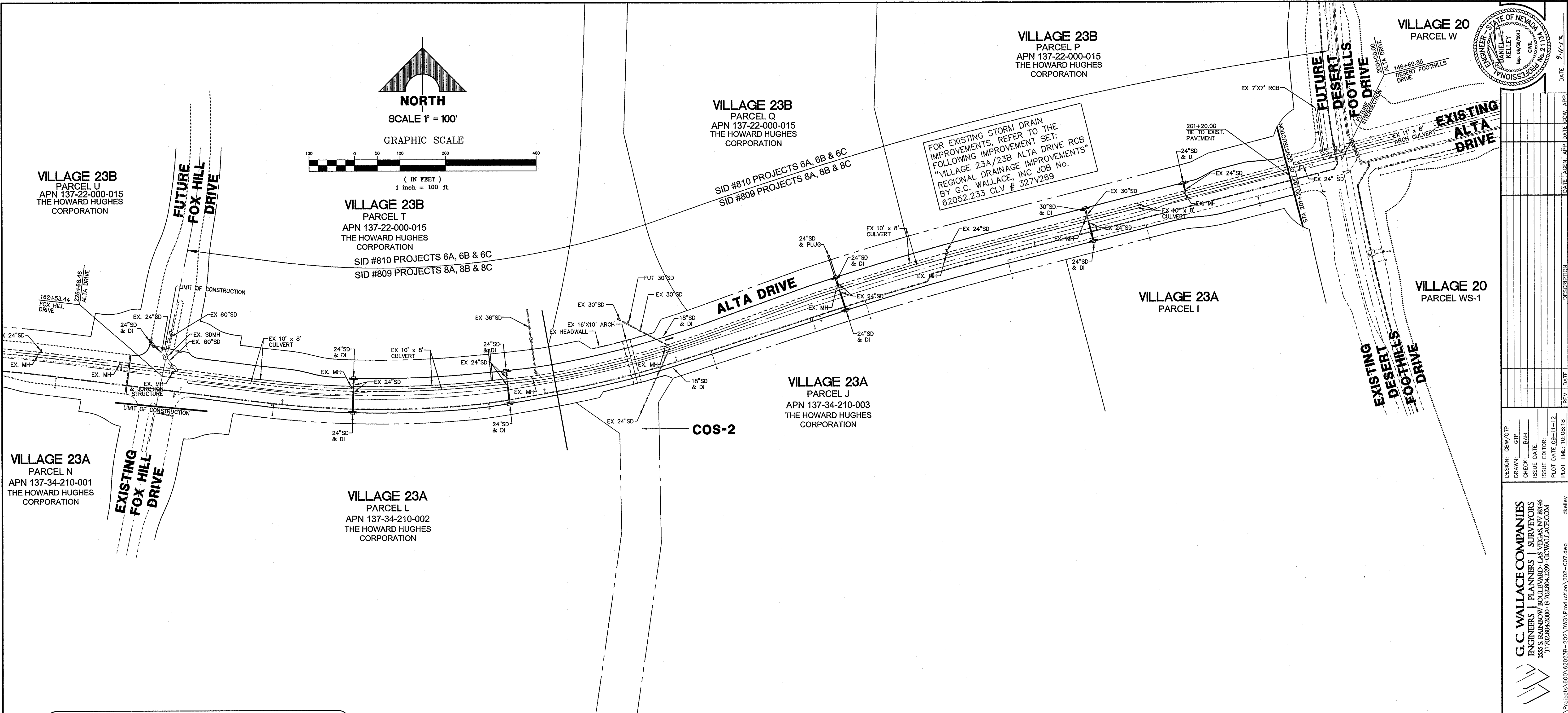
1. ALL STREET LIGHTING INSTALLATIONS SHALL BE IN ACCORDANCE WITH THE STREET LIGHTING PLANS, THE "UNIFORM STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION OFF-SITE IMPROVEMENTS, CLARK COUNTY AREA, NEVADA," LATEST REVISION, AND THE "UNIFORM STANDARD DRAWINGS FOR PUBLIC WORKS CONSTRUCTION OFF-SITE IMPROVEMENTS, CLARK COUNTY AREA, NEVADA," LATEST REVISION, AND ANY ADOPTED SPECIAL AREA STANDARDS.
2. NO DEVIATION OF STREET LIGHT, PULL BOX, CONDUITS (ETC.) LOCATIONS SHALL BE PERMITTED WITHOUT WRITTEN APPROVAL OF THE TRAFFIC ENGINEER AND THE CITY ENGINEER.
3. ALL EXISTING STREET LIGHTING SHALL REMAIN OPERATIONAL DURING CONSTRUCTION.
4. ALL STREET LIGHTING CONDUITS STUB SHALL HAVE AT LEAST ONE GREEN #8 THW WIRE INSTALLED, AS TRACER WIRE. WHEN "EMPTY" CONDUIT IS COMPLETELY INSTALLED FROM PB TO FB, IT SHALL HAVE MINIMUM OF 2 #4 AND 1 #8 THW WIRE WITH THE ENDS TAPED OR "SAFE OFF" PRIOR TO FINAL INSPECTION.
5. ANY STRUCTURE SUCH AS BLOCK WALLS, CHAIN LINK FENCES, RETAINING WALLS, ETC., SHALL LEAVE A MINIMUM CLEARANCE IN ACCORDANCE WITH THE USD NO. 320A.
6. AS-BUILT DRAWINGS SHALL BE SUPPLIED TO THE TEF0 PRIOR TO ANY PRE-FINAL INSPECTION. THE AS-BUILT DRAWING NEEDS TO BE STAMPED AS-BUILT AND SIGNED BY THE PREPARER.
7. SERVICE POINT SHALL BE COORDINATED WITH NV ENERGY COMPANY, AND WHEREVER POSSIBLE, BE LOCATED NEAR THE CENTER OF THE CIRCUIT. SERVICE POINTS SHALL BE SHOWN ON THE PLANS.
8. IT SHALL BE ASSUMED THAT IN THE ABSENCE OF AN EXISTING, WORKABLE CIRCUIT TO ATTACH TO, ALL INSTALLATIONS SHALL REQUIRE A NEW SERVICE FOR OPERATION OF THE CIRCUIT.
9. WHEREVER THERE IS AN OVERHEAD UTILITY THAT MAY CONFLICT WITH THE INSTALLATION OF STREET LIGHTING CIRCUITS AND/OR POLES, THESE CONFLICTS MUST BE RESOLVED BETWEEN THE DEVELOPER AND THE UTILITIES INVOLVED, AT NO EXPENSE TO THE CITY OF LAS VEGAS, BEFORE STREETLIGHT BASES ARE INSTALLED.
10. THE CONTRACTOR SHALL FURNISH COMPLETE SERVICE TO TRANSFORMERS AND CONTROL SYSTEMS IF REQUIRED ON PLANS.
11. THE DEVELOPER/OWNER WILL BE REQUIRED TO SUPPLY POWER TO ALL NEW PUBLIC STREET LIGHTS INSTALLED UNDER THIS DESIGN PRIOR TO BOND RELEASE OR PROJECT COMPLETION. THE DEVELOPER/OWNER WILL BE RESPONSIBLE FOR ALL ITEMS ASSOCIATED WITH THE INSTALLATION, CONSTRUCTION, ENERGIZING, MAINTENANCE AND OPERATIONAL COST OF SAID STREET LIGHTS PRIOR TO PROJECT COMPLETION. REFER TO THE PLAN FOR ALL NEW SERVICE REQUIREMENTS. THE TRANSFER OF OWNERSHIP FROM THE DEVELOPER/OWNER TO THE CITY OF LAS VEGAS FOR ALL NEW PUBLIC STREET LIGHT/S AND/OR SERVICE/S INSTALLED UNDER THIS PLAN WILL BE IN CONJUNCTION WITH THIS PROJECT COMPLETION. COORDINATE ALL MAINTENANCE AND OPERATIONAL TRANSFERS WITH THE CITY OF LAS VEGAS TRAFFIC ENGINEERING DEPARTMENT (TEF0) AT (702) 229-6331.

1. ALL CONSTRUCTION SIGNING, BARRICADING, AND TRAFFIC DELINEATION SHALL CONFORM TO THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES", LATEST EDITION.
2. THE STREET SIGN CONTRACTOR SHALL OBTAIN STREET NAMES AND BLOCK NUMBERING FROM THE PLANNING DEPARTMENT PRIOR TO CONSTRUCTION.
3. BEFORE ANY WORK IS STARTED IN THE RIGHT-OF-WAY, THE CONTRACTOR SHALL INSTALL ALL ADVANCED WARNING SIGNS FOR THE CONSTRUCTION ZONE. THE CONTRACTOR SHALL INSTALL TEMPORARY STOP SIGNS AT ALL NEW STREET ENCROACHMENTS INTO EXISTING CITY STREETS WHERE WARRANTED IMMEDIATELY AFTER FIRST GRADING WORK IS ACCOMPLISHED, AND SHALL MAINTAIN SAID SIGNS UNTIL PERMANENT SIGNS ARE INSTALLED.
4. WHEN A DESIGNATED "SAFE ROUTE TO SCHOOL" IS ENCLOSED UPON BY A CONSTRUCTION WORK ZONE AND ALL PUBLIC WORKS STAFF IDENTIFY A NEED FOR SIGNAGE TO BE ASSISTED IN THE SAFE CROSSING THROUGH THAT WORK ZONE, THE CONTRACTOR SHALL BE REQUIRED TO PROVIDE A QUALIFIED "CROSSING GUARD", THE GUARD SHALL BE PRESENT FOR THE FULL DURATION OF TIME THAT CHILDREN ARE LIKELY TO BE PRESENT.
5. IF THE IMPROVEMENTS NECESSITATE THE OBLITERATION, TEMPORARY OBSTRUCTION, TEMPORARY REMOVAL OR RELOCATION OF ANY EXISTING TRAFFIC PAVEMENT MARKINGS, THE CONTRACTOR SHALL BE REQUIRED TO RESTORE OR REPLACED WITH LIKE MATERIALS TO THE SATISFACTION OF THE CITY TRAFFIC ENGINEER.
6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING AND INSTALLING ALL PERMANENT SIGNS SHOWN ON THE PLANS. ALL NEW SIGNS SHALL BE FABRICATED WITH DIAMOND GRADE PIV CLASS 6 REFLECTIVE SHEETING OR APPROVED EQUAL. ALL NEW TRAFFIC SIGNS, EXCEPT STREET NAME AND SCHOOL SPEED LIMIT SIGNS, SHALL HAVE 3M SERIES 1160 OR APPROVED EQUIVALENT ANTI-GRAFFITI PROTECTIVE OVERLAY FILM. SCHOOL ZONE SIGNS SHALL HAVE 3M SERIES 1150 ANTI-GRAFFITI PROTECTIVE OVERLAY FILM. STREET NAME SIGNS SHALL CONFORM IN THEIR ENTIRETY TO CURRENT CITY STANDARDS. ALL OTHER SIGNS SHALL BE STANDARD SIZE UNLESS OTHERWISE SPECIFIED ON THE PLANS. SIGN POSTS SHALL BE INSTALLED IN ACCORDANCE WITH THE CURRENT CITY STANDARDS.
7. WHEN A PROPOSED STREET LIGHT STANDARD IS LOCATED WITHIN FIVE (5') FEET OF ANY PROPOSED SIGN SHOWN ON THE PLANS, TO BE MOUNTED ON A SIGNPOST, THE SIGN SHALL BE MOUNTED ON THE STREET LIGHT STANDARD AND THE SIGNPOST SHALL BE ELIMINATED.
8. ALL PERMANENT TRAFFIC CONTROL DEVICES CALLED FOR HEREON SHALL BE IN PLACE AND IN FINAL POSITION PRIOR TO ALLOWING ANY PUBLIC TRAFFIC ONTO THE PORTIONS OF THE ROAD(S) BEING IMPROVED HERE UNDER, REGARDLESS OF THE STATUS OF COMPLETION OF PAVING OR OTHER OFF-SITE IMPROVEMENTS CALLED FOR BY THESE PLANS.
9. STREET SIGNS AND STOP SIGNS SHALL BE INSTALLED PER CITY STANDARD SPECIFICATIONS FOR PLACEMENT OF STREET NAME SIGNS.
10. THE CONTRACTOR SHALL PROVIDE ALL NECESSARY TRAFFIC CONTROL DEVICES AND FLAGGERS TO INSURE THE SAFETY OF THE PUBLIC IN OR AROUND THE WORK AREA. THE CONTRACTOR SHALL PROVIDE ALL NECESSARY TEMPORARY MODIFICATIONS TO OCAAN OR ISMA WORK ZONE SAFETY SPECIALIST SET UP, MAINTAIN AND/OR REMOVE ALL TRAFFIC CONTROL DEVICES IN THE CITY OF LAS VEGAS RIGHT-OF-WAY.
11. WORK IN PUBLIC STREETS, ONCE BEGUN, SHALL BE EXPEDITED TO COMPLETION SO AS TO PROVIDE MINIMUM INCONVENIENCE TO ADJACENT PROPERTY OWNERS AND TO THE TRAVELING PUBLIC.
12. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING CITIZENS AREA TRANSIT (C.A.T.) IF THE CONSTRUCTION INTERRUPTS OR RELOCATES A BUS STOP OR HAS AN ADVERSE EFFECT ON BUS SERVICE ON THAT STREET TO ARRANGE FOR TEMPORARY RELOCATION OF STOP.
13. GUARDS SHALL BE OBTAINED BY CONTACTING THE METROPOLITAN POLICE DEPARTMENT SPECIAL EVENTS UNIT (PHONE # 828-3442) WHO WILL PROVIDE OFFICERS PROPERLY TRAINED IN TRAFFIC CONTROL. FEES FOR THE USE OF THESE OFFICERS SHALL BE SET BY METRO AND WILL BE PAID BY THE CONTRACTOR. THE CONTRACTOR IS RESPONSIBLE FOR ALL ARRANGEMENTS WITH METRO.
14. ANY WORK WITHIN 300' OF A SIGNALIZED INTERSECTION WILL BE NIGHT WORK, UNLESS DIRECTED BY THE CITY OF LAS VEGAS TRAFFIC ENGINEER.
15. CONTRACTOR SHALL CONTACT THE TRAFFIC ENGINEERING DIVISION (TRANSPORTATION SECTION) THROUGH THE PROJECT'S OFFSITE INSPECTOR PRIOR TO INITIATING PAVING TO THE PROPOSED SECTION. THE CONTRACTOR SHALL SUBMIT ALL REQUESTS FOR APPROVAL OF THE APPROVED DRAWINGS REGARDING FINAL PAVEMENT TRANSITIONS, MARKINGS AND SIGNING THAT ARE REQUIRED TO MATCH ADJACENT ROADWAY SEGMENTS. THE CONTRACTOR SHALL PROVIDE A DRAWING FOR APPROVAL BY THE TRAFFIC ENGINEERING DIVISION. THE DRAWING SHALL BE SUBMITTED TO THE FINAL PAVEMENT MARKINGS AND SIGNAGE, WHICH MAY INCLUDE OMITTING, ADJUSTING OR MODIFYING PAVEMENT MARKINGS AND TRAFFIC CONTROL SIGNS SUCH THAT ADEQUATE TRANSITIONS AND LANE TERMINATIONS BETWEEN ADJACENT ROADWAY SEGMENTS ARE CONSTRUCTED.

1. ALL WORK SHALL BE DONE IN STRICT ACCORDANCE WITH THE LAS VEGAS FIRE AND RESCUE ADOPTED FIRE CODE ORDINANCE #6124 FOR HYDRANT SPECIFICATIONS AND HYDRANT INSTALLATION SPECIFICATIONS. AUTHORIZED FIRE HYDRANTS ARE AS FOLLOWS:
 - A. KENNEDY – GUARDIAN MODELS K81A AND K81D
 - B. MUELLER – SUPER CENTURION 250 MODEL A-423
 - C. W. MEDALLION MODEL FV-250U
 - D. TROY VALVE – PATRIOT MODEL PT8100N NEVADA HYDRANT
 - E. U.S. PIPE – METROFLOW/M-03
2. A PERMIT IS REQUIRED FROM LAS VEGAS FIRE AND RESCUE FOR THE INSTALLATION OF ON-SITE WATER LINES AND FIRE HYDRANTS. THE PERMIT AND CONTRACTORS MATERIAL TEST CERTIFICATE FOR UNDERGROUND PIPING FORM SHALL BE OBTAINED FROM THE FIRE PROTECTION ENGINEER BEFORE COMMENCEMENT OF WORK.
3. ON ANY RESIDENTIAL OR COMMERCIAL INSTALLATIONS, FIRE HYDRANTS SHALL BE INSTALLED AT APPROPRIATE ACCESS ROADS SHALL BE MAINTAINED BEFORE COMMENCEMENT OF ANY COMBUSTIBLE CONSTRUCTION. ALL FIRE HYDRANTS SHALL BE IN GOOD WORKING ORDER AND SHALL BE CAPABLE OF DELIVERING THE REQUIRED FIRE FLOW.
4. TO IDENTIFY THE FIRE HYDRANT LOCATIONS, THE CONTRACTOR SHALL PLACE A BLUE REFLECTIVE MARKER AT THE CENTER LINE OF STREET ADJACENT TO THE FIRE HYDRANTS.
5. ALL UNDERGROUND INSPECTIONS, PRESSURE AND FLUSH VERIFICATIONS OF ALL FIRE HYDRANTS SHALL BE COMPLETED WITHIN 100 FEET OF THE CENTER LINE OF THE STREET. THE CENTER LOADING IS ACCEPTABLE FOR THE HYDRO TESTS WITH PRIOR FIRE PREVENTION APPROVAL.
6. ALL ON-SITE UNDERGROUND WATER MAINS AND MATERIALS SHALL BE U.L. LISTED, AWWA APPROVED AND SHALL BE RATED FOR THE APPROPRIATE WORKING PRESSURE.
7. PAINTING OF CURBS, FIRE HYDRANTS, PADS, PROTECTION OF FIRE HYDRANTS FROM PHYSICAL DAMAGE AND ALL OTHER WORK NECESSARY PER PLANS SHALL BE COMPLETED BEFORE APPROVAL BY THE LAS VEGAS FIRE AND RESCUE, FIRE PREVENTION DIVISION.
8. PRIVATE FIRE HYDRANTS SHALL BE PAINTED RED.
9. PRIOR TO THE FINAL OCCUPANCY, A FLOW TEST SHALL BE WITNESSED BY THE LAS VEGAS FIRE AND RESCUE, FIRE PREVENTION DIVISION TO VERIFY AVAILABILITY OF THE REQUIRED FIRE FLOW.
10. FIRE HYDRANTS SPACING SHALL BE AS FOLLOWS:
 - RESIDENTIAL – 500 FT UNSPRINKLERED; 600 FT SPRINKLERED.
 - COMMERCIAL – 300 FT UNSPRINKLERED; 400 FT SPRINKLERED.
11. WHERE THE WATER MAINS ARE EXTENDED ALONG STREETS OR NEW STREETS ARE INSTALLED WHERE FIRE HYDRANTS ARE NOT NEEDED FOR PROTECTION OF THE STREET, FIRE HYDRANTS SHALL BE INSTALLED AT A MAXIMUM OF 150 FT SPACING, TO PROVIDE FOR TRANSPORTATION HAZARDS. WHERE STREETS ARE PROVIDED WITH MEDIAN DIVIDERS OR HAVE FOUR OR MORE TRAFFIC LANES AND HAVE A TRAFFIC COUNT OF MORE THAN 30,000 PER DAY, HYDRANTS ARE REQUIRED ON EACH SIDE OF THE STREET SPACED AT 500 FEET ON AN ALTERNATING BASIS.
12. NO FIRE HYDRANTS SHALL BE LOCATED WITHIN THE RADIUS OF A CUL-DE-SAC OR WITHIN 20 FEET OF THE PERIMETER OF THE RADIUS OF THE CUL-DE-SAC.
13. NO FIRE HYDRANTS SHALL BE LOCATED WITHIN 6 FEET OF ANY CURB RETURN, DRIVEWAY, POWER POLE, STREETLIGHT OR OTHER OBSTRUCTION.
14. THE MAXIMUM DISTANCE FROM A FIRE HYDRANT TO A ONE-TWO FAMILY DWELLING SHALL NOT EXCEED 300 FT, AS MEASURED BY AN APPROVED ROUTE.
15. THE MAXIMUM DISTANCE FROM A FIRE HYDRANT TO A FIRE DEPARTMENT CONNECTION (FDC) SHALL NOT EXCEED 100 FT, AS MEASURED BY AN APPROVED ROUTE.
16. THE MAXIMUM DISTANCE FROM A FIRE HYDRANT TO THE END OF A DEAD-END STREET SHALL NOT EXCEED 200 FT.
17. TWO SOURCES OF SUPPLY ARE REQUIRED WHENEVER THERE ARE 4 OR MORE FIRE HYDRANTS/SPRINKLER LEAD-INS ARE INSTALLED ON A SINGLE SYSTEM. SECTIONAL CONTROL VALVES SHALL BE INSTALLED SO THAT NO MORE THAN 2 FIRE HYDRANTS CAN BE OUT OF SERVICE DUE TO A BREAK IN A WATER MAIN.
18. ALL FIRE APPARATUS ACCESS ROADS SHALL BE PAVED TO PROVIDE ALL-WEATHER DRIVING CAPABILITIES, AND SHALL BE DESIGNED AND MAINTAINED TO SUPPORT THE IMPOSED LOADS OF THE FIRE APPARATUS.
19. THE GRADIENT FOR THE FIRE APPARATUS ACCESS ROADS SHALL NOT EXCEED 12% ANGLES OF APPROACH AND ANGLES OF DEPARTURE. ADJUTANT TO 25 FT PRIOR TO OR AFTER THE GRADIENT CHANGE, ADJUTANT TO THE STRUCTURES GRADIENT SHALL NOT EXCEED 6%.
20. THE TURNING RADIUS OF THE FIRE APPARATUS ACCESS ROADS SHALL BE NO LESS THAN 52 FT OUTSIDE AND 28 FT INSIDE TURNING RADIUS.
21. VERTICAL CLEARANCE OF ALL FIRE APPARATUS ACCESS ROADS SHALL BE NOT LESS THAN 13 FT 6 INS.
22. FIRE DEPARTMENT ACCESS ROADS IN ALL RESIDENTIAL DEVELOPMENTS (EXCEPT APARTMENT BUILDINGS) SHALL HAVE A MINIMUM UNOBSTRUCTED WIDTH OF NOT LESS THAN 36 FT FLOW LINE TO THE FLOW LINE. THIS WIDTH MAY BE REDUCED TO 24 FT IF ALL BUILDINGS FRONTING THE STREET ARE SPRINKLERED FOR MAIN RESIDENTIAL STREETS, WITH PARKING PERMITTED ON BOTH SIDES OF THE STREET. PRIVATE DRIVE ALLEYS, DRIVEWAYS, ETC. SHALL BE ALLOWED TO BE REDUCED TO A MINIMUM WIDTH OF 10 FT FLOW LINE TO THE FLOW LINE WHEN SERVING NO MORE THAN 6 RESIDENCES, AND WHEN ON STREET PARKING IS DISALLOWED.
23. ALL FIRE APPARATUS ACCESS ROADS IN COMMERCIAL DEVELOPMENTS AND APARTMENT COMPLEXES SHALL HAVE A MINIMUM UNOBSTRUCTED WIDTH OF NOT LESS THAN 24 FT (FLOW LINE TO THE FLOW LINE), PROVIDED NO PARKING IS ALLOWED ON EITHER SIDE; 32 FT (FLOW LINE TO THE FLOW LINE), WITH PARALLEL PARKING ON ONE SIDE; AND 36 FT (FLOW LINE TO THE FLOW LINE) WITH PARALLEL PARKING IS ALLOWED ON BOTH SIDES. THESE WIDTHS MAY BE REDUCED TO 24 FT IF SPRINKLERED.
24. A FIRE APPARATUS ACCESS ROAD SHALL BE REQUIRED WHEN ANY PORTION OF AN EXTERIOR WALL OF THE FIRST STORY IS LOCATED MORE THAN 150 FT FROM A FIRE DEPARTMENT VEHICLE ACCESS. THIS DISTANCE COULD BE INCREASED TO 250 FT IF THE BUILDING IS SPRINKLERED.
25. APPROVED SECONDARY FIRE APPARATUS ACCESS SHALL BE PROVIDED FOR 100 OR MORE DWELLING UNITS, ROAD(S) WITH DEAD-ENDS OR WITH A SINGLE POINT OF ACCESS IN EXCESS OF 600 FT, AND FOR ALL COMMERCIAL, INDUSTRIAL, AND MULTI-FAMILY RESIDENTIAL DEVELOPMENTS.
26. ALL DEAD-END FIRE APPARATUS ACCESS ROADS AND/OR FIRE LANES, PUBLIC OR PRIVATE, EXCEPT SIDE SIPS 10 FT IN LENGTH SHALL BE PROVIDED WITH AN APPROVED TURN AROUND AREA HAVING A MINIMUM DIAMETER OF 81 FT.
27. ALL FIRE APPARATUS ACCESS ROADS SHALL BE MARKED BY PLACING APPROVED SIGNS AT THE START OF THE DESIGNATED FIRE LANE, ONE SIGN AT THE END OF THE FIRE LANE AND WITH SIGNS AT INTERVALS 100 FT ALONG THE DESIGNATED FIRE LANES. SIGNS TO BE PLACED ON BOTH SIDES OF AN ACCESS ROADWAY IF NEEDED TO PREVENT PARKING ON EITHER SIDE. SIGNS TO BE INSTALLED NO HIGHER THAN 10 FT OR LESS THAN 6 FT FROM ROADWAY LEVEL. THE CURB ALONG OR ON THE PAVEMENT OR CEMENT (IF NO CURB IS PROVIDED) SHALL BE PAINTED WITH A RED WEATHER RESISTANT PAINT IN ADDITION TO THE SIGNS.
28. ELECTRICALLY CONTROLLED ACCESS GATES SHALL BE PROVIDED WITH AN APPROVED EMERGENCY VEHICLE DETECTOR/RECEIVER SYSTEM. SAID SYSTEM SHALL BE INSTALLED IN ACCORDANCE WITH THE CITY OF LAS VEGAS GUIDELINES FOR AUTOMATIC EMERGENCY ACCESS GATES.

1. ALL CONSTRUCTION AND MATERIALS SHALL BE IN ACCORDANCE WITH THE "UNIFORM STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION OFF-SITE IMPROVEMENTS, CLARK COUNTY AREA NEVADA", LATEST EDITION, THE "UNIFORM STANDARD DRAWINGS FOR PUBLIC WORKS CONSTRUCTION, CLARK COUNTY AREA NEVADA", LATEST REvised EDITION; THE "SUMMERLIN IMPROVEMENT STANDARDS" FOR WORK IN THE SUMMERLIN AREA; AND OTHER APPLICABLE APPROVED STANDARDS ISSUED BY THE CONTROLLING AGENCY UNIFORM BUILDING CODE; AND ALL LOCAL CITY CODES AND ORDINANCES APPLICABLE, EXCEPT AS NOTED ON THIS SHEET AS "DEVIATIONS FROM STANDARDS".
2. THE EXISTENCE AND LOCATION OF ANY OVERHEAD OR UNDERGROUND UTILITY LINES, PIPES, OR STRUCTURES SHOWN ON THESE PLANS ARE OBTAINED BY A RESEARCH OF THE AVAILABLE RECORDS. EXISTING UTILITIES AS SHOWN FROM CLV PLANS LIBRARY ARE APPROXIMATE AND FOR RECORD PURPOSES. EXISTING UTILITIES ARE LOCATED ON CLV PLANS ONLY FOR THE CONVENIENCE OF THE CONTRACTOR. EXISTING UTILITY SERVICE LATERALS MAY NOT BE SHOWN ON THE PLANS. THE CONTRACTOR SHALL, AT HIS OWN EXPENSE, LOCATE ALL UNDERGROUND AND OVERHEAD INTERFERENCE, WHICH MAY AFFECT CONSTRUCTION DURING CONSTRUCTION AND SHALL TAKE ALL NECESSARY PRECAUTIONS TO AVOID DAMAGE TO SAME. THE CONTRACTOR SHALL USE EXTREME CAUTION WHEN WORKING NEAR OVERHEAD UTILITIES SO AS TO SAFELY PROTECT ALL PERSONNEL, AND EQUIPMENT, AND SHALL BE RESPONSIBLE FOR ALL COST AND LIABILITY IN CONNECTION THEREWITH.
3. THE CONTRACTOR SHALL TAKE ALL PRECAUTIONARY MEASURES NECESSARY TO PROTECT EXISTING UNDERGROUND STRUCTURES AND STREET IMPROVEMENTS WHICH ARE TO REMAIN IN PLACE, FROM DAMAGE, AND ALL SUCH IMPROVEMENTS OR STRUCTURES DAMAGED BY THE CONTRACTOR'S OPERATIONS SHALL BE REPAIRED OR REPLACED SATISFACTORILY TO THE CITY ENGINEER OR OWNING UTILITY COMPANY AT THE EXPENSE OF THE CONTRACTOR.
4. ALL CONSTRUCTION SHALL BE AS SHOWN ON THESE PLANS, ANY REVISIONS SHALL HAVE THE PRIOR WRITTEN APPROVAL OF THE CITY ENGINEER.
5. TYPE V CEMENT SHALL BE USED IN ALL OFF-SITE CONCRETE WORK. CONCRETE TO BE 3000 P.S.I. MINIMUM @ 28 DAYS. MIX DESIGNS TO BE APPROVED BY THE CITY, PRIOR TO THE USE ON THE PROJECT.
6. PERMITS ARE REQUIRED FOR ANY WORK IN THE PUBLIC RIGHT-OF-WAY. THE CONTRACTOR SHALL SECURE ALL PERMITS AND INSPECTIONS REQUIRED FOR THIS CONSTRUCTION.
7. EXPANSION JOINTS REQUIRED, MAXIMUM EVERY 300' IN EXTRUDED-TYPE CURB.
8. AC PAVEMENT TO BE 1/2" ABOVE ALL OF ALL GUTTERS AFTER COMPACTION, EXCEPT AT SIDEWALK RAMPERS.
9. CURB AND GUTTER FOUND TO BE UNACCEPTABLE TO THE CITY OF LAS VEGAS SHALL BE REMOVED AND REPLACED PER USD 216.
10. SIDEWALK RAMPS SHALL BE CONSTRUCTED IN EACH QUADRANT OF AN INTERSECTION PER USD 235. EXACT LOCATION OF RAMPS MAY BE ADJUSTED IN THE FIELD BY A CITY INSPECTOR.
11. CONTRACTOR SHALL PROVIDE ALL NECESSARY HORIZONTAL AND VERTICAL TRANSITIONS BETWEEN NEW CONSTRUCTION AND EXISTING SURFACES TO PROVIDE FOR PROPER DRAINAGE AND FOR INGRESS AND EGRESS TO NEW CONSTRUCTION. THE EXTENT OF TRANSITIONS TO BE AS SHOWN ON PLANS.
12. ALL GRADING WORK SHALL CONFORM TO THE SOILS REPORT AS PREPARED BY THE (COMPACT, REPORT #, DATE) APPROVED BY THE CITY ENGINEER, AND AS SHOWN ON THESE PLANS.
13. EXACT LOCATION OF ALL SAWCUT LINES MAY BE DETERMINED IN THE FIELD BY A CITY INSPECTOR. IF PLANS ARE NOT CLEARLY SHOWN, OR EXISTING PAVEMENT CONDITION REQUIRES RELOCATIONS.
14. THE CONTRACTOR SHALL TAKE ALL PRECAUTIONS NECESSARY TO PROTECT EXISTING PERMANENT SURVEY MONUMENTS. ANY MONUMENTS DISTURBED SHALL BE REPLACED AND ADJUSTED PER AVAILABLE RECORDS IN ACCORDANCE WITH N.R.S. STATUTE NO. 625.380 AND CITY OF LAS VEGAS TITLE 18, APPENDIX D.
15. UTILITY COMPANY METER BOXES, MANHOLE LIDS, VALVE COVERS, ETC., SHALL BE LOCATED OUT OF DRIVEWAYS, DRIVEWAY APRONS, FLOW LINES, AND CROSS GUTTERS. THE PRIOR WRITTEN APPROVAL IS GRANTED BY THE UTILITY COMPANY AND THE CITY ENGINEER.
16. ALL WALLS, NEW OR EXISTING, ARE ONLY SHOWN ON CIVIL PLANS FOR THE PURPOSE OF REVIEWING GRADING RELATIONSHIPS; FLOOD CONTROL AND SIGHT DISTANCE AT INTERSECTIONS. NEW WALLS REQUIRE A SEPARATE PERMIT AND INSPECTION BY THE BUILDING DEPARTMENT.
17. ASPHALT MIX DESIGN MUST BE SUBMITTED AND APPROVED BY THE CITY ENGINEER PRIOR TO THE PLACEMENT OF ASPHALT WITHIN CITY RIGHT OF WAY.
18. CONTRACTOR SHALL ADJUST ALL NEW AND EXISTING INLETS, VALVE BOXES, MANHOLE RIMS, AND SEWER CLEAN OUTS, ETC. TO FINISH GRADE AS APPLICABLE WHETHER OR NOT THEY ARE SHOWN ON THE PLANS.
19. MATERIALS, HANDLING AND PLACEMENT OF PORTLAND CEMENT CONCRETE SHALL BE IN ACCORDANCE WITH APPLICABLE SECTIONS OF NDOT OR THE CLARK COUNTY AREA SPECIFICATIONS (AS APPLICABLE) AND THE PLANS AND DETAILS SHOWN HEREON.
20. WHEN INSTALLING UNDERGROUND FACILITIES THAT REQUIRE UNDERGROUND LOCATING DEVICES SUCH AS MARKER BALLS, LOCATING RIBBON, ETC., THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING PLACEMENT OF THE OFFSHOULDER SHARP TURNER (+/- 0.3 FEET). A SEPARATE ELECTRONIC COMMA DELIMITED FILE FOR THE SANITARY SEWER AND STORM DRAIN COORDINATES SHALL ALSO ACCOMPANY THE SANITARY SEWER AND STORM DRAIN FINAL LOCATION MAP(S).
21. SANITARY SEWER AND STORM DRAIN FINAL LOCATION MAP(S) SHALL BE PROVIDED TO THE OFFSITE INSPECTION AND TESTING PRIOR TO PROJECT ACCEPTANCE. THE MAP(S) SHALL INCLUDE THE HORIZONTAL AND VERTICAL (INVERT) LOCATION OF PUBLIC SEWER MANHOLES, STORM DRAIN MANHOLES, AND STORM DRAIN LATERALS. THE CONNECTION TO THE STORM DRAIN MAIN AND AT THE CONNECTION TO A DROP INLET, AND THE CONNECTION OF SEWER SERVICE LATERALS TO THE SERVICE MAIN AND WHERE THE SEWER SERVICE LATERALS EXITS THE PUBLIC RIGHT-OF-WAY OR THE LOCATION SHALL BE DESCRIBED BY STA. PLANE COORDINATES WHICH SHALL BE BASED ON THE NEVADA COORDINATE SYSTEM OF 1983, EAST ZONE" AS DEFINED BY THE NEVADA REVISED STATUTES CHAPTER 327, AND TIED TO THE CITY OF LAS VEGAS VERTICAL CONTROL BENCHMARK NETWORK. COORDINATES MUST BE CERTIFIED BY A NEVADA PROFESSIONAL SURVEYOR. PLANS MAY HAVE POSITIVE OR NEGATIVE ELEVATION OF THE TURNER (+/- 0.3 FEET). A SEPARATE ELECTRONIC COMMA DELIMITED FILE FOR THE SANITARY SEWER AND STORM DRAIN COORDINATES SHALL ALSO ACCOMPANY THE SANITARY SEWER AND STORM DRAIN FINAL LOCATION MAP(S).
22. SANITARY SEWER SERVICE LATERALS REQUIRE THE INSTALLATION OF A MARKER BALL AT THE CONNECTION OF THE SEWER SERVICE LATERAL TO THE SEWER MAIN AND WHERE THE SEWER SERVICE LATERAL EXITS THE PUBLIC RIGHT-OF-WAY OR WHERE THE STORM DRAIN LATERAL EXITS THE PUBLIC RIGHT-OF-WAY OF A MARKER BALL AT THE CONNECTION OF THE STORM DRAIN LATERAL TO THE STORM DRAIN MAIN AND WHERE THE STORM DRAIN LATERAL EXITS THE PUBLIC RIGHT-OF-WAY OR WHERE THE STORM DRAIN LATERAL EXITS THE PUBLIC RIGHT-OF-WAY. THE MARKER BALL SHALL BE 3M 4" MARKER BALL 1404-XR OR APPROVED EQUAL.
23. CCTV VIDEO INSPECTION IS REQUIRED FOR ALL SEWER AND STORM DRAINS. THE CCTV VIDEO INSPECTIONS NEED TO BE PERFORMED PER THE DESIGN AND CONSTRUCTION STANDARDS FOR WASTEWATER COLLECTION SYSTEMS LATEST EDITION.
24. A SEPARATE BORING PERMIT IS REQUIRED FOR ALL BORING ACTIVITIES.

JOE NO 62023B-202



VILLAGE 23B
PARCEL U
APN 137-22-000-015
THE HOWARD HUGHES
CORPORATION

VILLAGE 23B
PARCEL T
APN 137-22-000-015
THE HOWARD HUGHES
CORPORATION
SID #810 PROJECTS 6A, 6B & 6C
SID #809 PROJECTS 8A, 8B & 8C

VILLAGE 23B
PARCEL Q
APN 137-22-000-015
THE HOWARD HUGHES
CORPORATION
SID #810 PROJECTS 6A, 6B & 6C
SID #809 PROJECTS 8A, 8B & 8C

VILLAGE 23B
PARCEL P
APN 137-22-000-015
THE HOWARD HUGHES
CORPORATION

VILLAGE 20
PARCEL W

VILLAGE 23A
PARCEL I

VILLAGE 20
PARCEL WS-1

VILLAGE 23A
PARCEL N
APN 137-34-210-001
THE HOWARD HUGHES
CORPORATION

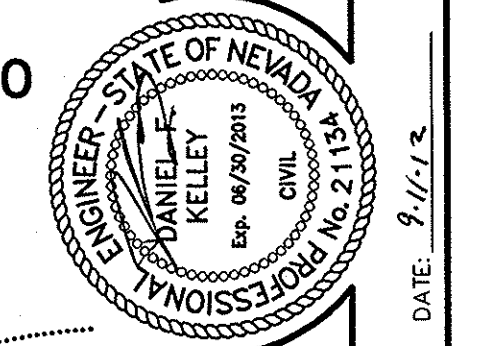
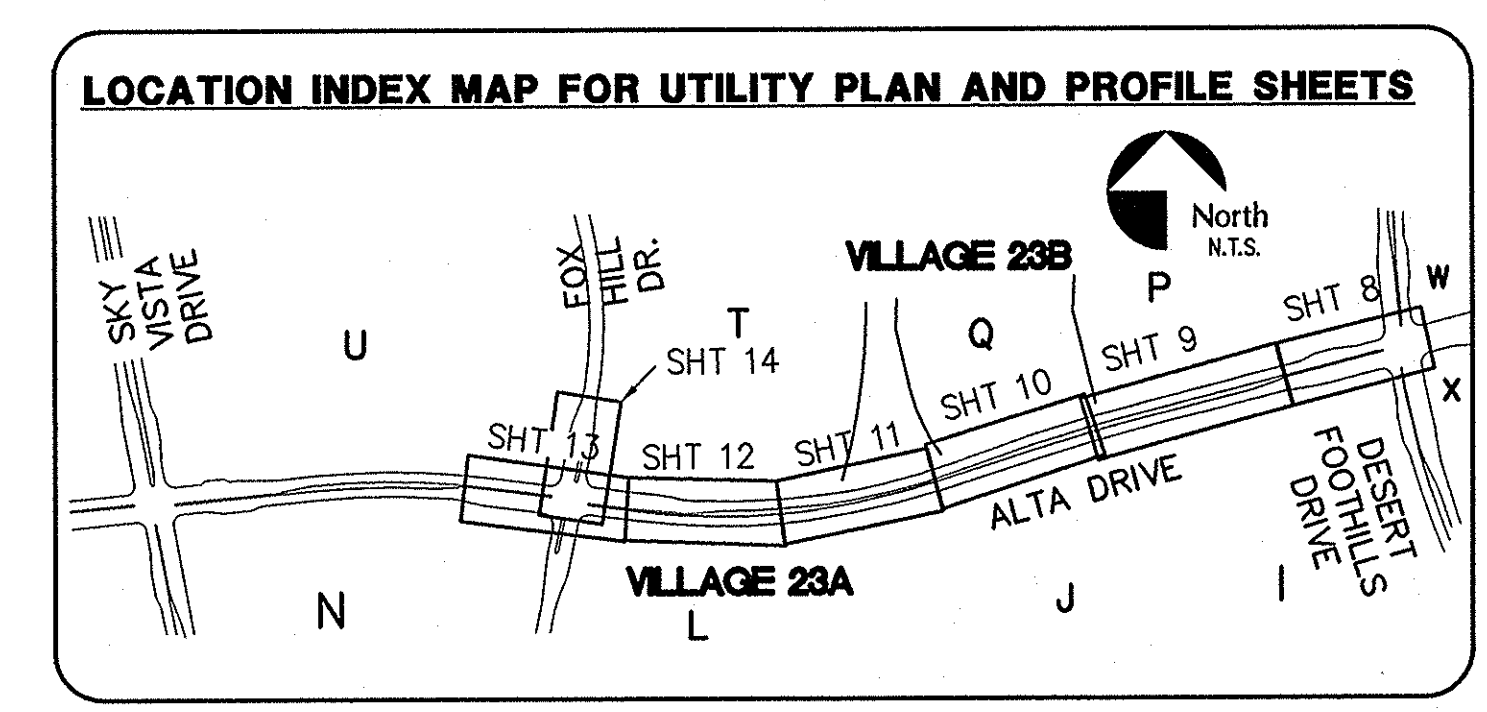
VILLAGE 23A
PARCEL L
APN 137-34-210-002
THE HOWARD HUGHES
CORPORATION

VILLAGE 23A
PARCEL J
APN 137-34-210-003
THE HOWARD HUGHES
CORPORATION

STORM DRAIN ESTIMATED QUANTITIES (PUBLIC)

24" STORM DRAIN CLASS III RCP	280 LF
30" STORM DRAIN CLASS III RCP	11 LF
TYPE "CM" DROP INLET ~ 10.0'	3 EA
TYPE "CM" DROP INLET ~ 7.5'	6 EA
TYPE "CM" DROP INLET ~ 5.0'	1 EA

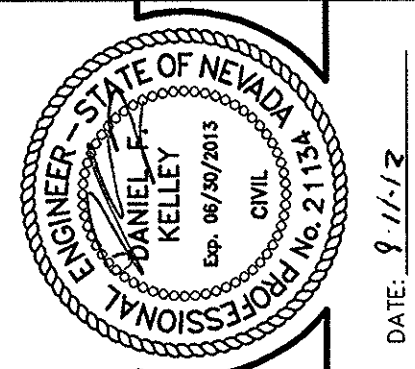
QUANTITIES ARE ESTIMATED ONLY. CONTRACTOR
IS TO VERIFY DURING BIDDING PROCESS.



DESIGN	CHK	DATE
GENL/GTP		
DRAWN	GTP	
CHECK	BAH	
ISSUE DATE		
ISSUE EDITOR		
PLOT DATE	09-11-12	
PLOT TIME	10:08:18	

G. C. WALLACE COMPANIES
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T: 702.804.2000 F: 702.804.2299 GCWALLACE.COM

THE HOWARD HUGHES COMPANY, LLC
VILLAGE 23A/23B ALTA DRIVE IMPROVEMENTS
STORM DRAIN MASTER PLAN



8 OF 28 SHEETS

SHEET

8

THE HOWARD HUGHES COMPANY, LLC

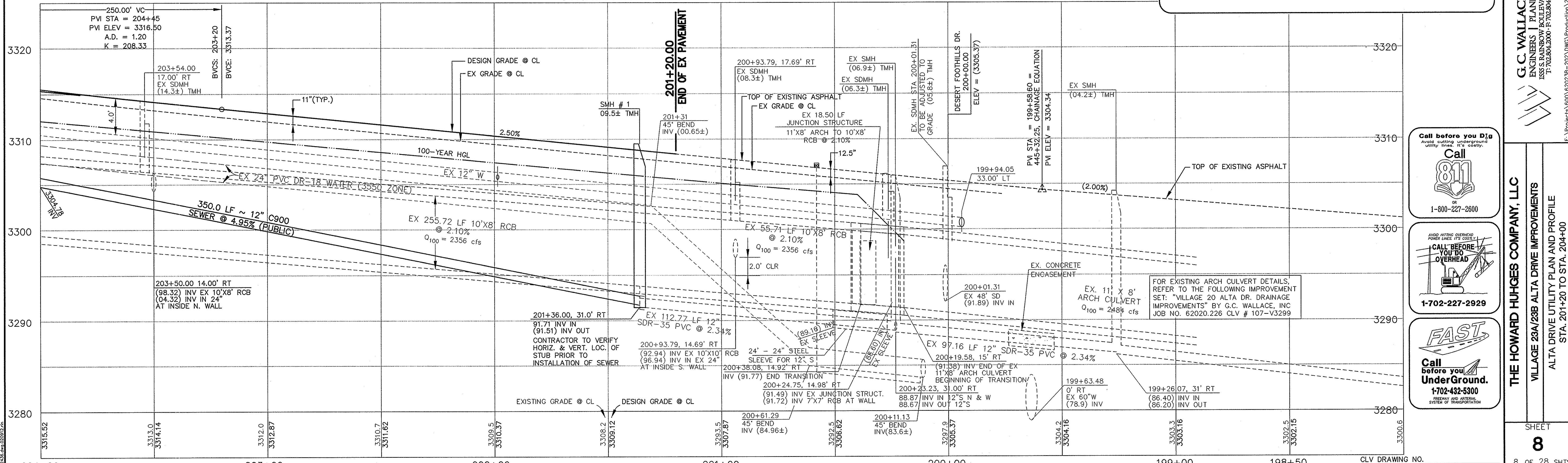
VILLAGE 23A/23B ALTA DRIVE IMPROVEMENTS

ALTA DRIVE UTILITY PLAN AND PROFILE

STA. 201+20 TO STA. 204+00



F:\Projects\60001920\

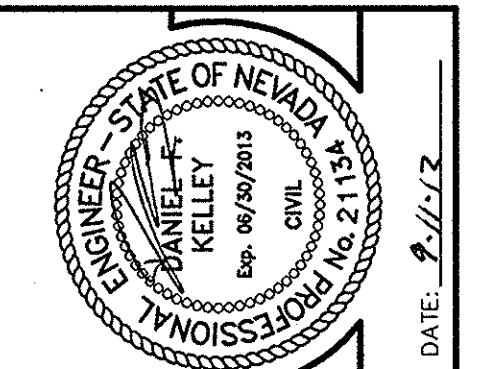
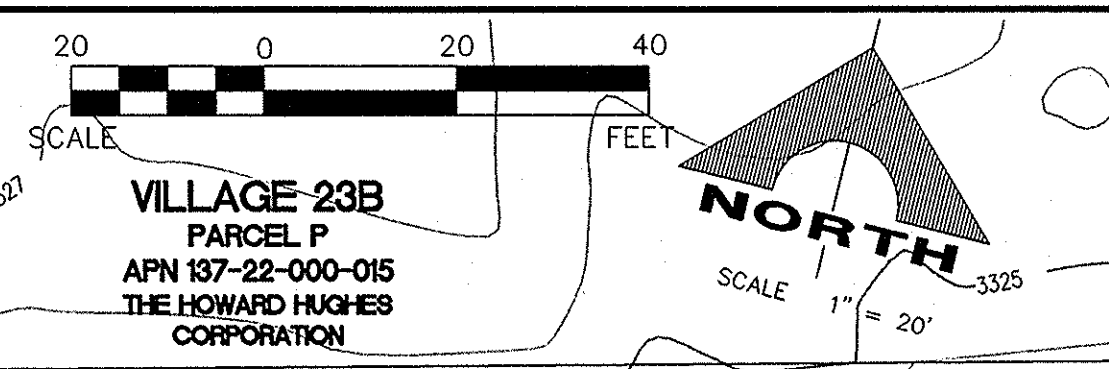


MATCHLINE 210+00 SEE SHEET 10

MATCHLINE 204+00 SEE SHEET 8

FOR EXISTING GRADING SEE: "VILLAGE 23B ALTA DRIVE INTERIM GRADING" BY G.C. WALLACE, INC., JOB NUMBER 62023-140 CLV #45986

EXISTING CHANNEL AND RIPRAP IN PARCEL W TO REMAIN IN PLACE.



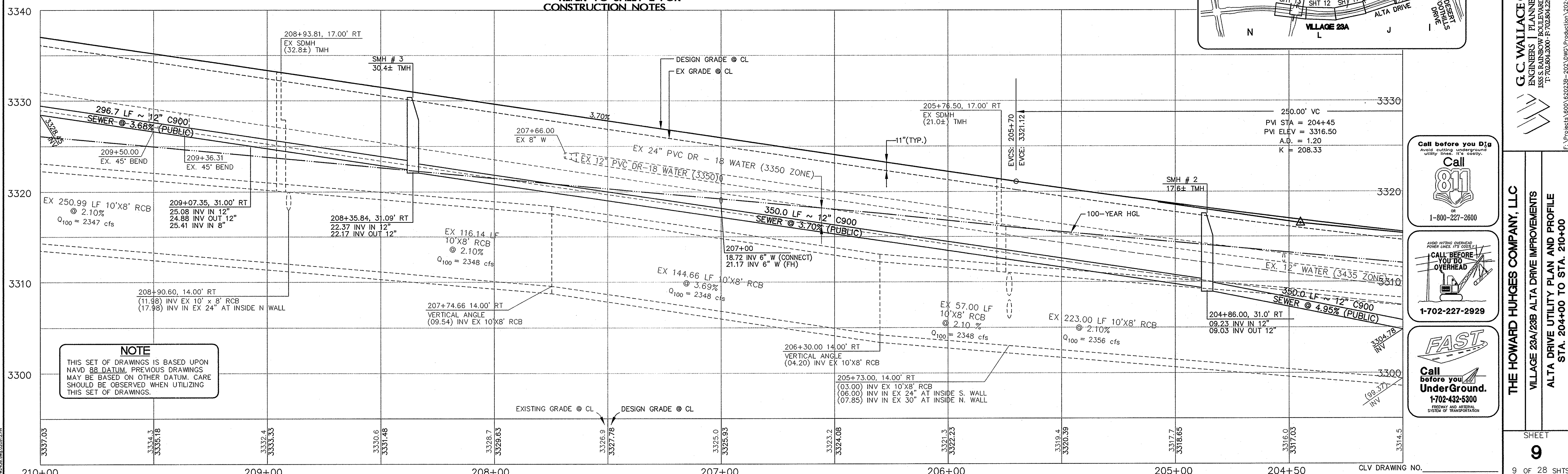
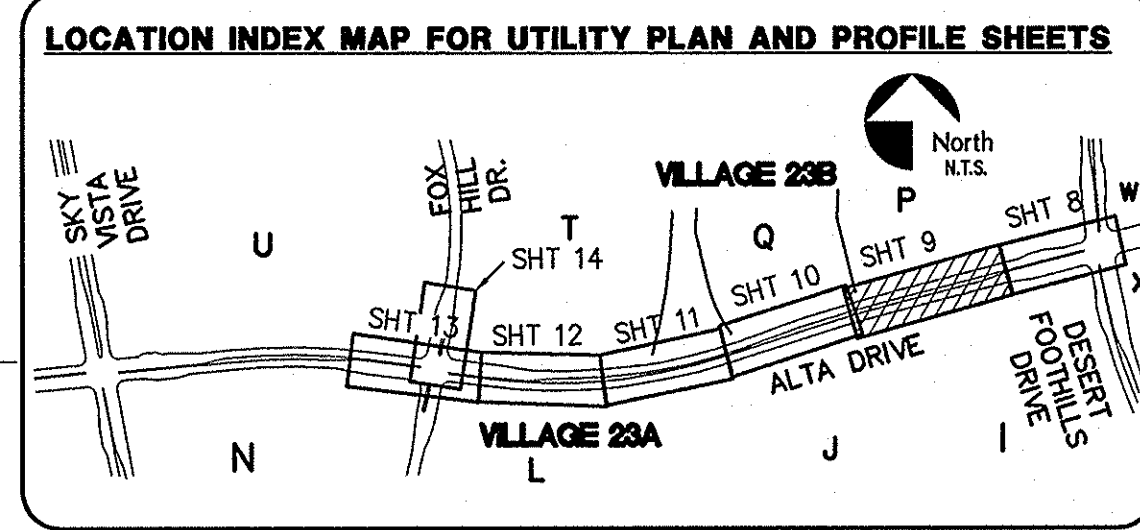
BENCHMARK		NAVD 88 DATUM	NAVD 88 DATUM
BM #	DESC.		
CLV BM No. 0368 3	U.S.C. & G.S. BRASS DISC SET IN ROCK ON THE EAST SIDE OF CHARLESTON BOULEVARD AND SOUTH OF THE RED ROCK DETENTION BASIN.	3246.71 (FEET)	989.599 (METERS)

BASIS OF BEARINGS
NORTH 89°45'05" EAST BEING THE SOUTH LINE OF THE SOUTHWEST QUARTER (SW 1/4) OF SECTION 35, TOWNSHIP 20, SOUTH, RANGE 59 EAST, M.D.M., AS SHOWN BY MAP ON FILE IN FILE 91, PAGE 28 OF PARCEL MAPS IN THE CLARK COUNTY RECORDER'S OFFICE, CLARK COUNTY, NEVADA

**SID #810 PROJECTS 6A, 6B & 6C
SID #809 PROJECTS 8A, 8B & 8C
ALTA DRIVE (PUBLIC)**

SCALE: HORIZ. 1" = 20'
VERT. 1" = 5'
REFER TO SHEET 2 FOR CONSTRUCTION NOTES

APPROVAL:
LAS VEGAS VALLEY WATER DISTRICT (PROJECT #) DATE



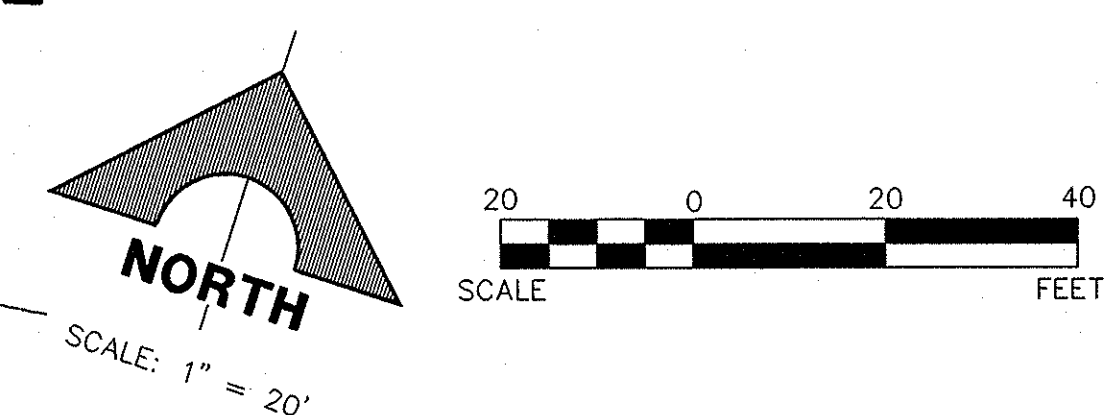
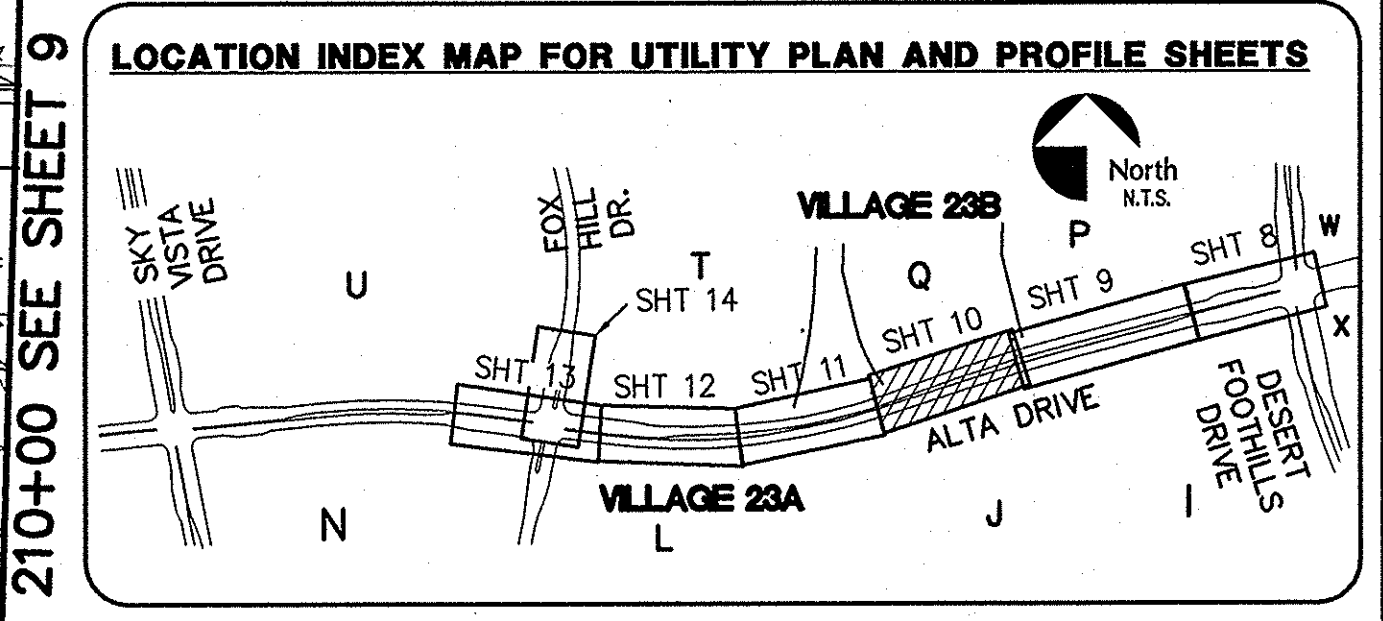
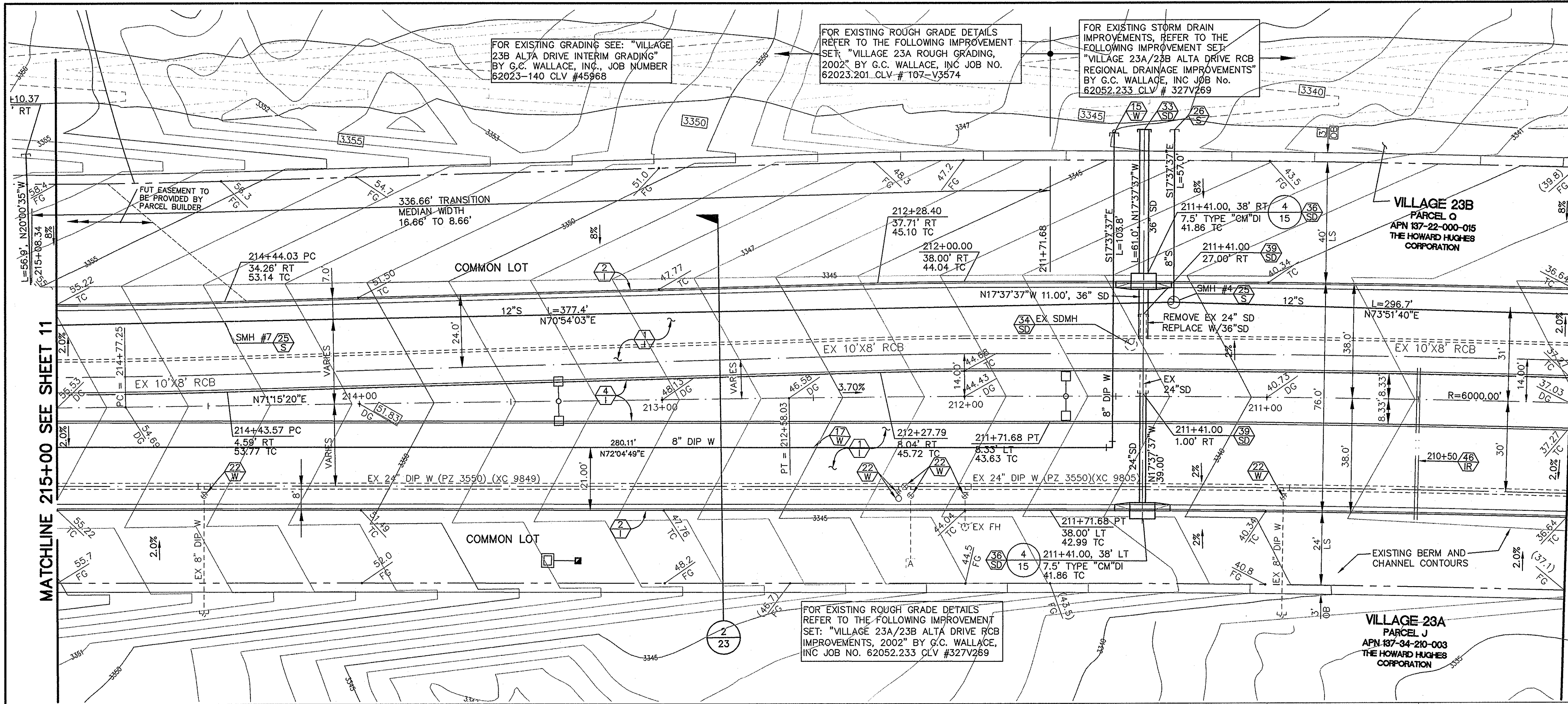
NOTE
THIS SET OF DRAWINGS IS BASED UPON NAVD 88 DATUM. PREVIOUS DRAWINGS MAY BE BASED ON OTHER DATUM. CARE SHOULD BE OBSERVED WHEN UTILIZING THIS SET OF DRAWINGS.

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OVERHEAD
1-702-227-2929

FAST
Call before you UnderGround.
1-702-432-5300

THE HOWARD HUGHES COMPANY, LLC
VILLAGE 23A/23B ALTA DRIVE IMPROVEMENTS
ALTA DRIVE UTILITY PLAN AND PROFILE
STA. 204+00 TO STA. 210+00



SID #810 PROJECTS 6A, 6B & 6C
SID #809 PROJECTS 8A, 8B & 8C
ALTA DRIVE (PUBLIC)

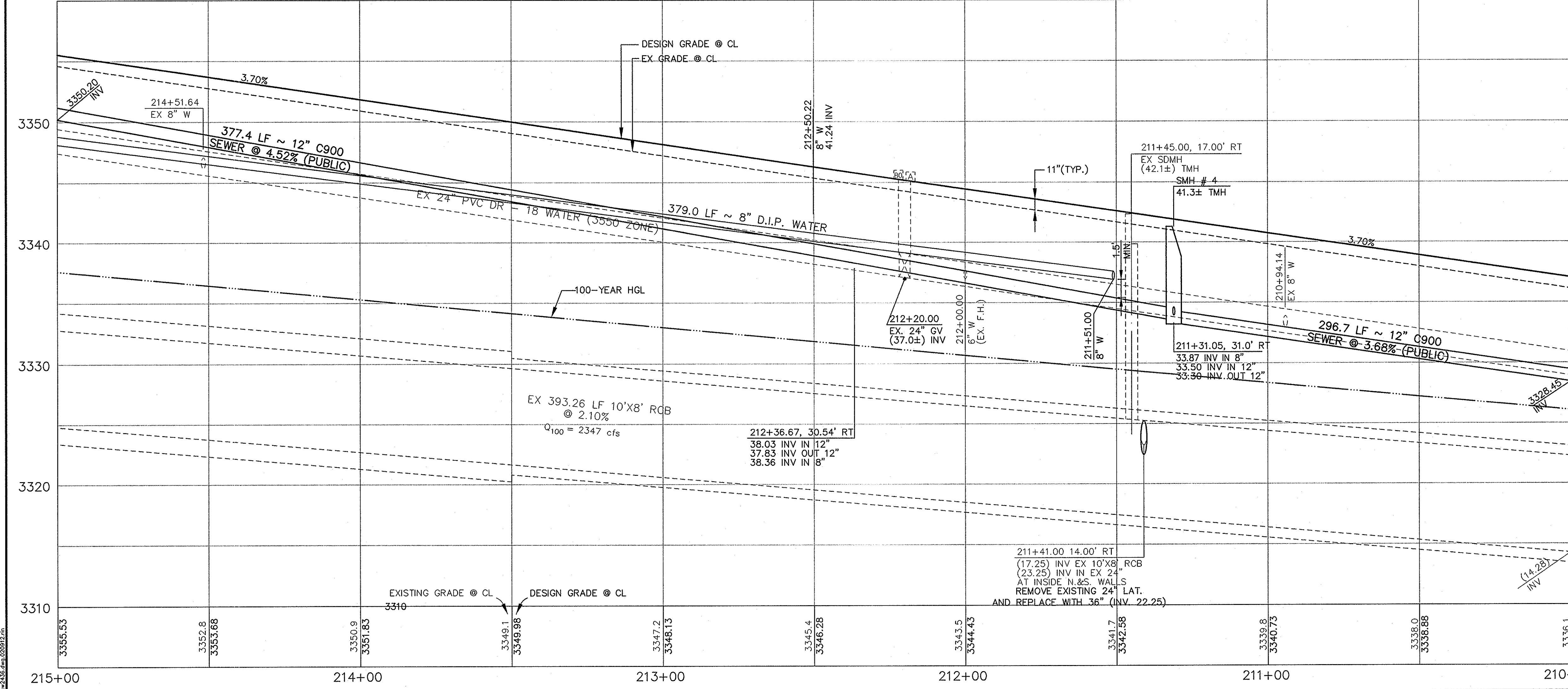
SCALE: HORIZ. 1" = 20'
VERT. 1" = 5'
REFER TO SHEET 2 FOR
CONSTRUCTION NOTES

BENCHMARK			
BM #	DESC.	NAVD 88 DATUM	NAVD 88 DATUM
CLV BM No. D368 3	U.S.C. & G.S. BRASS DISC SET IN ROCK ON THE EAST SIDE OF CHARLESTON BOULEVARD AND SOUTH OF THE RED ROCK DETENTION BASIN.	3246.71 (FEET)	989.599 (METERS)

BASIS OF BEARINGS
NORTH 89°45'05" EAST BEING THE SOUTH LINE OF THE SOUTHWEST QUARTER (SW 1/4) OF SECTION 35, TOWNSHIP 20 SOUTH, RANGE 59 EAST, M.D.M., AS SHOWN BY MAP ON FILE IN FILE 91, PAGE 28 OF PARCEL MAPS IN THE CLARK COUNTY RECORDER'S OFFICE, CLARK COUNTY, NEVADA

NOTE
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APPROVAL:
LAS VEGAS VALLEY WATER DISTRICT (PROJECT # _____) DATE _____



DESIGN: CBW/GTP	DRAWN: GTP	CHECK: BAH	ISSUE DATE: 09-11-12	DATE: 09-11-12
G.C. WALLACE COMPANIES ENGINEERS PLANNERS SURVEYORS 1702-227-2929 1-702-432-6300 F:\Projects\600\62023B-202\DWG Production\202-C10.dwg				ISSUE DATE: REV. DATE: DATE: 09-11-12
THE HOWARD HUGHES COMPANY, LLC VILLAGE 23A/23B ALTA DRIVE IMPROVEMENTS ALTA DRIVE UTILITY PLAN AND PROFILE STA. 210+00 TO STA. 215+00				JOB NO. 62023B-202
SHEET 10 10 OF 28 SHTS				

FOR INTERIM
CHANNEL GRADING
SEE SHEET 19

VILLAGE 23B
PARCEL U
APN 137-22-000-015
THE HOWARD HUGHES
CORPORATION

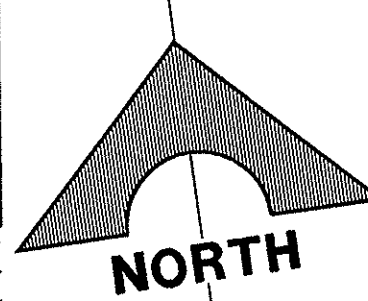
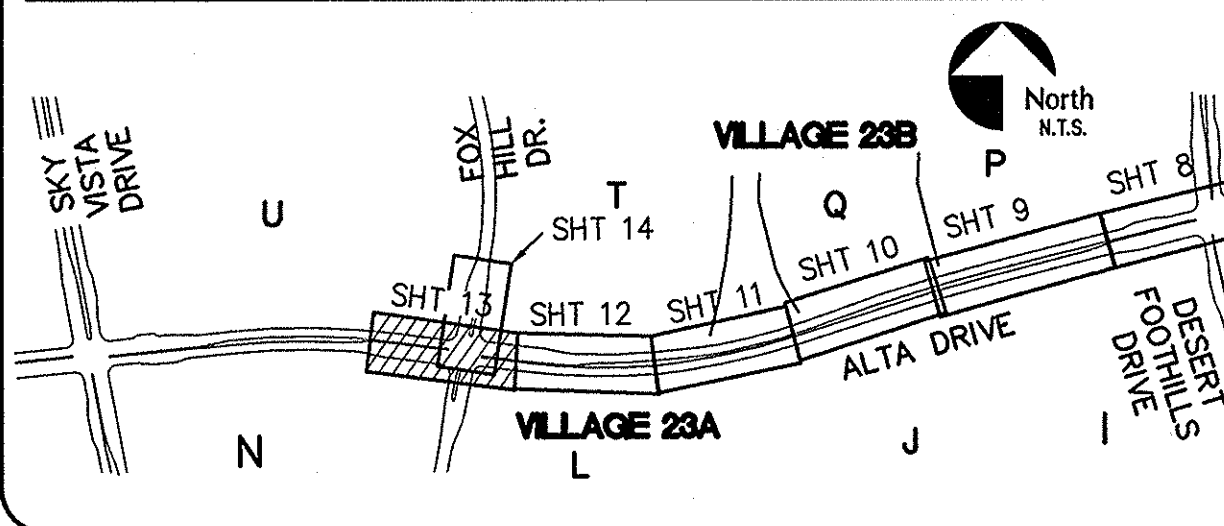
FOR EXISTING GRADING SEE: "VILLAGE
23B ALTA DRIVE INTERIM GRADING"
BY G.C. WALLACE, INC., JOB NUMBER
62023-140 CLV #45968

FOR EXISTING STORM DRAIN
IMPROVEMENTS, REFER TO THE
FOLLOWING IMPROVEMENT SET:
"VILLAGE 23A/23B ALTA DRIVE RCB
REGIONAL DRAINAGE IMPROVEMENTS"
BY G.C. WALLACE, INC. JOB NO.
62052.233 CLV # 327V269

SEE SHEET 14
FOR CONTINUATION

VILLAGE 23B
PARCEL T
APN 137-22-000-016
THE HOWARD HUGHES
CORPORATION

LOCATION INDEX MAP FOR UTILITY PLAN AND PROFILE SHEETS



SID #810 PROJECTS 6A, 6B & 6C
SID #809 PROJECTS 8A, 8B & 8C

ALTA DRIVE (PUBLIC)

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

REFER TO SHEET 2 FOR
CONSTRUCTION NOTES



BENCHMARK			
BM #	DESC.	NAVD 88 DATUM	NAVD 88 DATUM
CLV BM No. D368.3	U.S.C. & G.S. BRASS DISC SET IN ROCK ON THE EAST SIDE OF CHARLESTON BOULEVARD AND SOUTH OF THE RED ROCK DETENTION BASIN.	3246.71 (FEET)	989.599 (METERS)

BASIS OF BEARINGS

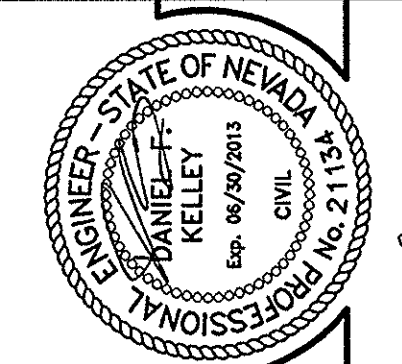
NORTH 89°45'05" EAST BEING THE SOUTH LINE OF THE SOUTHWEST QUARTER (SW 1/4) OF SECTION 35, TOWNSHIP 20 SOUTH, RANGE 59 EAST, M.D.M., AS SHOWN BY MAP ON FILE IN FILE 91, PAGE 28 OF PARCEL MAPS IN THE CLARK COUNTY RECORDER'S OFFICE, CLARK COUNTY, NEVADA

NOTE

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APPROVAL:

LAS VEGAS VALLEY WATER DISTRICT (#_____) DATE _____



G.C. WALLACE COMPANY, LLC
ENGINEERS | PLANNERS | SURVEYORS
1515 SOUTH MAIN STREET, SUITE 200, LAS VEGAS, NV 89102
TEL: 702.894.2000 FAX: 702.894.2299 GCWALLACE.COM

THE HOWARD HUGHES COMPANY, LLC
VILLAGE 23A/23B ALTA DRIVE IMPROVEMENTS
ALTA DRIVE UTILITY PLAN AND PROFILE
STA. 225+00 TO STA. 230+00

SHEET
13

JOB NO. 62023B-202

DATE: 9/1/12

DATE: 09/11/12

DATE: 09/11/12

DATE: 09/11/12

DATE: 09/11/12

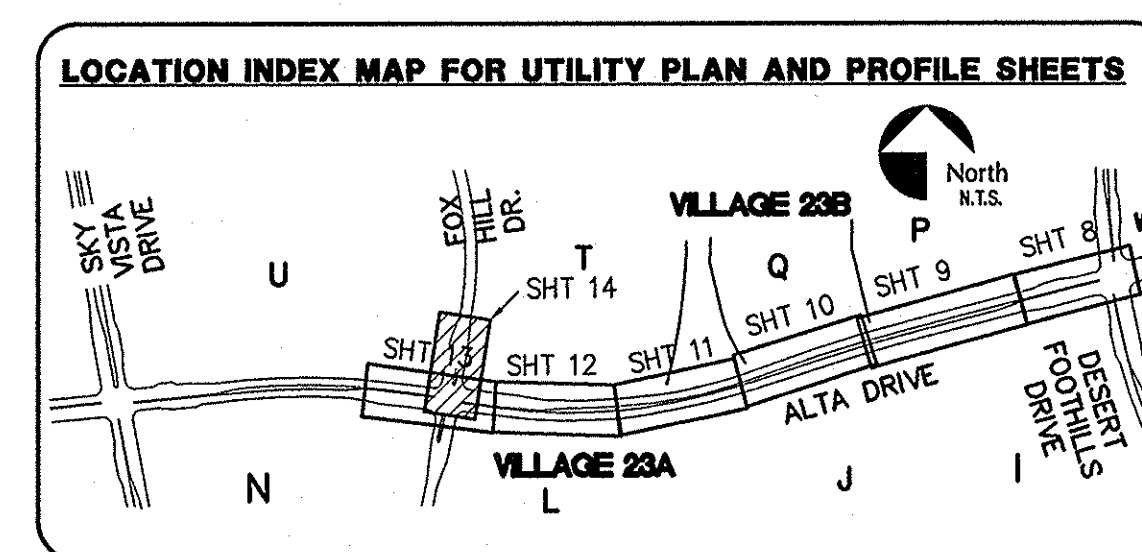
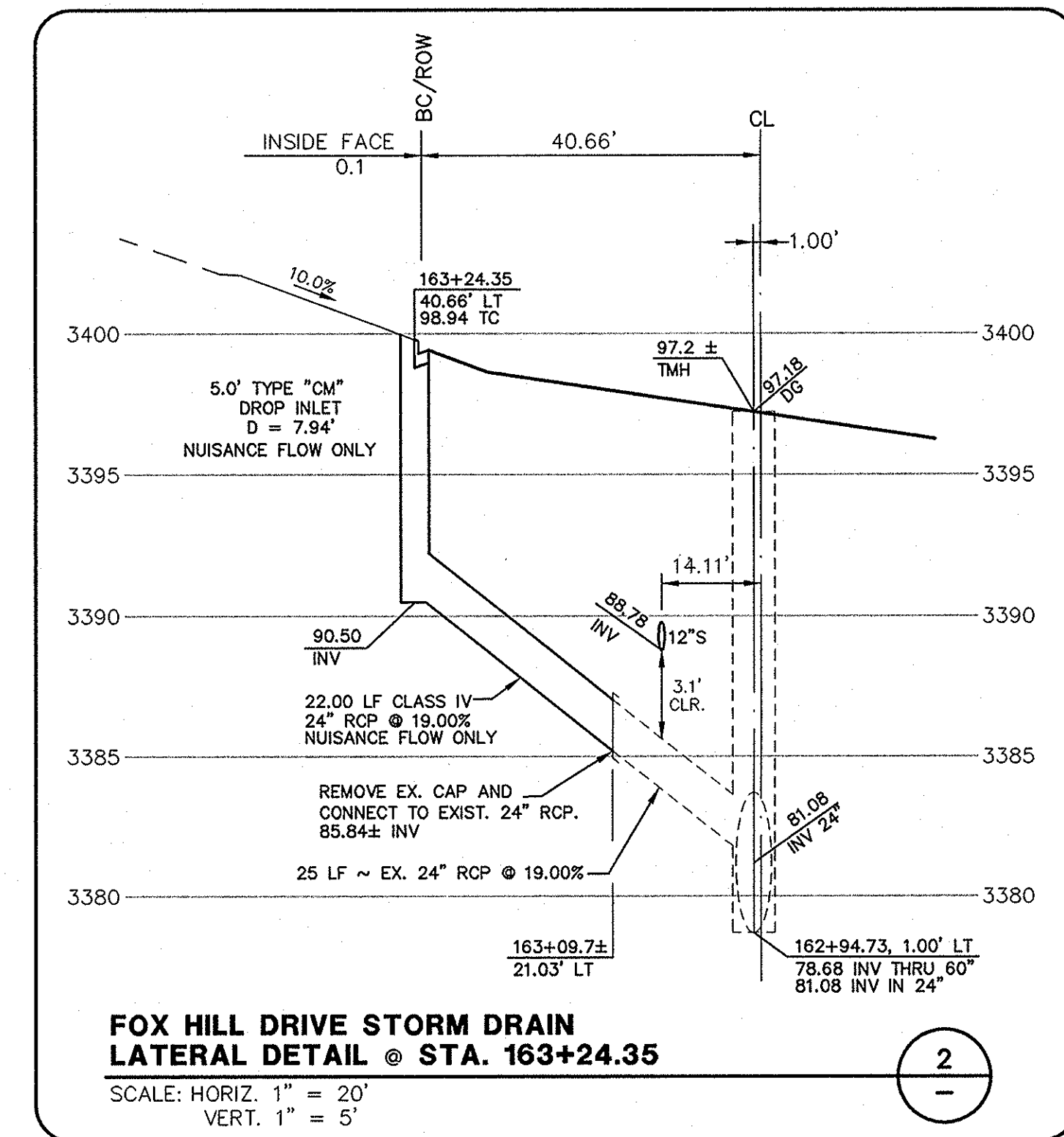
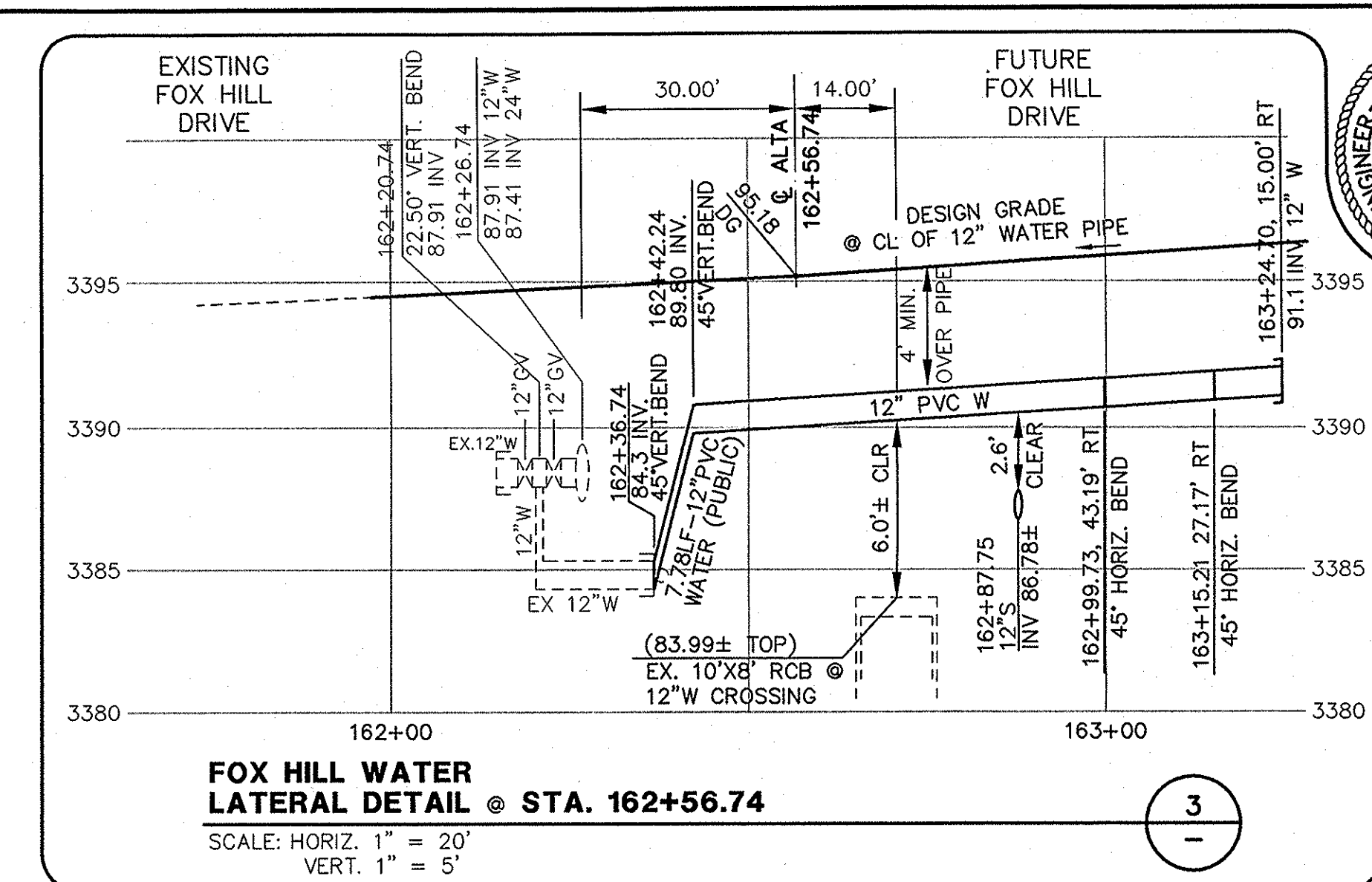
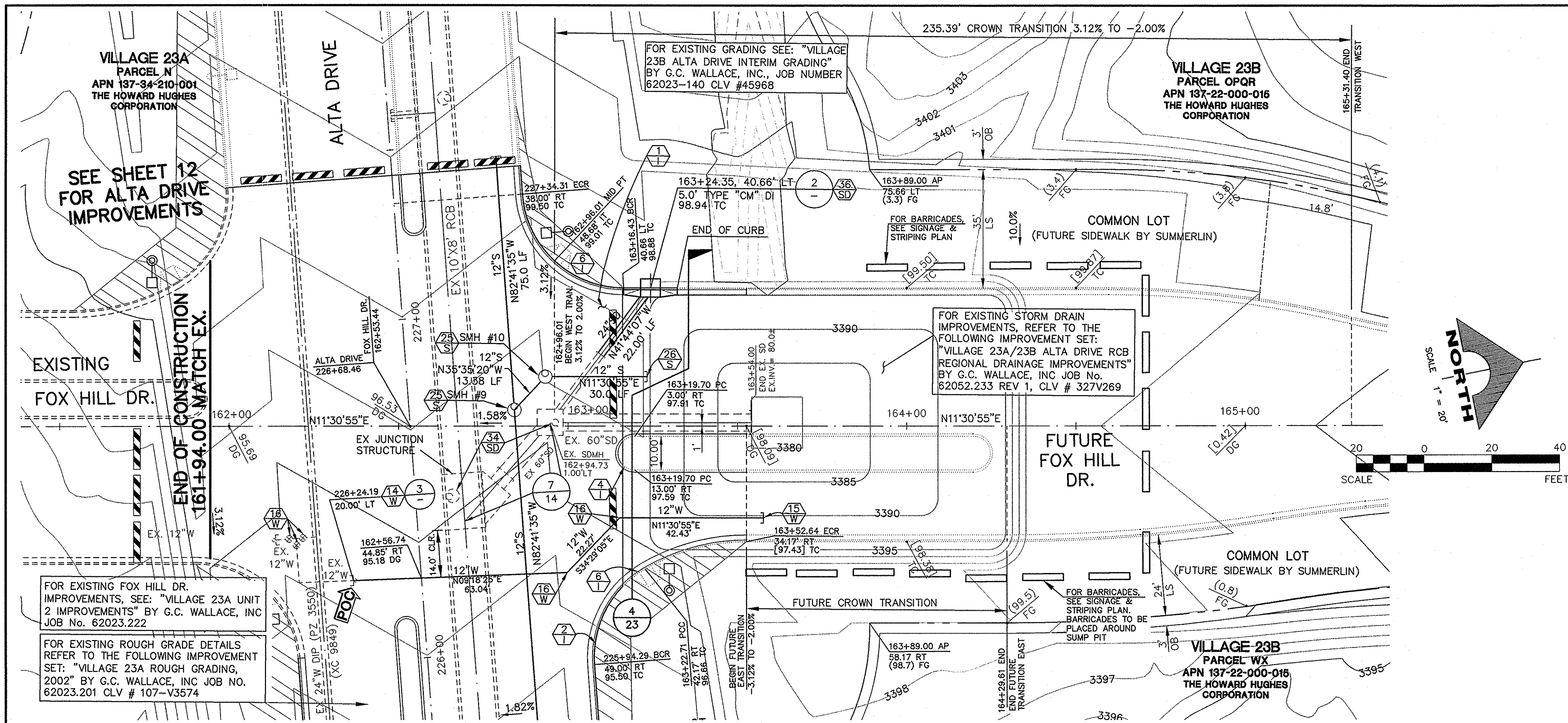
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DATE: 09/11/12

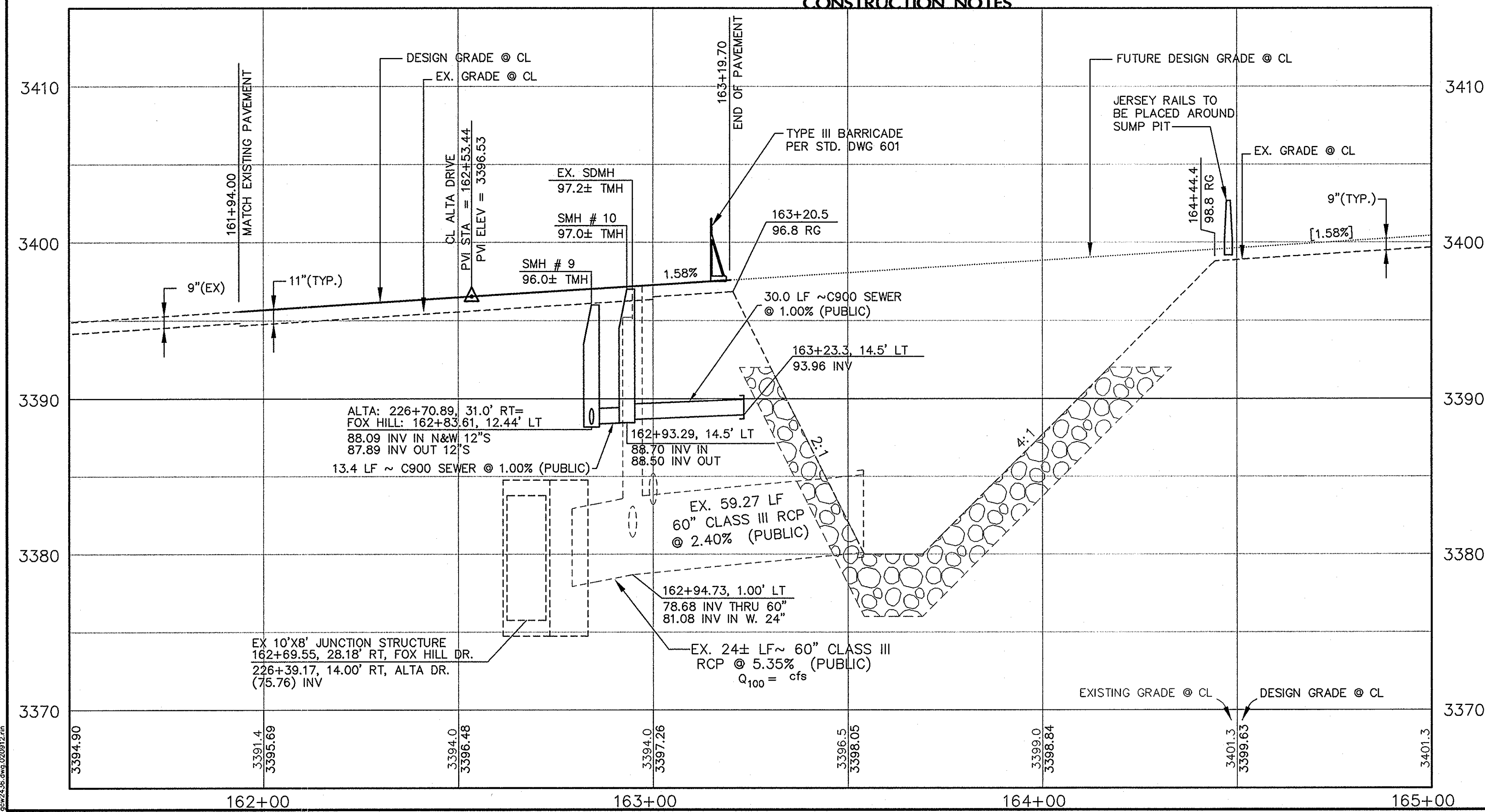


BASIS OF BEARINGS
NORTH 89°45'05" EAST BEING THE SOUTH LINE OF THE SOUTHWEST QUARTER (SW 1/4) OF SECTION 35, TOWNSHIP 20 SOUTH, RANGE 59 EAST, M.D.M., AS SHOWN BY MAP ON FILE IN FILE 91, PAGE 28 OF PARCEL MAPS IN THE CLARK COUNTY RECORDER'S OFFICE, CLARK COUNTY, NEVADA

NOTE
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**SID #810 PROJECTS 6A, 6B & 6C
SID #809 PROJECTS 8A, 8B & 8C
FOX HILL DRIVE (PUBLIC)**
SCALE: HORIZ. 1" = 20', VERT. 1" = 5'
REFER TO SHEET 2 FOR CONSTRUCTION NOTES

BENCHMARK			
BM #	DESC.	NAVD 88 DATUM	NAVD 88 DATUM
CLV BM No. D368 3	U.S.C. & G.S. BRASS DISC SET IN ROCK ON THE EAST SIDE OF CHARLESTON BOULEVARD AND SOUTH OF THE RED ROCK DETENTION BASIN.	3246.71 (FEET)	989.599 (METERS)



APPROVAL:
LAS VEGAS VALLEY WATER DISTRICT (PROJECT # _____) DATE _____

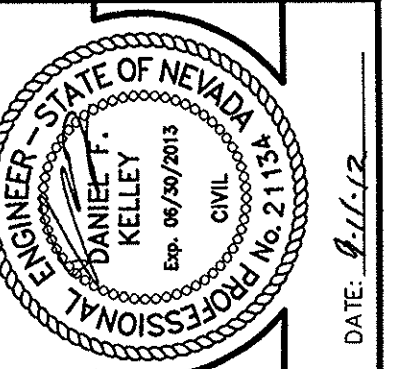
G.C. WALLACE COMPANIES
ENGINEERS | PLANNERS | SURVEYORS
1770 S. LAS VEGAS AVENUE, SUITE 200
LAS VEGAS, NV 89102
TEL: 702.894.2200 FAX: 702.894.2299 GCWALLACE.COM

THE HOWARD HUGHES COMPANY, LLC
VILLAGE 23A/23B ALTA DRIVE IMPROVEMENTS
FOX HILL DRIVE UTILITY PLAN AND PROFILE
STA. 162+00 TO STA. 165+50

DANIEL KELLEY
REGISTERED PROFESSIONAL ENGINEER
STATE OF NEVADA
No. 21131
Exp. 06/30/2021
DATE: 9/1/12
DATE AGED: APP DATE: GCW APP

DESIGN: GBW/STP
DRAWN: GTP
CHECK: BAH
ISSUE DATE: 09-11-12
PLOT DATE: 09-11-12
PLOT TIME: 10:09:30

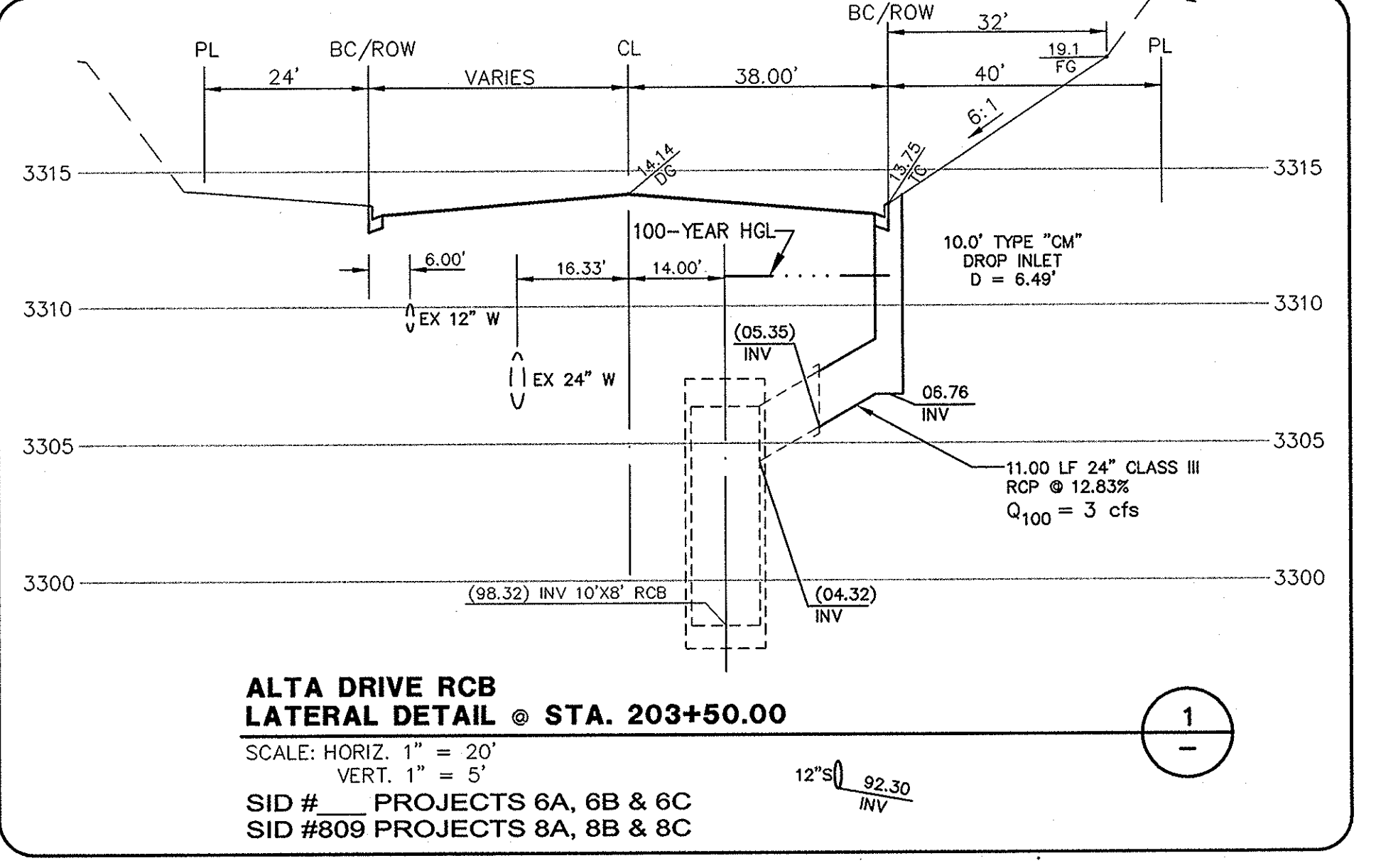
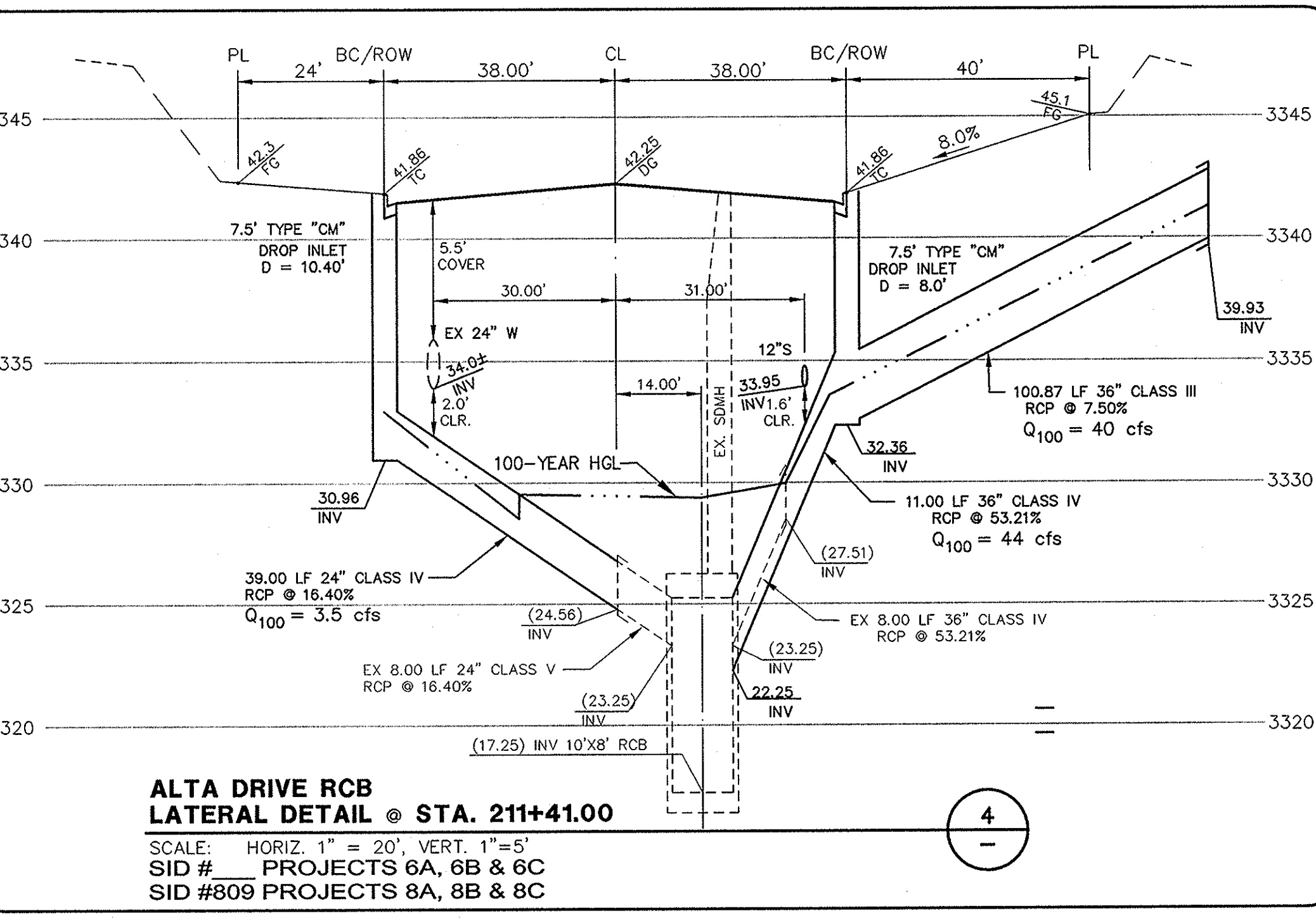
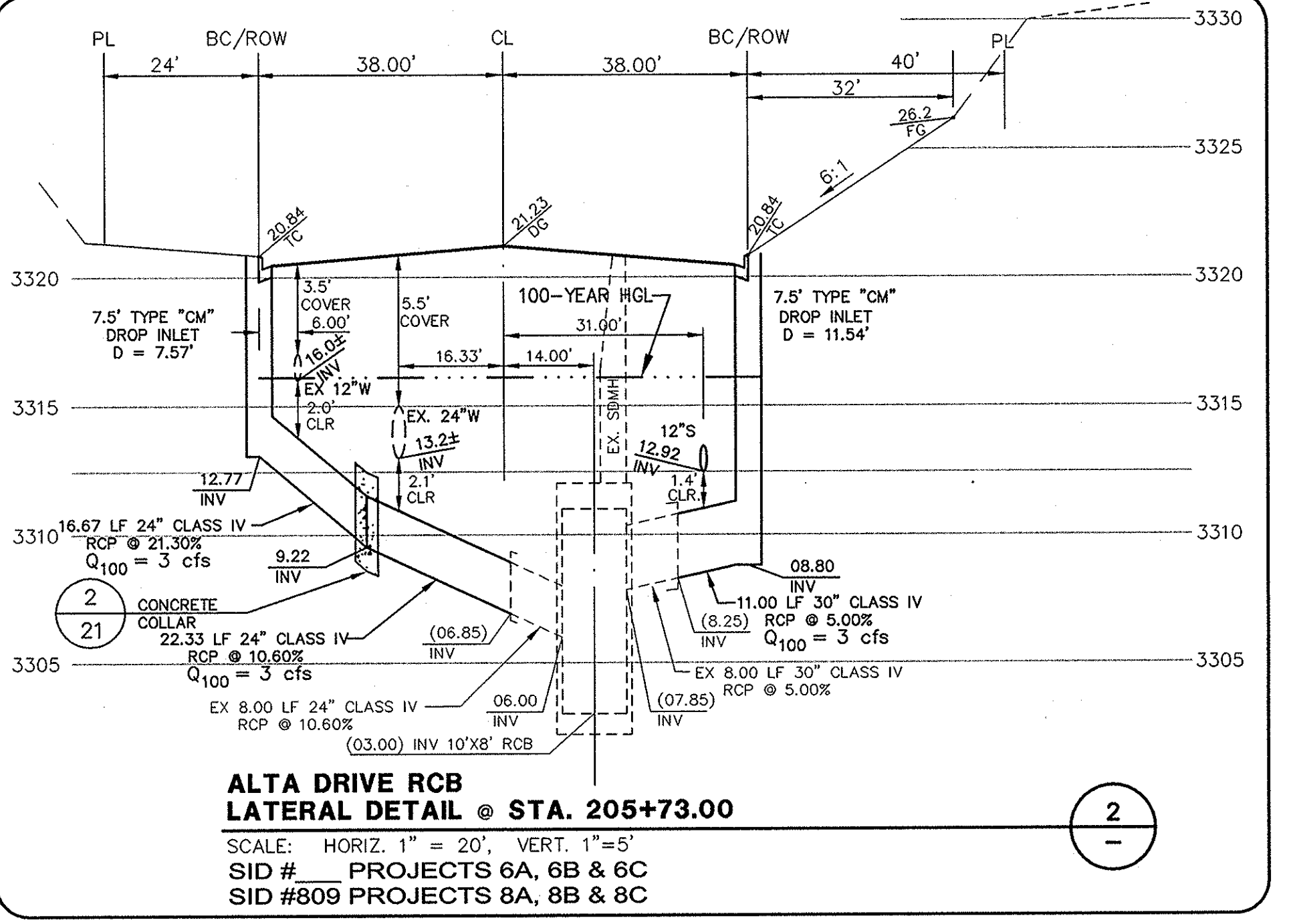
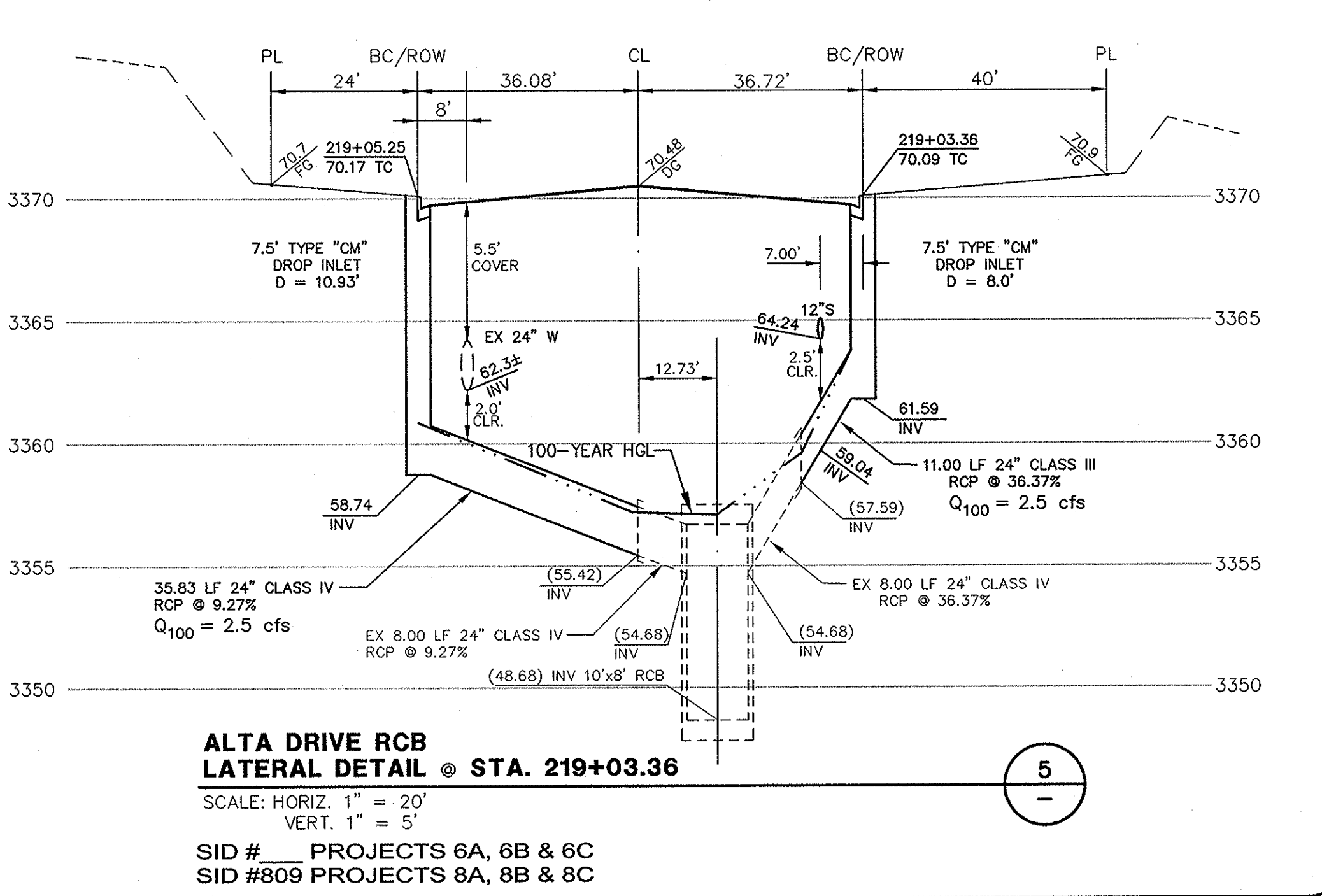
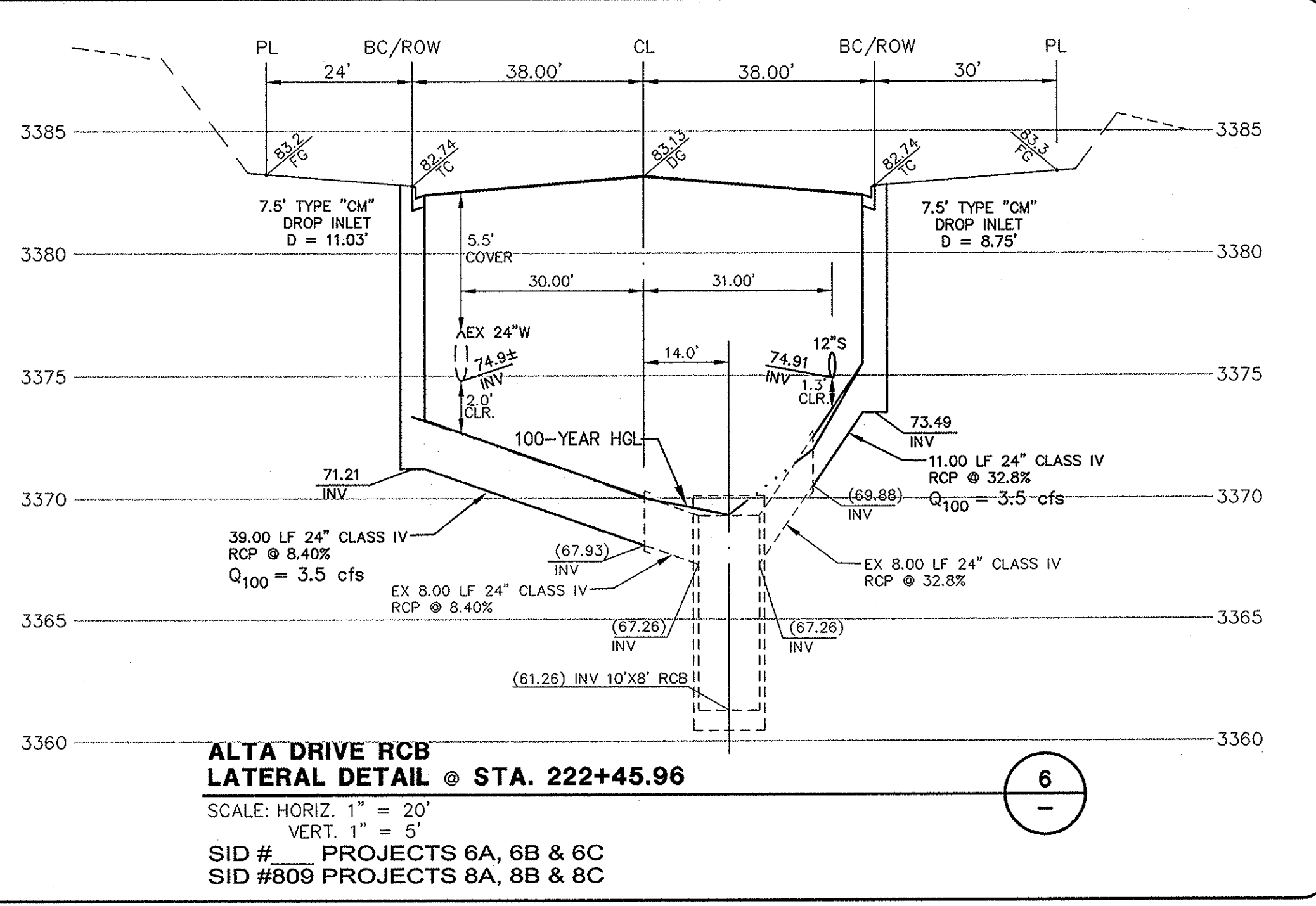
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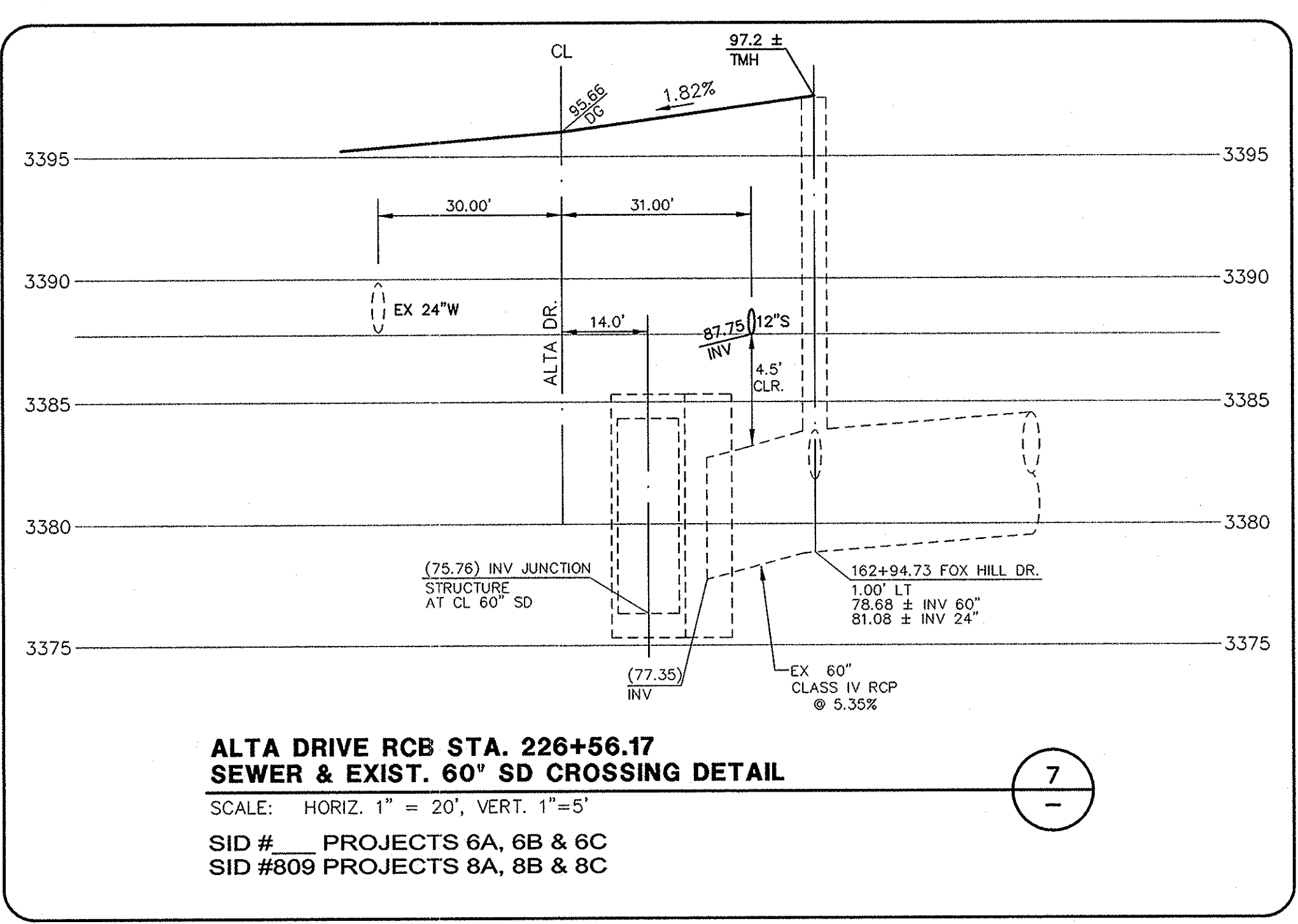
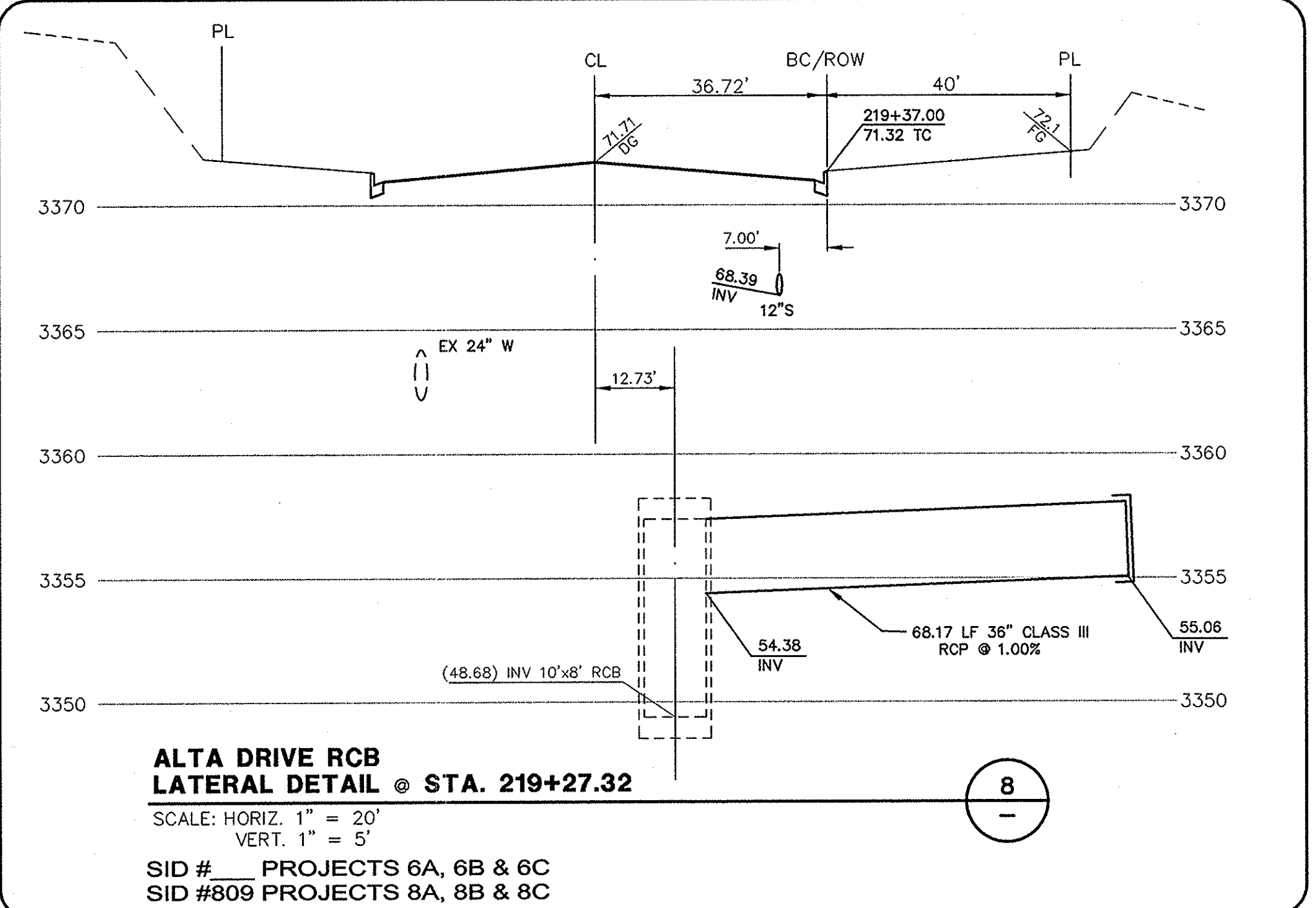
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2	10-09-16	DATE LAGEN APP. DATE GCW APP.

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CHECK: BAH
ISSUE DATE: 10-09-16
PLOT DATE: 09-11-12
PLOT TIME: 10:09:36
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THE HOWARD HUGHES COMPANY, LLC
VILLAGE 23A/23B ALTA DRIVE IMPROVEMENTS
LATERAL PROFILES 1



APPROVAL:
LAS VEGAS VALLEY WATER DISTRICT (PROJECT # _____) DATE _____



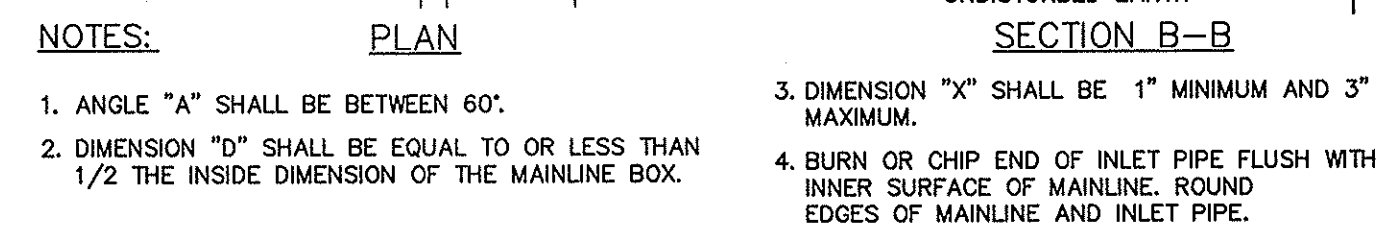
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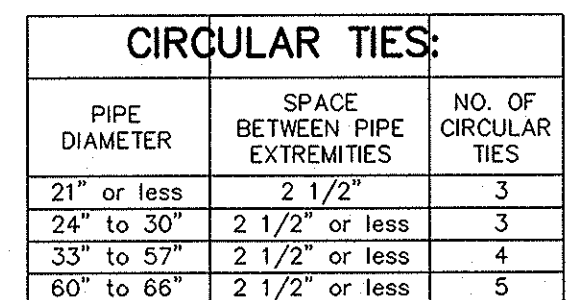
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OB NO. 1

2

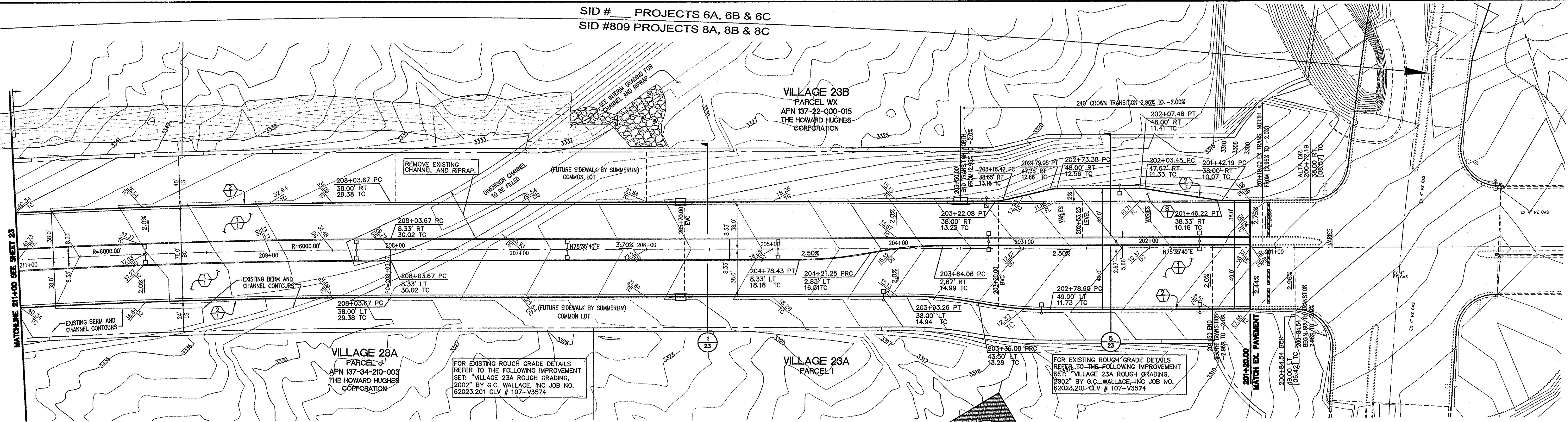


NO SCALE



CLV DRAWING NO. _____

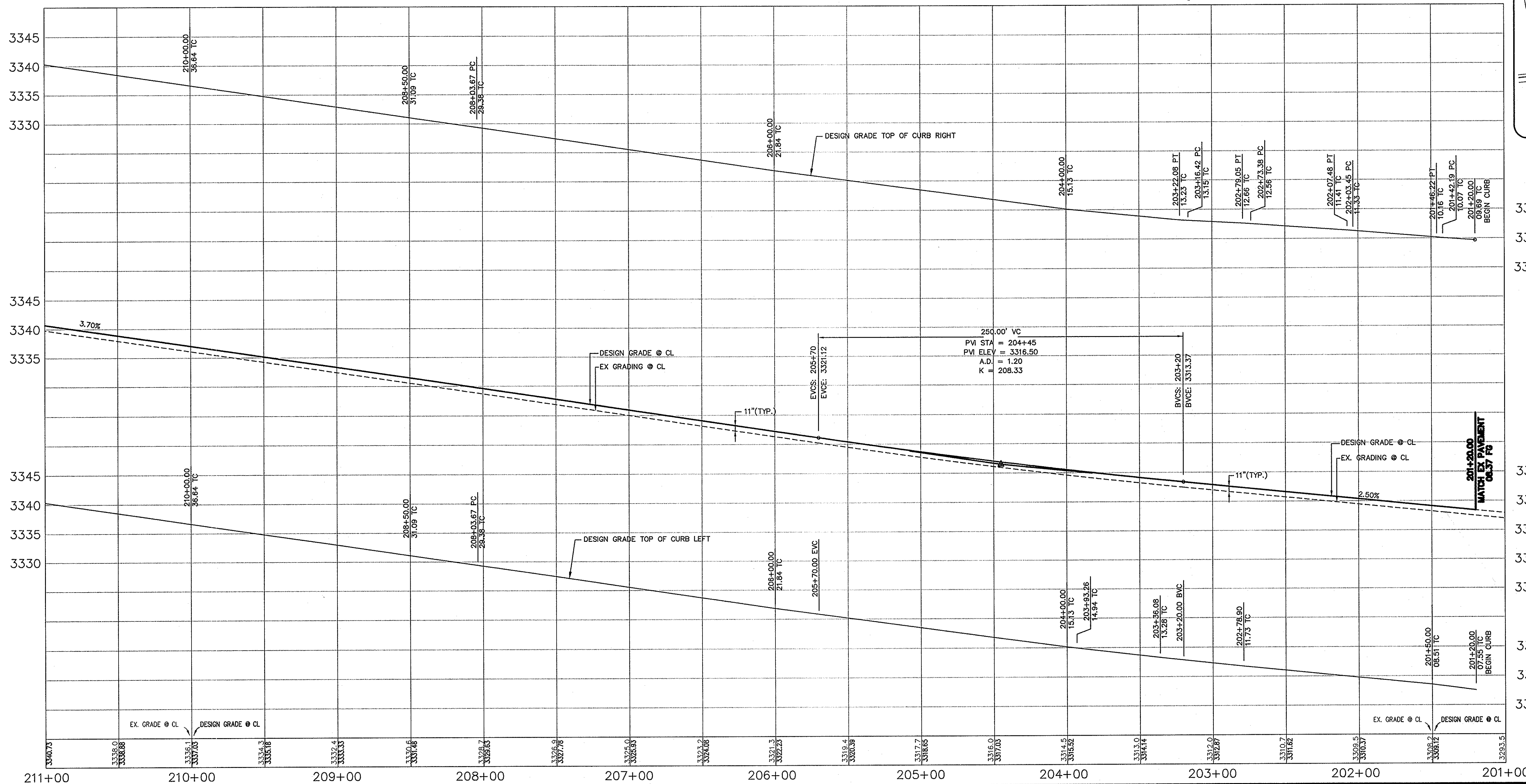
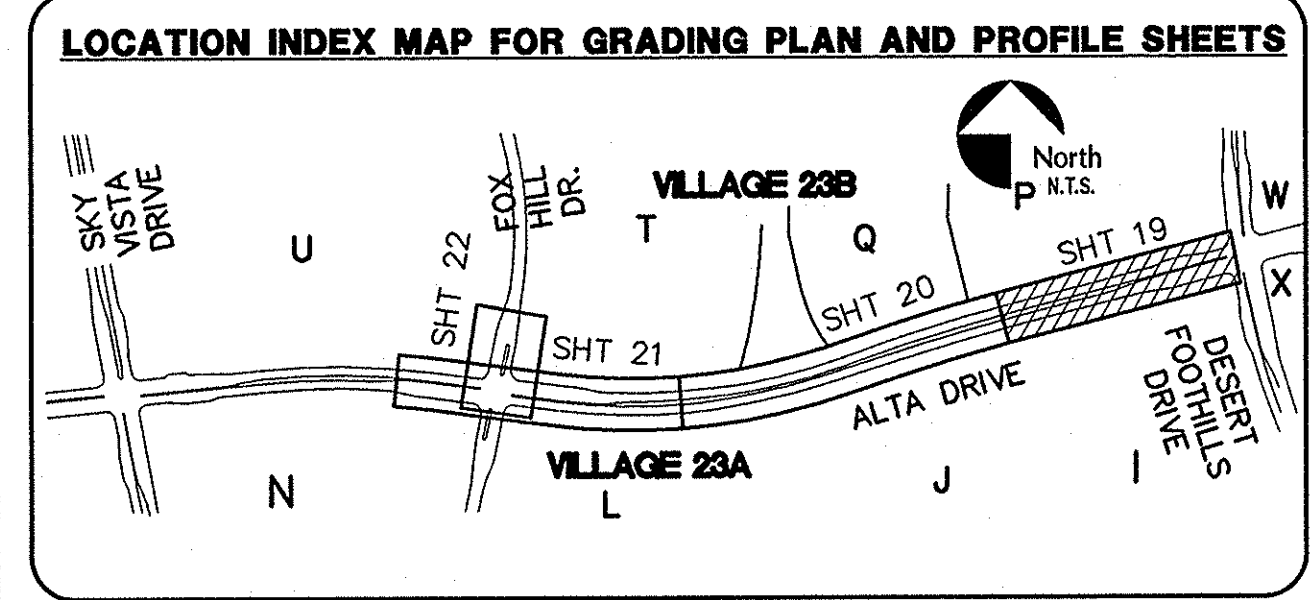
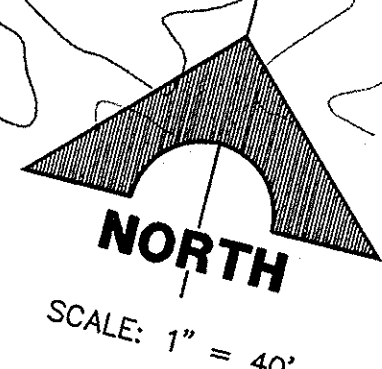
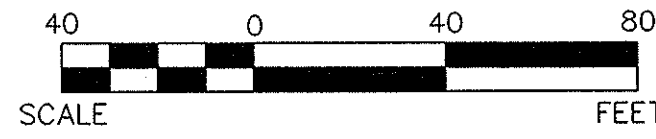
SID #____ PROJECTS 6A, 6B & 6C
SID #809 PROJECTS 8A, 8B & 8C



**REFER TO SHEET 2 FOR
CONSTRUCTION NOTES**

ALTA DRIVE (PUBLIC)

SCALE: HORIZ. 1" = 40'
VERT. 1" = 4'



3315
3310
3305

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**FREEWAY AND ARTERIAL
SYSTEM OF TRANSPORTATION**

BENCHMARK			
BM #	DESC.	NAVD 88 DATUM	NAVD 88 DATUM
CLV BM No. D368 3	U.S.C. & G.S. BRASS DISC SET IN ROCK ON THE EAST SIDE OF CHARLESTON BOULEVARD AND SOUTH OF THE RED ROCK DETENTION BASIN.	3246.71 (FEET)	989.599 (METERS)

BASIS OF BEARINGS

NORTH 89°45'05" EAST BEING THE SOUTH LINE OF THE SOUTHWEST QUARTER (SW 1/4) OF SECTION 35, TOWNSHIP 20 SOUTH, RANGE 59 EAST, M.D.M., AS SHOWN BY MAP ON FILE IN FILE 91, PAGE 28 OF PARCEL MAPS IN THE CLARK COUNTY RECORDER'S OFFICE, CLARK COUNTY, NEVADA

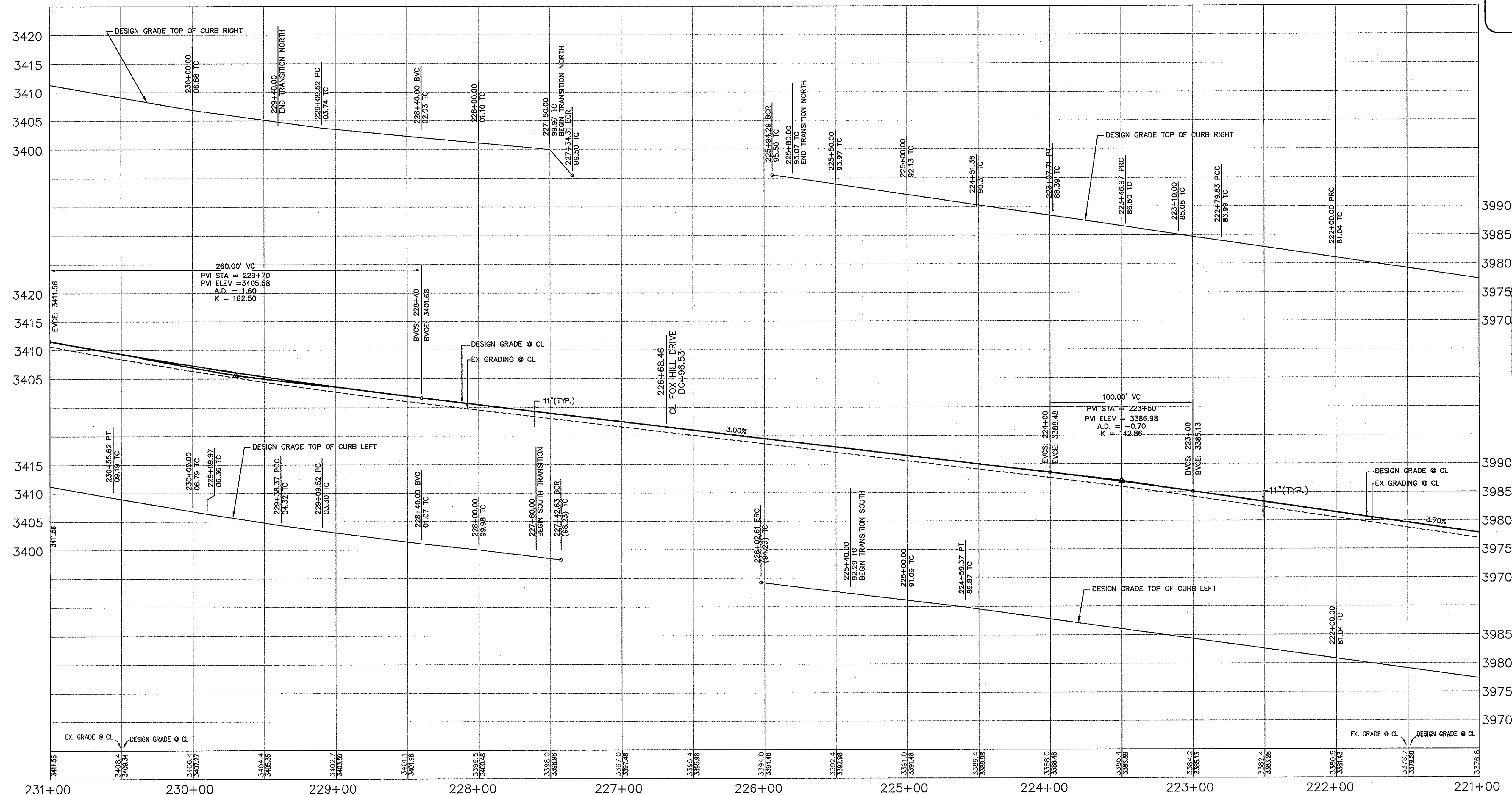
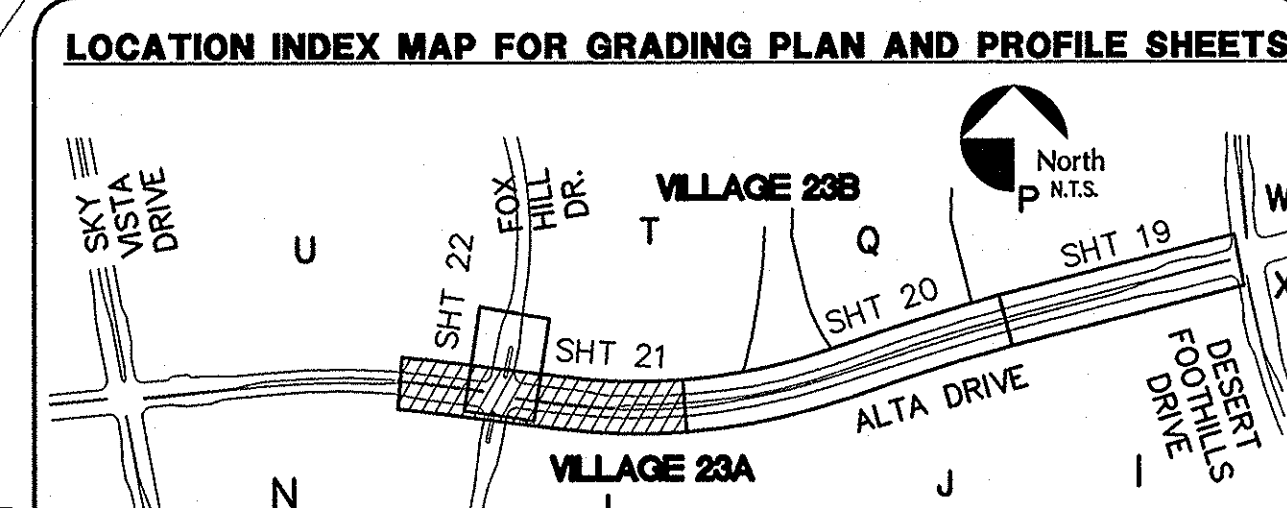
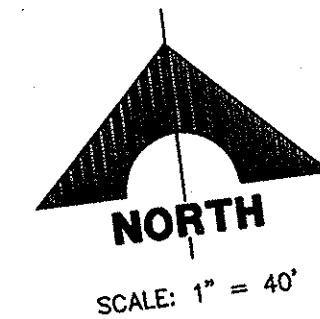
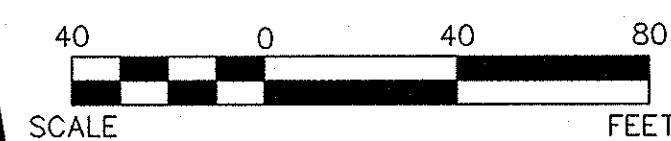
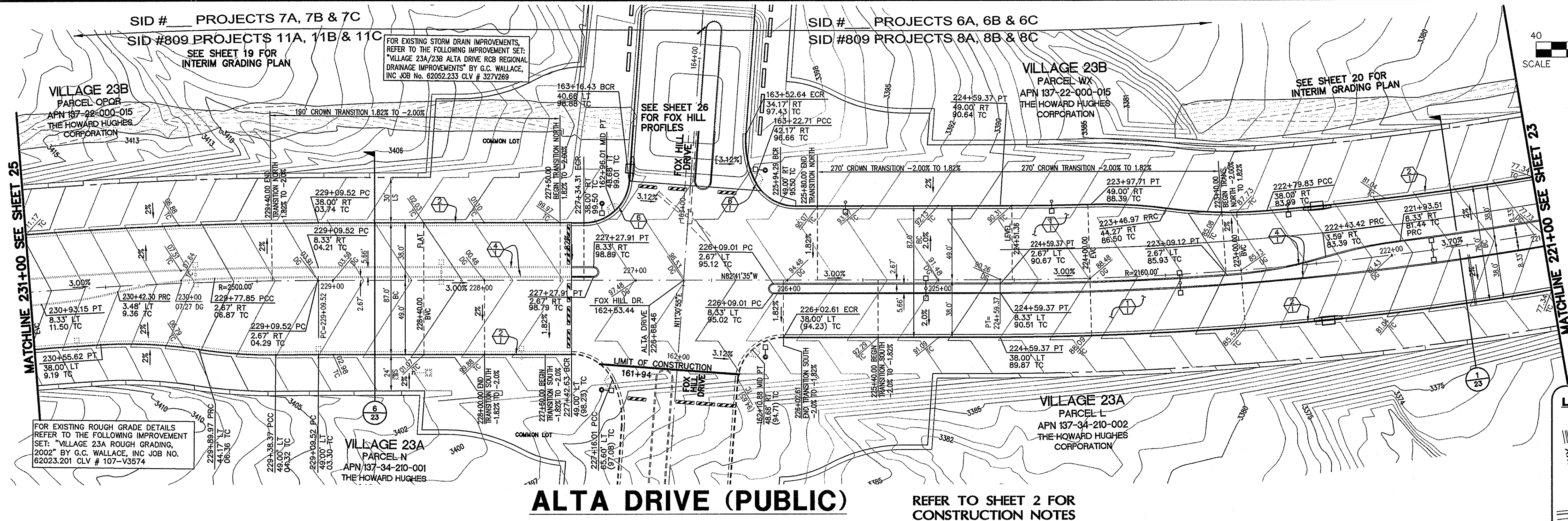
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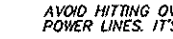
THIS SET OF DRAWINGS IS BASED UPON NAVD 88 DATUM.
PREVIOUS DRAWINGS MAY BE BASED ON OTHER DATUM.
CARE SHOULD BE OBSERVED WHEN UTILIZING THIS SET
OF DRAWINGS.



G. C. WALLACE COMPANIES
ENGINEERS | PLANNERS | SURVEYORS
1555 S. RAINBOW BOULEVARD • LAS VEGAS NV 89146
T: 702.804.2000 • F: 702.804.2299 • GCWALLACE.COM

THE HOWARD HUGHES COMPANY, LLC
VILLAGE 23A/23B ALTA DRIVE IMPROVEMENTS
ALTA DRIVE PLAN AND PROFILE



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--	---	--



AVOID HITTING OVERHEAD
POWER LINES. IT'S COSTLY.

**CALL BEFORE
YOU DO
OVERHEAD**

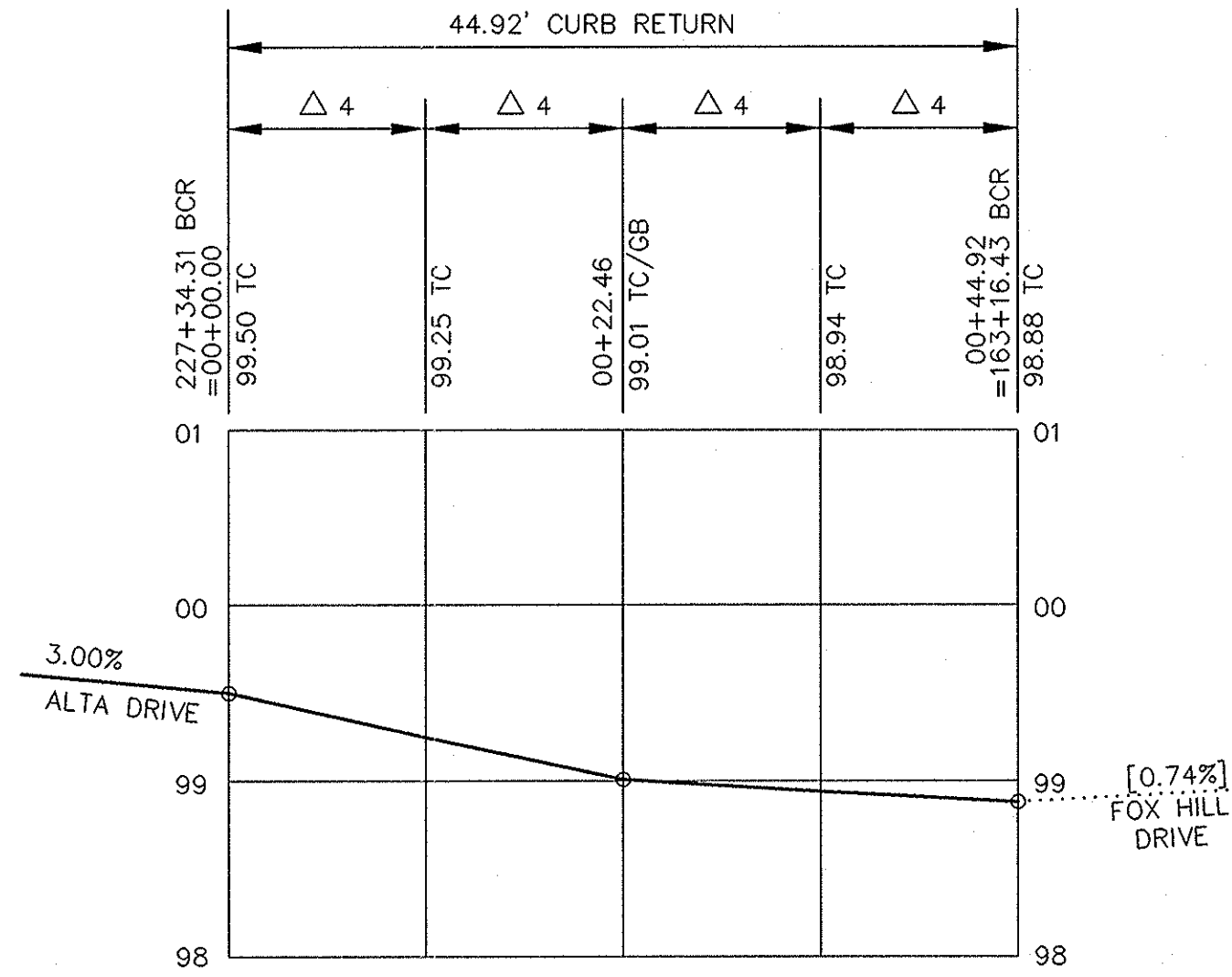
1-702-227-2929

FAST
Call before you UnderGround.
1-702-432-5300
FREeway AND ARTERIAL
SYSTEM OF TRANSPORTATION

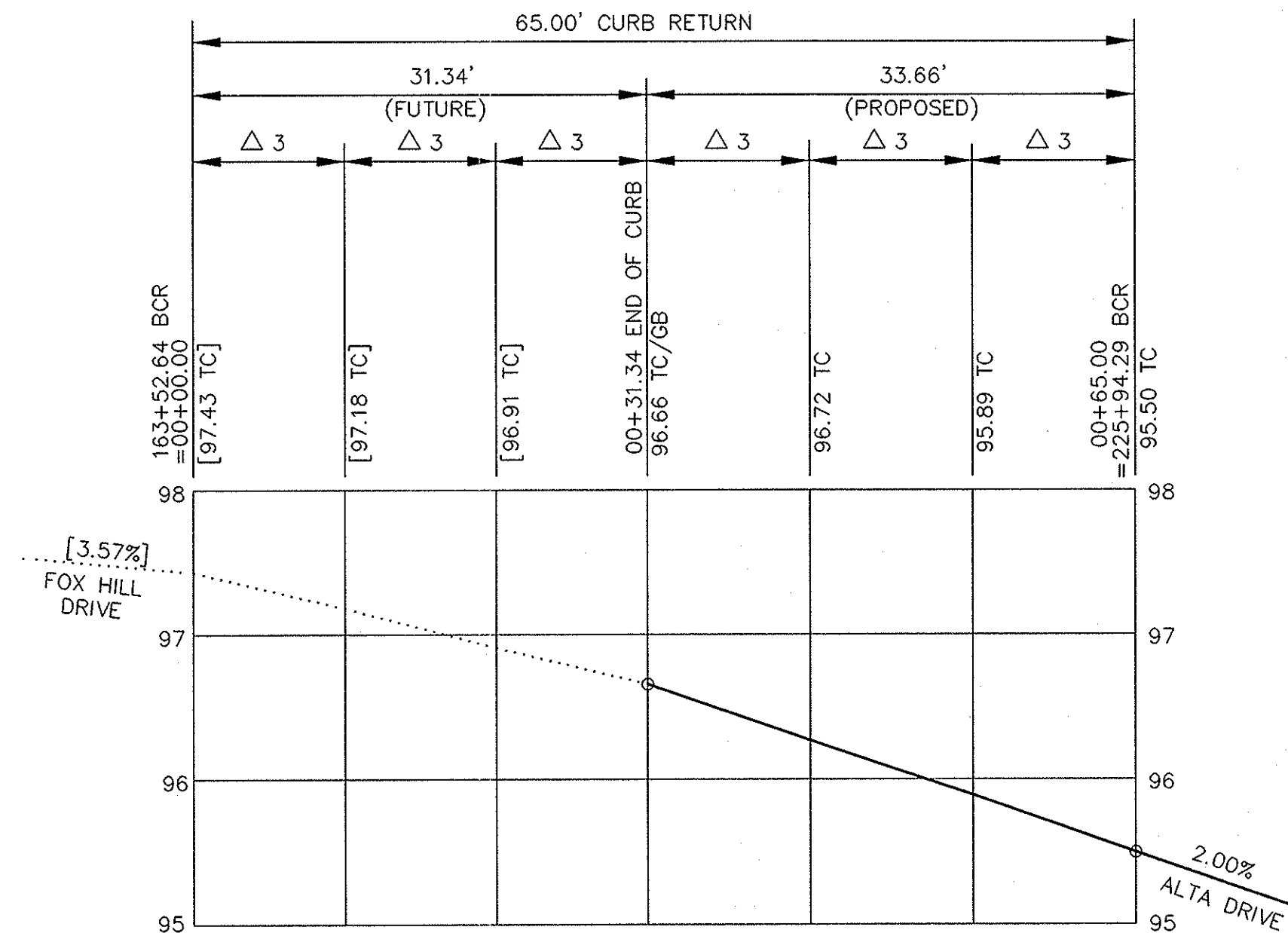
BENCHMARK			
BM #	DESC.	NAVD 88 DATUM	NAVD 88 DATUM
CLV BM No. D368 3	U.S.C. & G.S. BRASS DISC SET IN ROCK ON THE EAST SIDE OF CHARLESTON BOULEVARD AND SOUTH OF THE RED ROCK DETENTION BASIN.	3246.71 (FEET)	989.599 (METERS)

BASIS OF BEARINGS
NORTH 89°45'05" EAST BEING THE SOUTH LINE OF THE SOUTHWEST
QUARTER (SW 1/4) OF SECTION 35, TOWNSHIP 20 SOUTH, RANGE
59 EAST, M.D.M., AS SHOWN BY MAP ON FILE IN FILE 91, PAGE 28
OF PARCEL MAPS IN THE CLARK COUNTY RECORDER'S OFFICE,
CLARK COUNTY, NEVADA

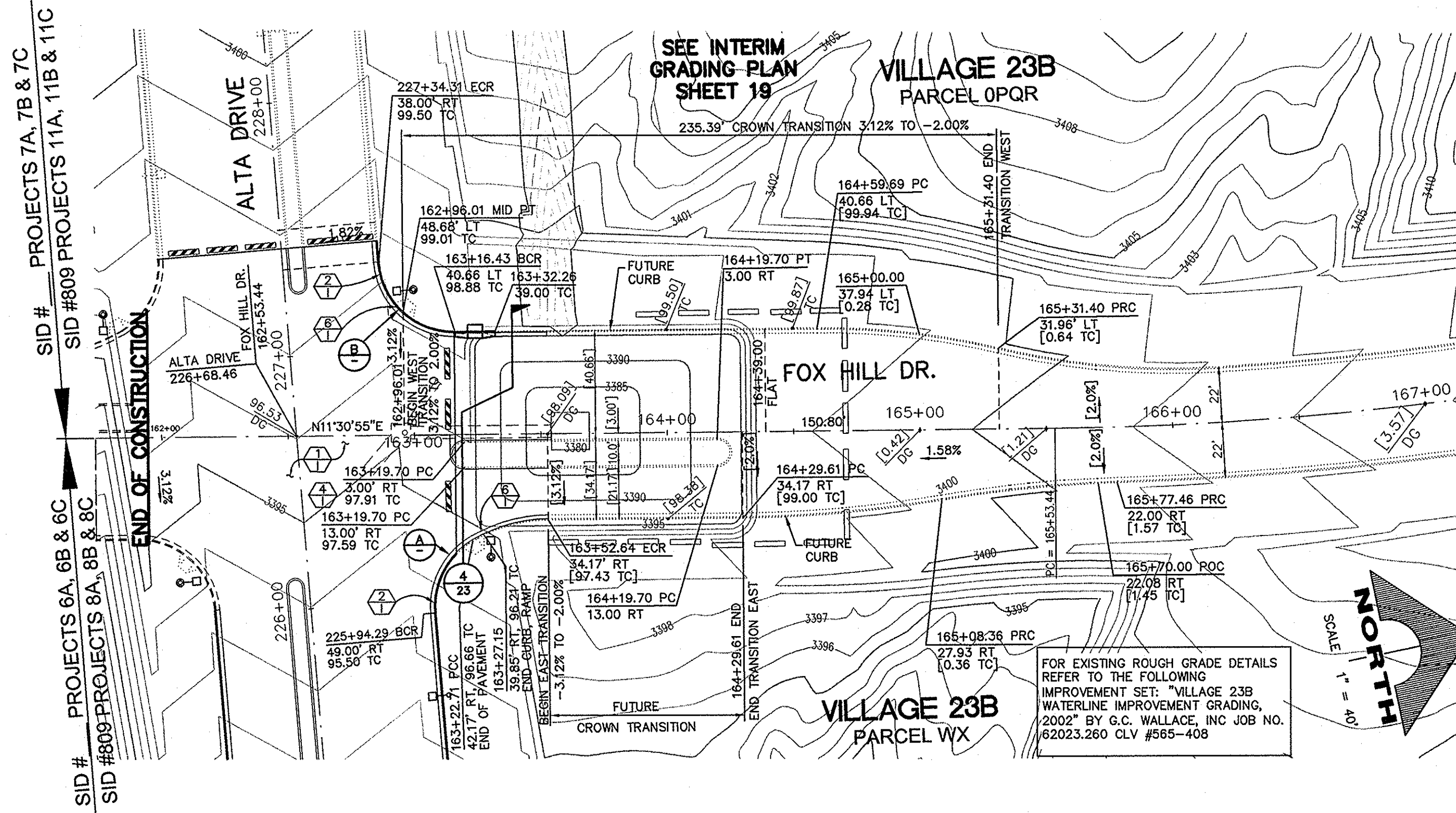
NOTE
THIS SET OF DRAWINGS IS BASED UPON NAVD 88 DATUM.
PREVIOUS DRAWINGS MAY BE BASED ON OTHER DATUM.
CARE SHOULD BE OBSERVED WHEN UTILIZING THIS SET
OF DRAWINGS.



**ALTA DRIVE/FOX HILL DRIVE
NORTHWEST CURB RETURN**
SCALE: HORIZ. 1" = 10'
VERT. 1" = 1'

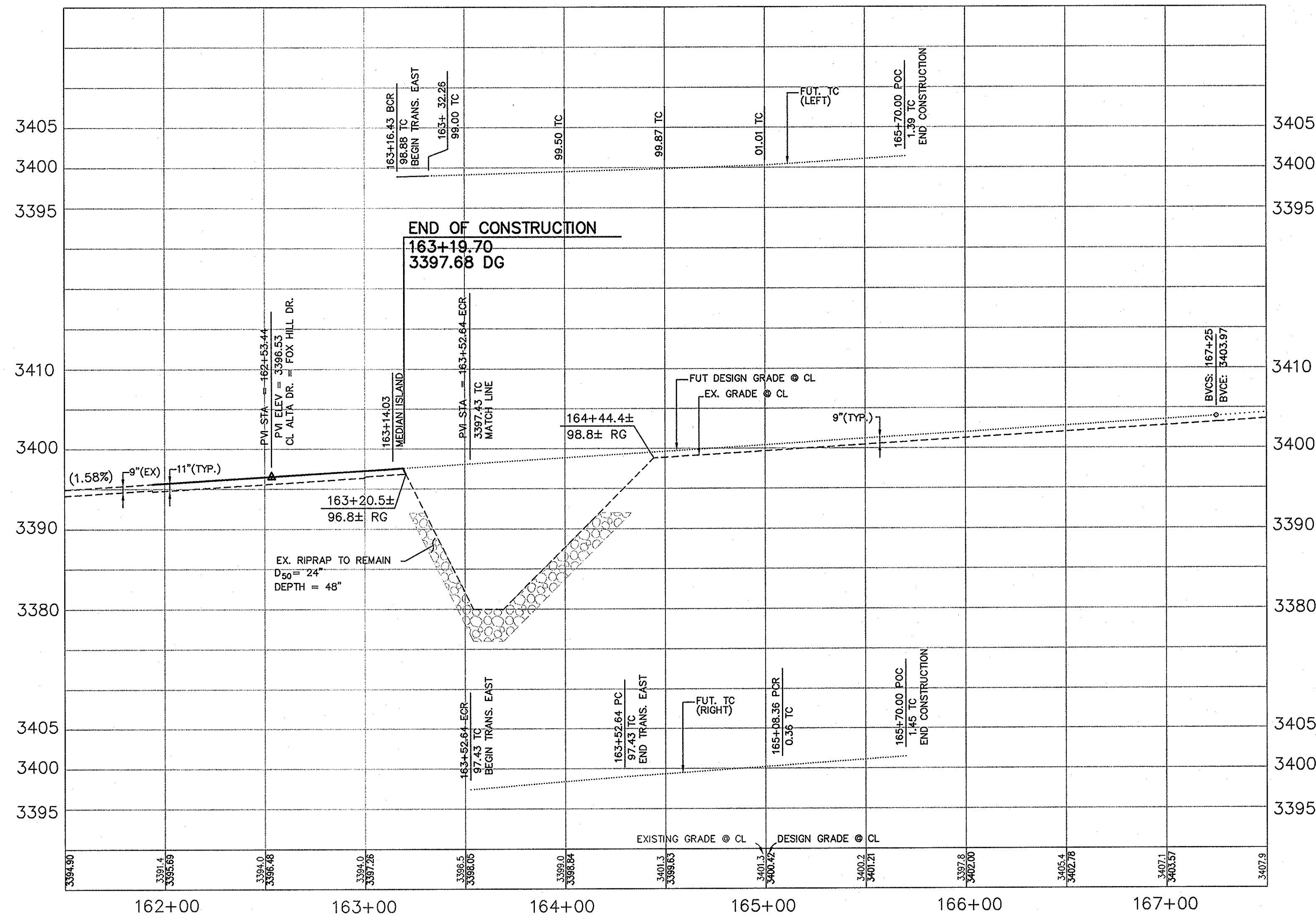
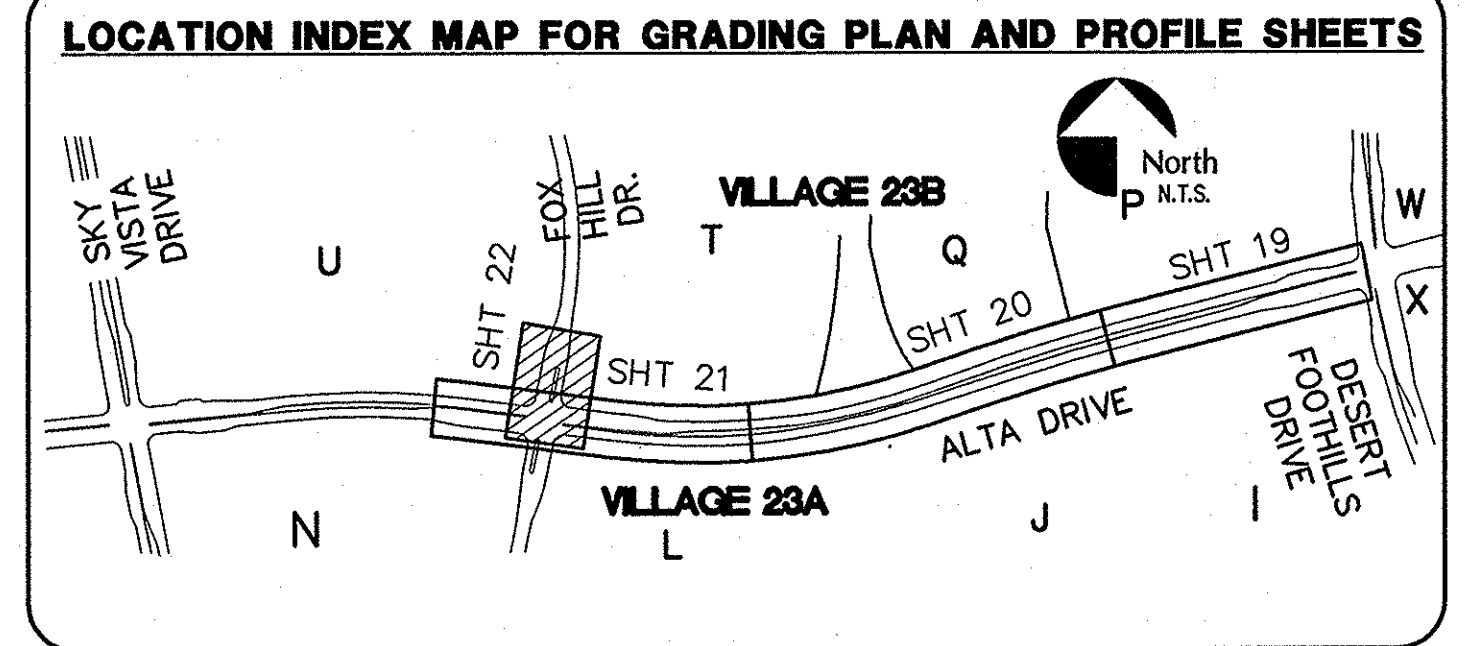
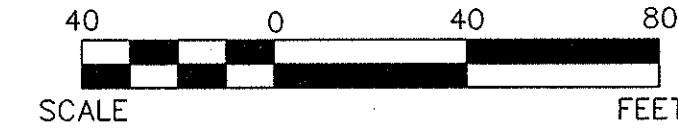


**ALTA DRIVE/FOX HILL DRIVE
NORTHEAST CURB RETURN**
SCALE: HORIZ. 1" = 10'
VERT. 1" = 1'



FOX HILL DRIVE (PUBLIC)

SCALE: HORIZ. 1" = 40'
VERT. 1" = 4'
REFER TO SHEET 2 FOR
CONSTRUCTION NOTES



NOTE

THIS SET OF DRAWINGS IS BASED UPON NAVD 88 DATUM. PREVIOUS DRAWINGS MAY BE BASED ON OTHER DATUM. CARE SHOULD BE OBSERVED WHEN UTILIZING THIS SET OF DRAWINGS.

BENCHMARK

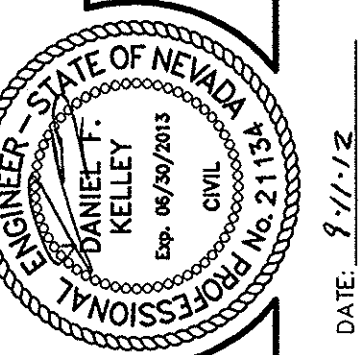
BM #	DESC.	NAVD 88 DATUM	NAVD 88 DATUM
CLV BM No. D368 3	U.S.C. & G.S. BRASS DISC SET IN ROCK ON THE EAST SIDE OF CHARLESTON BOULEVARD AND SOUTH OF THE RED ROCK DETENTION BASIN.	3246.71 (FEET)	989.599 (METERS)

BASIS OF BEARINGS

NORTH 89°45'05" EAST BEING THE SOUTH LINE OF THE SOUTHWEST QUARTER (SW 1/4) OF SECTION 35, TOWNSHIP 20 SOUTH, RANGE 59 EAST, M.D.M., AS SHOWN BY MAP ON FILE IN FILE 91, PAGE 28 OF PARCEL MAPS IN THE CLARK COUNTY RECORDER'S OFFICE, CLARK COUNTY, NEVADA

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SHEET
22

CLV DRAWING NO.

22 OF 28 SHEETS

JOB NO. 62023B-202

