

DS #:

4967

APN:

126-12-410.003

PROJECT:

Skyc Canyon Phase 2 Neighborhood Park

SUBMITTAL:

2nd

SCANNED BY/DATE:

CHECKED BY/DATE:



CITY OF LAS VEGAS		DATE:
INTER-OFFICE MEMORANDUM		May 15, 2018
TO: Land Development Services Department of Building & Safety		FROM: Albert Sung, P.E. Flood Control Project Engineer Department of Public Works
SUBJECT:	Drainage Study for:	
	Skye Canyon Phase 2 – Neighborhood Park	
Cross Streets:	SEQ of Shaumber Rd. & Eagle Canyon Ave.	COPIES TO:
File Number:	F:\Depot\DSMemos\DS4967B.doc	Slater Hanifan Group
Parcel Number:	126-12-410-003	KAG Development West, LLC
Zoning Action:	FMP-71631	Bart Anderson, P.E., DevCo
FEMA Flood Zone	YES	NO X
Proposed Storm Drain	YES	NO X

HISTORY	DATE RECEIVED	DATE REVIEWED	COMMENTS	REVIEW FEES	FEES PAID Payment Trn #
1 st Submittal	3/13/2018	3/22/2018	Not Approved	\$400.00	494090: \$400
2 nd Submittal	5/2/2018	5/15/2018	See Comments Below	\$400.00	495621: \$400
TOTAL FEES (LDDRS):				\$800.00	----

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.
	is conditionally approved subject to Clark County Public Works Department concurrence.

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 Update 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: T19S/R59E/12
AREA F-12

TRANSACTION REPORT

MAY/15/2018/TUE 05:09 PM

FAX (TX)

#	DATE	START T.	RECEIVER	COM.TIME	PAGE	TYPE/NOTE	FILE
001	MAY/15	05:08PM	7022845399	0:00:25	1	MEMORY OK	SG3 1291

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File Number:	F:\Depot\DSMemos\DS4967B.doc	Bart Anderson, P.E., DevCo	
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Zoning Action:	FMP-71631		
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END OF REMARKS

ays

T/R/S: T19S/R59E/12

AREA F-12

TECHNICAL DRAINAGE STUDY UPDATE SUPPLEMENT NO.2

West Ridge Access Road Southern Highlands

Unincorporated Clark County, Nevada

Job No.: OLY1614.000

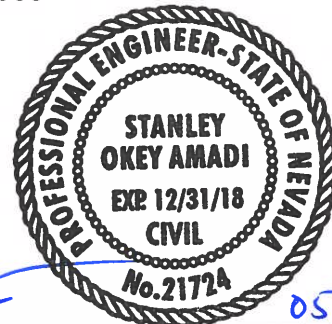
Date: February 2018

Prepared By:

Slater Hanifan Group, Inc.
5740 S. Arville Street, Suite 216
Las Vegas, Nevada 89118
Phone: 702-284-5300 • Fax: 702-284-5399

Prepared For:

Olympia Companies, LLC
11411 Southern Highlands Parkway, Suite 300
Las Vegas, Nevada 89141
Phone: 702-616-3800 • Fax: 702-220-6566



05/01/18

Stanley Okey Amadi, P.E.
NV Professional Engineer No. 21724

Assisted by: Cameron Bencini, P.E.



Department of Public Works

Development Review Division

500 S Grand Central Pky | Box 554000 | Las Vegas NV 89155-4000
(702) 455-4600 | Fax (702) 388-2550
www.ClarkCountyNV.gov/PubWorks

Clear Form

Drainage Study Submittal Sheet

(Each Submittal must have a separate sheet and check)

HTE # 17-19403

Date Submitted: April 30, 2018

Previous HTE Number 07-37860

Type of Submittal: ☐ Initial ☐ Addendum ☒ Supplement

Number of Acres: ☐ up to 5 acres ☒ up to 40 acres ☐ up to 320 acres ☐ over 320 acres

Project Name: West Ridge Access Road - Southern Highlands Update (Suppl No.2)

Assessor's Parcel Numbers (APN's): Portions of 192-01-301-001 & 192-01-601-001, 192-12-000-001, 191-07-211-001

Street Location: East/West Starr Hills Avenue

North/South Patores Street

Land Use Applications: Access Road Improvement

Project Type: (Check any that apply)

☒ Update ☐ List previous Tracking Number

☐ Concurrence Review

☐ Grading Plan Review

☐ Structural Review

Engineering Firm/Responsible Engineer Slater Hanifan Group Stanley Okey Amadi, P.E. Phone number 702-284-5300

Address 5740 S. Arville Street #216

Fax number 702-284-5399

City/State/Zip Las Vegas

NV

E-mail Address Samadi@shg-inc.com

Owner/Developer BLM/Southern Highlands Development Corporation

Phone number 702-220-6565

Address 11411 Southern Highlands Pkwy #300,

Fax number 702-220-6566

City/State/Zip Las Vegas,

NV

E-mail Address bwilliamson@olympiacompanies.com

HYDROLOGIC CRITERIA AND DRAINAGE MANUAL
DRAINAGE STUDY INFORMATION FORM

Name of Development: West Ridge Access Road - Southern Highlands Update (Suppl No.2) Date: April 30, 2018

Location of Development: a) Descriptive (Cross Streets) North/South: Patores Street

East/West: Starr Hills Avenue

b) Section: 01, 07, 12 Township: 23 South Range: 60 & 61 East

c) APN : Portions of 192-01-301-001 & 192-01-601-001, 192-12-000-001, 191-07-211-001

Name of Owner: BLM/Southern Highlands Development Corporation

Telephone No.: 702-220-6565 Fax No.: 702-220-6566 E-Mail Address: bwilliamson@olympiacompanies.com

Address: 11411 Southern Highlands Pkwy #300, Las Vegas, NV 89141

Contact Person-Name: Stanley Okey Amadi, P.E. Telephone No.: 702-284-5300

* E-Mail Address: Samadi@shg-inc.com Fax No.: 702-284-5399

Firm: Slater Hanifan Group

Address: 5740 S. Arville Street #216 Las Vegas NV 89118

Type of Land Development/Land Disturbance Process:

☐	Rezoning	☐	Subdivision Map	☐	Clearing and Grading Only
☐	Parcel Map	☐	Planned Unit Development	☒	Other (Please specify below)
☐	Large Parcel Map	☐	Building Permit	☐	Access Road Improvements

1. Total Owned Land Area: At Site: ±28.87 acres Being Developed/Disturbed: ±10.9 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.): Access Road Improvement

5. Approximate upstream land area which drains to the subject site: ±968 acres

6. Has the site drainage been evaluated in the past? ☒ YES ☐ NO If yes, please identify documentation: Technical Drainage Study for Westridge Access Road Southern Highlands (HTE #07-37860)

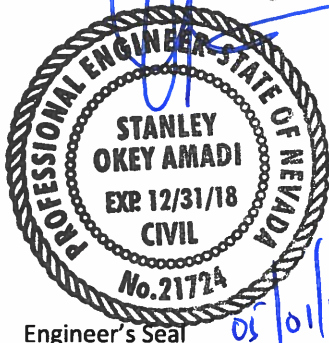
7. If known, please briefly identify the proposed discharge point(s) of runoff from the site: The site generally drains west to the existing washh tributary to the Central Duck Creek Detention Basin

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

Submit this form as part of the required drainage study to the local entity which has jurisdiction over the subject property. This form may provide sufficient information to serve as the Conceptual Drainage Study.

***New Required Field**

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



Engineer's Seal

Local Entity File No.

REFERENCE:

STANDARD FORM 1



OLY1614.000

February 23, 2017

W. Layne Weber, P.E., CFM - Principal Engineer
Development Review
Clark County Department of Public Works
500 S Grand Central Parkway – Box 554000
Las Vegas, Nevada 89155-4000

Subject: Supplement No. 2 to the Addendum to the Technical Drainage Study Update for West Ridge Access Road (HTE# 17-19403)

Dear Mr. Weber:

This letter is submitted in response to the email request of August 01, 2017 for supplemental information regarding the above subject project. A copy of the Clark County Department of Public Works (CCPW) email request has been provided in Appendix A.

In an effort to ensure that the concerns are adequately addressed, a meeting was held at Clark County Public Works on January 18, 2018 with the developer (Olympia Companies), Slater Hanifan Group (SHG) and CCPW staff (including Mr. Denis Cederburg, Layne Weber, Erick Denman & Brian Churchill). The agreements reached from the meeting have been incorporated in the responses below.

The items of concern in the email request have been individually addressed as follows:

1. **Comment:** *As proposed the BLM grant is 180' wide with a 60' R/W grant. This will need to be revised to be all R/W grant. You will need to specify somewhere that the future R/W width is 60' and the remaining grant is for grading. Note that the entire construction area will need to meet the disturbance requirement from BLM and may need to be re-vegetated or mitigated thru their application process.*

Response: As agreed to in the aforementioned meeting, the width of the BLM grant has been reduced to just accommodate the area of the future right-of-way and any scarp grading required. A note has been provided on the plans indicating that the future right-of-way width will be 60-ft while the remaining grant area is for grading purposes. It is acknowledged that the construction area will need to meet the disturbance requirements from BLM and may need to be re-vegetated.

2. **Comment:** *The maintenance of the road is to be private by HOA/Southern Highlands and will need to post a bond for the maintenance. Denis did not recall a maximum time of 5 years as indicated in the study, he specified that it was until another private residence/development tied into the project, which may be more than 5 years.*

Response: It is acknowledged that the roadway maintenance will be by the HOA/developer and a maintenance bond will be posted. Per the agreement in the meeting, Clark County will take over maintenance of the road when the last subdivided single-family lot is sold.

3. **Comment:** *Reduce the dimensions of the grant area to match to the scope of the project area.*

Response: The dimensions of the grant area has been reduced as noted in the response to Item No. 1 above. The grant area will expand or widen out to accommodate areas where significant scarp grading is proposed and back down as necessary. Please refer to the revised plans provided.

4. **Comment:** Revise design as necessary to remove riprap within the grant area. CCPW will not maintain riprap lined swales. Revise design to reduce velocities in earthen swales.

Response: Acknowledged. The section design of the roadside swales has been revised to ensure uniform geometry and non-erosive velocities. Thus, all the roadside swales will now be earth lined. The hydraulic calculations for Sections 1, 10 and 13A that were previously riprapped have been revised accordingly. Other sections that were previously non-erosive have not been revised since the revised swale geometry will result in even lower non-erosive velocities and depth. As agreed to in the meeting, all other areas where riprap is proposed (like the culvert outlets and bank protection along the inflow wash to the Central Duck Creek Detention Basin) will be solid grouted for ease of maintenance. Please refer to the revised roadside swale calculations in the appendix and revised sections on the improvement plans.

5. **Comment:** Consider the use of cutoff walls to reduce grant area.

Response: Cut-off walls have been explored but not utilized as the grading and construction grant area will only be temporary and will be relinquished eventually.

6. **Comment:** Storm drains are not required and can be replaced with low water crossings which meet street v*d criteria. This may eliminate the need for large riprap areas to reduce velocities coming out of the culverts.

Response: All culvert outlet riprap protection will now be solid grouted. Low water crossings are not possible due to the significant fall in the roadway profile and are therefore not proposed.

Additional Revision:

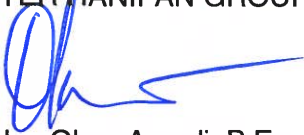
We noticed that the drainage area for basin ON1 was incorrectly estimated in the interim condition as 3.32 acres whereas it is only 0.71 acres. This discrepancy was also noticed and pointed out by the reviewer in our prior telephone coordination. The Standard Form 4 and Curve Number calculations as well as the associated HEC-1 model has been corrected and provided with this submittal for completeness of the study. The pertinent hydraulic section(s) and summary table on the exhibits have also been corrected and provided in the appendix.

The revised improvement plans adopting the revisions addressed in this letter have been included in Appendix E. We believe that the above responses and revisions provided on the plans have

adequately addressed your concerns as outlined in the aforementioned email supplemental request. If you have any questions or require additional information, please do not hesitate to contact us at (702) 284-5300.

Respectfully Submitted,

SLATER HANIFAN GROUP



Stanley Okey Amadi, P.E.
Project Manager - Flood Control Division

cc: Mark Failla, P.E., CFM – SHG
Tim Mulrooney, P.E. – SHG
Matt Key – SHG

APPENDIX

Appendix A CCPW Supplemental Submittal Request Email

Appendix B Revised Drainage Exhibits

Appendix C Update Hydrologic Calculations

Appendix D Revised Roadside Swale Sections

Appendix E Revised Improvement Plans

APPENDIX A

CCPW Supplemental Submittal Request Email

Stanley Okey Amadi

From: Brian Churchill <Brian.Churchill@ClarkCountyNV.gov>
Sent: Monday, December 18, 2017 11:18 AM
To: Stanley Okey Amadi; Tim Mulrooney
Cc: Matt Key; Layne Weber
Subject: RE: West Ridge Access Road

Stanley and Tim,

I spoke to Denis Cederburg about the project and the BLM grant. There are a few issues that will need to be cleaned up, let me know how you want to proceed. Here is a brief summary:

- As proposed the BLM grant is 180' wide with a 60' R/W grant. This will need to be revised to be all R/W grant. You will need to specify somewhere that the future R/W width is 60' and the remaining grant is for grading. Note that the entire construction area will need to meet the disturbance requirement from BLM and may need to be re-vegated or mitigated thru their application process.
- The maintenance of the road is to be private by HOA/Southern Highlands and will need to post a bond for the maintenance. Denis did not recall a maximum time of 5 years as indicated in the study, he specified that it was until another private residence/development tied into the project, which may be more than 5 years.
- Reduce the dimensions of the grant area to match to the scope of the project area.
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- Consider the use of cutoff walls to reduce grant area.
- Storm drains are not required, and can be replaced with low water crossings which meet street v*d criteria. This may eliminate the need for large riprap areas to reduce velocities coming out of the culverts.

Let me know if you have any questions, and how you want to proceed,
Brian

From: Stanley Amadi [mailto:samadi@shg-inc.com]
Sent: Tuesday, December 12, 2017 3:14 PM
To: Brian Churchill
Subject: West Ridge Access Road

Hi Brian,

As a follow up to our conversation, we should also note that the watershed impacting the access road and the culvert crossings is mainly hill side with slopes between 5 and 20%. It will be highly unlikely that the entire hill side will be developable at such grades and/or to higher densities than current. You can bring this up to Erick as well.

Thanks,

Stanley Amadi, P.E.
Project Manager I

SLATER HANIFAN GROUP
"The Benchmark of Our Profession."



Proud to be continuously ranked by Zweig Group National "Best Firms To Work For" and "Hot Firm" Survey

LAS VEGAS
5740 S. ARVILLE STREET #216
LAS VEGAS, NV 89118

PHOENIX
11201 N. TATUM BLVD. #250
PHOENIX, AZ 85028

T: 702.284.5300

| T: 602.687.9664

www.shg-inc.com

Any files contained within are to be used for information ONLY. Accuracy and/or design information to be verified from approved original plans.
Use of electronic media is at the sole risk of the user.

APPENDIX B

Revised Drainage Exhibits

APPENDIX C

Updated Hydrologic Calculations

Data:

Reference:

Exhibit D
NRCS Soil Data

Soil Type - Soil Survey Area & Version, Soil Description				A	B	C	D
LV	152	Las Vegas Valley 2016	Cave gravelly fine sandy loam, 0 to 4 percent slopes	0%	0%	0%	100%
LV	155	Las Vegas Valley 2016	Cave gravelly fine sandy loam, 4 to 15 percent slopes	0%	0%	0%	100%
LV	360	Las Vegas Valley 2016	Rock outcrop-St. Thomas complex, 15 to 30 percent slopes	15%	0%	0%	85%

Land Use	A	B	C	D
Paved Open Ditches	83	89	92	93
Desert Shrub (poor)	63	77	85	88

ONSITE BASINS

BASIN ID	SURVEY AREA	SOIL TYPE	SUBAREA PERCENT	LAND USE	HYDROLOGIC SOIL GROUP				LAND USE CN				SUBAREA ACRES	CURVE NUMBER
					A	B	C	D	A	B	C	D		
ON1	LV	155	100.0%	Paved Open Ditches	0%	0%	0%	100%	83	89	92	93	0.71	93.00
TOTAL PERCENT				100.0%	TOTAL AREA & COMPOSITE CURVE NUMBER:								0.71	93.0

BASIN ID	SURVEY AREA	SOIL TYPE	SUBAREA PERCENT	LAND USE	HYDROLOGIC SOIL GROUP				LAND USE CN				SUBAREA ACRES	CURVE NUMBER
					A	B	C	D	A	B	C	D		
ON2	LV	155	16.1%	Paved Open Ditches	0%	0%	0%	100%	83	89	92	93	0.05	15.00
	LV	360	83.9%	Paved Open Ditches	15%	0%	0%	85%	83	89	92	93	0.26	76.74
TOTAL PERCENT				100.0%	TOTAL AREA & COMPOSITE CURVE NUMBER:								0.31	91.7

BASIN ID	SURVEY AREA	SOIL TYPE	SUBAREA PERCENT	LAND USE	HYDROLOGIC SOIL GROUP				LAND USE CN				SUBAREA ACRES	CURVE NUMBER
					A	B	C	D	A	B	C	D		
ON3	LV	360	100.0%	Paved Open Ditches	15%	0%	0%	85%	83	89	92	93	0.21	91.50
TOTAL PERCENT				100.0%	TOTAL AREA & COMPOSITE CURVE NUMBER:								0.21	91.5

BASIN ID	SURVEY AREA	SOIL TYPE	SUBAREA PERCENT	LAND USE	HYDROLOGIC SOIL GROUP				LAND USE CN				SUBAREA ACRES	CURVE NUMBER
					A	B	C	D	A	B	C	D		
ON4	LV	360	100.0%	Paved Open Ditches	15%	0%	0%	85%	83	89	92	93	0.68	91.50
TOTAL PERCENT				100.0%	TOTAL AREA & COMPOSITE CURVE NUMBER:								0.68	91.5

BASIN ID	SURVEY AREA	SOIL TYPE	SUBAREA PERCENT	LAND USE	HYDROLOGIC SOIL GROUP				LAND USE CN				SUBAREA ACRES	CURVE NUMBER
					A	B	C	D	A	B	C	D		
ON5	LV	152	25.5%	Paved Open Ditches	0%	0%	0%	100%	83	89	92	93	0.12	23.74
	LV	360	74.5%	Paved Open Ditches	15%	0%	0%	85%	83	89	92	93	0.35	68.14
TOTAL PERCENT				100.0%	TOTAL AREA & COMPOSITE CURVE NUMBER:								0.47	91.9

BASIN ID	SURVEY AREA	SOIL TYPE	SUBAREA PERCENT	LAND USE	HYDROLOGIC SOIL GROUP				LAND USE CN				SUBAREA ACRES	CURVE NUMBER
					A	B	C	D	A	B	C	D		
ON6	LV	152	72.2%	Paved Open Ditches	0%	0%	0%	100%	83	89	92	93	0.52	67.17
	LV	360	27.8%	Paved Open Ditches	15%	0%	0%	85%	83	89	92	93	0.20	25.42
TOTAL PERCENT				100.0%	TOTAL AREA & COMPOSITE CURVE NUMBER:								0.72	92.6

BASIN ID	SURVEY AREA	SOIL TYPE	SUBAREA PERCENT	LAND USE	HYDROLOGIC SOIL GROUP				LAND USE CN				SUBAREA ACRES	CURVE NUMBER
					A	B	C	D	A	B	C	D		
ON7	LV	152	47.1%	Paved Open Ditches	0%	0%	0%	100%	83	89	92	93	0.16	43.76
	LV	360	52.9%	Paved Open Ditches	15%	0%	0%	85%	83	89	92	93	0.18	48.44
TOTAL PERCENT				100.0%	TOTAL AREA & COMPOSITE CURVE NUMBER:								0.34	92.2

BASIN ID	SURVEY AREA	SOIL TYPE	SUBAREA PERCENT	LAND USE	HYDROLOGIC SOIL GROUP				LAND USE CN				SUBAREA ACRES	CURVE NUMBER
					A	B	C	D	A	B	C	D		
ON8	LV	152	90.4%	Paved Open Ditches	0%	0%	0%	100%	83	89	92	93	0.47	84.06
	LV	360	9.6%	Paved Open Ditches	15%	0%	0%	85%	83	89	92	93	0.05	8.80
TOTAL PERCENT				100.0%	TOTAL AREA & COMPOSITE CURVE NUMBER:								0.52	92.9

BASIN ID	SURVEY AREA	SOIL TYPE	SUBAREA PERCENT	LAND USE	HYDROLOGIC SOIL GROUP				LAND USE CN				SUBAREA ACRES	CURVE NUMBER
					A	B	C	D	A	B	C	D		
ON9	LV	152	2.5%	Paved Open Ditches	0%	0%	0%	100%	83	89	92	93	0.01	2.33
	LV	360	97.5%	Paved Open Ditches	15%	0%	0%	85%	83	89	92	93	0.39	48.21
TOTAL PERCENT				100.0%	TOTAL AREA & COMPOSITE CURVE NUMBER:								0.40	91.5

BASIN ID	SURVEY AREA	SOIL TYPE	SUBAREA PERCENT	LAND USE	HYDROLOGIC SOIL GROUP				LAND USE CN				SUBAREA ACRES	CURVE NUMBER
					A	B	C	D	A	B	C	D		
ON10	LV	152	55.7%	Paved Open Ditches	0%	0%	0%	100%	83	89	92	93	0.73	51.82
	LV	360	44.3%	Paved Open Ditches	15%	0%	0%	85%	83	89	92	93	0.58	40.51
TOTAL PERCENT				100.0%	TOTAL AREA & COMPOSITE CURVE NUMBER:								1.31	92.3

HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL TIME OF CONCENTRATION

Project Name & Number: WEST RIDGE ACCESS ROAD - SOUTHERN HIGHLANDS - SUPPLEMENT #2

Description: INTERIM CONDITION

By: JSR

Date: 2/14/2018

SUB-BASIN DATA					INITIAL / OVERLAND TIME (Ti)				TRAVEL TIME (Tt)					Tc		Tc Check		Tag
DESIG:	DEV./EX. (D or E)	CN	K	AREA Ac	AREA Mi^2	INITIAL LENGTH Feet	SLOPE %	Ti Min	TRAVEL LENGTH Feet	SLOPE %	V1 VELOCITY FPS	V2 VELOCITY FPS	Tt Min	Tc Calc.	Total Length Feet	Tc Check	Tag	
			[1]		[2]			[3]			[4]	[5]	[6]	[7]	[8]	[9]	[10]	
ONSITE BASINS																		
ON1	D	93.0	0.838	0.71	0.0011	19	42.10	0.59	653	2.50	3.19	4.84	3.14	3.73	672	13.733	0.050	
ON2	D	91.7	0.820	0.31	0.0005	17	39.10	0.61	308	1.10	2.12	3.21	2.42	3.03	325	11.806	0.050	
ON3	D	91.5	0.818	0.21	0.0003	17	2.00	1.66	204	1.20	2.21	3.35	1.54	3.20	221	11.228	0.050	
ON4	D	91.5	0.818	0.68	0.0011	17	2.00	1.66	676	3.00	3.50	5.30	2.94	4.60	693	13.850	0.050	
ON5	D	91.9	0.823	0.47	0.0007	17	2.00	1.63	411	2.90	3.44	5.21	1.99	3.62	428	12.378	0.050	
ON6	D	92.6	0.832	0.72	0.0011	17	2.00	1.58	647	2.20	3.00	4.54	3.32	4.90	664	13.689	0.050	
ON7	D	92.2	0.827	0.34	0.0005	17	2.00	1.61	299	3.40	3.72	5.64	1.34	2.95	316	11.756	0.050	
ON8	D	92.9	0.836	0.52	0.0008	17	2.00	1.55	468	1.70	2.63	3.99	2.96	4.51	485	12.694	0.050	
ON9	D	91.5	0.818	0.40	0.0006	17	2.00	1.66	347	1.40	2.39	3.62	2.42	4.08	364	12.022	0.050	
ON10	D	92.3	0.828	1.31	0.0020	17	2.00	1.60	826	1.70	2.63	3.99	4.53	6.13	843	14.683	0.061	
ON11	D	92.9	0.836	0.80	0.0013	25	43.60	0.67	682	1.90	2.78	4.22	3.71	4.39	707	13.928	0.050	
ON12	D	92.9	0.836	5.73	0.0090	17	2.00	1.55	1222	2.60	3.26	4.93	5.00	6.55	1239	16.883	0.066	
ON13A	D	93.0	0.838	0.64	0.0010	17	2.00	1.55	781	3.00	3.50	5.30	3.27	4.81	798	14.433	0.050	
ON13	D	91.5	0.818	0.34	0.0005	17	2.00	1.66	407	1.90	2.78	4.22	2.44	4.10	424	12.356	0.050	
ON14	D	93.0	0.838	0.53	0.0008	17	2.00	1.55	702	1.90	2.78	4.22	3.79	5.34	719	13.994	0.053	
ON15	D	92.7	0.834	0.94	0.0015	17	2.00	1.57	1139	1.80	2.71	4.11	5.67	7.24	1156	16.422	0.072	
ON16	D	92.3	0.828	2.15	0.0034	17	2.00	1.60	2700	2.90	3.44	5.21	9.46	11.06	2717	25.094	0.111	
ON17	D	92.9	0.836	0.90	0.0014	17	2.00	1.55	1054	2.20	3.00	4.54	4.82	6.37	1071	15.950	0.064	
ON18	D	92.6	0.832	0.37	0.0006	24	49.90	0.64	130	6.20	5.03	7.62	0.43	1.07	154	10.856	0.050	

INT

```
1*****
*
* FLOOD HYDROGRAPH PACKAGE (HEC-1)
*   JUN 1998
*   VERSION 4.1
*
* RUN DATE 14FEB18 TIME 14:41:34
*
*****
```

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

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X  X  XXXXXX  XXXX  X
X  X  X      X  X  XX
X  X  X      X  X  X
XXXXXX XXXX  X  XXXX  X
X  X  X      X  X  X
X  X  X      X  X  X
X  X  XXXXXX  XXXX  XXX
```

THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1G5, HEC1DB, AND HEC1KW.

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

1

HEC-1 INPUT

PAGE 1

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

```
*DIAGRAM
1 ID SLATER HANIFAN GROUP
2 ID WESTRIDGE ACCESS ROAD - SOUTHERN HIGHLANDS (TDS ADD1)
3 ID INTERIM CONDITION
4 ID
5 ID RETURN PERIOD ----- 100-YR & 10-YR
6 ID DISTRIBUTION ----- 6-HOUR SDN3
7 ID PROJECT NO. ----- OLY1614.000
8 ID FILENAME ----- INT.H1
9 ID DATE ----- JUNE 2017
10 ID MODELED BY ----- JSR
11 ID
12 ID SIX HOUR DEPTH-AREA REDUCTION FACTORS
13 ID STORM EVENT RATIO
14 ID 10-YR 0.60
15 ID 100-YR 1.00
16 ID
17 IT 5 0 0 300
18 IO 5 0 0
19 IN 5 0 0
20 JR PREC 1.00 0.60
*
21 KK OFF16
22 BA 0.0148
23 PB 3.00
24 PC 0 0.020 0.057 0.070 0.087 0.108 0.124 0.130 0.130 0.130
25 PC 0.130 0.130 0.130 0.133 0.140 0.142 0.148 0.158 0.172 0.181
26 PC 0.190 0.197 0.199 0.200 0.201 0.204 0.214 0.229 0.241 0.249
27 PC 0.251 0.256 0.270 0.278 0.281 0.283 0.295 0.322 0.352 0.409
28 PC 0.499 0.590 0.710 0.744 0.781 0.812 0.819 0.835 0.851 0.856
29 PC 0.860 0.868 0.876 0.888 0.910 0.926 0.937 0.950 0.970 0.976
30 PC 0.982 0.985 0.987 0.989 0.990 0.993 0.993 0.994 0.995 0.998
31 PC 0.998 0.999 1.000
32 LS 0 84.3
33 UD 0.100
*
34 KK ON1
35 BA 0.0011
36 PB 3.00
37 LS 0 93.0
38 UD 0.050
*
39 KK OFF17
40 BA 0.0050
41 PB 3.00
42 LS 0 84.5
43 UD 0.100
*
```

LINE	ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10
44	KK CP1
45	HC 3
	*
46	KK ON2
47	BA 0.0005
48	PB 3.00
49	LS 0 91.7
50	UD 0.050
	*
51	KK OFF15
52	BA 0.0192
53	PB 3.00
54	LS 0 84.3
55	UD 0.100
	*
56	KK CP2
57	HC 2
	*
58	KK ON3
59	BA 0.0003
60	PB 3.00
61	LS 0 91.5
62	UD 0.050
	*
63	KK OFF14
64	BA 0.0178
65	PB 3.00
66	LS 0 84.3
67	UD 0.100
	*
68	KK CP3
69	HC 2
	*
70	KK CP4
71	HC 3
	*
72	KK ON4
73	BA 0.0011
74	PB 3.00
75	LS 0 91.5
76	UD 0.050
	*

LINE	ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10
77	KK OFF12
78	BA 0.0108
79	PB 3.00
80	LS 0 84.3
81	UD 0.100
	*
82	KK OFF13
83	BA 0.0051
84	PB 3.00
85	LS 0 84.3
86	UD 0.100
	*
87	KK CP5
88	HC 3
	*
89	KK ON5
90	BA 0.0007
91	PB 3.00
92	LS 0 91.9
93	UD 0.050
	*
94	KK OFF11
95	BA 0.0244
96	PB 3.00
97	LS 0 84.3

INT

98	UD	0.100	
	*		
99	KK	CP6	
100	HC	2	
	*		
101	KK	ON6	
102	BA	0.0011	
103	PB	3.00	
104	LS	0	92.6
105	UD	0.050	
	*		
106	KK	OFF10	
107	BA	0.0162	
108	PB	3.00	
109	LS	0	84.4
110	UD	0.100	
	*		

1 HEC-1 INPUT PAGE 4

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

111	KK	CP7	
112	HC	2	
	*		
113	KK	CP8	
114	HC	4	
	*		
115	KK	OFF9	
116	BA	0.0087	
117	PB	3.00	
118	LS	0	84.4
119	UD	0.100	
	*		
120	KK	ON7	
121	BA	0.0005	
122	PB	3.00	
123	LS	0	92.2
124	UD	0.050	
	*		
125	KK	CP9	
126	HC	2	
	*		
127	KK	ON8	
128	BA	0.0008	
129	PB	3.00	
130	LS	0	92.9
131	UD	0.050	
	*		
132	KK	OFF8	
133	BA	0.0143	
134	PB	3.00	
135	LS	0	84.8
136	UD	0.100	
	*		
137	KK	CP10	
138	HC	2	
	*		
139	KK	ON9	
140	BA	0.0006	
141	PB	3.00	
142	LS	0	91.5
143	UD	0.050	
	*		

1 HEC-1 INPUT PAGE 5

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

144	KK	OFF7	
145	BA	0.0063	
146	PB	3.00	
147	LS	0	84.3
148	UD	0.100	
	*		
149	KK	CP11	
150	HC	2	

INT

	*		
151	KK	ON10	
152	BA	0.0020	
153	PB	3.00	
154	LS	0	92.3
155	UD	0.061	
	*		
156	KK	OFF4	
157	BA	0.0020	
158	PB	3.00	
159	LS	0	84.7
160	UD	0.100	
	*		
161	KK	OFF5	
162	BA	0.0055	
163	PB	3.00	
164	LS	0	84.3
165	UD	0.100	
	*		
166	KK	OFF6	
167	BA	0.0063	
168	PB	3.00	
169	LS	0	84.3
170	UD	0.100	
	*		
171	KK	CP12	
172	HC	4	
	*		
173	KK	ON11	
174	BA	0.0013	
175	PB	3.00	
176	LS	0	92.9
177	UD	0.050	
	*		

1

HEC-1 INPUT

PAGE 6

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

178	KK	OFF2	
179	BA	0.0086	
180	PB	3.00	
181	LS	0	84.3
182	UD	0.100	
	*		
183	KK	OFF3	
184	BA	0.0035	
185	PB	3.00	
186	LS	0	85.8
187	UD	0.100	
	*		
188	KK	CP13	
189	HC	3	
	*		
190	KK	CP14	
191	HC	5	
	*		
192	KK	ON13A	
193	BA	0.0010	
194	PB	3.00	
195	LS	0	93.0
196	UD	0.050	
	*		
197	KK	OFF18	
198	BA	0.0070	
199	PB	3.00	
200	LS	0	88.0
201	UD	0.100	
	*		
202	KK	ON12	
203	BA	0.0090	
204	PB	3.00	
205	LS	0	92.9
206	UD	0.066	
	*		
207	KK	OFF1	

INT

208 BA 0.0026
209 PB 3.00
210 LS 0 84.3
211 UD 0.100
*

1

HEC-1 INPUT

PAGE 7

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

212 KK CP15
213 HC 4
*

214 KK ON13
215 BA 0.0005
216 LS 0 91.5
217 UD 0.050
*

218 KK ON14
219 BA 0.0008
220 LS 0 93.0
221 UD 0.053
*

222 KK ON15
223 BA 0.0015
224 LS 0 92.7
225 UD 0.072
*

226 KK ON18
227 BA 0.0006
228 PB 3.00
229 LS 0 92.6
230 UD 0.050
*

231 KK ON17
232 BA 0.0014
233 PB 3.00
234 LS 0 92.9
235 UD 0.064
*

236 KK ON16
237 BA 0.0034
238 PB 3.00
239 LS 0 92.3
240 UD 0.111
*

241 KK CP17
242 HC 3
*
243 ZZ

1

SCHEMATIC DIAGRAM OF STREAM NETWORK

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

21 OFF16
.
.
34 . ON1
.
.
39 . OFF17
.
.
44 CP1.....
.
.
46 . ON2
.
.
51 . OFF15
.
.
56 . CP2.....
.
.
58 . ON3
.
.
63 . OFF14
.

INT

68	.	.	.	.
	.	.	CP3.....	.
70	CP4.....	.	.	.
72	.	ON4	.	.
77	.	.	OFF12	.
82	.	.	.	OFF13
87	.	CP5.....	.	.
89	.	.	ON5	.
94	.	.	.	OFF11
99	.	CP6.....	.	.
101	.	.	.	ON6
106	.	.	.	OFF10
111	.	.	CP7.....	.
113	CP8.....	.	.	.
115	.	OFF9	.	.
120	.	.	ON7	.
125	CP9.....	.	.	.
127	.	.	ON8	.
132	.	.	.	OFF8
137	.	CP10.....	.	.
139	.	.	ON9	.
144	.	.	.	OFF7
149	.	.	CP11.....	.
151	.	.	.	ON10
156	.	.	.	OFF4
161	.	.	.	OFF5
166	.	.	.	OFF6
171	.	.	CP12.....	.
173	.	.	.	ON11
178	.	.	.	OFF2
	.	.	.	.

INT

COMPUTATION INTERVAL .08 HOURS
TOTAL TIME BASE 24.92 HOURS

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

JP MULTI-PLAN OPTION
NPLAN 1 NUMBER OF PLANS

JR MULTI-RATIO OPTION
RATIOS OF PRECIPITATION
1.00 .60

1

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

OPERATION	STATION	AREA	PLAN		RATIOS APPLIED TO PRECIPITATION	
					RATIO 1	RATIO 2
					1.00	.60
HYDROGRAPH AT						
+	OFF16	.01	1	FLOW	21.	8.
				TIME	3.50	3.58
HYDROGRAPH AT						
+	ON1	.00	1	FLOW	3.	1.
				TIME	3.50	3.50
HYDROGRAPH AT						
+	OFF17	.00	1	FLOW	7.	3.
				TIME	3.50	3.58
3 COMBINED AT						
+	CP1	.02	1	FLOW	30.	13.
				TIME	3.50	3.50
HYDROGRAPH AT						
+	ON2	.00	1	FLOW	1.	1.
				TIME	3.50	3.50
HYDROGRAPH AT						
+	OFF15	.02	1	FLOW	27.	11.
				TIME	3.50	3.58
2 COMBINED AT						
+	CP2	.02	1	FLOW	28.	11.
				TIME	3.50	3.50
HYDROGRAPH AT						
+	ON3	.00	1	FLOW	1.	0.
				TIME	3.50	3.50
HYDROGRAPH AT						
+	OFF14	.02	1	FLOW	25.	10.
				TIME	3.50	3.58
2 COMBINED AT						
+	CP3	.02	1	FLOW	26.	10.
				TIME	3.50	3.50
3 COMBINED AT						
+	CP4	.06	1	FLOW	84.	35.
				TIME	3.50	3.50
HYDROGRAPH AT						
+	ON4	.00	1	FLOW	2.	1.
				TIME	3.50	3.50
HYDROGRAPH AT						
+	OFF12	.01	1	FLOW	15.	6.
				TIME	3.50	3.58
HYDROGRAPH AT						
+	OFF13	.01	1	FLOW	7.	3.
				TIME	3.50	3.58
3 COMBINED AT						
+	CP5	.02	1	FLOW	25.	10.
				TIME	3.50	3.50

INT

HYDROGRAPH AT +	ON5	.00	1	FLOW TIME	2. 3.50	1. 3.50
HYDROGRAPH AT +	OFF11	.02	1	FLOW TIME	34. 3.50	14. 3.58
2 COMBINED AT +	CP6	.03	1	FLOW TIME	36. 3.50	15. 3.50
HYDROGRAPH AT +	ON6	.00	1	FLOW TIME	3. 3.50	1. 3.50
HYDROGRAPH AT +	OFF10	.02	1	FLOW TIME	23. 3.50	9. 3.58
2 COMBINED AT +	CP7	.02	1	FLOW TIME	25. 3.50	11. 3.50
4 COMBINED AT +	CP8	.12	1	FLOW TIME	170. 3.50	70. 3.50
HYDROGRAPH AT +	OFF9	.01	1	FLOW TIME	12. 3.50	5. 3.58
HYDROGRAPH AT +	ON7	.00	1	FLOW TIME	1. 3.50	1. 3.50
2 COMBINED AT +	CP9	.01	1	FLOW TIME	13. 3.50	6. 3.50
HYDROGRAPH AT +	ON8	.00	1	FLOW TIME	2. 3.50	1. 3.50
HYDROGRAPH AT +	OFF8	.01	1	FLOW TIME	21. 3.50	8. 3.50
2 COMBINED AT +	CP10	.02	1	FLOW TIME	22. 3.50	9. 3.50
HYDROGRAPH AT +	ON9	.00	1	FLOW TIME	1. 3.50	1. 3.50
HYDROGRAPH AT +	OFF7	.01	1	FLOW TIME	9. 3.50	4. 3.58
2 COMBINED AT +	CP11	.01	1	FLOW TIME	10. 3.50	4. 3.50
HYDROGRAPH AT +	ON10	.00	1	FLOW TIME	4. 3.50	2. 3.50
HYDROGRAPH AT +	OFF4	.00	1	FLOW TIME	3. 3.50	1. 3.50
HYDROGRAPH AT +	OFF5	.01	1	FLOW TIME	8. 3.50	3. 3.58
HYDROGRAPH AT +	OFF6	.01	1	FLOW TIME	9. 3.50	4. 3.58
4 COMBINED AT +	CP12	.02	1	FLOW TIME	24. 3.50	10. 3.50
HYDROGRAPH AT +	ON11	.00	1	FLOW TIME	3. 3.50	2. 3.50

INT

HYDROGRAPH AT +	OFF2	.01	1	FLOW TIME	12. 3.50	5. 3.58
HYDROGRAPH AT +	OFF3	.00	1	FLOW TIME	5. 3.50	2. 3.50
3 COMBINED AT +	CP13	.01	1	FLOW TIME	20. 3.50	9. 3.50
5 COMBINED AT +	CP14	.06	1	FLOW TIME	90. 3.50	38. 3.50
HYDROGRAPH AT +	ON13A	.00	1	FLOW TIME	2. 3.50	1. 3.50
HYDROGRAPH AT +	OFF18	.01	1	FLOW TIME	11. 3.50	5. 3.50
HYDROGRAPH AT +	ON12	.01	1	FLOW TIME	20. 3.50	10. 3.50
HYDROGRAPH AT +	OFF1	.00	1	FLOW TIME	4. 3.50	1. 3.58
4 COMBINED AT +	CP15	.02	1	FLOW TIME	37. 3.50	18. 3.50
HYDROGRAPH AT +	ON13	.00	1	FLOW TIME	1. 3.50	1. 3.50
HYDROGRAPH AT +	ON14	.00	1	FLOW TIME	2. 3.50	1. 3.50
HYDROGRAPH AT +	ON15	.00	1	FLOW TIME	3. 3.50	2. 3.50
HYDROGRAPH AT +	ON18	.00	1	FLOW TIME	1. 3.50	1. 3.50
HYDROGRAPH AT +	ON17	.00	1	FLOW TIME	3. 3.50	2. 3.50
HYDROGRAPH AT +	ON16	.00	1	FLOW TIME	6. 3.50	3. 3.58
3 COMBINED AT +	CP17	.01	1	FLOW TIME	11. 3.50	5. 3.50

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

APPENDIX D

Revised Roadside Swale Sections

Worksheet for Section 1 - Roadside Swale (Min. Slope)

Project Description

Friction Method Manning Formula
Solve For Normal Depth

Input Data

Channel Slope 0.01220 ft/ft
Discharge 10.00 ft³/s
Section Definitions

Station (ft)	Elevation (ft)
0+00	1.00
0+07	0.00
0+12	0.00
0+14	1.00

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00, 1.00)	(0+14, 1.00)	0.025

Options

Current Roughness Weighted Method Improved Lotter's Method
Open Channel Weighting Method Improved Lotter's Method
Closed Channel Weighting Method Horton's Method

Results

Normal Depth 0.45 ft
Elevation Range 0.00 to 1.00 ft
Flow Area 3.12 ft²
Wetted Perimeter 9.14 ft
Hydraulic Radius 0.34 ft
Top Width 9.01 ft
Normal Depth 0.45 ft
Critical Depth 0.44 ft
Critical Slope 0.01332 ft/ft

Worksheet for Section 1 - Roadside Swale (Min. Slope)

Results

Velocity	3.21	ft/s
Velocity Head	0.16	ft
Specific Energy	0.61	ft
Froude Number	0.96	
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
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.45	ft
Critical Depth	0.44	ft
Channel Slope	0.01220	ft/ft
Critical Slope	0.01332	ft/ft

Worksheet for Section 1 - Roadside Swale (Max. Slope)

Project Description

Friction Method Manning Formula
Solve For Normal Depth

Input Data

Channel Slope 0.03750 ft/ft
Discharge 10.00 ft³/s
Section Definitions

Station (ft)	Elevation (ft)
0+00	1.00
0+07	0.00
0+12	0.00
0+14	1.00

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00, 1.00)	(0+14, 1.00)	0.025

Options

Current Roughness Weighted Method Improved Lotter's Method
Open Channel Weighting Method Improved Lotter's Method
Closed Channel Weighting Method Horton's Method

Results

Normal Depth 0.33 ft
Elevation Range 0.00 to 1.00 ft
Flow Area 2.12 ft²
Wetted Perimeter 8.04 ft
Hydraulic Radius 0.26 ft
Top Width 7.94 ft
Normal Depth 0.33 ft
Critical Depth 0.43 ft
Critical Slope 0.01332 ft/ft

Worksheet for Section 1 - Roadside Swale (Max. Slope)

Results

Velocity	4.73	ft/s
Velocity Head	0.35	ft
Specific Energy	0.67	ft
Froude Number	1.61	
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	0.33	ft
Critical Depth	0.43	ft
Channel Slope	0.03750	ft/ft
Critical Slope	0.01332	ft/ft

Cross Section for Section 1 - Roadside Swale (Max. Slope)

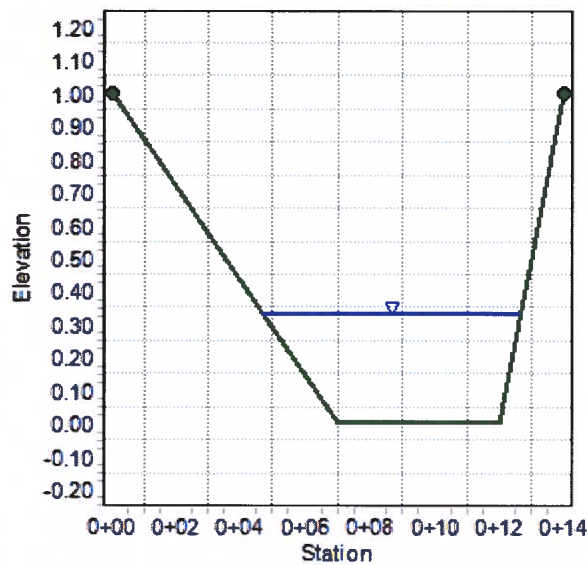
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.03750	ft/ft
Normal Depth	0.33	ft
Discharge	10.00	ft ³ /s

Cross Section Image



Worksheet for Section 10 - Roadside Swale (Max. Slope)

Project Description

Friction Method Manning Formula
Solve For Normal Depth

Input Data

Channel Slope 0.02360 ft/ft
Discharge 24.00 ft³/s
Section Definitions

Station (ft)	Elevation (ft)
0+00	1.00
0+07	0.00
0+12	0.00
0+22	1.00

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00, 1.00)	(0+22, 1.00)	0.025

Options

Current Roughness Weighted Method Improved Lotter's Method
Open Channel Weighting Method Improved Lotter's Method
Closed Channel Weighting Method Horton's Method

Results

Normal Depth 0.54 ft
Elevation Range 0.00 to 1.00 ft
Flow Area 5.16 ft²
Wetted Perimeter 14.23 ft
Hydraulic Radius 0.36 ft
Top Width 14.16 ft
Normal Depth 0.54 ft
Critical Depth 0.63 ft
Critical Slope 0.01227 ft/ft

Worksheet for Section 10 - Roadside Swale (Max. Slope)

Results

Velocity	4.65	ft/s
Velocity Head	0.34	ft
Specific Energy	0.87	ft
Froude Number	1.36	
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	0.54	ft
Critical Depth	0.63	ft
Channel Slope	0.02360	ft/ft
Critical Slope	0.01227	ft/ft

Cross Section for Section 10 - Roadside Swale (Max. Slope)

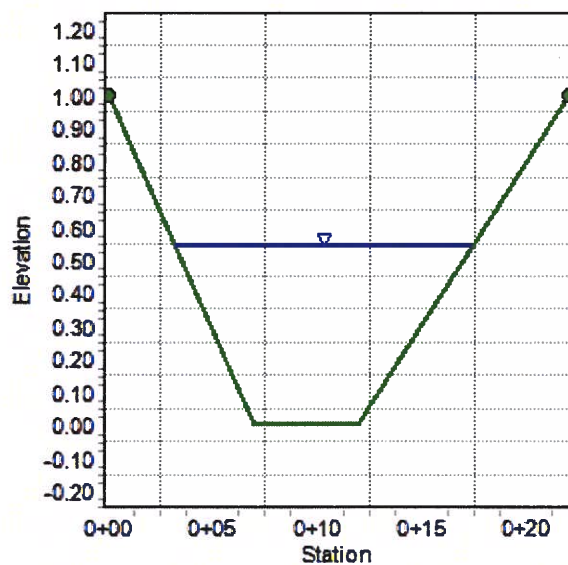
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.02360	ft/ft
Normal Depth	0.54	ft
Discharge	24.00	ft ³ /s

Cross Section Image



Worksheet for Section 10 - Roadside Swale (Min. Slope)

Results

Velocity	3.81	ft/s
Velocity Head	0.23	ft
Specific Energy	0.84	ft
Froude Number	1.05	
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	0.62	ft
Critical Depth	0.63	ft
Channel Slope	0.01370	ft/ft
Critical Slope	0.01228	ft/ft

Cross Section for Section 10 - Roadside Swale (Min. Slope)

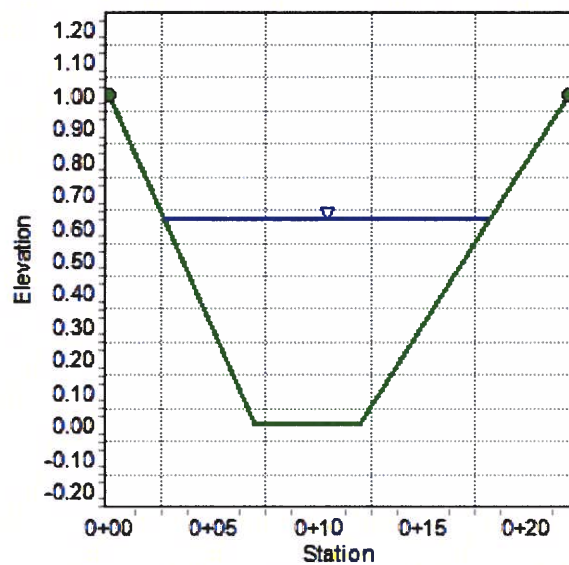
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.01370	ft/ft
Normal Depth	0.62	ft
Discharge	24.00	ft ³ /s

Cross Section Image



Worksheet for Section 13A - Roadside Swale (Min. Slope)

Project Description

Friction Method Manning Formula
Solve For Normal Depth

Input Data

Channel Slope 0.00600 ft/ft
Discharge 13.00 ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00	1.00
0+07	0.00
0+12	0.00
0+22	1.00

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00, 1.00)	(0+22, 1.00)	0.025

Options

Current Roughness Weighted Method Improved Lotter's Method
Open Channel Weighting Method Improved Lotter's Method
Closed Channel Weighting Method Horton's Method

Results

Normal Depth 0.56 ft
Elevation Range 0.00 to 1.00 ft
Flow Area 5.44 ft²
Wetted Perimeter 14.56 ft
Hydraulic Radius 0.37 ft
Top Width 14.49 ft
Normal Depth 0.56 ft
Critical Depth 0.46 ft
Critical Slope 0.01342 ft/ft

Worksheet for Section 13A - Roadside Swale (Min. Slope)

Results

Velocity	2.39	ft/s
Velocity Head	0.09	ft
Specific Energy	0.65	ft
Froude Number	0.69	
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
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.56	ft
Critical Depth	0.46	ft
Channel Slope	0.00600	ft/ft
Critical Slope	0.01342	ft/ft

Cross Section for Section 13A - Roadside Swale (Min. Slope)

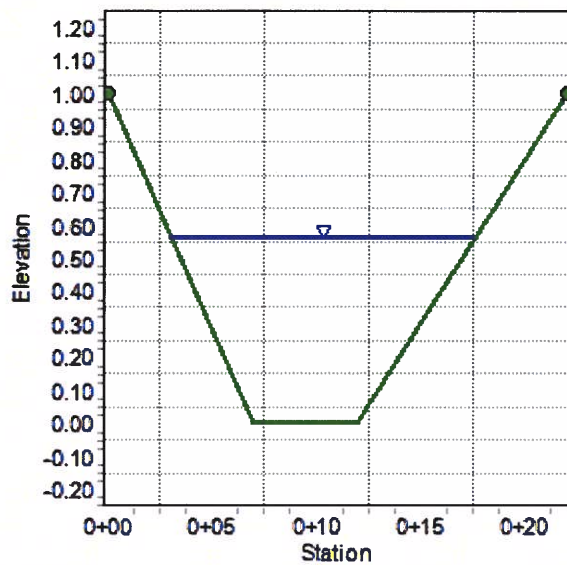
Project Description

Friction Method Manning Formula
Solve For Normal Depth

Input Data

Channel Slope 0.00600 ft/ft
Normal Depth 0.56 ft
Discharge 13.00 ft³/s

Cross Section Image



Worksheet for Section 13A - Roadside Swale (Max. Slope)

Project Description

Friction Method Manning Formula
Solve For Normal Depth

Input Data

Channel Slope 0.04490 ft/ft
Discharge 13.00 ft³/s
Section Definitions

Station (ft)	Elevation (ft)
0+00	1.00
0+07	0.00
0+12	0.00
0+22	1.00

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00, 1.00)	(0+22, 1.00)	0.025

Options

Current Roughness Weighted Method Improved Lotter's Method
Open Channel Weighting Method Improved Lotter's Method
Closed Channel Weighting Method Horton's Method

Results

Normal Depth 0.34 ft
Elevation Range 0.00 to 1.00 ft
Flow Area 2.63 ft²
Wetted Perimeter 10.74 ft
Hydraulic Radius 0.25 ft
Top Width 10.70 ft
Normal Depth 0.34 ft
Critical Depth 0.46 ft
Critical Slope 0.01342 ft/ft

Worksheet for Section 13A - Roadside Swale (Max. Slope)

Results

Velocity	4.94	ft/s
Velocity Head	0.38	ft
Specific Energy	0.71	ft
Froude Number	1.76	
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	0.46	ft
Channel Slope	0.04490	ft/ft
Critical Slope	0.01342	ft/ft

Cross Section for Section 13A - Roadside Swale (Max. Slope)

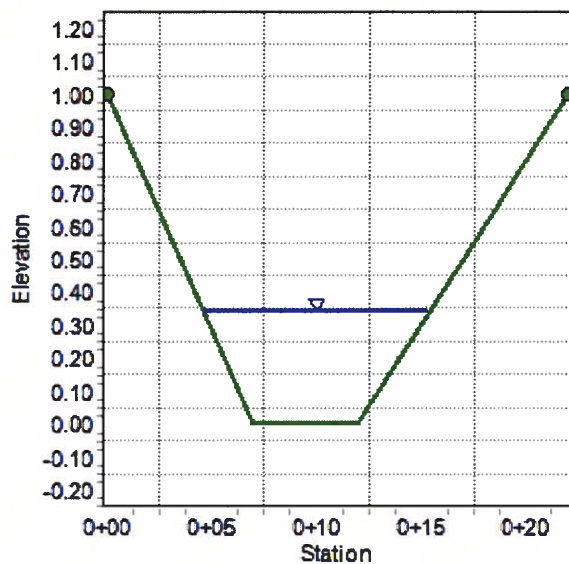
Project Description

Friction Method Manning Formula
Solve For Normal Depth

Input Data

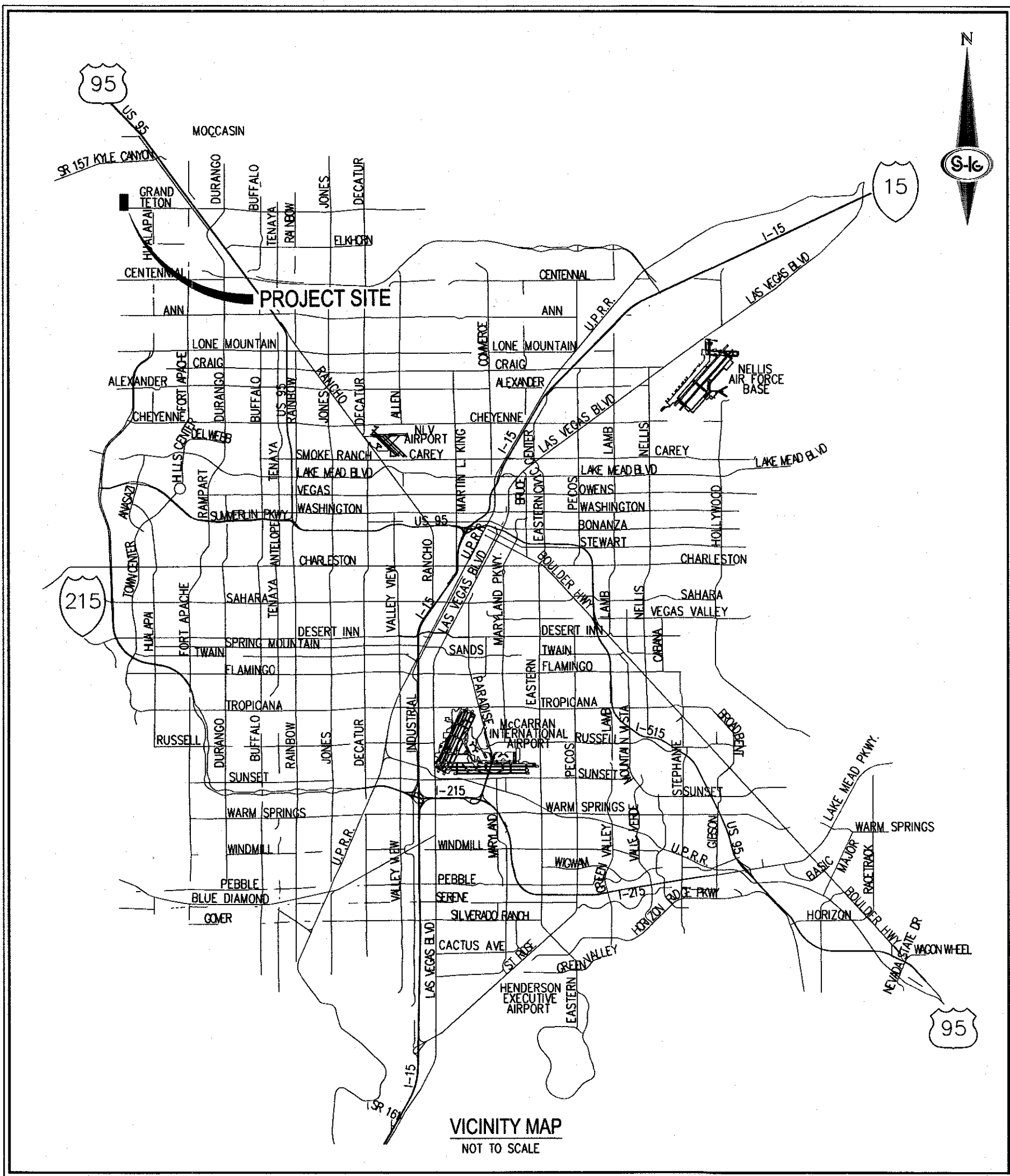
Channel Slope 0.04490 ft/ft
Normal Depth 0.34 ft
Discharge 13.00 ft³/s

Cross Section Image



APPENDIX E

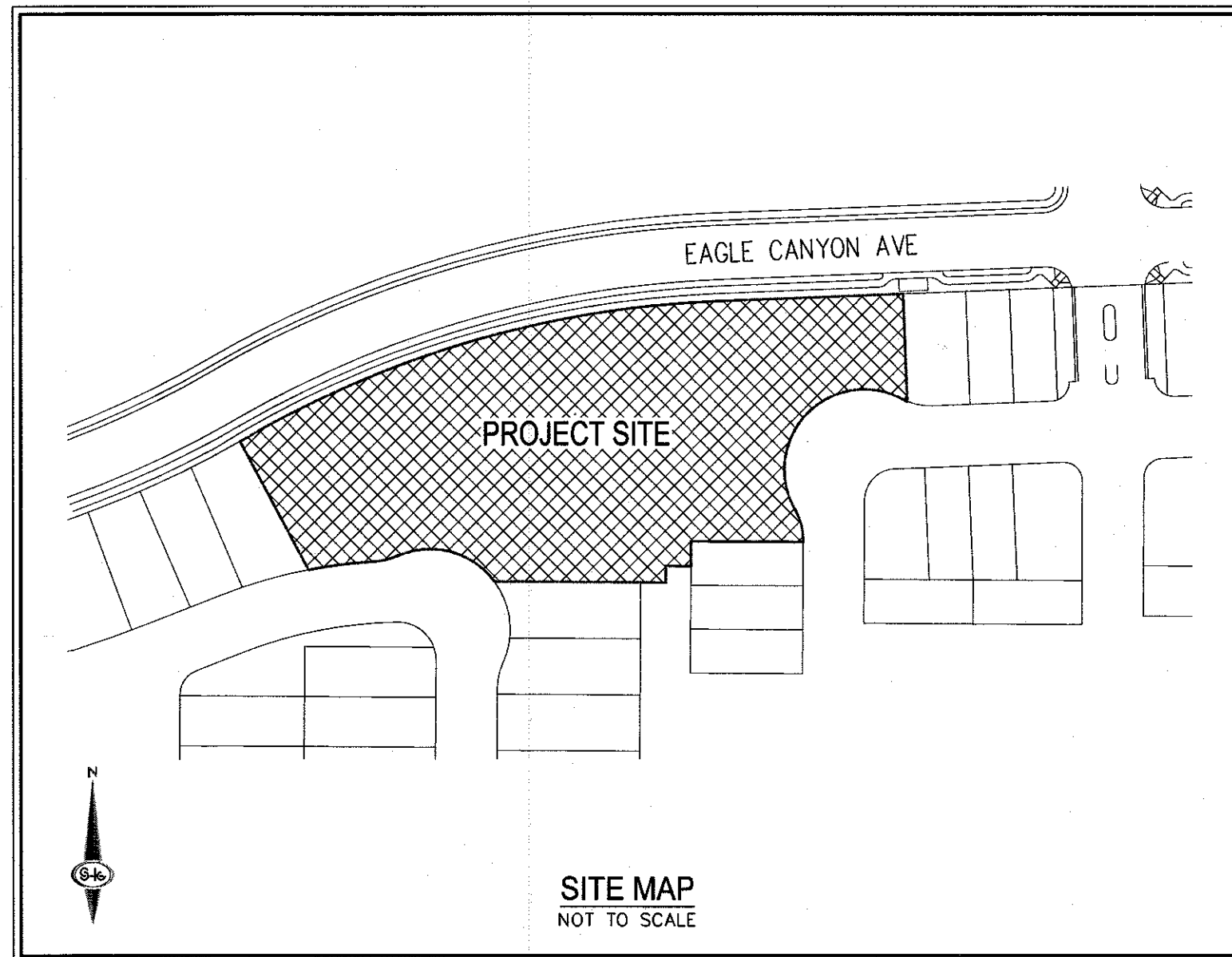
Revised Improvement Plans



KAG DEVELOPMENT WEST LLC

IMPROVEMENT PLANS FOR SKYE CANYON PH-2 NEIGHBORHOOD PARK

CITY OF LAS VEGAS, NEVADA
APN: 126-12-410-003



SHEET INDEX		
SHEET NUMBER	SHEET DESCRIPTION	SHEET TITLE
1	C-1	COVER SHEET
2	C-2	NOTES SHEET
3	C-3	LEGEND, QUANTITY AND ABBREVIATION SHEET
4	C-1	GRADING PLAN I
5	D-1	DETAIL SHEET I
6	D-2	DETAIL SHEET II

APPROVALS	
CITY ENGINEER-ALLEN PAVELKA PE, #9029	DATE
APPROVAL OF THESE PLANS BY THE CITY ENGINEER IS LIMITED TO THOSE IMPROVEMENTS CONSTRUCTED IN THE DEDICATED RIGHT-OF-WAY, AND/OR DEDICATED EASEMENTS. THIS APPROVAL DOES NOT AUTHORIZE CONSTRUCTION OF ANY IMPROVEMENTS THAT DEVIATE FROM ADOPTED STANDARDS AND/OR SPECIFICATIONS EXCEPT THOSE SPECIALLY LISTED UNDER DEVIATIONS FORM 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.	
LAS VEGAS FIRE AND RESCUE	DATE
CITY OF LAS VEGAS - PLANNING DEPARTMENT	DATE
THIS PLAN MEETS THE APPLICABLE STANDARDS OF THE PLANNING DEPARTMENT.	
CENTRAL TELEPHONE CO. DBA CENTURYLINK	DATE
THE AFFIRED 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.	
APPROVED FOR CONSTRUCTION	
LAS VEGAS VALLEY WATER DISTRICT ENGINEERING SERVICES	
PROJECT NO.:	FIRST APPROVED DATE:
LVMWD APPROVED FIRE FLOW	GPM AT 20 PSI RESIDUAL SHEETS:
APPROVAL BY THE FIRE DEPARTMENT HAVING JURISDICTION IS REQUIRED PRIOR TO OBTAINING FINAL APPROVAL FROM LAS VEGAS VALLEY WATER DISTRICT.	
NV ENERGY	DATE
NV ENERGY ACKNOWLEDGES THAT WE HAVE RECEIVED YOUR PLANS AND WILL PROVIDE SERVICE TO ALL ELECTRICAL NEEDS ASSOCIATED WITH THIS PROJECT. NV ENERGY 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.	
SOUTHWEST GAS CORPORATION	DATE
COX COMMUNICATIONS LAS VEGAS, INC.	DATE

OWNER/DEVELOPER	ENGINEER
KAG DEVELOPMENT WEST LLC 11411 SOUTHERN HIGHLANDS #300 LAS VEGAS, NV 89141 PH: 702-220-6565 FX: 702-220-6566 CONTACT: BOBBY WILLIAMSON	SLATER HANIFAN GROUP, INC. 5740 S. ARVILLE STREET, SUITE 216 LAS VEGAS, NV 89118 PH: (702) 284-5300 FX: (702) 284-5399 CONTACT: EFRAN BALIZAN

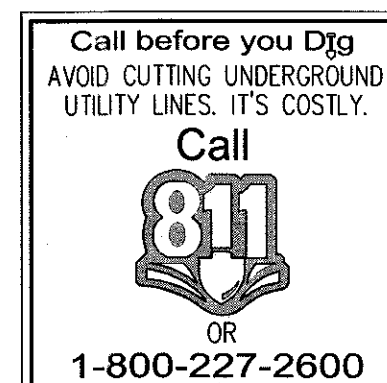
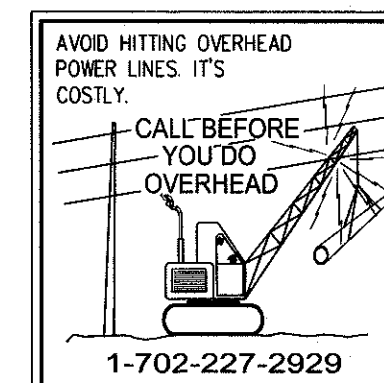
BENCHMARK
USDA BRASS CAP ON AN IRON PIPE, 140' SOUTHWEST OF TELEPHONE POLE #269941, SOUTHWEST CORNER OF THE U.S. 95/KYLE CANYON TURNOFF.
ELEVATION = 2817.62 FEET, 858.813 METERS
N.A.V.D. 88
PER THE CLARK COUNTY VERTICAL CONTROL LAST REVISED 2003

BASIS OF BEARINGS
THE BASIS OF BEARING IS SOUTH 00°22'12" WEST, BEING THE BEARING OF THE WEST LINE OF THE NORTHWEST QUARTER (NW 1/4) OF SECTION 6, TOWNSHIP 19 SOUTH, RANGE 60 EAST, M.D.M., CITY OF LAS VEGAS, CLARK COUNTY, NEVADA, AS SHOWN BY MAP THEREOF IN FILE 151, PAGE 14 OF SURVEYS IN THE CLARK COUNTY RECORDER'S OFFICE, NEVADA.

FEMA FLOOD ZONE INFORMATION
THE PROJECT SITE IS LOCATED WITHIN A FEMA DESIGNATED ZONE 'X' (UNSHADED), AREA OUTSIDE THE 0.2% ANNUAL CHANCE (500 YEAR) FLOODPLAIN, PER THE FEMA FIRM PANELS 32003C1750E DATED SEPTEMBER 27, 2002.

DEVIATIONS FROM STANDARDS
NONE

SWPPP NOTE
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 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/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. NWR100000 ALONG WITH THE APPROPRIATE FILLING FEE.



SLATER HANIFAN GROUP
CONSULTING ENGINEERS & PLANNERS
5740 S. ARVILLE STREET #216, LAS VEGAS, NV 89118
PHONE (702) 284-5300 FAX (702) 284-5399

SKYE CANYON
SKYE CANYON PH-2 NEIGHBORHOOD PARK
COVER SHEET

DATE: 4/30/18
DRAFTER: JMP
DESIGNER: EB
CHECKED: EB
PROJECT NO.
OLY1714-000

C-1
SHEET 1 OF 6

STORMWATER RUNOFF MANAGEMENT

(REQUIRED FOR ALL SITES GREATER THAN 1 ACRE (43,560 SQ.FT.))

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 RIGHTS OF WAYS OF CLARK COUNTY 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 SPECIFIED IN TITLE 24.40 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 NVIR00000, SECTION III.A.5.
4. AT A MINIMUM, THE CONTRACTOR OR HIS AGENT SHALL INSPECT ALL DISTURBED AREAS, AREAS USED FOR STORAGE OF MATERIALS AND EQUIPMENT THAT ARE EXPOSED TO PRECIPITATION, VEHICLE ENTRANCES 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 OR MODIFY THE STORMWATER POLLUTION PREVENTION PLAN AS NECESSARY. SOME EXCEPTIONS TO WEEKLY INSPECTIONS MAY APPLY, SUCH AS SUSPENSION OF LAND DISTURBANCE ACTIVITIES. REFER TO NEVADA STORMWATER GENERAL PERMIT FOR CONSTRUCTION ACTIVITY NVIR00000, SECTION III.A.12.
5. ACCUMULATED SEDIMENT IN BMPs SHALL BE REMOVED WITHIN SEVEN DAYS AFTER A STORMWATER RUNOFF EVENT OR PRIOR TO THE NEXT ANTICIPATED STORM EVENT, WHICHEVER IS EARLIER. SEDIMENT MUST BE REMOVED WHEN BMP DESIGN CAPACITY HAS BEEN REDUCED BY 50 PERCENT OR MORE.

BENCHMARK

USDA BRASS CAP ON AN IRON PIPE, 140' SOUTHWEST OF TELEPHONE POLE #259941, SOUTHWEST CORNER OF THE U.S. 95/KYLE CANYON TURNOFF.
ELEVATION = 2817.62 FEET, 858.813 METERS
N.A.V.D. 88
PER THE CLARK COUNTY VERTICAL CONTROL LAST REVISED 2003

BASIS OF BEARINGS

THE BASIS OF BEARING IS SOUTH 00°22'12" WEST, BEING THE BEARING OF THE WEST LINE OF THE NORTHWEST QUARTER (NW1/4) OF SECTION 6, TOWNSHIP 19 SOUTH, RANGE 60 EAST, M.D.N., CITY OF LAS VEGAS, CLARK COUNTY, NEVADA, AS SHOWN BY MAP THEREOF IN FILE 151, PAGE 14 OF SURVEYS IN THE CLARK COUNTY RECORDER'S OFFICE, NEVADA.

2.2 CITY OF LAS VEGAS SEWER NOTES

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 UNIFORM STANDARD SPECIFICATIONS FOR PUBLIC WORKS' CONSTRUCTION OFF-SITE 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. POLYVNYL (PVC) SEWER PIPE SHALL MEET ASTM D-3034 SDR 35 SPECIFICATIONS, INSTALLED WITH SAND BEDDING AND BACKFILL OF TYPE 1 AGGREGATE BASE.
5. ALL MANHOLES PAVED IN STREETS EIGHTY (80') FOOT R/W AND LARGER SHALL HAVE CONCRETE COLLARS. STREETS LESS THAN EIGHTY (80') FOOT R/W WILL REQUIRE RETIPIFF IF PAVING DOES NOT CONFORM TO CITY STANDARDS 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" "S" SHALL BE USED ON LINES TWELVE INCHES (12") OR ABOVE.
7. WATER MAINS SHALL BE PROTECTED IN ACCORDANCE WITH LVVWD 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 TOLERANCE 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.

LAS VEGAS VALLEY WATER DISTRICT (LVVWD) STANDARD NOTES

LVVWD PROJECT # _____ (REVISED 01/09/2017)

1. NO WORK SHALL BEGIN UNTIL THE WATER PLANS HAVE BEEN APPROVED FOR CONSTRUCTION BY THE LVVWD. FOLLOWING WATER PLAN APPROVAL, NOTICE SHALL BE GIVEN TO THE LVVWD COMMUNICATION SUPPORT CENTER (258-7171) TWO (2) WORKING DAYS PRIOR TO THE START OF CONSTRUCTION. FOR FUTURE INSPECTIONS, NOTICE MUST BE GIVEN BY 2:00 P.M. THE BUSINESS DAY PRIOR TO THE REQUESTED LVVWD INSPECTION. WHEN REQUESTING INSPECTIONS, PLEASE REFER TO THE PROJECT # IDENTIFIED ABOVE.
2. ALL WORK SHALL CONFORM TO LVVWD STANDARD PLANS, DRAWINGS, AND SPECIFICATIONS, AND TO THE 2010 EDITION OF THE UNIFORM DESIGN AND CONSTRUCTION STANDARDS FOR POTABLE WATER SYSTEMS (UDACS). THE LATEST EDITION OF UDACS SHALL SUPERSEDE ANY CONFLICTS CONTAINED IN THE APPROVED DRAWINGS AND/OR SPECIFICATIONS.
3. ALL WORK, EXCEPT AS MODIFIED BY THESE PLANS OR BY NOTE 2 ABOVE, SHALL BE DONE IN ACCORDANCE WITH THE MOST RECENT EDITION OF THE UNIFORM STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION OFFSITE IMPROVEMENT, CLARK COUNTY AREA.
4. A SINGLE PIPE MATERIAL SHALL BE USED THROUGHOUT THE PROJECT UNLESS OTHERWISE APPROVED BY THE LVVWD.
5. ALL SERVICE LATERALS TWO (2) INCHES IN DIAMETER AND SMALLER SHALL BE TYPE K COPPER TUBING WITH LVVWD APPROVED SERVICE SADDLES.
6. ALL WATER METER BOXES SHALL BE LOCATED OUTSIDE OF DRIVEWAY AREAS.
7. ALL VALVES SHALL BE LOCATED OUTSIDE OF DRIVEWAYS, VALLEY AND CURB CUTTERS.
8. ALL WATER AND STORM DRAIN OR SANITARY SEWER CROSSEINGS SHALL CONFORM TO SECTION 2.22 OF THE 2010 EDITION OF THE UDACS.
9. ALL WATER FACILITIES SHALL BE FILLED, DISINFECTED, PRESSURE TESTED, FLUSHED, FILLED, AND AN ACCEPTABLE WATER SAMPLE OBTAINED, PRIOR TO CONNECTION TO THE LVVWD DISTRIBUTION SYSTEM.
10. THE CONTRACTOR MUST OBTAIN ALL METERS TWO (2) INCHES AND SMALLER FROM LVVWD CENTRAL STORES. TELEPHONE 258-3152 OR 258-3802, TWO (2) WORKING DAYS PRIOR TO METER PICKUP.
11. ANY INTERRUPTION OF SERVICE MUST BE PERFORMED IN ACCORDANCE WITH UDACS SECTION 3.14.01, AND APPROVED BY THE LVVWD INSPECTION DIVISION PRIOR TO SHUTDOWN. PROPER WRITTEN NOTIFICATION MUST BE GIVEN TO ALL AFFECTED CUSTOMERS.
12. ALL WATER FACILITY CONSTRUCTION MATERIALS USED MUST BE AS LISTED ON THE LVVWD PRE-APPROVED MATERIALS AND MANUFACTURER'S LISTING FOR NEW FACILITIES. LATEST REVISION, OR SPECIFICALLY APPROVED ON THESE PLANS.
13. TELEPHONE "CALL BEFORE YOU DIG" AT "811" OR 1-800-227-2600.

14. THE INSTALLATION OF LAS VEGAS VALLEY WATER DISTRICT (LVVWD) MUNICIPAL WATER FACILITIES WITHIN ALL STREETS IS ASSUMED TO BE IN COMPLIANCE WITH THE UNIFORM STANDARDS, INCLUDING THE PLACEMENT OF ASPHALT PAVING STREET SURFACES. ANY REPAIR WORK DONE BY THE LVVWD TO THE MUNICIPAL WATER FACILITIES WILL INCLUDE THE PLACEMENT OF AN APPROPRIATELY SIZED ASPHALT REPAIR PATCH ON THE STREET SURFACE.

ANY DECORATIVE PAVING SURFACE WITHIN THE STREET IS THE RESPONSIBILITY OF THE OWNER'S ASSOCIATION, OR THE INDIVIDUAL PROPERTY OWNERS IF NO OWNER'S ASSOCIATION IS IN EXISTENCE, OR THE AGENCY HAVING JURISDICTION. DECORATIVE SURFACE MATERIALS PLACED WITHIN THE TEN FOOT EASEMENT ADJUTING A PUBLIC OR PRIVATE STREET, IF DISTURBED BY THE LVVWD DURING THE REPAIR OR OPERATION OF ITS FACILITIES, WILL BE REPLACED BY LVVWD WITH AN APPROPRIATELY SIZED PLAIN FINISH CONCRETE PATCH. THE LVVWD WILL NOT RESTORE, AND WILL NOT BE RESPONSIBLE FOR THE RESTORATION OF, ANY DECORATIVE PAVING SURFACE WITHIN THE STREET. THE LVVWD WILL NOT ATTEMPT TO MATCH COLOR OR FINISH OF ANY ADJACENT MATERIALS.

IS NO LEAD COMPLIANCE NOTE
TO COMPLY WITH THE FEDERAL SAFE DRINKING WATER ACT, ALL WATER WORKS BRASS PRODUCTS PROPOSED TO BE RELOCATED, OR INSTALLED AS NEW MUST BE INSTALLED WITH THE LEAD FREE APPROVED PRODUCT. THE OLD LEADED PRODUCT MAY NOT BE USED.

GRADING NOTES

1. INDICATED GRADES OTHER THAN T.C., F.G. & GUTTER F.L. ARE ROUGH GRADES.
2. THE ROUGH GRADING PLANS SHALL BE ON THE JOB SITE AT ALL TIMES. THE ROUGH GRADING SHALL BE FINISHED IN CONFORMANCE WITH THE LINES AND GRADES SHOWN ON THE PLANS. THE GRADING QUANTITIES ARE BASED ON THE ELEVATION AND DETAILS SHOWN ON THE PLANS. ANY DEVIATIONS FROM THE PLANS WILL RESULT IN QUANTITY CHANGES.
3. CARE SHALL BE EXERCISED IN GRADING CORNER LOTS.
4. ROUGH PAD ELEVATIONS SHALL BE GRADED TO WITHIN 0.1' OF THE PAD ELEVATIONS SHOWN ON THE PLANS. WHEN GRADING IS COMPLETE PER THE PLANS, THE CONTRACTOR SHALL NOTIFY THE ENGINEER SO THAT THE LOTS CAN BE INSPECTED. AT THAT TIME, THE ENGINEER SHALL ALSO DECIDE IF ANY ADDITIONAL DITCHES OR BERMS ARE REQUIRED. THE CONTRACTOR IS REQUESTED NOT TO REMOVE ANY OF HIS ROUGH GRADING EQUIPMENT UNTIL HE RECEIVES GRADING APPROVAL FROM THE ENGINEER.
5. SOILS REPORT PREPARED BY ?????, PROJECT NO. ####-##, DATED ###/###/####

CITY OF LAS VEGAS FIRE AND RESCUE GENERAL NOTES

1. ALL WORK SHALL BE DONE IN STRICT ACCORDANCE WITH THE LAS VEGAS FIRE AND RESCUE ADOPTED FIRE CODE AND CONSTRUCTION STANDARDS FOR WASTEWATER COLLECTION SYSTEMS AND HYDRANT INSTALLATION SPECIFICATIONS.
2. ONLY FIRE HYDRANTS THAT ARE ON THE LAS VEGAS VALLEY WATER DISTRICT'S - APPROVED PRODUCTS LIST ARE ALLOWED TO BE INSTALLED.
3. A PERMIT IS REQUIRED FROM LAS VEGAS FIRE AND RESCUE FOR ALL 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 [JFC 105.7.12]
4. ON ANY RESIDENTIAL OR COMMERCIAL INSTALLATIONS, FIRE HYDRANTS SHALL BE INSTALLED AND FIRE APPARATUS 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. [JFC 3310, 3312]
5. TO IDENTIFY THE FIRE HYDRANT LOCATIONS, THE CONTRACTOR SHALL PLACE A BLUE REFLECTIVE MARKER AT THE CENTER LINE OF THE STREET ADJACENT TO THE FIRE HYDRANTS. [JFC 507.5.7.3]
6. ALL UNDERGROUND INSPECTIONS, PRESSURE AND FLUSH VERIFICATIONS OF ALL FIRE HYDRANTS AND FIRE LINES, SHALL BE CONDUCTED BEFORE COVERING THE LINES. CENTER LOADING IS ACCEPTABLE FOR THE HYDRO TESTS WITH PRIOR FIRE PREVENTION APPROVAL. [JFC 106.3]
7. ALL ON-SITE UNDERGROUND WATER MAINS AND MATERIALS SHALL BE U.L. LISTED, A.W.W.A APPROVED AND SHALL BE RATED FOR THE APPROPRIATE WORKING PRESSURE. [JFC 507.2.1, NFPA 24]
8. PAINTING OF CURBS, FIRE HYDRANTS, PADS, PROTECTION OF FIRE HYDRANTS FROM PHYSICAL DAMAGE, AND ALL OTHER WORK NECESSARY PER PLAN SHALL BE COMPLETED BEFORE APPROVAL BY LAS VEGAS FIRE AND RESCUE, FIRE PREVENTION DIVISION. [JFC 507]
9. PRIVATE HYDRANTS SHALL BE PAINTED RED. [JFC 507.5.7.1]
10. PRIOR TO THE FINAL OCCUPANCY, A FIRE FLOW TEST SHALL BE WITNESSED BY LAS VEGAS FIRE AND RESCUE, FIRE PREVENTION DIVISION TO VERIFY AVAILABILITY OF THE REQUIRED FIRE FLOW. [JFC 507]
11. FIRE HYDRANT SPACING SHALL BE AS FOLLOWS: [JFC C102]
 - * RESIDENTIAL - 500 FT UNSPRINKLERED; 400 FT SPRINKLERED.
 - * COMMERCIAL - 300 FT UNSPRINKLERED; 400 FT SPRINKLERED.
12. WHERE NEW WATER MAINS ARE EXTENDED ALONG STREETS OR NEW STREETS ARE INSTALLED WHERE FIRE HYDRANTS ARE NOT NEEDED FOR PROTECTION OF THE STRUCTURES, FIRE HYDRANTS SHALL BE INSTALLED AT A MAXIMUM OF 1,000 FT SPACING, TO PROVIDE FOR TRANSPORTATION HAZARDS. WHERE STREETS ARE PROVIDED WITH MEDIAN DIVIDERS OR HAVE FOUR (4) 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 FT ON AN ALTERNATING BASIS. [JFC C102.8]
13. 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.
14. NO FIRE HYDRANTS SHALL BE LOCATED WITHIN 6 FT OF ANY CURB RETURN, DRIVEWAY, POWER POLE, STREETLIGHT OR ANY OTHER OBSTRUCTION. [JFC C102.12]
15. A MAXIMUM DISTANCE FROM A FIRE HYDRANT TO A ONE-TWO FAMILY DWELLING SHALL NOT EXCEED 300 FT, AS MEASURED BY AN APPROVED ROUTE. [JFC C102.4]
16. THE MAXIMUM DISTANCE FROM A FIRE HYDRANT TO A FIRE DEPARTMENT CONNECTION (FDC) SHALL NOT EXCEED 100 FT, AS MEASURED BY AN APPROVED ROUTE. [JFC C102.7]
17. THE MAXIMUM DISTANCE FROM A HYDRANT TO THE END OF A DEAD-END STREET SHALL NOT EXCEED 200 FT. [JFC C102.6]
18. TWO (2) 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. [JFC C104]
19. 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. [JFC 503.2.3]
20. THE GRADIENT FOR THE FIRE APPARATUS ACCESS ROADS SHALL NOT EXCEED 12% ANGLES OF APPROACH AND ANGLES OF DEPARTURE. SHALL NOT EXCEED 6% PRIOR TO OR AFTER THE GRADE CHANGE. ADJACENT TO THE STRUCTURES GRADIENT SHALL NOT EXCEED 6%. [JFC 503.2.7, 503.2.8]
21. THE TURNING RADIUS OF THE FIRE APPARATUS ACCESS ROADS SHALL BE NO LESS THAN 52 FEET OUTSIDE AND 28 FEET INSIDE TURNING RADIUS. [JFC 503.2.4]
22. VERTICAL CLEARANCE OF ALL FIRE APPARATUS ACCESS ROADS SHALL NOT BE LESS THAN 13 FT 6 INS. [JFC 503.2.1]
23. FIRE DEPARTMENT ACCESS ROADS SHALL HAVE A MINIMUM UNOBSTRUCTED WIDTH OF NOT LESS THAN 40 FT. FLOW LINE TO FLOW LINE WITH PARALLEL PARKING PERMITTED ON BOTH SIDES. NOT LESS THAN 32 FT WIDE. FLOW LINE TO FLOW LINE, WHERE PARKING IS PERMITTED ONLY ON ONE SIDE OF THE FIRE APPARATUS ACCESS ROAD, NOT LESS THAN 24 FT WIDE. FLOW LINE TO FLOW LINE, WHERE NO PARKING IS PERMITTED ON EITHER SIDE, FIRE LANES THROUGH PARKING LOTS SHALL BE NOT LESS THAN 24 FT. [JFC 503.2.1.1]
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. THE DISTANCE COULD BE INCREASED TO 250 FT IF THE BUILDING IS SPRINKLERED. [JFC 503.1.1]
25. APPROVED SECONDARY FIRE APPARATUS ACCESS SHALL BE PROVIDED FOR 100 OR MORE DWELLING UNITS, ROADS WITH DEAD-ENDS OR WITH A SINGLE POINT OF ACCESS IN EXCESS OF 600 FT. COMMERCIAL AND INDUSTRIAL DEVELOPMENTS WHERE BUILDINGS EXCEED 2 STORIES OR 30 FEET IN HEIGHT, OR EXCEEDING 62,000 SQUARE FEET IN AREA. [JFC 503.1.2]
26. ALL DEAD-END FIRE APPARATUS ROADS AND/OR FIRE LANES, PUBLIC OR PRIVATE, IN EXCESS OF 150 FT IN LENGTH SHALL BE PROVIDED WITH AN APPROVED TURN AROUND HAVING A MINIMUM DIAMETER OF 81 FT. [JFC 503.1.5]
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 OF 100 FEET ALONG THE DESIGNATED FIRE LANES. SIGNS TO BE PLACED ON BOTH SIDES OF AN ACCESS ROADWAY IF NEEDED TO PREVENT PARKING AND OTHER OBSTRUCTIONS TO BE INSTALLED NO HIGHER THAN 4 FT. IF LESS THAN 4 FT FROM THE 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. [JFC 503.3]
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 JFC 503.6 AND JFC APPENDIX M.

2.5 CITY OF LAS VEGAS GRADING NOTES

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 MATERIAL 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
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 THE PUBLICLY OWNED PROPERTY DURING CONSTRUCTION AND UPON COMPLETION OF THE PROJECT. 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, THE OWNER AGREES TO PROVIDE AND INSTALL SUCH ITEM AT HIS OWN EXPENSE AND AT THE DIRECTION OF THE CITY ENGINEER. TEMPORARY CONSTRUCTION INCLUDES DITCHES, BERMS, ROAD SIGNS AND BARRICADES, ETC.

UTILITY LOCATION NOTE TO CONTRACTOR

EXISTING UTILITY LOCATIONS SHOWN HEREIN ARE APPROXIMATE ONLY. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE EXACT VERTICAL AND HORIZONTAL LOCATION OF ALL EXISTING UNDERGROUND UTILITIES PRIOR TO COMMENCING CONSTRUCTION. NO REPRESENTATION IS MADE THAT ALL EXISTING UTILITIES ARE SHOWN HEREON. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR UTILITIES NOT SHOWN OR UTILITIES NOT SHOWN IN THEIR PROPER LOCATIONS. CALL BEFORE YOU DIG: 1 (800) 227-2600, SOUTHWEST GAS CORPORATION: 702-400-1789 (STANDBY CONTACT NUMBER)

2.1 CITY OF LAS VEGAS GENERAL NOTES

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 ISSUE; 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 CLARK COUNTY ENGINEERING AGENCY. THE 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 CITY PLANS LIBRARY ARE APPROXIMATE AND FOR RECORD PURPOSES. EXISTING UTILITIES ARE LOCATED ON 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 HIS OPERATION 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 UTILITY LINES, 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 AND 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 ONE-HALF INCH (1/2") ABOVE LIP OF ALL GUTTERS AFTER COMPACTION, EXCEPT AT SIDEWALK RAMPS AND CROSS CUTTERS.
9. CURB AND GUTTER FOUND TO BE UNACCEPTABLE TO THE CITY OF LAS VEGAS SHALL BE REMOVED AND REPLACED PER STANDARD DRAWING 216.
10. SIDEWALK RAMPS SHALL BE CONSTRUCTED IN EACH QUADRANT OF AN INTERSECTION PER STANDARD DRAWING 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 INCREASED AND EXPOSED TO NEW CONSTRUCTION. THE EXTENT OF THE TRANSITIONS TO BE AS SHOWN ON PLANS.
12. ALL GRADING WORK SHALL CONFORM TO THE SOILS REPORT AS PREPARED BY ADD. CITY OF LAS VEGAS TITLE 18, APPENDIX B.
13. EXACT LOCATION OF ALL SAWCUT LINES MAY BE ADJUSTED OR DETERMINED IN THE FIELD BY A CITY OF LAS VEGAS ENGINEER IF LOCATION ON PLANS IS 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 & CITY OF LAS VEGAS TITLE 18, APPENDIX B.
15. UTILITY COMPANY METER BOXES, MANHOLE LIDS, VALVE COVERS, ETC., SHALL BE LOCATED OUT OF DRIVEWAYS, DRIVEWAY APRONS, FLOWLINES, AND CROSS CUTTERS UNLESS WRITTEN APPROVAL IS GRANTED BY THE UTILITY COMPANY AND THE CITY ENGINEER.

SOUTHERN NEVADA - SOUTHWEST GAS CORPORATION GENERAL NOTES

1. IN THE EVENT OF NATURAL GAS EMERGENCIES CALL 911 AND 1-877-860-6020
 2. THERE SHALL BE A MINIMUM HORIZONTAL AND VERTICAL CLEARANCE OF 12-INCHES BETWEEN NATURAL GAS FACILITIES AND ANY UNDERGROUND FACILITIES AND/OR STRUCTURES, INCLUDING BUT NOT LIMITED TO WATER, SEWER, STORM DRAIN, COMMUNICATIONS, AND ELECTRIC.
 3. FOR VALVE ADJUSTMENT CONTACT 702-668-6107 48 HOURS PRIOR TO CONSTRUCTION.
 4. IN THE EVENT OF NATURAL GAS CONFLICT WITH PROPOSED UTILITIES AND/OR STRUCTURES CONTACT 702-365-2099
- CAUTION: HIGH PRESSURE GAS**
- CALL SOUTHWEST GAS AT 702-400-1789 FOR STANDBY WHEN EXCAVATING OVER OR NEAR HIGH PRESSURE GAS LINES 48 HOURS PRIOR TO CONSTRUCTION

2.3 CITY OF LAS VEGAS TRAFFIC NOTES

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 ADVANCE 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 ENCROACHED UPON BY A CONSTRUCTION WORK ZONE AND PUBLIC WORKS STAFF DETERMINES A NEED FOR STUDENTS TO BE ASSIGNED 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 MARKING, SUCH PAVEMENT MARKING SHALL BE RESTORED 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 TRAFFIC SIGNS SHALL BE FABRICATED WITH DIAMOND GRADE VIB 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. ALL 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 TO ENTER 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 STOPS 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 HAVE A CERTIFIED ATSSA TRAFFIC CONTROL TECHNICIAN OR INSA 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 OTHERWISE DIRECTED BY THE CITY OF LAS VEGAS TRAFFIC ENGINEER.
15. THE CONTRACTOR SHALL CONTACT THE TRAFFIC ENGINEERING DIVISION (TRANSPORTATION SECTION) THROUGH THE PROJECT'S OFFSITE INSPECTOR PRIOR TO INITIATING PAVING TO RECEIVE DIRECTION FOR ANY PERMANENT OR TEMPORARY MODIFICATIONS TO 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 DETECTING ANY ADJUSTMENTS TO THE FINAL PAVEMENT MARKINGS AND SIGNAGE, WHICH MAY INCLUDE OMITTING, ADDING OR MODIFYING PAVEMENT MARKINGS AND TRAFFIC CONTROL SIGNS SUCH THAT ADEQUATE TRANSITIONS AND LANE TERMINATIONS BETWEEN ADJACENT ROADWAY SEGMENTS ARE MAINTAINED.

DEVIATIONS FROM STANDARDS

NONE

APPROVED FOR CONSTRUCTION

LAS VEGAS VALLEY WATER DISTRICT ENGINEERING SERVICES

PROJECT No. _____ FIRST APPROVED DATE: _____



SLATER HANIFAN GROUP
CONSULTING ENGINEERS & PLANNERS
5740 S. ARVILLE STREET #216, LAS VEGAS, NV 89118
PHONE (702) 284-5300 FAX (702) 284-5399

DATE	BY	APP.

DESCRIPTION	NO.

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ABBREVIATIONS

AC	ASPHALTIC CONCRETE OR ACRE	FL	FIRE HYDRANT	PVC	POLYVINYL CHLORIDE
AGG	AGGREGATE BASE	FL	FEET OR FOOT	PVI	POINT OF VERTICAL INTERSECTION
APN	ASSESSORS PARCEL NUMBER	FUT	FUTURE	BTY	QUANTITY
APPROX OR ~	APPROXIMATE	GRD	GRADE OR GROUND	RCA	REINFORCED CONCRETE ARCH
AVE	AVENUE	GB	GRADE BREAK OR GRADE CHANGE	RCB	REINFORCED CONCRETE BOX
Ø	AT	GV	GATE VALVE	RCP	REINFORCED CONCRETE PIPE
BC	BEGIN CURVE OR BACK OF CURB	HDPE	HIGH DENSITY POLYETHYLENE	RD	ROAD
BCR	BEGINNING OF CURB RETURN	HDA	HOME OWNERS ASSOCIATION	RDWY ESMT	ROADWAY EASEMENT
BHW	BOTTOM OF HEADWALL	HORZ	HORIZONTAL	REDD	REQUIRED
BLDG	BUILDING	HP	HIGH POINT	REV	REVISION
BLVD	BOULEVARD	HML	HIGH WATER LEVEL	RG	ROUGH GRADE
BM	BENCHMARK	HDWL OR HW	HEADWALL	RT OR R	RIGHT
BVC	BEGIN VERTICAL CURVE	HYD	HYDRAULIC OR HYDRANT	S/W, ROW	RIGHT OF WAY
BWV	BACK WATER VALVE	ID	INSIDE DIAMETER	S	SLOPE
CC	CLARK COUNTY	IN	INCH	SCH	SCHEDULE
CCAUSSD	CLARK COUNTY AREA UNIFORM STANDARD DRAWINGS	INT	INTERSECTION	SD	STORM DRAIN
CCPW	CLARK COUNTY PUBLIC WORKS	INV	INVERT ELEVATION	SDDI	STORM DRAIN DROP INLET
CCRFCD	CLARK COUNTY REGIONAL FLOOD DISTRICT	IP	IRON PIPE	SDMH	STORM DRAIN MANHOLE
CCWRD	CLARK COUNTY WATER RECLAMATION DISTRICT	IRRIG	IRRIGATION	SEC	SECTION
CE	COMMON ELEMENT	LF	LINEAR FEET	SF	SQUARE FEET
CLC/LC	CENTERLINE	LP	LOW POINT	SH	SHEET
CLR	CLEAR OR CLEARANCE	LT OR L	LEFT	SNWA	SOUTHERN NEVADA WATER AUTHORITY
CLSM	CONTROLLED LOW STRENGTH MATERIAL	LWWD	LAS VEGAS VALLEY WATER DISTRICT	SPECS	SPECIFICATIONS
CLV	CITY OF LAS VEGAS	LWL	LOW WATER LEVEL	ST	STREET
CML&C	CEMENT MORTAR LINED AND COATED	MAX	MAXIMUM	SSMH	SANITARY SEWER MANHOLE
CMU	CONCRETE MASONRY UNIT	MECH	MECHANICAL	STA	STATION
CON	CITY OF NORTH LAS VEGAS	MANH	MANHOLE	STD	STANDARD
CONC	CONCRETE	MIN	MINIMUM	STL	STEEL OR STREET LIGHT
CT	COURT	MISC	MISCELLANEOUS	SW	SIDEWALK
CY OR CU YD	CUBIC YARD	MUE	MUNICIPAL UTILITY EASEMENT	SWG	SOUTHWEST GAS
DOWNS	DESIGN AND CONSTRUCTION FOR WASTEWATER COLLECTION SYSTEMS	NDOT	NEVADA DEPARTMENT OF TRANSPORTATION	SWR OR SS	SANITARY SEWER
DET	DETAIL	NPC	NEVADA POWER COMPANY	SY	SQUARE YARD
DI	DUCTILE IRON OR DRAIN INLET	NTS	NOT TO SCALE	TAN	TANGENT
DIA, Ø	DIAMETER	NUE	NONEXCLUSIVE UTILITY EASEMENT	TC	TOP OF CURB
DIP	DUCTILE IRON PIPE	OC	ON CENTER	TF	TOP OF FLOOR OR TOP OF FOOTING
DR	DRIVE	OD	OUTSIDE DIAMETER OR OVERALL DIMENSION	TG	TOP OF GRADE
DWG(S)	DRAWING	OFF	OFFSET	THRU	THROUGH
DWV	DRIVEWAY	ORIG	ORIGINAL	THW	TOP OF HEADWALL
EA	EACH	PAC	PUBLIC OR PEDESTRIAN ACCESS EASEMENT	TP	TOP OF PIPE
EGR	END CURB RETURN	PB	PULL BOX	TW	TOP OF WALL
EG	EXISTING GROUND	PC	POINT OF CURVE	TRW	TOP OF RETAINING WALL
EL	ELEVATION	PCC	POINT OF COMPOUND CURVE	TSW	TOP OF SCREEN WALL
ESMT	EASEMENT	PDE	PUBLIC DRAINAGE EASEMENT	TYP	TYPICAL
EP	EDGE OF PAVEMENT	PL	PROPERTY LINE	UDACS	UNIFORM DESIGN AND CONSTRUCTION STANDARDS
ERU	EQUIVALENT RESIDENTIAL UNIT	PGB	POINT OF BEGINNING	VC	VERTICAL CURVE
EVC	END VERTICAL CURVE	POC	POINT OF CURVATURE	VERT	VERTICAL
EX OR EXIST	EXISTING	POE	POINT OF ENDING	WG	WATER GATE VALVE
FC	FACE OF CURB	PRC	POINT OF REVERSE CURVATURE	WL	WATER LINE
FF	FINISHED FLOOR	PRELIM	PRELIMINARY	WPZ	WATER PRESSURE ZONE
FG	FINISHED GRADE	PROP	PROPOSED	WT	WEIGHT
FGH	FINISHED GRADE, HIGH SIDE	PRV	PRESSURE REDUCING VALVE	WTR	WATER LINE
FGL	FINISHED GRADE, LOW SIDE	PUE	PUBLIC UTILITY EASEMENT		
		PT	POINT OF TANGENT OR POINT		

SPECIAL NOTE

IN THE EVENT THAT ANY TEMPORARY CONSTRUCTION ITEM IS REQUIRED WHICH IS NOT SHOWN ON THESE DRAWINGS, THE OWNER AGREES TO PROVIDE AND INSTALL SUCH ITEM AT HIS OWN EXPENSE AND AT THE DIRECTION OF THE CLARK COUNTY DEPT. OF PUBLIC WORKS. TEMPORARY CONSTRUCTION ITEMS INCLUDE: PAVEMENT TRANSITIONS, PROTECTIVE DITCHES AND BERMS, ROAD SIGNS AND BARRICADES, ETC.

NOTICE TO CONTRACTOR

QUANTITIES SHOWN ARE ESTIMATES ONLY AND ARE INTENDED TO ILLUSTRATE SCOPE OF WORK. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THE EXACT QUANTITIES INVOLVED.

EXISTING UTILITY LOCATIONS SHOWN HEREIN ARE APPROXIMATE ONLY. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE EXACT VERTICAL AND HORIZONTAL LOCATION OF ALL EXISTING UNDERGROUND UTILITIES PRIOR TO COMMENCING CONSTRUCTION. NO REPRESENTATION IS MADE THAT ALL EXISTING UTILITIES ARE SHOWN HEREON. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR UTILITIES NOT SHOWN OR UTILITIES NOT SHOWN IN THEIR PROPER LOCATIONS. CALL BEFORE YOU DIG. (800) 227-2600

LEGEND

EXISTING	PROPOSED	DESCRIPTION
		5' CONTOUR
		1' CONTOUR
		STRIPING
		SEWER MANHOLE
		CURB AND GUTTER
		SANITARY SEWER PIPE AND FLOW ARROW
		WATER PIPE
		WATER GATE VALVE
		FIRE HYDRANT
		WATER BLOW-OFF
		WATER LATERAL W/ METER
		SANITARY SEWER LATERAL
		STREETLIGHT
		EDGE OF PAVEMENT
		TRAFFIC SIGN
		PAD ELEVATION
		FINISHED FLOOR ELEVATION
		ELEVATION
		RETAINING WALL
		STORM DRAIN W/ MANHOLE
		EXISTING GAS GATE VALVE
		EXISTING UNKNOWN MANHOLE
		EXISTING GAS, SIZE PER PLAN
		EXISTING POWER POLE
		EXISTING TRAFFIC SIGNAL
		EXISTING WALL
		WATER PIPE FITTING
		WATER POINT OF CONNECTION
		SEWER POINT OF CONNECTION
		DAYLIGHT LINE
		STREET CENTERLINE
		RIGHT-OF-WAY
		MATCHLINE
		BOUNDARY LINE
		PHASE LINE
		PROPERTY LINE
		FLOWLINE
		SAWCUT
		CUT/FILL TRANSITION LINE
		SIDEWALK
		EX STRIPING TO BE OBLITERATED
		GRADE BREAK LINE
		REFLECTIVE RAISED PAVEMENT MARKERS
		BACK WATER VALVE
		WROUGHT IRON FENCE
		PONY WALL
		DECORATIVE PERIMETER WALL
		DECORATIVE PERIMETER
		RETAINING WALL
		PROPOSED CURB AND GUTTER WITH RIGHT-OF-WAY AT BACK OF CURB
		EXISTING CURB AND GUTTER WITH RIGHT-OF-WAY AT BACK OF CURB
		FUTURE CURB AND GUTTER WITH RIGHT-OF-WAY AT BACK OF CURB

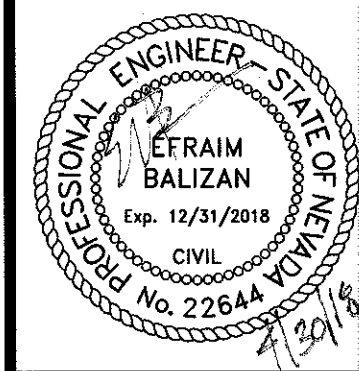
QUANTITIES

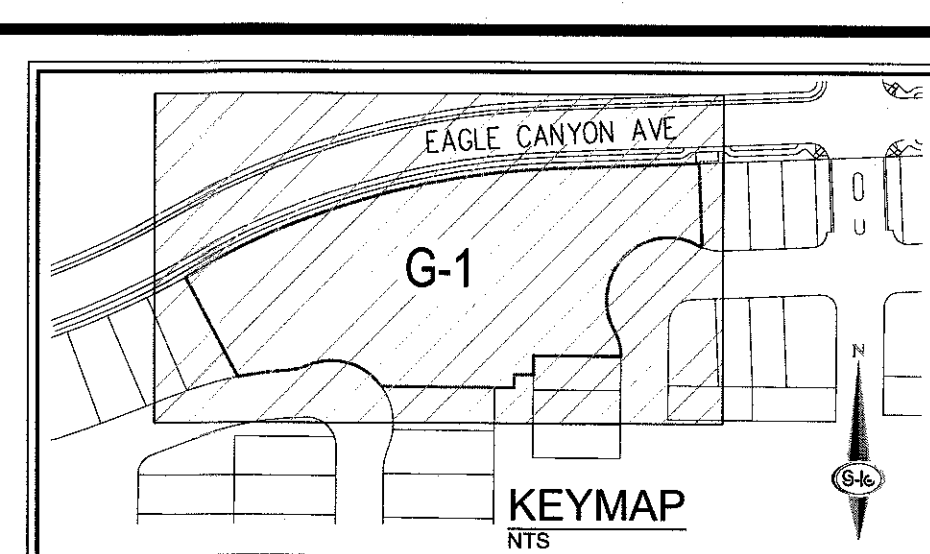
	PRIVATE	PUBLIC
DRAINAGE		
1. 24" CLASS III RCP STORM DRAIN	LF	38
2. SIDEWALK UNDERDRAIN	EA	6
3. 6.0' CONCRETE U-CHANNEL	SF	2,295
4.		
5.		
6.		
7.		
8.		
9.		
10.		
11.		
12.		
13.		
SEWER SYSTEM		
1. 4" PVC SEWER LATERAL (PRIVATE)	LF	-
2. 8" PVC SEWER PIPE (PUBLIC)	LF	-
3. STANDARD 48" SEWER MANHOLE (PUBLIC)	EA	-
4. 8" SEWER PIPE CAP	EA	-
5. BACK WATER VALVE	EA	-
6. 8" C-900 WATER QUALITY SEWER PIPE (PUBLIC)	EA	-
7.		
WATER SYSTEM		
1. FIRE HYDRANT ASSEMBLY W/ 8" GATE VALVE PER UDACS PLATE NO. 40	EA	-
2. 8" PVC WATER PIPE (CLASS 150)	LF	-
3. 8" PVC WATER PIPE (CLASS 150)	LF	-
4. 8" DIP WATER PIPE (CLASS 53)	LF	-
5. 8" GATE VALVE WITH VALVE BOX PER UDACS PLATE NO. 30 & 39	EA	-
6. 8" X 6" TEE PER UDACS PLATE NO. 31	EA	-
7. 8" X 8" TEE PER UDACS PLATE NO. 31	EA	-
8. 8" 5 DEGREE BEND WITH RESTRAINED JOINTS	EA	-
9. 8" 11.25 DEGREE BEND PER UDACS PLATE NO. 31	EA	-
10. 8" 22.5 DEGREE BEND PER UDACS PLATE NO. 31	EA	-
11. 8" 45 DEGREE BEND PER UDACS PLATE NO. 31	EA	-
12. 8" 90 DEGREE BEND PER UDACS PLATE NO. 31	EA	-
13. CAP AND 2" BLOW-OFF ASSEMBLY W/CAP PER UDACS PLATE NO. 36	EA	-
14. 1" COPPER SERVICE W/ 3/4" METER PER UDACS PLATE NO. 2	EA	-
15. 1" COPPER SERVICE W/ 1" METER PER UDACS PLATE NO. 4	EA	-
16. 1" COPPER SERVICE W/ 3/4" METER & 1" RPPA PER UDACS PLATE NO. 4 & 8	EA	-
17.		
STREET IMPROVEMENTS		
1. 2" A.C. PAVEMENT W/ 4" TYPE II OVER 6" TYPE I AGGREGATE BASE	SY	-
2. STANDARD 18" TYPE "I" ISLAND CURB & GUTTER W/ 6" TYPE I AGGREGATE BASE	LF	-
3. STANDARD 8" TYPE "A" ISLAND CURB W/ 6" TYPE I AGGREGATE BASE	LF	-
4. STANDARD 30" TYPE "ROLL" CURB & GUTTER W/ 6" TYPE I AGGREGATE BASE	LF	-
5. 4' WIDE CONCRETE SIDEWALK W/ 4" TYPE II AGGREGATE BASE	SF	-
6.		
7.		
TRAFFIC SIGNALS		
1. 30" STOP SIGN WITH POST (R1-1)	EA	-
2. 9" STREET NAME SIGN (D-3, BROWN W/ WHITE LETTERS)(6 POLES X 2 PER POLE=12)	EA	-
3. BLUE COLORED REFLECTIVE RAISED PAVEMENT MARKER	EA	-
4. CROSSWALK MARKINGS	LF	-
5.		
6.		
7.		
8.		
DRY UTILITIES		
1. 100W H.P.S. LUMINAIRE STREET LIGHT W/ DECORATIVE POLE	EA	-
2. 1-1/4" PVC STREET LIGHT CONDUIT WITH (2) #4 AND (1) #8 CONDUCTORS	LF	-
3. NO. 3-1/2 PULL BOX W/ METAL COVER	EA	-
4. 150 AMP SERVICE PEDESTAL (RR)	EA	-
5. 200 AMP SERVICE PEDESTAL (STLT)	EA	-
6.		

APPROVED FOR CONSTRUCTION

LAS VEGAS VALLEY WATER DISTRICT ENGINEERING SERVICES

PROJECT No. _____ FIRST APPROVED DATE: _____





1. CONSTRUCT AC PARKING AREA. SEE SOILS REPORT FOR SECTION.
2. CONSTRUCT 6" A-TYPE CURB PER DETAIL 1, SHEET D-1.
3. INSTALL PRECAST CONCRETE WHEEL STOPS PER DETAIL 3. SHEET D-1
4. CONSTRUCT 4" THICK CONCRETE SIDEWALK OVER 5" MIN TYPE II AGG. BASE. WIDTH PER PLAN. SEE LANDSCAPE PLAN FOR FINISH.
5. CONSTRUCT HANDICAPPED VAN ACCESSIBLE PARKING STALL IN ACCORDANCE WITH ADA STANDARDS.
6. CONSTRUCT 6" CONCRETE GUTTER PER CCASO # 228.
7. INSTALL PREFABRICATED RESTROOM BUILDING.
8. CONSTRUCT 1/2" SIDEWALK RAMP PER PLAN USING ARMOR TILE TRUNCATED DOMES OR EQUIVALENT PER CCASO NO. 235.
9. PICKLE BALL COURT. SEE LANDSCAPE PLANS FOR HORIZONTAL DIMENSIONS AND STRIPING DETAILS.
10. CHILD PLAY AREA. SEE LANDSCAPE PLANS FOR CONSTRUCTION MATERIALS AND HORIZONTAL DIMENSIONS.
11. TENNIS COURT. SEE LANDSCAPE PLANS FOR HORIZONTAL DIMENSIONS AND STRIPING DETAILS.
12. CONSTRUCT TRASH ENCLOSURE. SEE ARCHITECTURAL PLANS FOR CONSTRUCTION MATERIALS AND DETAILS.
13. INSTALL SIDEWALK UNDER DRAIN PER CCASO DWG NO. 236
14. SPLASH PAD AREA. SEE LANDSCAPE PLANS FOR CONSTRUCTION MATERIALS AND HORIZONTAL DIMENSIONS.
15. CONSTRUCT CONCRETE VALLEY GUTTER PER DETAIL 2, SHEET D-1. SEE PLAN FOR WIDTH.
16. CONSTRUCT BIKE RACK. SEE ARCHITECTURAL PLANS FOR CONSTRUCTION MATERIALS AND DETAILS.
17. INSTALL 6" BENCH. SEE ARCHITECTURAL PLANS FOR CONSTRUCTION MATERIALS AND DETAILS.
18. INSTALL TRASH RECEPTACLE. SEE ARCHITECTURAL PLANS FOR CONSTRUCTION MATERIALS AND DETAILS.
19. INSTALL 60" WASTE RECEPTACLE. SEE ARCHITECTURAL PLANS FOR CONSTRUCTION MATERIALS AND DETAILS.
20. EXISTING SIDEWALK DRAIN
21. INSTALL ACCESS GATE. SEE ARCHITECTURAL PLANS FOR CONSTRUCTION MATERIALS AND DETAILS.
22. CONSTRUCT 6.0" CONCRETE U-CHANNEL PER DETAIL 4, SHEET D-1.
23. CONSTRUCT 2" U-GUTTER
24. CONSTRUCT PUMP/ELECTRICAL BUILDING. SEE ARCHITECTURAL PLANS FOR CONSTRUCTION MATERIALS AND DETAILS.
25. CONSTRUCT FENCE. SEE ARCHITECTURAL PLANS FOR CONSTRUCTION MATERIALS AND DETAILS.
26. EXISTING WROUGHT IRON FENCE

1. FINAL GRASSES ADJACENT TO STRUCTURES SHALL BE IN CONFORMANCE WITH IBC 2012, SECTION 2304.11.2.2.
2. THE CONTRACTOR SHALL VERIFY ALL CONDITIONS AND DIMENSIONS AND REPORT ALL DISCREPANCIES TO THE ENGINEER.
3. ALL IMPROVEMENTS TO BE PROTECTED FROM EROSION BY SWPPP.
4. MAXIMUM MINIMUM SLOPES AND MINIMUM STREET SECTIONS NOT TO EXCEED THAT SHOWN ON GEOTECH REPORT.
5. SEE DETAIL SHEET FOR STREET SECTIONS AND DETAILS.
6. ALL PUBLIC AND PRIVATE DRAINAGE IMPROVEMENTS TO BE BONDED FOR AND INSPECTED.
7. CONSTRUCTION OF BLOCK WALLS REQUIRES A SEPARATE BUILDING PERMIT AND APPROVAL BY THE CITY OF LONG BEACH BUILDING DEPARTMENT.
8. CONTRACTOR TO VERIFY LOCATION AND ELEVATION OF EXISTING UTILITY STRUCTURES AND FACILITIES AND NOTIFY ENGINEER OF ANY DISCREPANCIES PRIOR TO CONSTRUCTION. CONTRACTOR TO PROTECT IN PLACE DURING CONSTRUCTION. ENGINEER TO BE NOTICED PRIOR TO ANY PRIOR DAMAGE TO EXISTING FACILITIES PRIOR TO CONSTRUCTION. CONTRACTOR WILL BE RESPONSIBLE FOR REPAIR/REPLACING FACILITIES IF ENGINEER/OWNER IS NOT NOTIFIED OF EXISTING DAMAGE PRIOR TO CONSTRUCTION COMMENCING.
9. NO STRUCTURE, UTILITY, OR OBJECTS OF ANY KIND IS PERMITTED OVER TWENTY-FOUR (24) INCHES ABOVE THE FINISHED GRADE OF THE ADJACENT CURB (IF CURB EXISTS) WITHIN THE SIGHT VISIBILITY ZONES.

USDA BRASS CAP ON AN IRON PIPE, 140' SOUTHWEST OF TELEPHONE POLE
#26994T, SOUTHWEST CORNER OF THE U.S. 95/KYLE CANYON TURNOFF.
ELEVATION = 2817.62 FEET, 858.813 METERS
N.A.V.D. 88
PER THE CLARK COUNTY VERTICAL CONTROL LAST REVISED 2003

THE BASIS OF BEARING IS SOUTH 00°22'12" WEST, BEING THE BEARING OF THE WEST LINE OF THE NORTHWEST QUARTER (NW1/4) OF SECTION 6, TOWNSHIP 19 SOUTH, RANGE 60 EAST, M.D.M., CITY OF LAS VEGAS, CLARK COUNTY, NEVAD, AS SHOWN BY MAP THEREOF IN FILE 151, PAGE 14 OF SURVEYS IN THE CLARK COUNTY RECORDER'S OFFICE, NEVADA.

I CERTIFY THAT THIS GRADING PLAN IS IN CONFORMANCE WITH THE APPROVED
TECHNICAL DRAINAGE STUDY DS 4967 ON FILE AT CITY OF LAS VEGAS FOR THE
SUBJECT PROJECT.

EFRAIM P. BALIZAN P.E. 22644 DATE

FLOOD ZONE

THE PROJECT SITE IS LOCATED WITHIN A FEMA DESIGNATED ZONE 'X' (UNSHADED), AREA OUTSIDE THE 0.2% ANNUAL CHANCE (500 YEAR) FLOODPLAIN, PER THE FEMA FIRM PANELS 32003C1750E DATED SEPTEMBER 27, 2002.

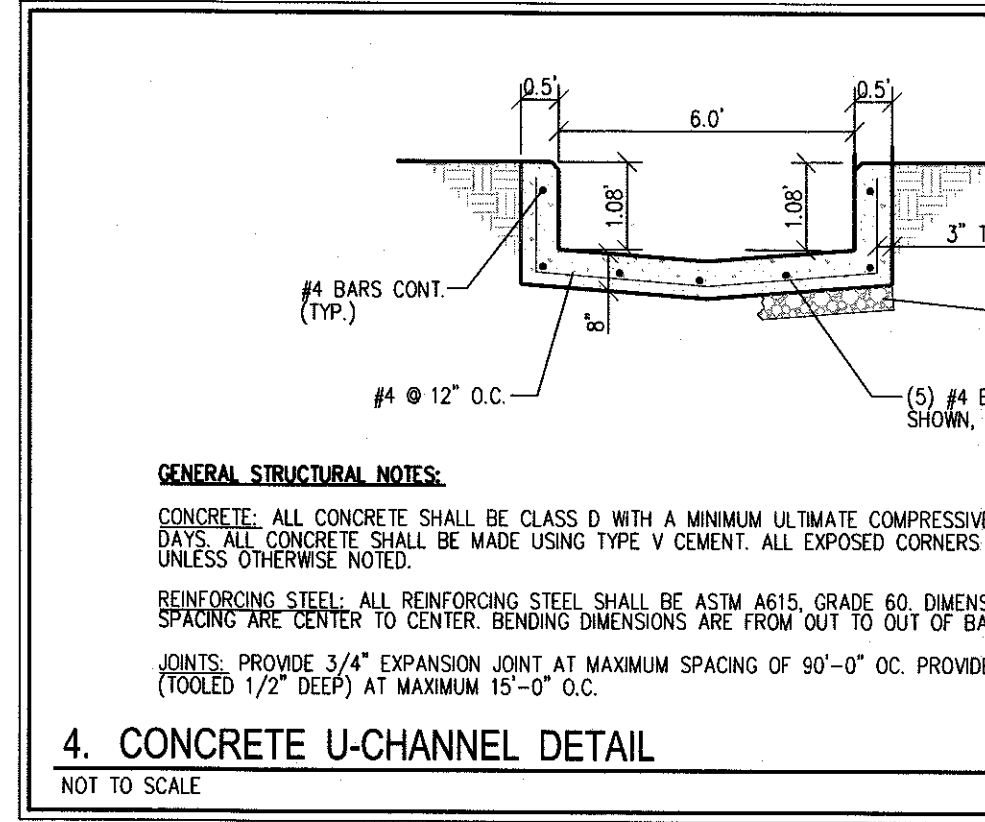
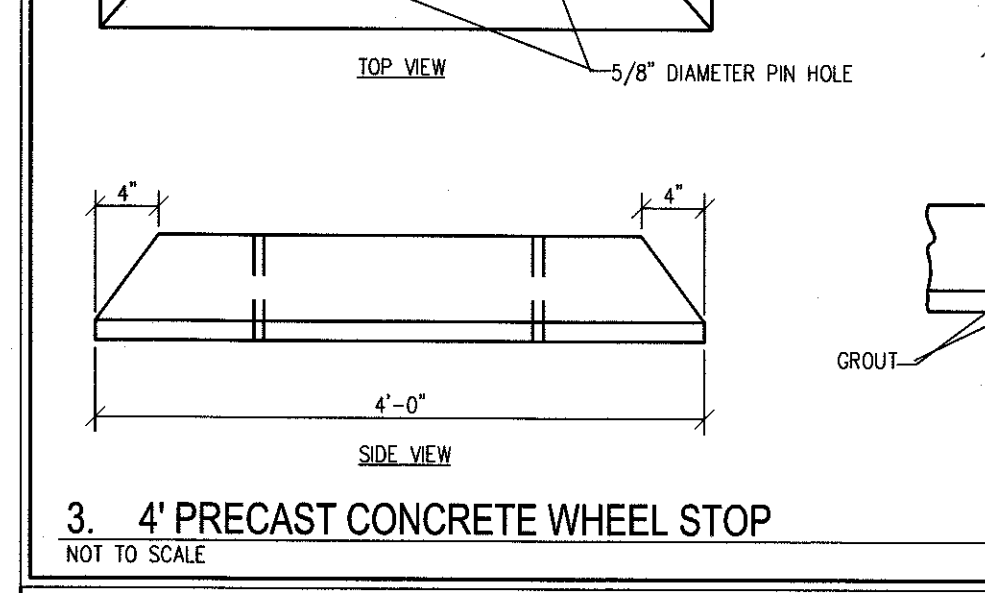
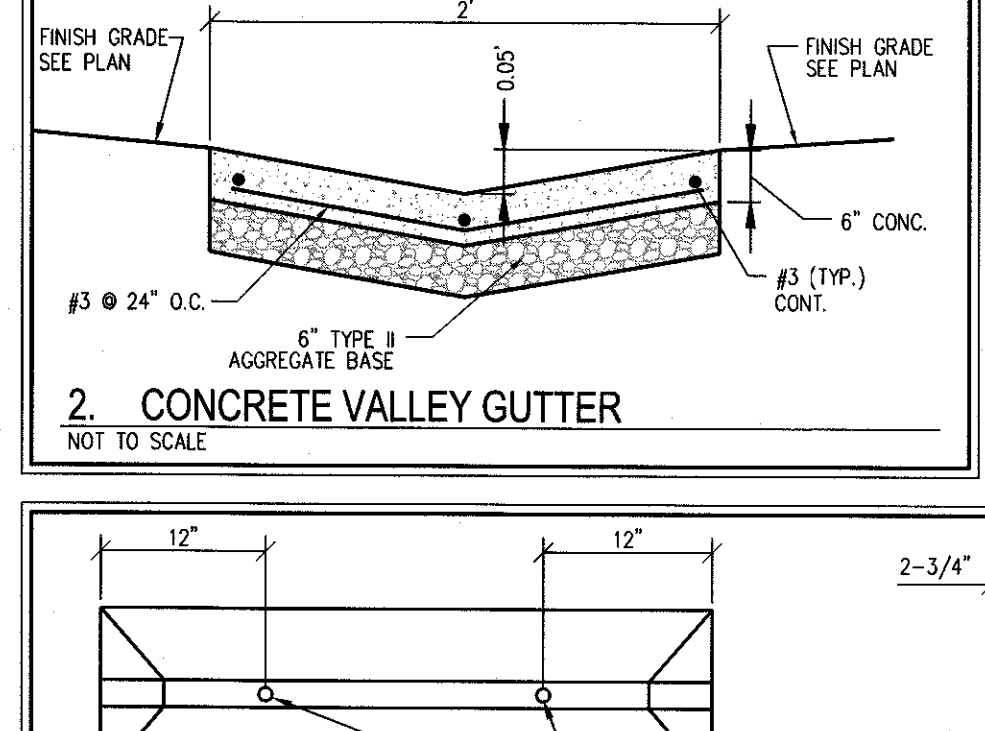
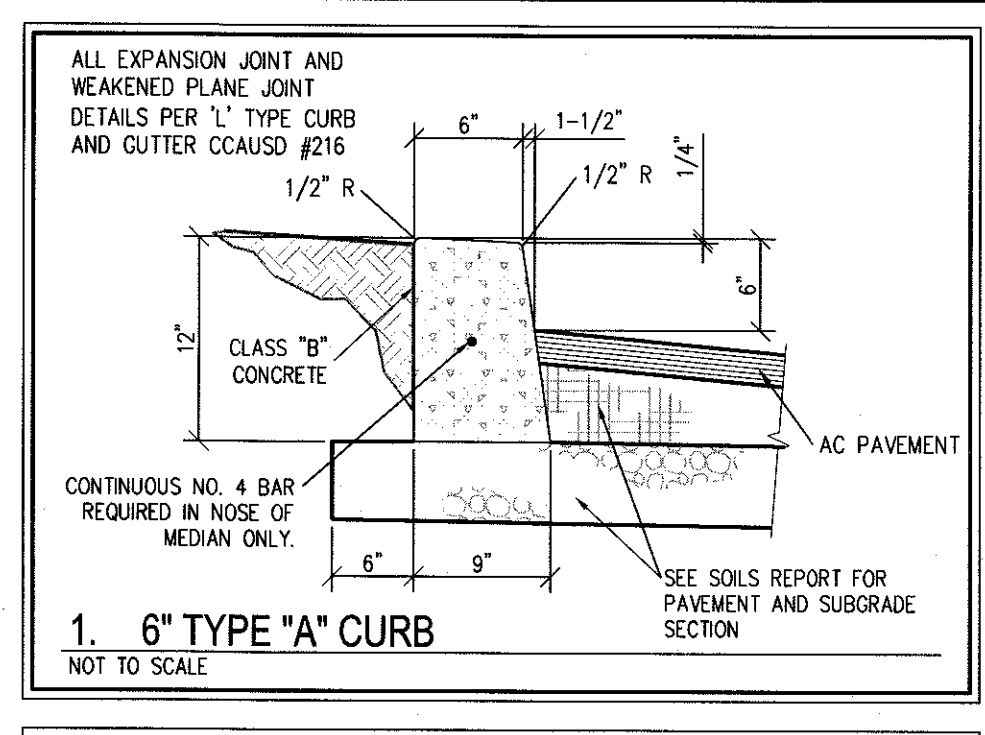
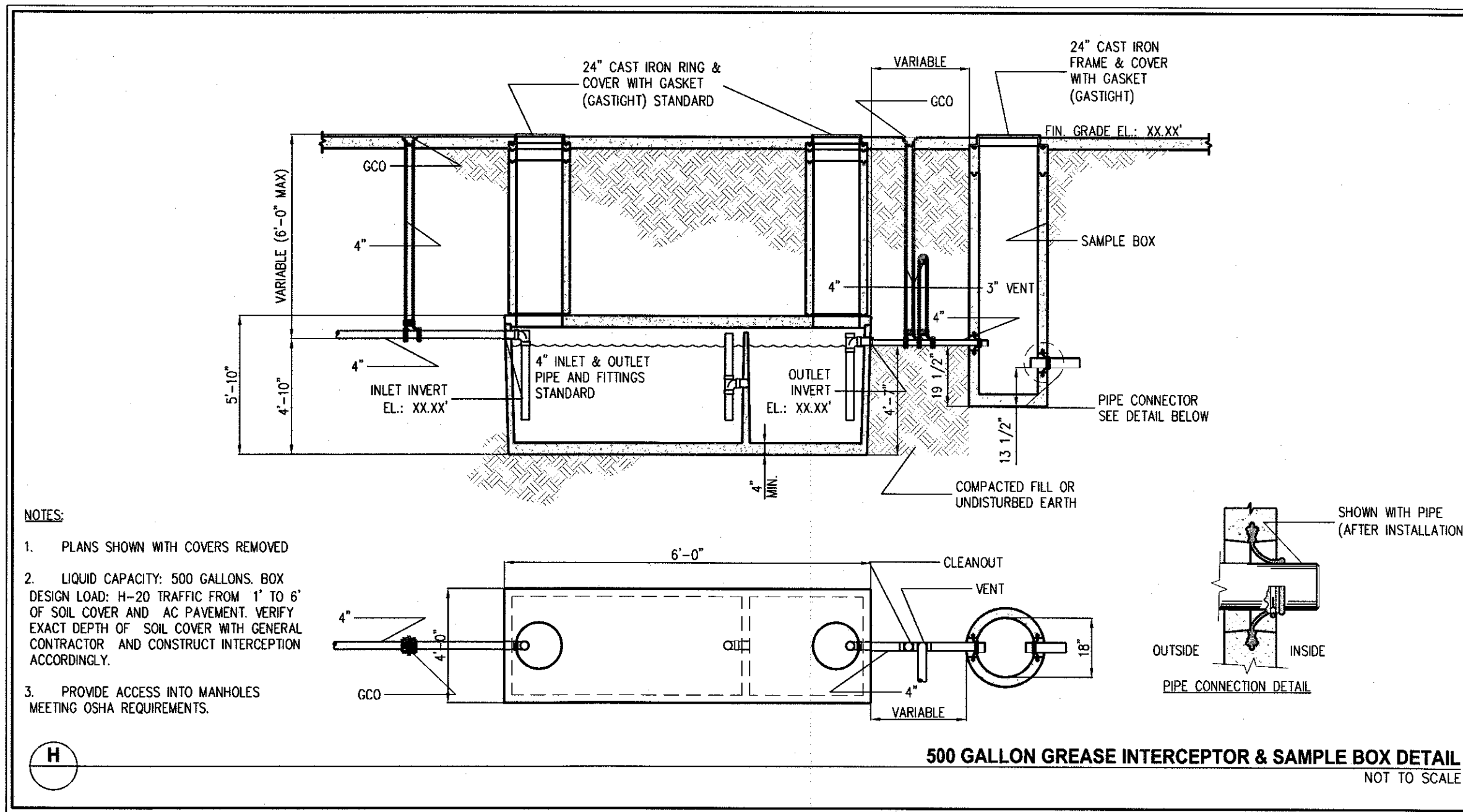
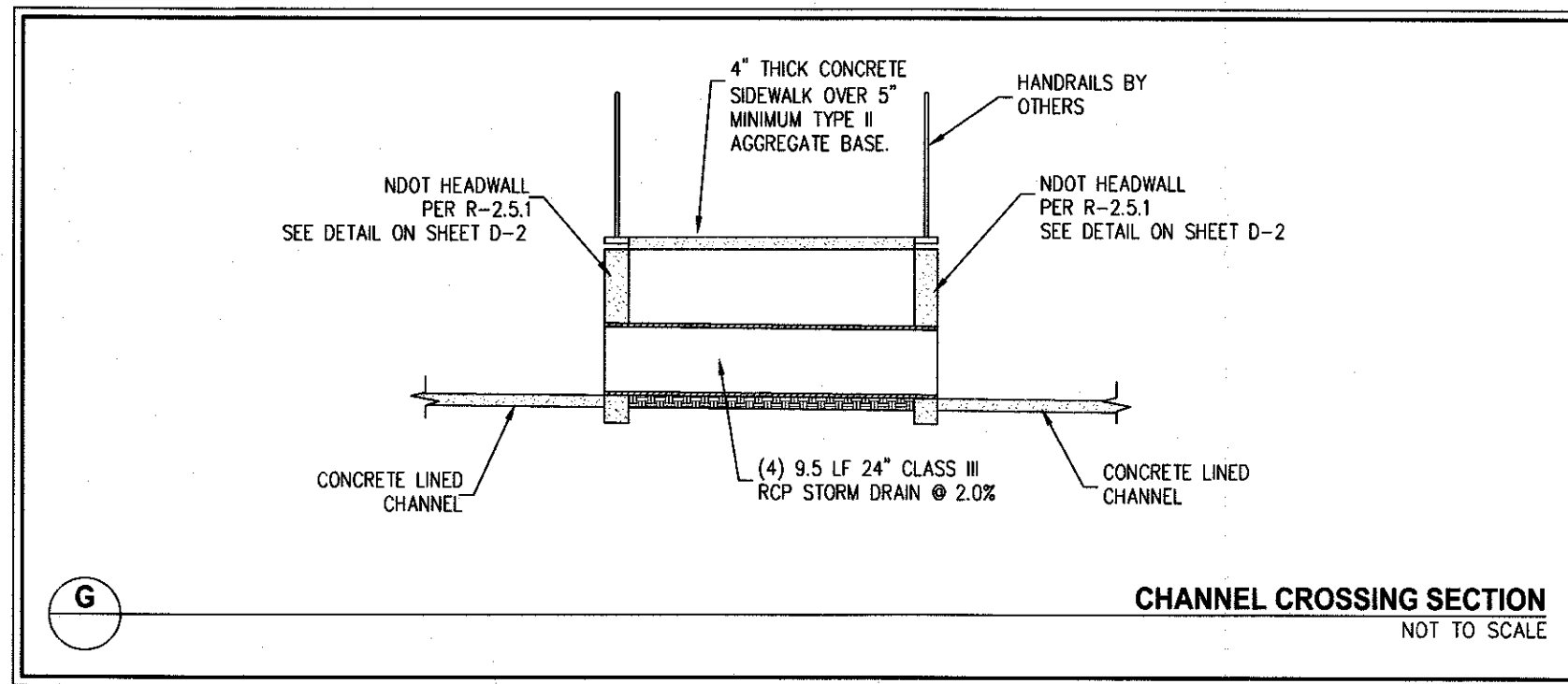
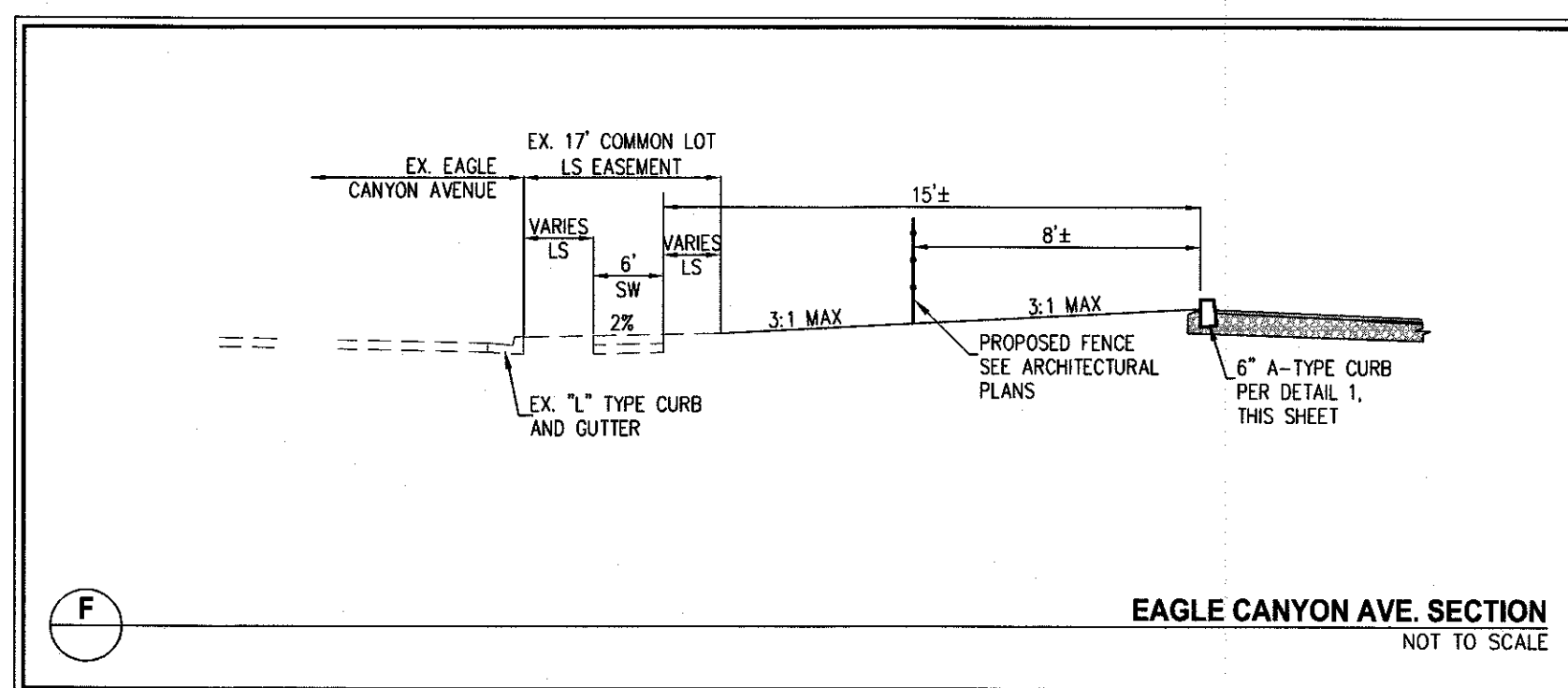
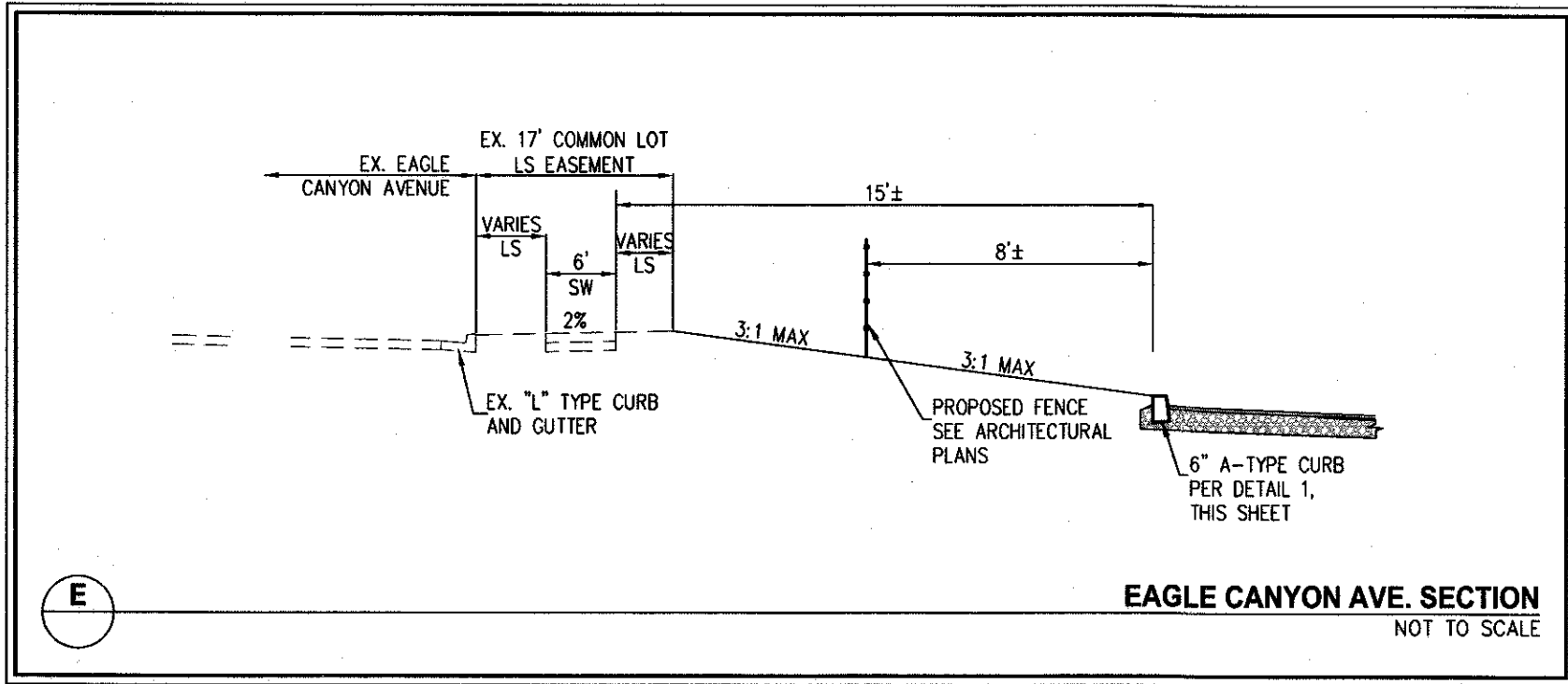
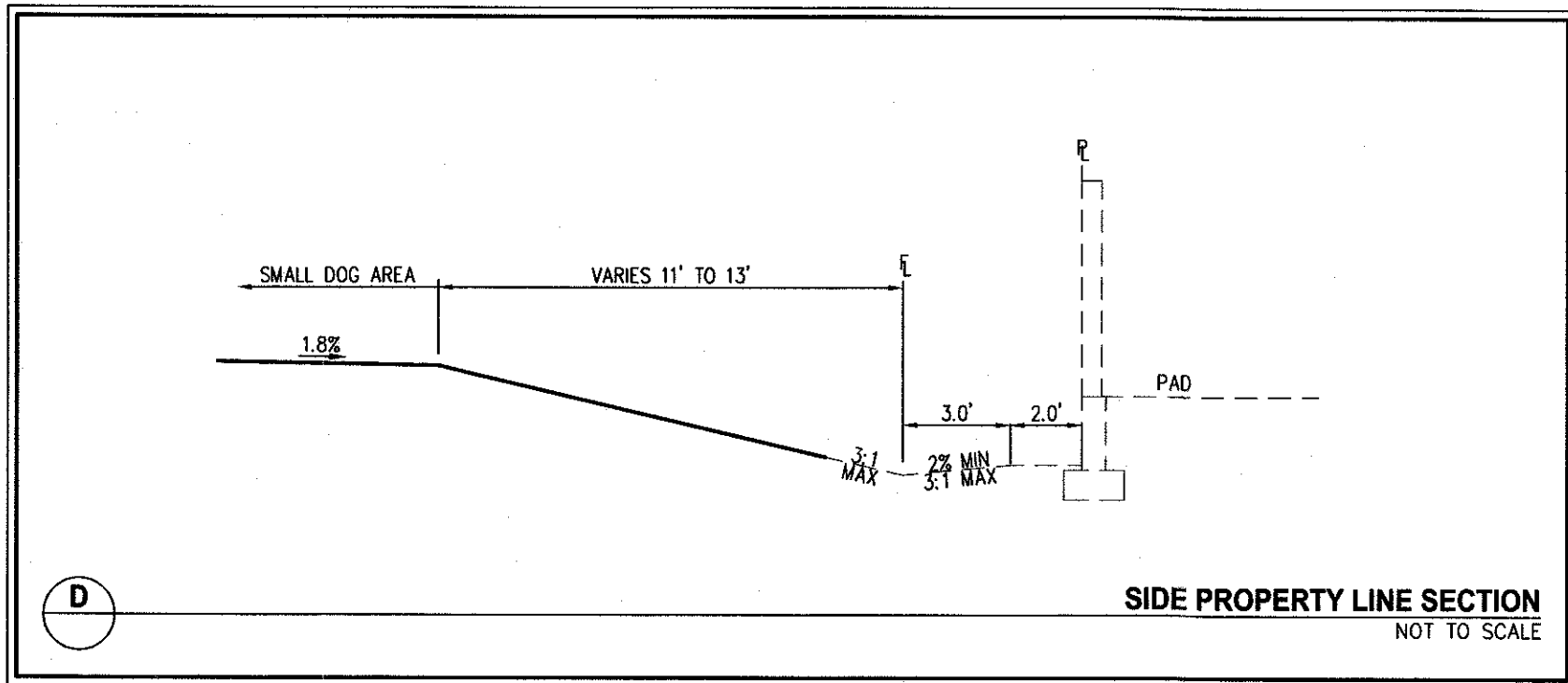
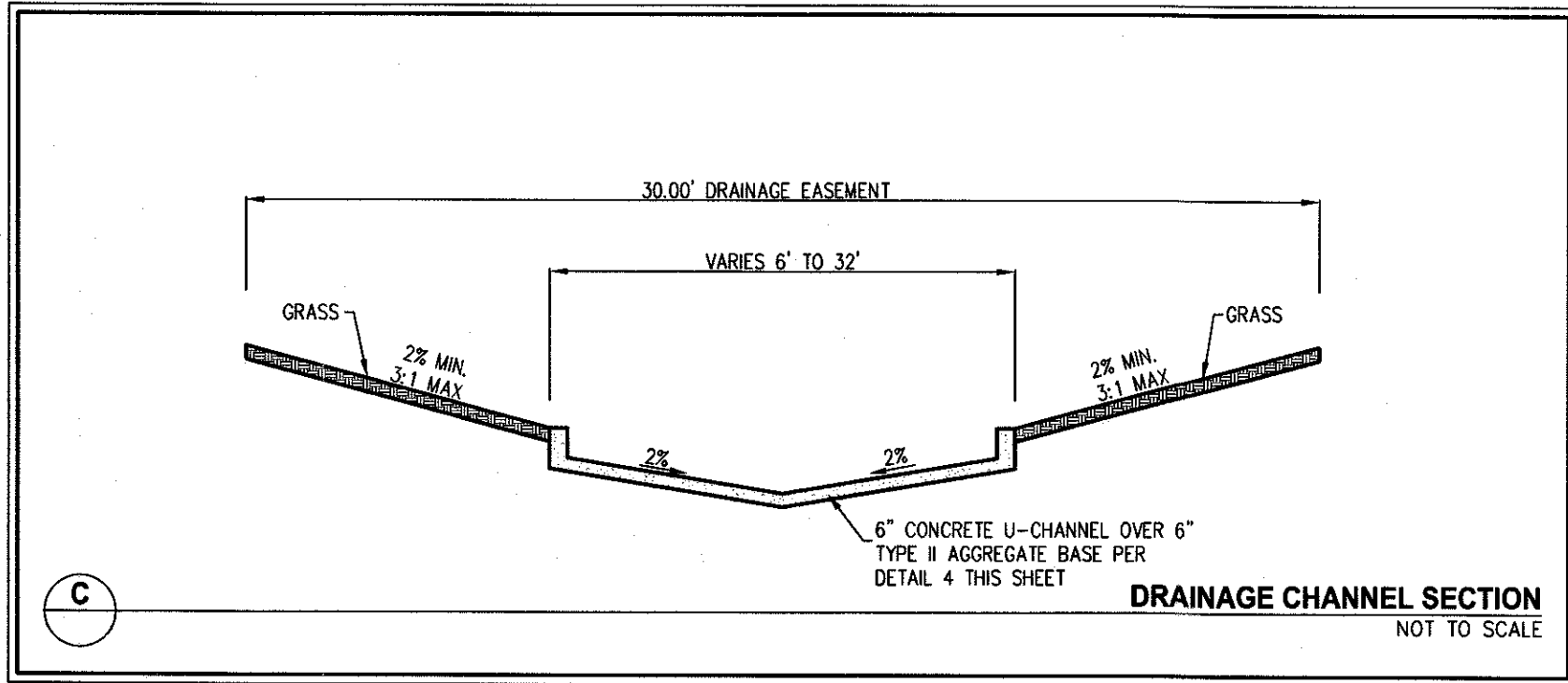
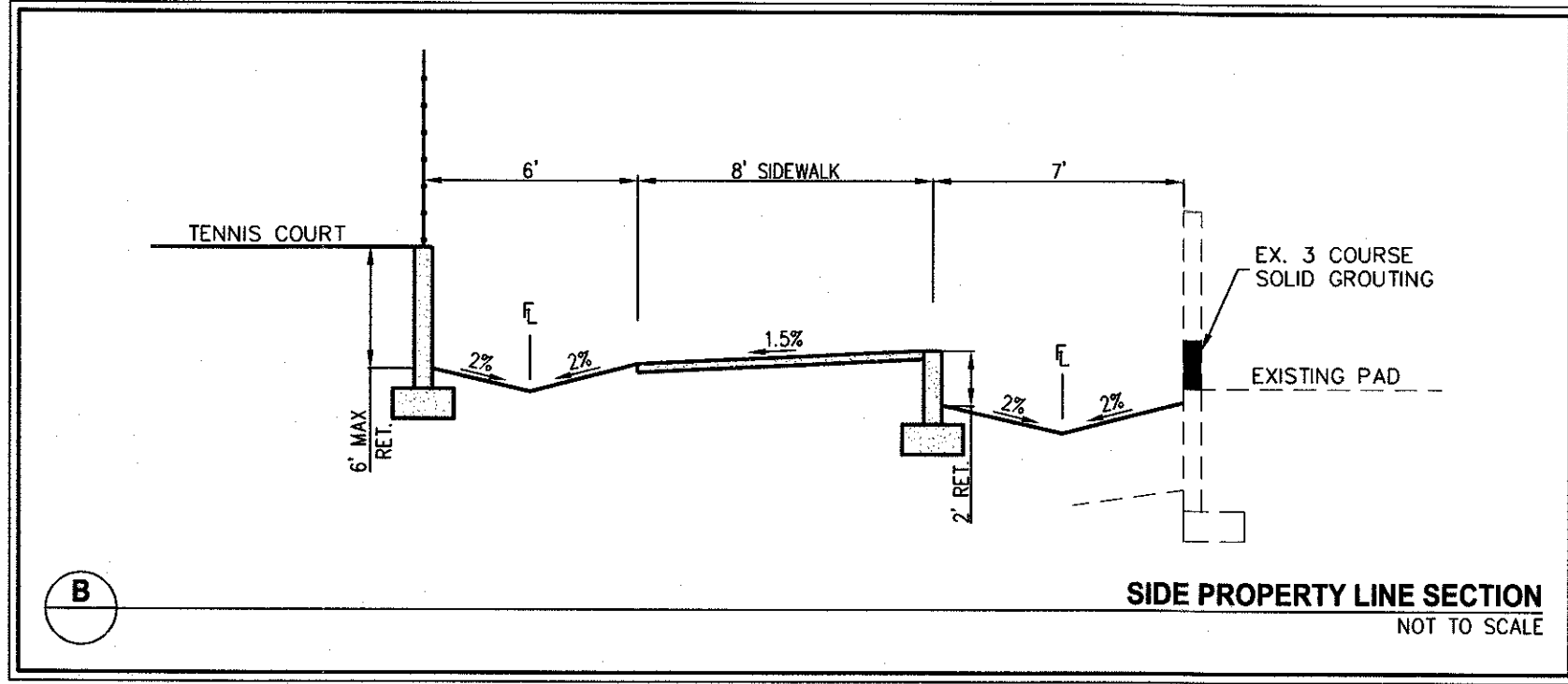
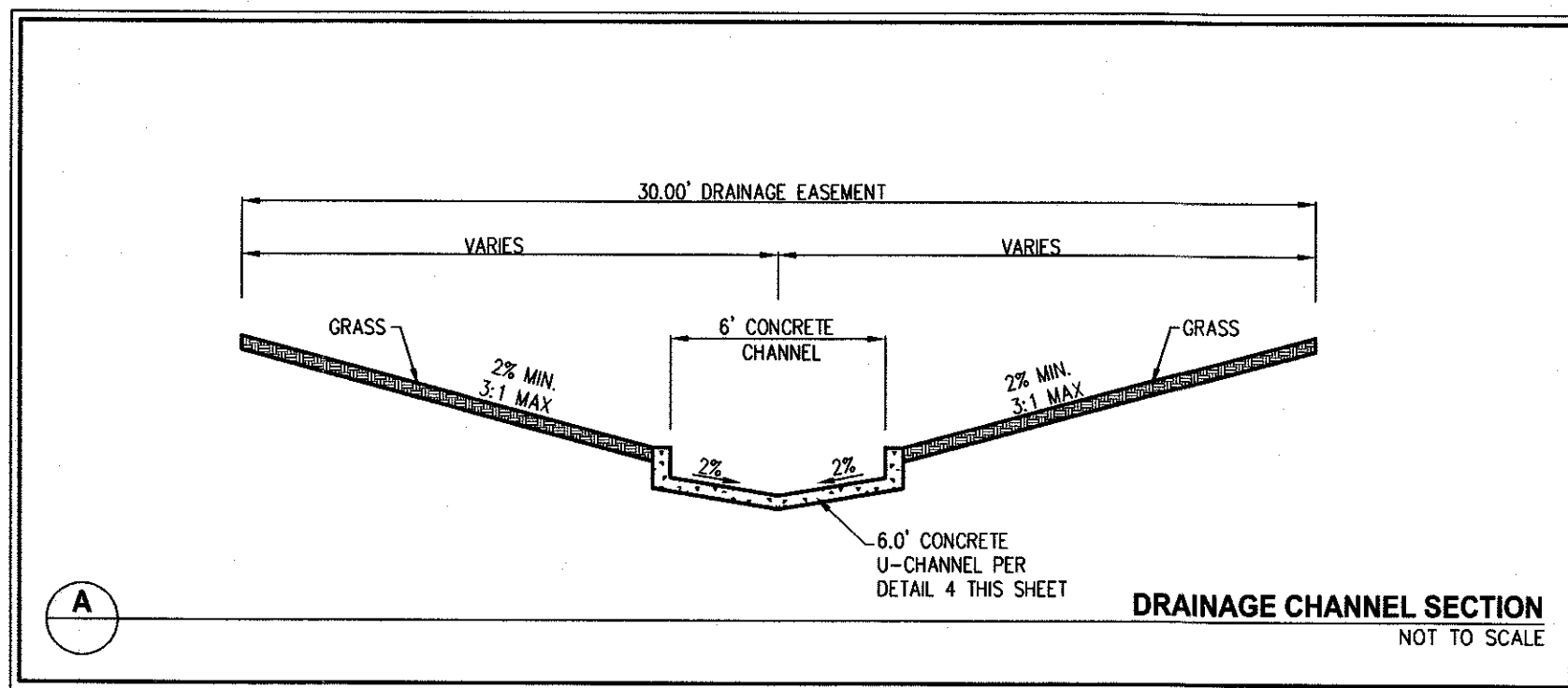
- 1) EXISTING UTILITY LOCATIONS SHOWN HEREON ARE APPROXIMATE ONLY. IF SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE EXACT VERTICAL AND HORIZONTAL LOCATION OF ALL UTILITIES UNDERGROUND UTILITIES PRIOR TO COMMENCING CONSTRUCTION. NO REPRESENTATION IS MADE THAT ALL EXISTING UTILITIES ARE SHOWN HEREON. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR UTILITIES NOT SHOWN IN THEIR PROPER LOCATION.
- 2) FOR ROADWAY WIDENING AND HALF STREET IMPROVEMENTS THE CONTRACTOR SHALL VERIFY CROSS SLOPES FROM EXISTING PAVEMENT SAWCUT LINE TO PROPOSED EDGE OF PAVEMENT OR PROJECTED LINE OF CUREST PIER TO SUBGRADE PREPARATION AND CONSTRUCTION OF PROPOSED CURB LINE. IF MINIMUM OR MAXIMUM CROSS SLOPES DO NOT MEET AGENCY STANDARDS THE CONTRACTOR SHALL NOTIFY THE ENGINEER.

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 ACCUMULATED IN, THE PUBLIC RIGHTS OF WAY OF CLARK COUNTY, NEVADA, AS PART OF CONSTRUCTION ACTIVITIES ASSOCIATED WITH THIS SITE DEVELOPMENT AND 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 UNRESOLVED EROSION PROBLEMS OR IF THE DISTURBED AREA CAN BE SEEN FROM A PUBLIC HIGHWAY OR FROM CLARK COUNTY TIE-IN 24.40 AND IN THE LAS VEGAS VALLEY CONSTRUCTION SITE BMP GUIDANCE 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 THE NEVADA STORMWATER GENERAL PERMIT FOR CONSTRUCTION ACTIVITY NV1000000, SECTION III.A.5.
4. AT A MINIMUM, THE CONTRACTOR OR HIS AGENT SHALL INSPECT ALL DISTURBED AREAS, AREAS USED FOR STORAGE OF MATERIALS AND EQUIPMENT THAT ARE EXPOSED TO PRECIPITATION, VEHICLE ENTRANCE AND EXIT LOCATIONS, AND ALL BMPs WEEKLY, AND WITHIN 24 HOURS AFTER A RAINFALL OF ONE INCH OR MORE. INSPECTIONS SHALL BE CONDUCTED AND RECORDED IN THE NEVADA STORMWATER POLLUTION PREVENTION PLAN AS NECESSARY. SOME EXCEPTIONS TO WEEKLY INSPECTIONS MAY APPLY, SUCH AS SCHEDULING OF LAND DISTURBANCE ACTIVITIES. REFER TO THE NEVADA STORMWATER GENERAL PERMIT FOR CONSTRUCTION ACTIVITY NV1000000, SECTION III.A.12.
5. ACCUMULATED SEDIMENT IN BMPs SHALL BE REMOVED WITHIN SEVEN DAYS AFTER A STORMWATER EVENT. SEDIMENT SHALL BE STORED IN A CONTAINED MANNER. SEDIMENT SHALL BE REMOVED WHEN BMP DESIGN CAPACITY HAS BEEN REDUCED BY 50 PERCENT OR



SLATER HANIFAN GROUP CONSULTING ENGINEERS & PLANNERS 5740 S. ARVILLE STREET #216, LAS VEGAS, NV 89118 PHONE (702) 284-5390 FAX (702) 284-5399 SKYE CANYON SKYE CANYON PH-2 NEIGHBORHOOD PARK GRADING PLAN I		NO.	DESCRIPTION	DATE	BY	APP. DATE	APP.

\\s01714-000 skye canyon neighborhood park of eagle canyon ave ph2\\img\\imprax\\sky714-000.dwg 4/30/2018 2:44 PM Jimmy Pappas



SLATER
HANIFAN
GROUP
CONSULTING ENGINEERS & PLANNERS
5740 S. ARVILLE STREET #216, LAS VEGAS, NV 89118
PHONE (702) 284-5390
FAX (702) 284-5399

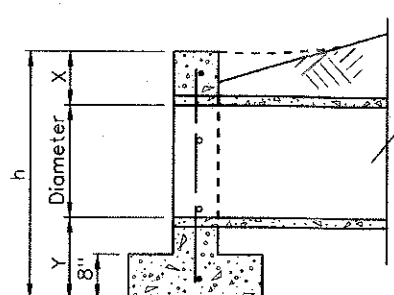
CITY OF LAS VEGAS, NEVADA

SKYE CANYON
SKYE CANYON PH-2 NEIGHBORHOOD PARK
DETAIL SHEET 1

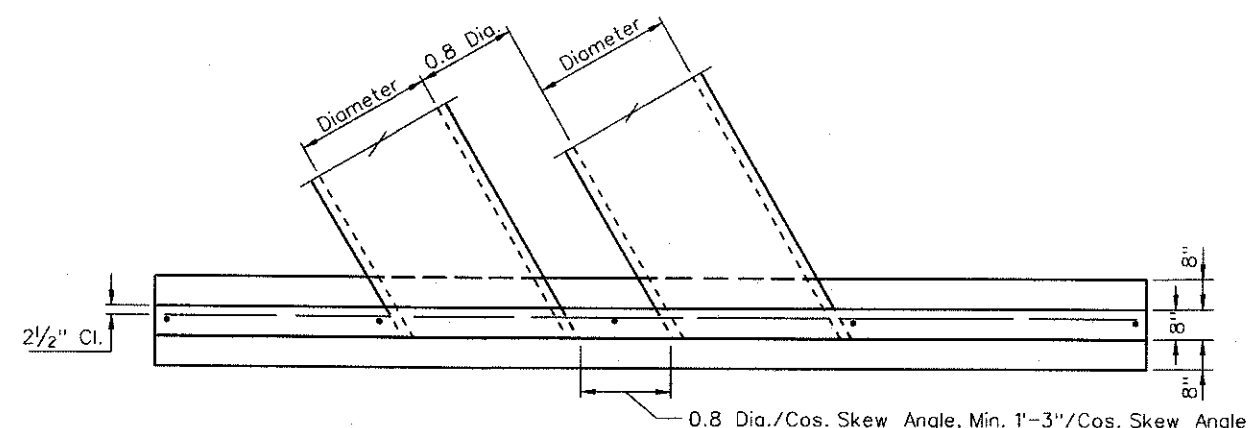
DATE: 4/30/18
DRAFTER: JMP
DESIGNER: EB
CHECKED: EB
PROJECT NO.
OLY1714-000

PROFESSIONAL ENGINEER - STATE OF NEVADA
BRIAN BALIZAN
Exp. 12/31/2018
No. 22644

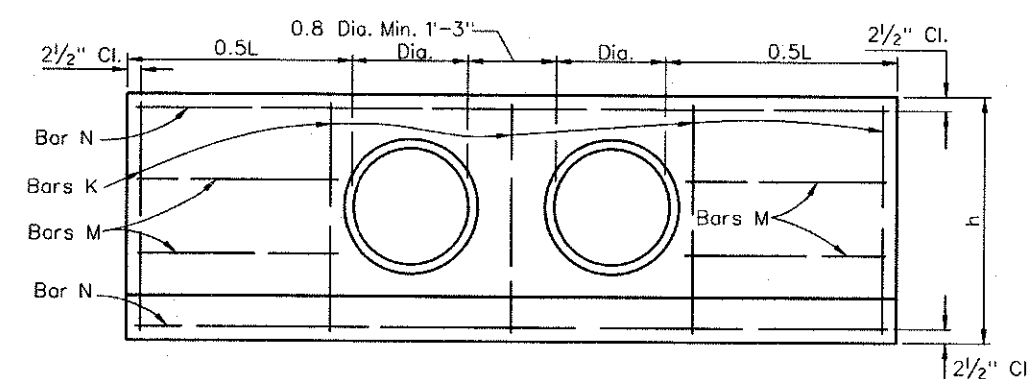
D-1
SHEET 5 OF 6



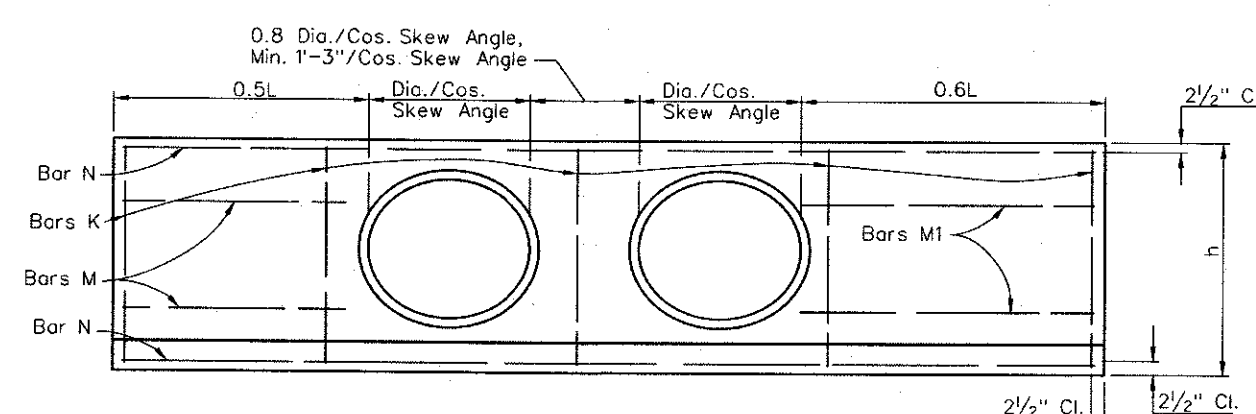
SECTION
FOR ALL HEADWALLS



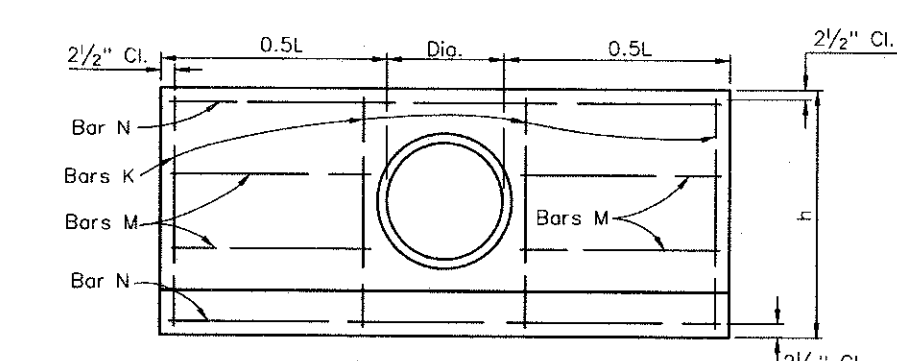
PLAN
DOUBLE RCP/HDPE



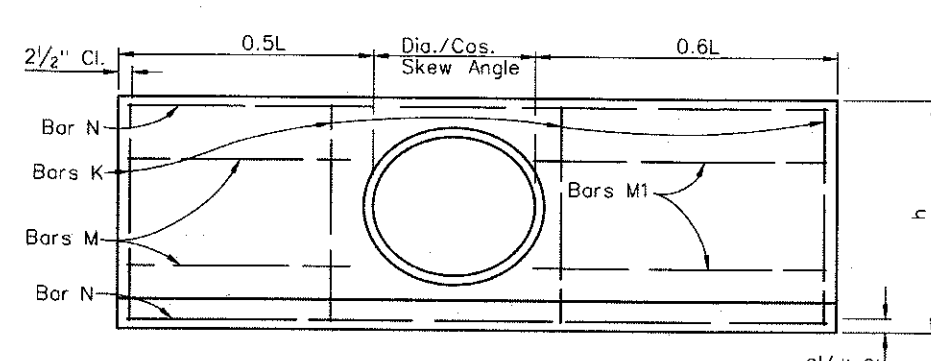
ELEVATION
DOUBLE RCP/HDPE



ELEVATION
DOUBLE RCP/HDPE



ELEVATION
SINGLE RCP/HDPE
0° SKEW



ELEVATION
SINGLE RCP/HDPE
15° TO 45° SKEW

SHEET 1 OF 2

STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

CULVERT HEADWALLS
12" TO 36" RCP/HDPE

R-2.5.1	(502)	Signed Original On File
ADOPTED 8/1/00	REVISED 8/1/00	CHIEF HYDRAULICS ENGINEER

QUANTITIES SHOWN BELOW ARE FOR ONE HEADWALL.

LENGTH OF REINFORCING BARS																												
RCF/MPH	SINGLE OR DOUBLE RCP/HDPDE										DOUBLE RCP/HDPDE																	
	SINGLE RCP/HDPDE					SINGLE OR DOUBLE RCP/HDPDE					DOUBLE RCP/HDPDE					DOUBLE RCP/HDPDE												
	0° 45°		0°		15°		30°		45°		0°		15°		30°		45°		0° 45°		0°		15°		30°		45°	
	K	N	K	N	K	N	K	N	K	N	K	N	K	N	K	N	K	N	K	N	K	N	K	N	K	N	K	N
SIZE DIA.	K	N	K	N	K	N	K	N	K	N	K	N	K	N	K	N	K	N	K	N	K	N	K	N	K	N	K	N
12"	682 - 9"	264 - 9"	285 - 2"	285 - 4"	285 - 7"	281 - 7"	187 - 5"	102 - 1"	181 - 4"	162 - 2"	181 - 1"	182 - 5"	782 - 9"	287 - 6"	287 - 6"	287 - 1"	288 - 9"	288 - 9"	288 - 9"	288 - 9"	288 - 9"	288 - 9"	288 - 9"	288 - 9"	288 - 9"	288 - 9"	288 - 9"	288 - 9"
18"	883 - 1"	286 - 6"	286 - 6"	288 - 8"	287 - 7"	282 - 1"	181 - 11"	182 - 8"	183 - 11"	182 - 9"	181 - 7"	183 - 5"	783 - 1"	288 - 6"	289 - 2"	289 - 7"	289 - 7"	289 - 7"	289 - 7"	289 - 7"	289 - 7"	289 - 7"	289 - 7"	289 - 7"	289 - 7"	289 - 7"	289 - 7"	289 - 7"
19"	883 - 4"	287 - 6"	287 - 6"	288 - 8"	287 - 3"	282 - 3"	182 - 3"	182 - 3"	183 - 11"	182 - 2"	181 - 11"	183 - 5"	783 - 4"	289 - 9"	289 - 9"	289 - 1"	289 - 1"	289 - 1"	289 - 1"	289 - 1"	289 - 1"	289 - 1"	289 - 1"	289 - 1"	289 - 1"	289 - 1"	289 - 1"	289 - 1"
21"	883 - 8"	288 - 8"	288 - 8"	288 - 11"	289 - 5"	282 - 9"	182 - 7"	182 - 7"	183 - 11"	182 - 2"	181 - 11"	183 - 5"	783 - 8"	289 - 9"	289 - 9"	289 - 1"	289 - 1"	289 - 1"	289 - 1"	289 - 1"	289 - 1"	289 - 1"	289 - 1"	289 - 1"	289 - 1"	289 - 1"	289 - 1"	289 - 1"
24"	883 - 11"	289 - 8"	289 - 10"	289 - 11"	289 - 7"	283 - 2"	183 - 4"	183 - 4"	184 - 11"	182 - 8"	182 - 8"	184 - 4"	983 - 11"	289 - 12"	289 - 12"	289 - 1"	289 - 1"	289 - 1"	289 - 1"	289 - 1"	289 - 1"	289 - 1"	289 - 1"	289 - 1"	289 - 1"	289 - 1"	289 - 1"	289 - 1"
27"	884 - 2"	289 - 10"	289 - 10"	289 - 11"	289 - 9"	283 - 6"	183 - 4"	184 - 4"	184 - 11"	182 - 8"	183 - 4"	184 - 4"	984 - 2"	289 - 12"	289 - 12"	289 - 1"	289 - 1"	289 - 1"	289 - 1"	289 - 1"	289 - 1"	289 - 1"	289 - 1"	289 - 1"	289 - 1"	289 - 1"	289 - 1"	289 - 1"
30"	884 - 6"	289 - 13"	289 - 13"	289 - 12"	289 - 7"	283 - 10"	183 - 4"	184 - 4"	184 - 11"	182 - 8"	183 - 4"	184 - 4"	984 - 6"	289 - 15"	289 - 15"	289 - 1"	289 - 1"	289 - 1"	289 - 1"	289 - 1"	289 - 1"	289 - 1"	289 - 1"	289 - 1"	289 - 1"	289 - 1"	289 - 1"	289 - 1"
33"	884 - 10"	289 - 16"	289 - 16"	289 - 15"	289 - 7"	283 - 14"	183 - 4"	184 - 4"	184 - 11"	182 - 8"	183 - 4"	184 - 4"	984 - 10"	289 - 18"	289 - 18"	289 - 1"	289 - 1"	289 - 1"	289 - 1"	289 - 1"	289 - 1"	289 - 1"	289 - 1"	289 - 1"	289 - 1"	289 - 1"	289 - 1"	289 - 1"
36"	1085 - 1"	289 - 13"	289 - 13"	289 - 13"	289 - 7"	284 - 8"	184 - 8"	184 - 8"	184 - 11"	182 - 8"	183 - 4"	184 - 4"	984 - 13"	289 - 18"	289 - 18"	289 - 1"	289 - 1"	289 - 1"	289 - 1"	289 - 1"	289 - 1"	289 - 1"	289 - 1"	289 - 1"	289 - 1"	289 - 1"	289 - 1"	289 - 1"

QUANTITIES SHOWN BELOW ARE FOR TWO HEADWALLS.

RCP/ HPIPE SIZE IN FT		SINGLE RCP/HPIPE												DOUBLE RCP/HPIPE												X	Y	
		0° SKEW		15° SKEW		30° SKEW		45° SKEW		0° SKEW		15° SKEW		30° SKEW		45° SKEW												
		CONC CYC YD	STEEL CYC YD	CONC CYC YD	STEEL CYC YD	CONC CYC YD	STEEL CYC YD	CONC CYC YD	STEEL CYC YD	CONC CYC YD	STEEL CYC YD	CONC CYC YD	STEEL CYC YD	CONC CYC YD	STEEL CYC YD	CONC CYC YD	STEEL CYC YD											
12"	0.79	1.00	46	1.09	49	1.10	49	1.14	50	1.17	50	1.52	62	1.58	64	1.73	67	10°	F - 2°	4°	3°	3/2°						
15"	1.23	1.32	55	1.45	58	1.47	59	1.52	60	1.50	70	1.83	69	1.88	74	2.00	76	10°/4°	F - 2°	4°	3°	3/2°						
18"	1.77	1.62	69	1.77	73	1.80	74	1.85	75	2.15	85	2.31	89	2.44	91	2.60	96	10°/4°	F - 2°	5°	9°	3°						
21"	2.41	1.88	87	2.22	82	2.16	83	2.23	85	2.59	95	2.79	101	2.90	103	3.05	114	10°/4°	F - 2°	6°	6°	3°						
24"	3.14	2.27	96	2.48	80	2.35	82	2.53	105	3.01	106	3.24	111	3.24	111	3.35	124	10°/4°	F - 2°	7°	3°	10°/4°						
27"	3.98	2.62	105	2.86	111	2.90	112	2.99	114	3.48	128	3.75	134	3.89	137	4.21	144	10°/4°	F - 2°	7°	3°	10°/4°						
30"	4.91	3.08	117	3.37	123	3.44	124	3.44	127	4.07	141	4.38	148	4.55	152	4.90	159	10°/4°	F - 2°	9°	4°	9°						
33"	6.02	3.50	125	3.52	132	3.82	137	3.87	142	4.62	155	4.98	168	5.17	174	5.64	185	10°/4°	F - 2°	9°	4°	9°						
36"	7.07	3.93	161	4.29	169	4.34	171	4.47	174	5.19	180	5.59	200	5.70	204	6.26	213	10°/4°	F - 2°	9°	4°	9°						

NOTES:

1. Concrete shall be class A or AA.
2. Reinforcing steel shall be deformed bars with maximum spacing of 18 inches. Bars shall be placed clear of surface of concrete as noted. Bar ends shall be kept 1 1/2 inches clear of surface of concrete. Reinforcing bars may be cut and bent in field.
3. Footings shown are of minimum depth and shall be extended 1' soil and pipe or liable to scour.
4. Culvert pipes to be set on a skew shall be mitered when heading is constructed, and shall normally not be constructed the pipes shall not be mitered except in overflow section.
5. For estimating headwall quantities on skewed culverts:
 - 10° to 30° = use quantities for 0° skew
 - 10° to 25° = use quantities for 15° skew
 - 25° to 40° = use quantities for 30° skew
 - 40° to 45° = use quantities for 45° skew
 - 45° to 55° = use quantities for 55° skew
 - over 55° = calculate quantities required.
 Culvert abutments shall be on the increments where it is feasible.
6. Dimensions X,Y,Z, and h to remain constant regardless of minor variations in wall thickness due to class or type of pipe used.
7. See sheet R-2.9.1 for details if connecting to HDPE pipe.

SHEET 2 OF 2

STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

CULVERT HEADWALLS
12" TO 36" RCP/HDPE

R-2.5.1.1 (502)		Signed Original On File
ADOPTED 8/69	REVISED 5/69	CHIEF HYDRAULICS ENGR.

S-I-G **SLATER HANIFAN GROUP**
CONSULTING ENGINEERS & PLANNERS
57540 S. ARVILLE STREET #216, LAS VEGAS, NV 89118
PHONE (702) 284-5300 FAX (702) 284-5399

CITY OF LAS VEGAS, NEVADA

SKYE CANYON

SKYE CANYON PH-2 NEIGHBORHOOD PARK

DETAIL SHEET II

S12
T19S
R59E

DATE: 4/30/18

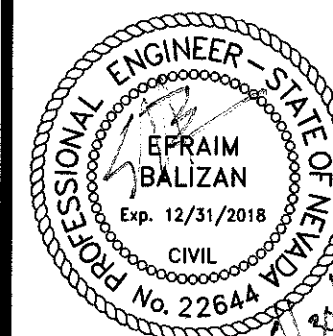
DRAFTER: JMP

DESIGNER: EB

CHECKED: FR

PROJECT NO.

OLY1714-000



D-2

SHEET 6 OF 6