

DS #: 4843

APN: 126-12.000.001

PROJECT: Skye Canyon Parcel 2.23 B

SUBMITTAL: 1st Submittal 5 Plans

SCANNED BY/DATE: _____

CHECKED BY/DATE: _____



CITY OF LAS VEGAS INTER-OFFICE MEMORANDUM		DATE: December 5, 2016
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 Parcel 2.23B	
Cross Streets:	SEC of Eagle Canyon Av. & Shaumber Rd.	
File Number:	F:\Depot\DSMemos\DS4843A.doc	
Parcel Number:	126-12-000-001	
Zoning Action:	TMP-65808	
FEMA Flood Zone	YES	NO X
Proposed Storm Drain	YES	NO X
COPIES TO:		Slater Hanifan Group
		Section 12, LLC / Ninety Five Mangt.
		Bart Anderson, P.E., DevCo

HISTORY	DATE RECEIVED	DATE REVIEWED	COMMENTS	REVIEW FEES	FEES PAID Payment Trn #
1 st Submittal	11/3/2016	12/1/2016	See Comments Below	\$400.00	464249: \$400
			TOTAL FEES (LDDRS):	\$400.00	----

REMARKS:

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

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

All Onsite **Skye Canyon Phase 2 Developments** such as **Parcel 2.xx series** are allowed to proceed with the following conditions:

1. The engineer provides the City with a letter stating that the partial detention basin has adequate capacity to protect downstream construction. That should be for the 100-year flows based on reducing the peak flows.
2. No **Certificate of Occupancy** on the houses will be issued until after the detention basin has been accepted for Substantial Completion by the City.
3. The *Developer* provides a bond for the detention basin now, showing good faith that the *Developer's* intentions are to get started with the final detention basin as soon as permitting allows.
4. That the *Developer, Olympia* provides the City with a letter stating that it is willing to take all the risk including any damages to the downstream properties / infrastructure / cleanup cost including offsite properties.

The following are comments pertaining to the subject site specific drainage study and grading plans:

5. Provide a copy of the zoning/planning conditions associated with this site (**TMP-65808**) with the next submittal to verify compliance with conditions. *Flood Control* will not issue conditional approval of the drainage study without the associated zoning/planning conditions (issued by the *City Council*). Any associated conditions of approval that revise the site drainage parameters will require that the drainage study be revised and resubmitted.

6. All roadways and flood control facilities as proposed and approved in ***Skye Canyon Phase 2 Infrastructures*** must be substantially constructed prior to the final acceptance of the subject improvement plans.
7. ***Exhibit E (Developed Condition Drainage Map)***: Per the ***Skye Canyon II Phase 2 Mass Grading Plans***, the land between *Shaumber Road* and *Egan Crest Drive*, *Grand Teton Boulevard* and *Eagle Canyon Avenue* should have been mass graded with sheet flow pattern from west to east with swales adjacent to *Egan Crest Drive* to perpetuate the basin flows to the storm drain systems in the perimeter streets.

Exhibit E and the pertinent subject grading plans must be revised to reflect the true existing conditions accordingly in the next submittal.
8. ***Exhibit E (Developed Condition Drainage Map)***: Due to the mass grading, there is no longer natural wash with "***Parcel 2.23C Future Park***" to perpetuate the subject site drainage. Address how the subject "***ON1***" flow will be conveyed into ***Parcel 2.23A*** and ***Parcel 2.23C***.
9. ***Exhibit E (Developed Condition Drainage Map)***: In the ***Developed Condition Drainage Hydraulic Summary***, Section W1 shows a width of 16' which is not consistent with the proposed 30'-public drainage easement. Revise the hydraulic calculations and the ***Summary*** to maintain a uniform 30'-wide drainage easement.
10. ***Grading Plan I (Sheet G-1)***: At the northern end of *Skye Sweep Street*, it appears that a sidewalk drain is required to drain through to *Eagle Canyon Avenue* to the north.
11. ***Grading Plan II (Sheet G-2)***: Per the developed condition drainage map, the 100-year flow depth in *Eagle Canyon Avenue* is 0.48'. The proposed hump in the entry way (*Skye Ravine Street*) does not provide adequate freeboard as shown on the grading plan. Note that a hump (high points) must provide a minimum of six inches freeboard above the 100-year water surface in the corresponding street. Review and revise accordingly.
12. ***Grading Plan III (Sheet G-3)***: Identify clearly where the proposed public drainage easement (privately maintained) will lead to in the next submittal. The proposed drainage easement must be dedicated and recorded by separate document or final map prior to the final approval of the subject drainage study.

Offsite grading is anticipated for the proposed public drainage easement within the future park (Parcel 2.23C) and Future Parcel 2.23A. Obtain a notarized letter of permission to grade from the adjacent parcel owners prior to the final approval of the drainage study.
13. ***Grading Plan III (Sheet G-3)***: The proposed location of the public drainage easement is right next to the driveway of ***Residential Lot 54*** which is not preferable. It is advisable for the engineer to shift the proposed drainage easement about 10' to 15' away from Lot 54.
14. ***Grading Plan III (Sheet G-3)***: Revise the slope in *Skye Quarry Street* in front of Lot 53 and Lot 54 to 1% minimum in the knuckle.
15. ***Details & Sections Sheet D-1: 1/D-1, 3/D-1 and 4/D-1***: Revise to solid grout a minimum of ***3-courses*** of 8"-CMU (or equivalent) above adjacent highest FG.
16. ***Details & Sections Sheet D-2 and Sheet D-3: 24/D-2 and 32/D-3***: Wrought iron fence / gate must be constructed per *Uniform Standard Drawing 425.S1*.

17. All drainage easements must be public drainage easements to be privately maintained and common lots to be labeled on the grading plans and to be dedicated as such in the final map.
18. The engineer must provide a table on the grading plans that shows a quantity estimate of all drainage improvements within Public Drainage Easements. All drainage improvements within Public Drainage Easements must be bonded and inspected.
19. Private streets must be public drainage easements. Provide a note on the grading plans: "Note: All private streets are P.U.E., Public Sewer Easements and Public Drainage Easements to be privately maintained by HOA".

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

 *** FAX TX REPORT ***

TRANSMISSION OK

JOB NO. 2412
 DESTINATION ADDRESS 7022845399
 PSWD/SUBADDRESS
 DESTINATION ID
 ST. TIME 12/05 13:50
 USAGE T 00' 58
 PGS. 3
 RESULT OK

CITY OF LAS VEGAS INTER-OFFICE MEMORANDUM		DATE: December 5, 2016
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 Parcel 2.23B	COPIES TO: Slater Hanifan Group
Cross Streets:	SEC of Eagle Canyon Av. & Shaumber Rd.	Section 12, LLC / Ninety Five Mangt.
File Number:	F:\Depot\DSMemos\DS4843A.doc	Bart Anderson, P.E., DevCo
Parcel Number:	126-12-000-001	
Zoning Action:	TMP-65808	
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	11/3/2016	12/1/2016	See Comments Below	\$400.00	464249: \$400
TOTAL FEES (LDDRS):				\$400.00	----

REMARKS:

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

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

All Onsite **Skye Canyon Phase 2 Developments** such as **Parcel 2.xx series** are allowed to proceed with the following conditions:

1. The engineer provides the City with a letter stating that the partial detention basin has adequate capacity to protect downstream construction. That should be for the 100-year flows based on reducing the peak flows.
2. No **Certificate of Occupancy** on the houses will be issued until after the detention basin has been accepted for Substantial Completion by the City.
3. The *Developer* provides a bond for the detention basin now, showing good faith that the *Developer's* intentions are to get started with the final detention basin as soon as permitting allows.
4. That the *Developer* provides the City with a letter stating that the *Developer* is committed to the project and will not abandon it.

TRANSMITTAL

To: Albert Sung, P.E.

Date: November 3, 2016

City of Las Vegas

Project No.: OLY1607.003

333 N. Rancho Drive

Las Vegas, NV 89106

From: Jonathan Rocha, E.I.

Subject: Skye Canyon Parcel 2.23b

CC: Jerry Slater, SHG

CC: Tracy Stratton, SHG

CC: Stanley Okey Amadi, SHG

CC: Chelsea Jensen, SHG

CC: Steve Jones, SHG

CC: Mark Failla, SHG

Transmitting Via:

- ☐ Mail
☒ Messenger / MDS
☐ Federal Express
☐ Pickup

For:

- ☒ Review & Comment
☐ Per your Request
☐ Information/File

Acknowledgement of Receipt:

- ☐ Not Required
☒ Acknowledgement Required

Received By: _____

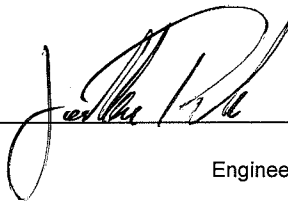
Date: _____ Time: _____

Copies	Description
<u>1</u>	<u>Subject Study</u>
<u>1</u>	<u>Stamped and Signed Standard Form 1</u>
<u>1</u>	<u>\$400 Submittal Fee</u>
<u>1</u>	<u>CD containing PDF of submittal documents</u>

Comments:

Please contact us if there are any questions at 702-284-5300. Thanks.

Signed: _____



Jonathan S Rocha, E.I.
Engineer Intern – Flood Control Division

Please, notify us at (702) 284-5300 if there are any problems receiving this transmission.

TECHNICAL DRAINAGE STUDY

Skye Canyon Parcel 2.23b

City of Las Vegas, Nevada

Job No.: OLY1607.003

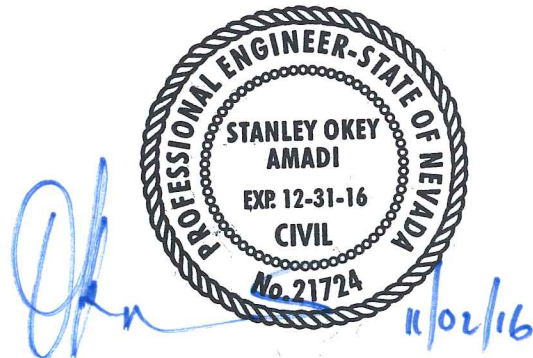
Date: November 2016

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:

Ninety-Five Management, LLC
11411 Southern Highlands Parkway, Suite 300
Las Vegas, NV 89141
Phone: 702-220-6565 • Fax: 702-220-6566



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

Assisted by: Jonathan S Rocha, E.I.

HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL
DRAINAGE STUDY INFORMATION FORM

Name of Development: Skye Canyon Parcel 2.23b Date: November 2016
Location of Development: a) Descriptive (Cross Streets): North/South: Shaumber Road
East/West: Eagle Canyon Ave
b) Section: 12 Township: 19 S Range: 59 E
c) APN: 126-12-000-001

Name of Owner: Ninety-Five Management, LLC.
Telephone No.: 702-220-6565 Fax No.: 702-220-6566 E-mail Address: mbolduc@olympiacompanies.com
Address: 11411 Southern Highlands Parkway, Suite 300 Las Vegas NV 89118

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 #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	☐

1. Total Owned Land Area: At Site: Approx. 16.8 Acres Being Developed/Disturbed: Approx. 16.8 Acres

2. Is a portion or all of the subject property located in a 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.): Single-Family Residential

5. Approximate upstream land area which drains to the subject site: +/- 4 Acres

6. Has the site drainage been evaluated in the past? ☒ Yes** ☐ No If yes, please identify documentation: _____

Master Drainage Study for Kyle Canyon (SHG, DS4420);

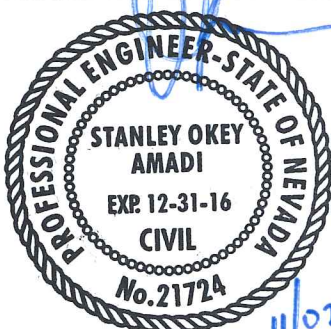
Master Drainage Study for Kyle Canyon (GCW, DS4091);

Technical Drainage Study for Skye Canyon – Phase 2 Infrastructure (SHG, DS4739)

7. If known, please briefly identify the proposed discharge point(s) of runoff from the site: _____

Discharges northeast into the adjacent Parcel 2.23c (future park)

8. Briefly describe your proposed schedule for the subject project: 1 Phase after completion of Phase 2 Infrastructure (DS4739)



Engineer's Seal

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

***Newly Required Field**

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

Revision	Date

Local Entity File No. _____

REFERENCE:

STANDARD FORM 1

Updated 05/01/2008

HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL

DRAINAGE SUBMITTAL CHECKLIST

Project Name: Skye Canyon Parcel 2.23b		Map ID:																									
Firm Name: Slater Hanifan Group		Engineer: Stanley Okey Amadi, P.E.																									
Address: 5740 S. Arville #216																											
City: Las Vegas		State: NV	Zip: 89118																								
Phone Number: (702) 284-5300		Fax Number: (702) 284-5399																									
Property Owner: Ninety-Five Management, LLC.																											
Address: 11411 Southern Highlands Parkway, Suite 300																											
City: Las Vegas		State: NV	Zip: 89118																								
Reviewed By:	Date Received:	Date Accepted for Review:																									
The following checklist is intended as a guide for the engineer preparing a Technical Drainage Study to submit to the local entity and Clark County Regional Flood Control District (if necessary). The listed items are the minimum information required prior to the entity performing a review. The engineer will remain responsible to ensure the Technical Drainage Study is prepared within the guidelines as set forth in the Clark County Regional Flood Control District (CCRFCD) Hydrologic Criteria and Drainage Design Manual (MANUAL). This document is intended as an aid in preparing Technical Drainage Studies. Each study submitted is reviewed for compliance with local and regional criteria. This form is not intended to be all inclusive and does not limit the extent of the information, calculations or exhibits which may be necessary to properly evaluate the intended land use. If items are not applicable for the subject site, provide N/A. I. GENERAL REQUIREMENT <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left; width: 10%;">Yes</th> <th style="text-align: left; width: 10%;">No</th> <th></th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">☒</td> <td style="text-align: center;">☐</td> <td>Design Manual Standard Form 1 with the engineer's seal and signature.</td> </tr> <tr> <td style="text-align: center;">☒</td> <td style="text-align: center;">☐</td> <td>Design Manual Standard Form 4.</td> </tr> <tr> <td style="text-align: center;">☒</td> <td style="text-align: center;">☐</td> <td>2 copies of the 24" x 36" Drainage Plan.</td> </tr> <tr> <td style="text-align: center;">☐</td> <td style="text-align: center;">☐</td> <td>N/A A notarized letter from the adjacent property owner(s) allowing off-site grading or discharge.</td> </tr> </tbody> </table> II. MAPS AND EXHIBITS <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left; width: 10%;">Yes</th> <th style="text-align: left; width: 10%;">No</th> <th></th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">☒</td> <td style="text-align: center;">☐</td> <td>A copy of a current Flood Insurance Rate Map (FIRM) with the site delineated.</td> </tr> <tr> <td style="text-align: center;">☒</td> <td style="text-align: center;">☐</td> <td>A copy of the current CCRFCD Master Plan Update Figure, (F-x), for Flood Control Facilities and Environmental areas with the site delineated.</td> </tr> </tbody> </table>				Yes	No		☒	☐	Design Manual Standard Form 1 with the engineer's seal and signature.	☒	☐	Design Manual Standard Form 4 .	☒	☐	2 copies of the 24" x 36" Drainage Plan.	☐	☐	N/A A notarized letter from the adjacent property owner(s) allowing off-site grading or discharge.	Yes	No		☒	☐	A copy of a current Flood Insurance Rate Map (FIRM) with the site delineated.	☒	☐	A copy of the current CCRFCD Master Plan Update Figure, (F-x), for Flood Control Facilities and Environmental areas with the site delineated.
Yes	No																										
☒	☐	Design Manual Standard Form 1 with the engineer's seal and signature.																									
☒	☐	Design Manual Standard Form 4 .																									
☒	☐	2 copies of the 24" x 36" Drainage Plan.																									
☐	☐	N/A A notarized letter from the adjacent property owner(s) allowing off-site grading or discharge.																									
Yes	No																										
☒	☐	A copy of a current Flood Insurance Rate Map (FIRM) with the site delineated.																									
☒	☐	A copy of the current CCRFCD Master Plan Update Figure, (F-x), for Flood Control Facilities and Environmental areas with the site delineated.																									
REFERENCE:		STANDARD FORM 2																									

HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL

DRAINAGE SUBMITTAL CHECKLIST

II. MAPS AND EXHIBITS (Continued)

Yes	No	
☒	☐	Off-site drainage basin maps for existing, interim and future conditions showing the existing topography, basin boundaries, concentration points, and flows in cfs.
☒	☐	On-site drainage basin maps for existing and proposed conditions showing the existing topography, basin boundaries, concentration points, and on-site and off-site flows in cfs.
☒	☐	Vicinity Map with local and major cross streets identified and a north arrow.

III. DRAINAGE PLAN

Yes	No	
☒	☐	Sheet size: 24" x 36" sealed by a registered engineer in the State of Nevada.
☒	☐	Minimum scale: 1" = 60'.
☒	☐	Project name.
☒	☐	Vicinity Map with local and major cross streets.
☒	☐	Revision box.
☒	☐	North arrow and bar scale.
☒	☐	Engineer's/consultant's address and phone number.
☒	☐	Elevation datum and benchmark.
☒	☐	Legend for symbols and abbreviations.
☒	☐	Cut/fill scarps, where applicable.
☒	☐	Street names, grades, widths.
☒	☐	Proposed future and existing spot grades for top of curbs and street crowns at lot lines, grade breaks, and along curb returns on both sides of the street.
☒	☐	Existing contours encompassing the site and 100 feet beyond with spot elevations for important locations, where appropriate.
☒	☐	Minimum finish floor elevations with top-of-curb elevations at upstream end of lot.
☒	☐	Proposed typical street sections.

REFERENCE:

STANDARD FORM 2

HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL

DRAINAGE SUBMITTAL CHECKLIST

III. DRAINAGE PLAN (Continued)

Yes	No	
-	N/A	Streets with off-set crowns.
X	-	Proposed contours or spot elevations in sufficient detail to exhibit intended drainage patterns and slopes.
X	-	Property lines.
X	-	Right-of-way lines and widths, existing and proposed.
X	-	Existing improvements and their elevations.
X	-	Delineation of proposed on-site drainage basins indicating area and 10-year and 100-year storm peak flows at basin concentration points.
X	-	Concentration points and drainage flow direction with Q_{100} and V_{100} and D_{100} in streets.
X	-	Cumulative flows, velocity, and direction of flow at upstream and downstream ends of site for the 10-year and 100-year flows.
X	-	Location and cross-section of street capacity calculations.
X	-	Cross-sectional detail for channels, including cutoff wall locations.
X	-	Existing and proposed drainage facilities, appurtenances, and connections (i.e., sidewalk, ditches, swales, storm drain systems, unimproved and improved channels, and culverts, etc.) stating size, material, shape, and slope with plan and profile and HGL calculations.
X	-	Existing and proposed drainage easements and widths shown with sufficient detail. A cross sectional detail must be provided that shows appropriate lining and reinforcement.
X	-	Location and detail of existing, proposed, and future block wall openings. Minimum size is 16" x 48". Wrought iron gate is required for flows > 10 cfs.
-	-	Location and detail of flood walls illustrating depth of flow, proposed grouting height, etc.
X	-	Perimeter retaining wall locations. All existing and proposed walls (retaining screen and flood) must be shown with adjacent ground elevations. Flood walls with 8-inch concrete masonry unit.
X	-	Building and/or lot numbers.
X	-	Alignment of all existing, proposed, or future Regional Facilities adjacent to the site.
-	N/A	Limits of existing floodplain based on current FIRM or best available information; limits of proposed floodplains based on best available information.

REFERENCE:

STANDARD FORM 2

HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL

DRAINAGE SUBMITTAL CHECKLIST

III. DRAINAGE PLAN (Continued)

Yes	No	
<u>-</u>	<u>N/A</u>	For areas in Zone A, AE, AH, and AO, base flood elevations (BFEs) must be shown for each lot; BFEs may be listed on each lot, or in a table. Finish floor elevations must be a minimum of 18 inches above BFE.
<u>X</u>	<u>-</u>	Appropriately elevated "humps" 6 inches above the 100 year water surface elevation at site accesses where the intent is to protect the site from the Q_{100} flows.
<u>X</u>	<u>-</u>	Street slopes for perimeter and interior streets. The minimum slope is 0.4 percent.
<u>-</u>	<u>N/A</u>	Location and detail of best management practice (BMP) for parking lots and low impact development (LID) (if required).

IV. HYDROLOGIC ANALYSIS

Yes	No	
<u>X</u>	<u>-</u>	Appropriate soil information and Soils Map for existing and future conditions with subbasins and property delineated.
<u>X</u>	<u>-</u>	Input and output information for existing conditions from computer models (HEC-1 or TR-55). The flow routing diagram must be provided with HEC-1 models.
<u>X</u>	<u>-</u>	Input and output information for future conditions from computer models (HEC-1 or TR-55). The flow routing diagram must be provided with HEC-1 models.
<u>X</u>	<u>-</u>	Use of correct precipitation values in and around the McCarran Airport rainfall area.
<u>X</u>	<u>-</u>	A discussion in the text of the hydrologic analysis justifying subbasin boundaries and cutoffs, supporting assumptions, and calculations.
<u>X</u>	<u>-</u>	A summary table of stormwater flows showing basin area, Q_{10} and Q_{100} for both individual basins and combined basin flows, where applicable.
<u>X</u>	<u>-</u>	Copies of supporting technical information referenced from a previously approved study and a statement accepting these results.
<u>X</u>	<u>-</u>	On-site facilities must perpetuate flows through or around the site without significantly impacting adjacent property owners in accordance with current Nevada Drainage Law.
<u>-</u>	<u>N/A</u>	Calculation for impervious area for parking lots and LIDs (if required).

REFERENCE:

STANDARD FORM 2

HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL

DRAINAGE SUBMITTAL CHECKLIST

V. HYDRAULIC ANALYSIS

Yes	No	
-	N/A	Flow split calculations and supporting documentation or reference for the method of flow split calculations used.
X	-	Normal depth street flow calculations and cross section diagrams for all interior and perimeter streets. Provide "d x v" products for the Q_{100} and Q_{10} flows representing the worst case for interior and all perimeter streets. $Q_{100} d \times v \leq 8$. $Q_{10} d \times v \leq 6$ and 12 foot dry lane for rights-of-way ≥ 80 feet. Calculations must be labeled by street name as indicated on the Grading Plan.
X	-	A summary table of interior and exterior street capacity calculations showing the street name, Q_{100} flow, slope, depth of flow, velocity and depth times velocity product and streets needing to meet 12 foot dry lane criteria.
-	N/A	Appropriate hydraulic calculations for block wall openings assuming a 50 percent vertical clogging factor. (Assume the lower half of the opening is plugged.)
X	-	Appropriate hydraulic calculations at drainage easement entrance and discharge locations to set finish floor elevations. Hydraulic calculations must include submerged weir, superelevation and tee intersection losses, where appropriate.
X	-	Provide necessary freeboard requirements to set the finished floor elevations of all proposed buildings, 2 x depth of flow or depth of flow plus 18 inches of freeboard, whichever is less. The minimum requirement is 6 inches above adjacent upstream top of curb. Buildings adjacent to drainage easements must always be provided with 18 inches of freeboard above the Q_{100} weir height or flow depth, whichever is greater.
-	N/A	A complete water surface profile analysis (HEC-2, HEC-RAS, etc.) for channel flows and FEMA Zone A flood zones. • Field survey data. • Input and output information. • Plotted cross-sections based on survey with proper encroachments. • A map showing the location of the cross-sections. • Analysis of both sub and super-critical flow segments. • A summary table and a discussion of the results in the text of the report.
-	N/A	Provide a 50 percent clogging factor in the capacity calculation for drop inlets.
-	N/A	Hydraulic calculations for culverts and storm drains. D-Load calculations must be provided for storm drain pipes in public rights-of-way, including headwater pool inundation.
X	-	The mitigation of nuisance water, both during construction and in the fully developed condition, must be addressed.
-	N/A	Provide BMP type, size and supporting calculations for parking lots and LIDs (if required).

REFERENCE:

STANDARD FORM 2



CITY OF LAS VEGAS

MINIMUM DRAINAGE STUDY CRITERIA STANDARD FORM 2 CHECKLIST SUPPLEMENT

(Revised 5/18/11)

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

An appointment must be made to preview this checklist in conjunction with CCRFCD Standard Form 2 prior to the City accepting a new drainage study for review. The engineer must contact the Flood Control Section at (702) 229-6541 to schedule a submittal appointment.

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

I. GENERAL REQUIREMENT		
Yes	No	
-	N/A	A notarized letter from the adjacent property owner(s) allowing off-site grading. (A copy of the letter must be received prior to final acceptance of the drainage study.)
X	-	Copies of all conditions of approval for development related to this property. (e.g. zoning, use permit, tentative map, etc.) Verify compliance with conditions.
X	-	An electronic copy of the complete submittal is required to be submitted with one original hard copy of the study. Electronic documents should be on a universal computer-readable digital output device replicating your submittal. An Indexed Portable Document Format (PDF) or Print Ready CAD file formats with a minimum of 300dpi are the desired formats. If figures are in color, they must be scanned in color and saved as a separate file. <u>S.O.K.</u> by initial here, the engineer on record acknowledges that the electronic copy is an identical replicate of the original hard copy submitted to the City of Las Vegas.

II. GRADING PLAN INFORMATION		
Yes	No	
X	-	(1) 24" X 36" copy of the Grading Plan, (including all Detail Sheets) sealed by the engineer.
X	-	Proposed future and existing spot grades for top of curbs and street crowns at lot lines, grade breaks, and along curb returns on both sides of the street. Note: Proposed top of curb elevations must be provided for both sides of roadways even if only half street construction is required.
X	-	Label existing topography at a minimum 5 foot elevation interval including adjacent developments, finished floor elevations of existing buildings and top of existing curbs extending 100 feet around the perimeter of the site. (*Measured from the centerline of the adjacent roadway.)

CITY OF LAS VEGAS MINIMUM DRAINAGE STUDY CRITERIA CHECKLIST

II. GRADING PLAN INFORMATION		
Yes	No	
-	N/A	Proposed on-site and off-site storm drains and other flood control facilities with plan and profile sheets for public storm drains showing the class of pipe, (Class III, IV, V, etc.), design hydraulic grade line, (HGL) and 100 year storm flow. A public drainage easement must be provided over on-site storm drains conveying off-site flows. An overflow path must be provided over all storm drains.
X	-	All existing and "to be constructed" walls with cross-sections showing wall type, (e.g. block wall, retaining wall, flood wall, etc.), with limits clearly defined, adjacent ground elevations. Wall heights must meet current ordinances and in no case exceed 14 feet above the adjacent property.
X	-	Street slopes for both interior and perimeter streets. Note: The minimum slope for a roadway is 0.4 percent, a minimum 18-inch storm drain must be provided where minimum slopes cannot be met.
X	-	Back of lot elevations and lot drainage pattern for all lots including common lots.
X	-	Sites with a grade difference two feet above or below existing ground are required to have approval from City of Las Vegas Current Planning. Current Planning approval is required prior to final approval of the drainage study.
X	-	On-site facilities must perpetuate flows through or around the site without significantly impacting adjacent property owners. (The project must pass flows through the site every 600 feet where the project is blocking flow paths.)
-	N/A	This project uses a solid grouted stem wall (or approved alternate) at the back of sidewalk to provide erosion protection for landscaped areas where the depth of flow in the roadway exceeds the back of walk elevation. A corresponding cross-section detail is included.
X	-	Commercial and Common Lot Landscape areas are not allowed to drain over the sidewalk. The grading plans show flow lines with grades and sidewalk under drains for all landscape areas draining to the public ROW.

III. Local Entity Criteria - City of Las Vegas – Manual Section 1600		
Yes	No	
-	N/A	Concrete valley gutters are required in parking lots with slopes less than 1 percent. Slopes through cul-de-sac must be at a 1 percent minimum where flow is drained through the cul-de-sac.
-	N/A	Ten-foot wide public drainage easements to be privately maintained are allowed for flow less than 20 cfs. The depth of flow entering the easement must be checked using the submerged weir calculation.
-	N/A	The limits of the flood zones and the base flood elevations (BFE) must be shown on all grading plans for all developments within a Special Flood Hazard Zone A, AO, AE, etc.
X	-	Minimum finish floor elevation is 6 inches above highest adjacent top of curb. Finish floor calculations must include allowances for super elevations on curves and velocity head for tee intersections.
X	-	Finished floor elevations for buildings adjacent to public drainage easements must be a minimum of 18 inches above the Q100 weir of submerged weir elevation, whichever is greater.

CITY OF LAS VEGAS MINIMUM DRAINAGE STUDY CRITERIA CHECKLIST

III. Local Entity Criteria - City of Las Vegas – Manual Section 1600		
Yes	No	
-	N/A	Lots with "B and C Type Drainage" that drain from one lot to another through a drainage easement shall be required to install an underground nuisance drainage system or a 2-foot valley gutter. 16" x 24" minimum block wall openings are required for both options.
-	N/A	Bubblers are required across 80 foot and greater ROW streets. When flows exceed 10 cfs, bubblers larger than 18 inches will be required up to a maximum of 36". Inlets must be sized to match the pipe size provided.

- Contact the Flood Control Section regarding the drainage study review fee. These fees are payable at the time of submittal.
- The Drainage Study must be conditionally approved prior to submitting improvement plans to the Civil and Planning Development of the Department of Building and Safety for review.

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

TABLE OF CONTENTS

1	INTRODUCTION.....	1
1.1	Project Overview & Study Purpose	1
1.2	Description of Improvements	1
1.3	FEMA Flood Zone Designation	1
1.4	CCRFCFCD Facility Information	2
1.5	Referenced Documents.....	2
2	METHODOLOGY.....	3
2.1	Compliance	3
2.2	Hydrologic Modeling.....	3
2.3	Hydraulic Modeling & Criteria	4
3	EXISTING DRAINAGE CONDITION.....	5
3.1	Definition/Discussion of Existing Condition.....	5
4	DEVELOPED DRAINAGE CONDITION.....	5
4.1	Definition of Developed Condition	5
4.2	Discussion of Developed Condition	5
4.3	Summary of Developed Condition Flows	5
4.4	Summary of Developed Condition Street Flows	6
4.5	Summary of Drainage Facilities	7
5	ULTIMATE DRAINAGE CONDITION	7
5.1	Definition/Discussion of Ultimate Condition.....	7
6	PROPOSED FINISHED FLOORS.....	7
7	CONCLUSIONS & RECOMMENDATIONS	8
8	REFERENCES.....	9

TABLES

TABLE 1: COMPARATIVE SUMMARY OF HYDROLOGIC SOIL GROUPS.....	4
TABLE 2: DEVELOPED CONDITION FLOW RATE SUMMARY.....	6
TABLE 3: DEVELOPED CONDITION FLOW RATE COMPARISON	6
TABLE 4: REFERENCED 100-YEAR STREET FLOW SUMMARY	6
TABLE 5: DEVELOPED CONDITION 100-YEAR STREET FLOW SUMMARY.....	7

LIST OF APPENDICES

- Appendix A** Drainage Exhibits
- Exhibit A – Location Map
 - Exhibit B – FEMA FIRM Panel Map
 - Exhibit C – CCRFCD 2013 MPU Facilities Exhibit
 - Exhibit D – Soils Map
 - Exhibit E – Developed Condition Drainage Map
- Appendix B** Hydrologic Computations
- Precipitation
 - Curve Number and Soils Data
 - Lag Time Data
 - Developed Condition HEC-1 Model
- Appendix C** Hydraulic Computations
- Interior Street Flow Computations
 - Weir Computations
- Appendix D** Finished Floor Analysis
- Appendix E** Reference Material
Technical Drainage Study for Skye Canyon – Phase 2 Infrastructure, by SHG
- Approval Letter
 - Referenced Drainage Figures
 - Referenced Hydrologic Data
 - Referenced Hydraulic Data
- Appendix F** Reference Material
Master Drainage Study for Skye Canyon, by SHG
- Approval Letter
 - Referenced Report Excerpts
 - Referenced Drainage Figures
 - Referenced Hydrologic Data
- Appendix G** Electronic Files (CD) & Improvement Plans

1 INTRODUCTION

1.1 Project Overview & Study Purpose

Ninety-Five Management, LLC is proposing a single-family residential development, identified as *Skye Canyon Parcel 2.23b*, within the city limits of Las Vegas, Nevada. The proposed development is approximately 16.8 acres in area, and located at the southeast corner of the intersection of Shaumber Road and Eagle Canyon Avenue.

The proposed development is located within the master planned Skye Canyon property and specifically in the Phase 2 area supported by the *Technical Drainage Study for Skye Canyon – Phase 2 Infrastructure* (DS4661). All roadways and perimeter drainage infrastructure required for development of Parcel 2.23b has been technically addressed in the Phase 2 Infrastructure drainage study. Parcel 2.23b proposes utilization of drainage facilities provided by the Phase 2 Infrastructure. It is the objective of this study to show conformance to the drainage patterns assumed by the Phase 2 Infrastructure drainage study.

Additionally, the 1,662 acre Skye Canyon property has been master planned and a *Master Drainage Study for Skye Canyon* (DS4420) has been approved by the City of Las Vegas. The subject Parcel 2.23b has been proposed to conform to the Master Drainage Study.

1.2 Description of Improvements

The project is located within Township 19 South, Range 59 East and Section 12, within a portion of APN 126-12-000-001. Parcel 2.23b is bound by Eagle Canyon Avenue to the north, Shaumber Road to the west, undeveloped land to the east and south. A location map identifying the site in relation to major streets in the vicinity has been prepared as Exhibit A, included in Appendix A.

The project consists of construction of single-family residential lots averaging less than 6,000 ft² in area and all associated interior roadways. The typical onsite roadway is to be proposed as a 49-ft wide private street with roll curb and sidewalks. The adjacent perimeter roadways will be installed by the Phase 2 Infrastructure improvements and are considered existing for development of Parcel 2.23b.

Drainage improvements necessary to control storm runoff and satisfy local drainage criteria onsite have been proposed by Parcel 2.23b. The proposed drainage and entry drive improvements are intended to connect into the existing Phase 2 Infrastructure facilities.

1.3 FEMA Flood Zone Designation

The Parcel 2.23b site boundary has been delineated on current FEMA FIRM Panel Map 32003C1750E, dated September 27, 2002, as Exhibit B included in Appendix A. Per the FIRM Panel, the project site is located within a FEMA designated unshaded Zone 'X', described as areas determined to be outside the 0.2% annual chance floodplain. An unshaded Zone 'X' is located outside of a FEMA designated Special Flood Hazard Area (SFHA).

1.4 CCRFCD Facility Information

The project site has been delineated on the current 2013 Clark County Regional Flood Control District (CCRFCD) Las Vegas Valley Flood Control Master Plan Update (2013 MPU, Reference 1) facility figure as Exhibit C, included in Appendix A. Review of Exhibit C indicates that there are no existing or proposed regional facilities adjacent to or traversing through the site.

1.5 Referenced Documents

The following documents have been utilized as reference materials in the preparation of this drainage study. The referenced documents have been reviewed and determined acceptable for reference. Slater Hanifan Group concurs with all referenced and adopted hydrologic and hydraulic analyses from the studies and the results established therein.

1. *Technical Drainage Study Update No. 2 for Skye Canyon – Phase 2 Infrastructure*, prepared by Slater Hanifan Group (hereinafter referred to as the Phase 2 Infrastructure Study, Reference 4), DS4739, has technically designed the adjacent perimeter roadways and associated drainage infrastructure utilized by Parcel 2.23b. The Phase 2 Infrastructure Study has been referenced to show Parcel 2.23b development conformance to the drainage patterns for the perimeter infrastructure in order to prove that development is in accordance with the master plan for the area. The following specific items have been referenced from the Phase 2 Infrastructure Study and has been included in Appendix E:
 - Hydraulic modeling of Shaumber Road and Eagle Canyon Avenue street flow depth (conservative flows obtained from the ultimate condition analysis).
2. *Master Drainage Study Update No. 3 for Skye Canyon and Supplements*, prepared by Slater Hanifan Group (hereinafter referred to as the Master Study, Reference 5), DS4420, has conceptually planned drainage patterns and improvements required for the current land plan on the entire Skye Canyon property. The Master study has been referenced for providing precipitation values and developing the ultimate condition drainage patterns for the project site. In response to the soil data that the site was previously analyzed, the discussion and relevant hydrologic data has been presented in the Master Study and supplements and also discussed in this report. Relevant reference material has been included in Appendix F.

Please note the Phase 2 Infrastructure improvements were designed and shown to be in conformance with the master drainage patterns per the Master Study. Therefore, if this study shows that the design of Parcel 2.23b is in conformance with drainage patterns presented in the Phase 2 Infrastructure Study, then it is inferred that it is also in conformance with the SHG Master Study.

2 METHODOLOGY

2.1 Compliance

The methodologies utilized in the preparation of this study are in compliance with the Clark County Regional Flood Control District's Hydrologic and Drainage Design Manual (CCRFCD Manual, Reference 2).

2.2 Hydrologic Modeling

Modeling:

The SCS Unit Hydrograph Method (SCS Method) was utilized to determine peak flow rates. The SCS Method utilizes precipitation, drainage area, curve number and lag time parameters to determine peak flow rates. The SCS Method routine within the U.S. Army Corp of Engineers HEC-1 Flood Hydrograph Package program was utilized to model the drainage basins analyzed by this study.

Precipitation:

The site is located outside of the McCarran Airport Rainfall Area. Per the CCRFCD Manual precipitation exhibits, the precipitation values utilized in this study's HEC-1 models are 3.00 and 1.67 inches for the 100-year and 10-year storm events, respectively. Note that the precipitation values have been referenced from the Master Study. No drainage area exceeds 8 square miles; therefore, an SDN 3 design storm distribution referenced from Table 503 of the CCRFCD Manual is used. Relevant reference tables and figures from the CCRFCD Manual have been included in Appendix F.

Curve Number:

The SCS curve number loss rate methodology was utilized to approximate infiltration for the drainage basins. The soils information within the watershed was obtained from the current 2014 NRCS Natural Resources Conservation Service of the Las Vegas Valley Area, Nevada, Part of Clark County (Soil Survey, Reference 3). This study's drainage basins lie within the following soil types delineated on Exhibit D, included in Appendix A:

- Soil Type 155 – Cave gravelly fine sandy loam, 4 to 15 percent slopes. This soil is composed of 100% HSG 'D'.
- Soil Type 191 – Dalian very cobbly fine sandy loam, 2 to 8 percent slopes. The soil is composed of 100% HSG 'A'.

Please note that the above soil type has been revised from the Master Study which evaluated the project site utilizing the previous 1995 soil data of the Las Vegas Area. Note also that the Master Study has addressed the difference in soil data and determined that the approved hydrologic analyses based on the previous soil data is more conservative. Thus, a revision to the hydrologic analyses by the Master Study was not necessary. The following table provides a comparison of the previous and current soils data for the site.

Table 1: Comparative Summary of Hydrologic Soil Groups			
Previous Soils Data		Current Soils Data	
Soil Number	Predominant Hydrologic Soil Group	Soil Number	Predominant Hydrologic Soil Group
155	D	155	D
191	B	191	A

As listed above, the soil composition/predominant hydrologic soil group (HSG) of Soil Type 191 has changed from HSG “B” to HSG “A”. This study will utilize with the current soils data as discussed in the Master Study. A composite curve number for land use utilized in this study’s hydrologic analysis has been obtained utilizing the soil composition identified above, and the computations are included in Appendix B.

Note that this project proposes lots that are an average of less than 6,000 ft² in area; thus, a “commercial” type curve number per CCRFCD Manual Table 602A has been utilized. Therefore, the curve numbers utilized are in conformance with the Master Study that designed the receiving drainage facilities. Refer to Appendix F for relevant hydrologic reference material from the Master Study.

Lag Time:

The lag time is defined as the time measured from the center of mass of excess rainfall to the time to peak of the outflow hydrograph. The lag time is related to the time of concentration as 0.6 times the time of concentration. The time of concentration is defined as the time required for runoff to flow from the hydraulically most distant point of a basin to the outlet point of the basin. Standard Form 4, as outlined in the CCRFCD Manual, was utilized to determine the lag times for basins modeled. The lag time computations have been included in Appendix B.

2.3 Hydraulic Modeling & Criteria

Street Flow:

Street flows have been analyzed utilizing the Flowmaster Version 8i software by Haestad Methods. In accordance with the CCRFCD Manual, the following criteria apply:

- 10-year minor storm event: maximum flow depth of 1-ft from gutter flowline, and depth times velocity factor (DxV) not exceeding 6.
- Streets with right-of-way width that is equal to and/or greater than 80-ft are required to maintain a minimum dry lane width of 12-ft excluding the center turning lane, during the 10-year minor storm event.
- 100-year major storm event: maximum flow depth of 2-ft from gutter flowline, and depth times velocity factor (DxV) not exceeding 8.

3 EXISTING DRAINAGE CONDITION

3.1 Definition/Discussion of Existing Condition

The existing condition considers the Phase 2 infrastructure improvements as existing and the project site composed of existing desert shrub draining in a northeasterly direction. Due to the site being surrounded by developed perimeter streets provided by the Phase 2 Infrastructure study, there are no direct impacts of runoff to the Parcel 2.23b project site that will differ from what has been previously analyzed in the approved studies. As a result, no additional analyses have been performed by this study to demonstrate an update to the existing drainage condition for Parcel 2.23b. Note, also that the Master Study has established the required developed condition drainage patterns and allowable flow rates for conformance. Therefore, a site specific existing condition analysis is not necessary.

4 DEVELOPED DRAINAGE CONDITION

4.1 Definition of Developed Condition

The developed condition considers the Parcel 2.23b area to be fully constructed. The developed drainage pattern of Parcel 2.23b maintains the drainage pattern as designated by the Master Study. The offsite storm drain improvements as well as the perimeter roadways proposed in Shaumber Road are assumed to be installed per the Phase 2 Infrastructure Study. The offsite drainage areas are adopted to be in their developed condition and quantify the most conservative flows as illustrated by the Phase 2 Infrastructure Study.

4.2 Discussion of Developed Condition

Refer to Exhibit E, included in Appendix A, for a detailed illustration of the developed condition drainage patterns.

The site is analyzed as a single drainage basin identified as ON1. Basin ON1 conveys storm runoff in a northeasterly direction. The onsite flow is routed via curb and gutter towards offsite Parcel 2.23c (Future Park) as designated in the Master Study. The flow will eventually be conveyed into the existing natural wash in Parcel 2.23c and the wash conveys the flow downstream thru the undeveloped parcel. The onsite flows will eventually be routed to the intersection of Egan Crest Drive and Eagle Canyon Avenue to be intercepted by the storm drain stub proposed by the Phase 2 Infrastructure.

4.3 Summary of Developed Condition Flows

A summary of developed condition flow, as determined by HEC-1 analysis, has been presented below in Table 1. Refer to Appendix C for the developed condition HEC-1 analysis.

Table 2: Developed Condition Flow Rate Summary			
Basin/Concentration Point ID	Area (ac)	Q ₁₀₀ (cfs)	Q ₁₀ (cfs)
ON1	16.8	53	26

The developed condition of the project site has been previously analyzed in the Master Study. The table below provides a comparison of the results from the Master Study to those estimated by this study.

Table 3: Developed Condition Flow Rate Comparison				
	Master Study		Technical Study	
Basin ID	Area (ac)	Q ₁₀₀ (cfs)	Area (ac)	Q ₁₀₀ (cfs)
ON1	16.4	55	16.8	53

Review of Table 2 shows that the project site development is in substantial conformance to the Master Study. Although the basin area has increased, the curve numbers has been slightly modified due to the soil data as discussed in Section 2.2 which has resulted in a slightly decreased flowrate.

4.4 Summary of Developed Condition Street Flows

The Phase 2 Infrastructure Study perimeter streets sections have been referenced for the 100-year street flow. As summarized in Table 4 below, Section ECA1 is a developed full street and Section SHA as the developed half street on the east side (adjacent to Parcel 2.23b). Further analysis of the perimeter street depth has been discussed in the finish floor evaluation located in Section 6 of this report. Refer to Appendix E for relevant referenced hydraulic computations.

Table 4: Referenced 100-Year Street Flow Summary					
Section ID	Slope (%)	Q ₁₀₀ (cfs)	Depth (ft)	Velocity (fps)	DxV
ECA1	4.90	38	0.48	6.4	3.0
SHA (East Half Street)	2.75	4	0.33	3.3	1.1

Table 5 below summarizes the street flow hydraulic computations for the onsite roadways during the 100-year storm event. Refer to Exhibit E, included in Appendix A, for the location of the street section. The supporting FlowMaster street flow computations have been included in Appendix C for reference.

Table 5: Developed Condition 100-Year Street Flow Summary					
Section ID	Slope (%)	Q ₁₀₀ (cfs)	Depth (ft)	Velocity (fps)	DxV
1 (Q = ON1)	6.13	53	0.45	7.2	3.2
	0.55		0.62	3.4	2.1

After review of Table 5, the street flow criteria presented in Section 2.3 has been satisfied. Note that only the 100-year flows have been analyzed for the street section because the 100-year flows are shown to satisfy the 10-year criteria. In addition, none of the above streets have dry lane requirements as discussed in Section 2.3 of this report.

4.5 Summary of Drainage Facilities

No storm drain facilities have been proposed by the project as onsite flows are fully conveyed by the interior roadways and no offsite flows are directly impacting the site as summarized by Section 4.2.

5 ULTIMATE DRAINAGE CONDITION

5.1 Definition/Discussion of Ultimate Condition

The ultimate drainage condition has been previously analyzed and will not require any updates in this study. The ultimate condition considers that Skye Canyon is entirely developed, inclusive of the future residential areas bound by the Phase 2 Infrastructure improvements. The ultimate condition considers Parcel 2.23b in the developed condition with assumptions that no future parcels will negatively impact the site with offsite flows.

6 PROPOSED FINISHED FLOORS

The proposed finished floor elevations satisfy the CCRFCD as well as the local City of Las Vegas criteria and are elevated minimum 6-inches above the adjacent top of curb elevation at the high side of the lot. In addition, all finished floors are adequately flood protected and elevated above twice the depth of flow in the adjacent street. The hydraulic evaluation of proposed finished floors, utilizing the applicable flow depths established by this study, has been included in Appendix D.

The following finish floor computations were necessary to sufficiently protect lots from storm runoff. Refer to Appendix D for supplemental finish floor calculations for the below discussions.

Since the onsite flows will be routed to Parcel 2.23c, a weir computation was necessary to analyze the lot adjacent to the discharge point. Since the 30' easement varies in width from

the up and downstream portion, the calculations for the Section W1 assumed the worst case scenario under the upstream 16' width. The flow depth was measured using a normal depth and weir depth calculation and the worst case flow depth was used for measuring flood protection. The lot has been determined to be sufficiently flood protected as the lot is elevated 18-inches above the weir depth measured at the adjacent side of the lot. Hydraulic calculations for the section are provided in Appendix C and a summary table has been provided on Exhibit E in Appendix A.

The lots along the site perimeter have been analyzed with the street flow depth in Eagle Canyon Avenue and Shaumber Road. The finish floors for the lots adjacent to the perimeter streets have been analyzed for twice the depth of flow in the streets and have been solid grouted accordingly where necessary.

A portion of lots were analyzed where flow in the streets may tend to continue forward when street turns. The specific energy computed for this evaluation has been analyzed where lots are in the path of the flow. The finish floors for lots are sufficiently elevated above the specific energy depth measured at the adjacent high side of the lot.

7 CONCLUSIONS & RECOMMENDATIONS

1. The proposed improvements are not located within a FEMA designated SFHA.
2. The proposed drainage patterns are generally in conformance with the Phase 2 Infrastructure Study. It is anticipated that the Phase 2 Infrastructure improvements are in place and functioning prior to start of Parcel 2.23b development.
3. Proposed street flow satisfy the CCRFCD and City of Las Vegas criteria.
4. Proposed finished floors are adequately flood protected meeting criteria against design flows.
5. The grading plan, storm drain profile and detail sheets for this project have been included with this study. These plans support the drainage patterns and conclusions detailed in this study.

8 REFERENCES

1. *Las Vegas Valley Flood Control Master Plan Update*. PBS&J, Louis Berger Group and Parsons Brinckerhoff, 2013.
2. *Hydrologic Criteria and Drainage Design Manual*. Clark County Regional Flood Control District, 1999.
3. *Soil Survey of Las Vegas Valley Area, Nevada*. U.S. Department of Agriculture, National Resources Conservation Service, August 2014.
4. *Technical Drainage Study Update No. 2 for Skye Canyon – Phase 2 Infrastructure*; Slater Hanifan Group, May 2016
5. *Master Drainage Study Update No. 3 for Skye Canyon and Supplements*; Slater Hanifan Group, April 2016.

APPENDIX A

Drainage Exhibits

Exhibit A – Location Map

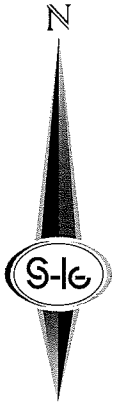
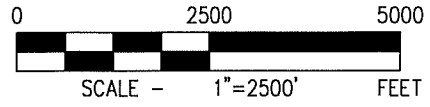
Exhibit B – FEMA FIRM Panel

Exhibit C – 2013 CCRFCD MPU Facilities

Exhibit D – Soils Map

Exhibit E – Developed Condition Drainage Map

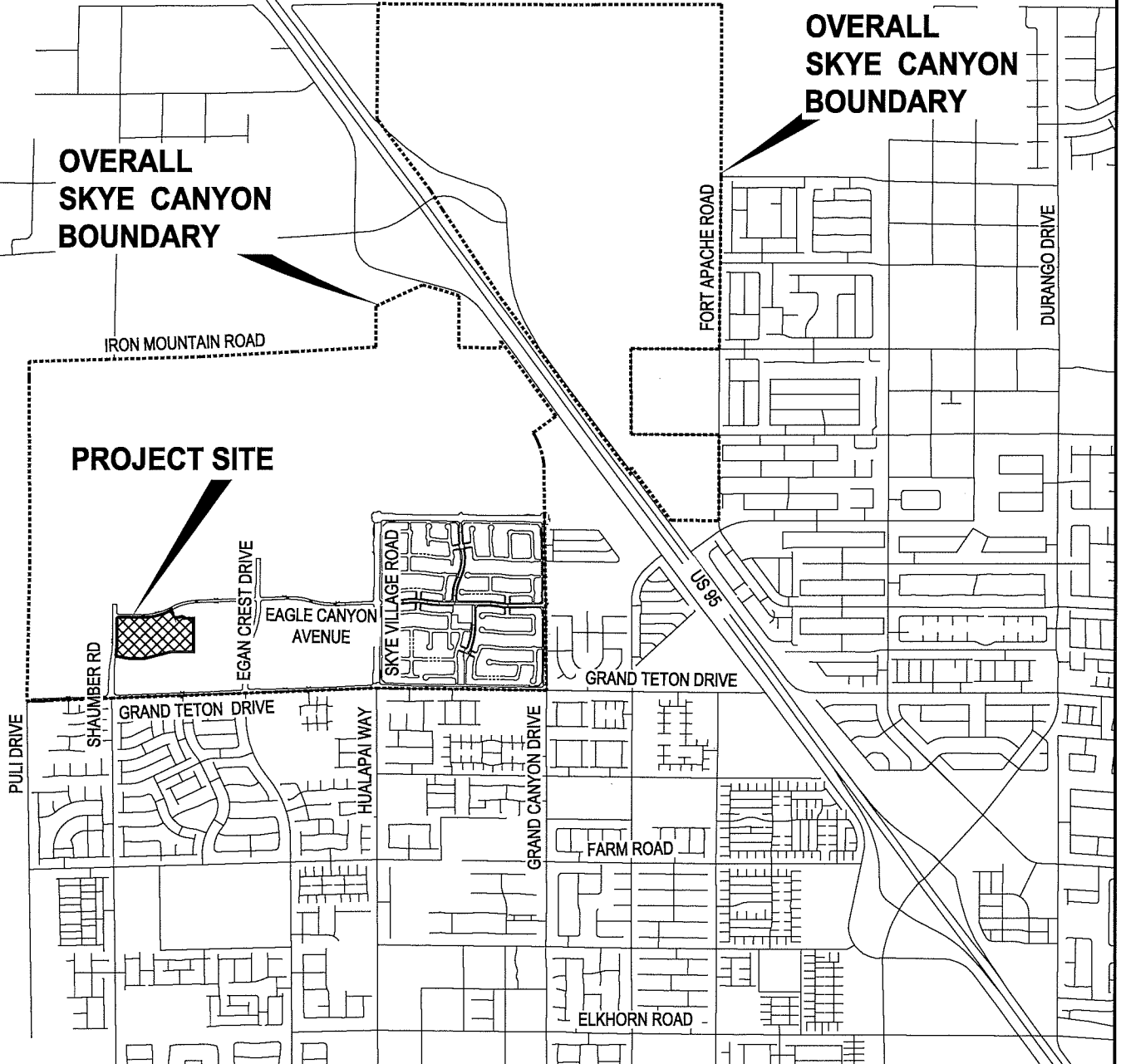
j:\oly1607-003 skye canyon parcel 2.23b\drainage\technical study\figures\oly1607-003 tds exhibit a location map.dwg 9/28/2016 11:43 AM Jonathan Rocha



**OVERALL
SKYE CANYON
BOUNDARY**

**OVERALL
SKYE CANYON
BOUNDARY**

PROJECT SITE

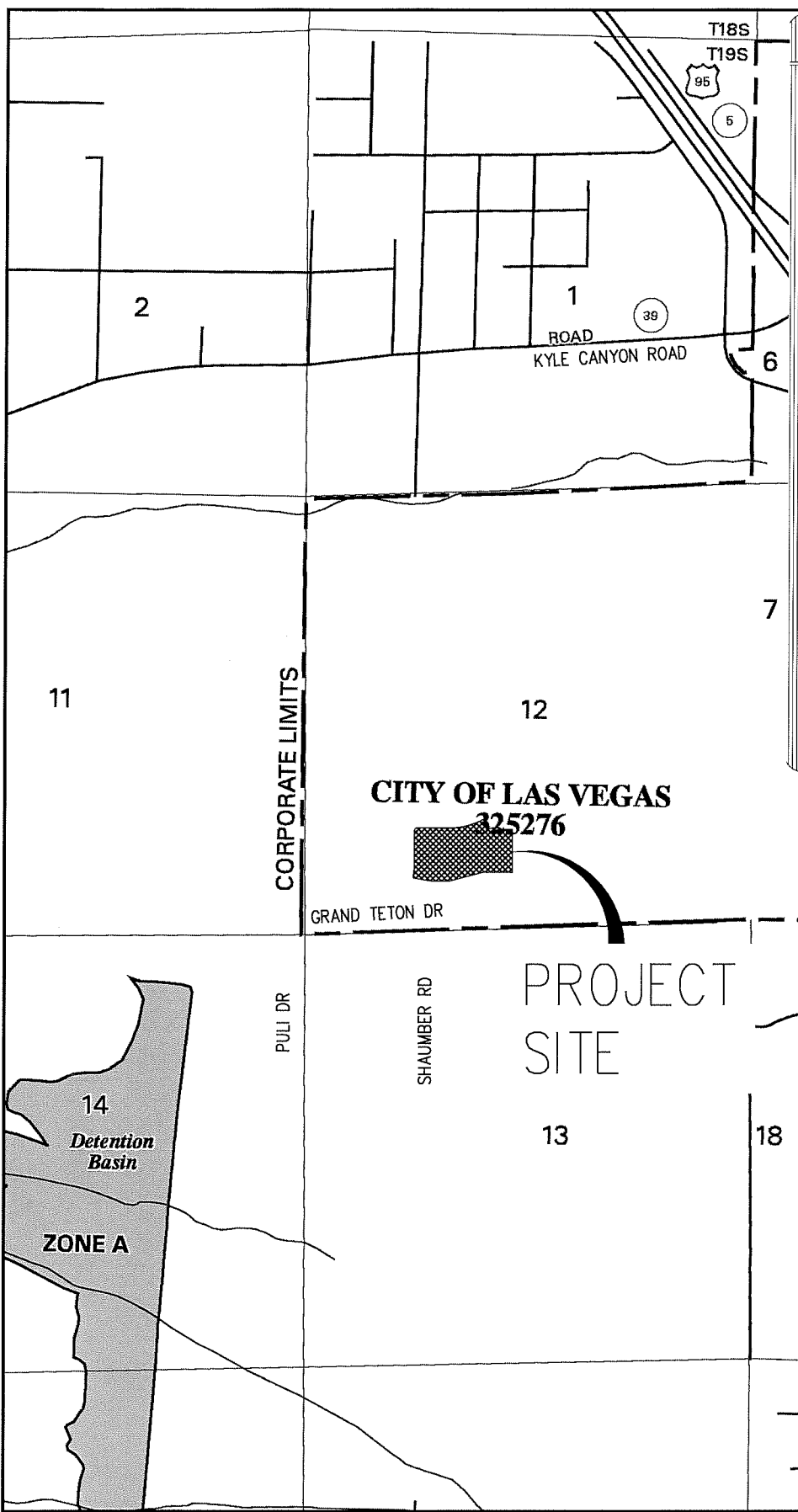


S-16
**SLATER
HANIFAN
GROUP**
CONSULTING ENGINEERS & PLANNERS
5740 S. ARVILLE STREET #216, LAS VEGAS, NV 89118
PHONE (702) 284-5300 FAX (702) 284-5399

NINETY-FIVE MANAGEMENT, LLC
SKYE CANYON PARCEL 2.23B
LOCATION MAP

DATE: SEPT 2016
DRAFTER: JSR
DESIGNER: JSR
CHECKED: SOA

PROJECT NO.
OLY1607-003
EXHIBIT A
SHEET 1 OF 1



PANEL 1750 E

FIRM
FLOOD INSURANCE RATE MAP
CLARK COUNTY,
NEVADA AND
INCORPORATED AREAS

PANEL 1750 OF 4090

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

<u>COMMUNITY</u>	<u>NUMBER</u>	<u>PANEL</u>	<u>SUFFIX</u>
------------------	---------------	--------------	---------------

LAS VEGAS, CITY OF	325278	1760	E
CLARK COUNTY, UNINCORPORATED AREAS	320003	1750	E

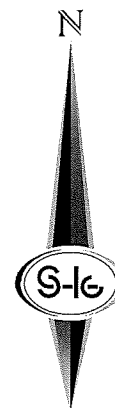
Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.



MAP NUMBER
32003C1750 E

**MAP REVISED:
SEPTEMBER 27, 2002**

Federal Emergency Management Agency

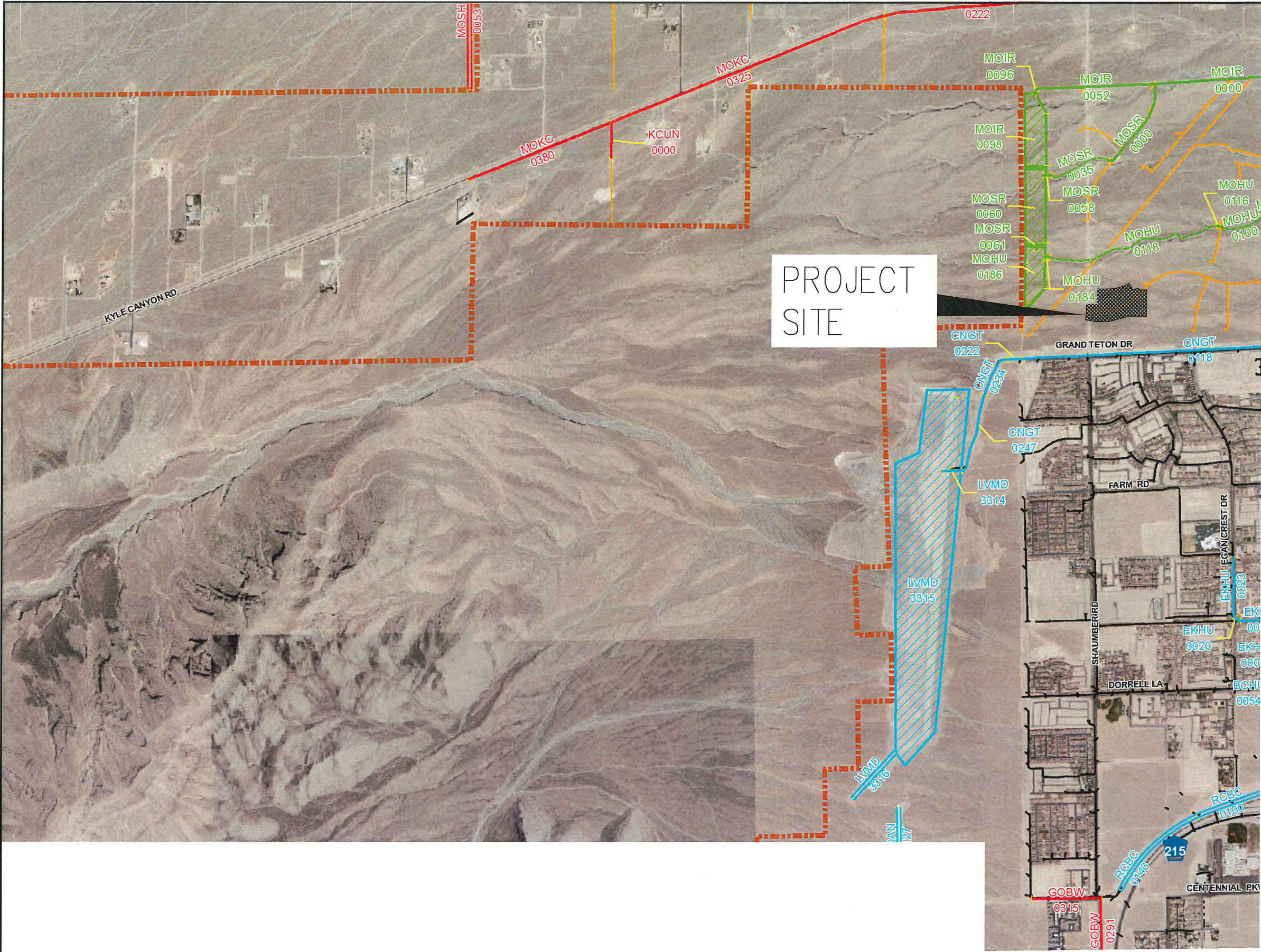


**S-I-G SLATER
HANIFAN
GROUP**
CONSULTING ENGINEERS & PLANNERS
5740 S. ARVILLE STREET #216, LAS VEGAS, NV 89118
PHONE (702) 284-5300 FAX (702) 284-5399

OLYMPIA COMPANIES, LLC
SKYE CANYON PARCEL 2.23B
FEMA FIRM MAP

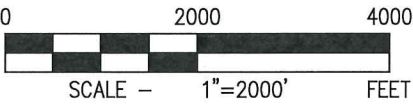
DATE: SEPT 2016	PROJECT NO. OLY1607-003
DRAFTER: JSR	
DESIGNER: JSR	EXHIBIT B
CHECKED: SOA	
	SHEET B OF 1

j:\oly1607-003 skye canyon parcel 2.23b\drainage\technical study\figures\oly1607-003 tds exhibit c 2013 ccrfcd facility map.dwg 9/28/2016 11:22 AM Jonathan Rocha



2013
LAS VEGAS VALLEY
FLOOD CONTROL
MASTER PLAN UPDATE
FIGURE F- 12
FLOOD CONTROL FACILITIES

- LEGEND**
- Ultimate Development Boundary
 - Existing Facilities
 - Category A Proposed Facilities
 - Category B Proposed Facilities
 - Local Existing Facilities
 - Local Proposed Facilities
 - Detention Basin
 - Stormdrain
 - Lined Channel
 - Unlined Channel
 - Levee/Dike
 - Natural Wash/Floodway
 - ID-Mile Separator
 - Remove & Replace/Parallel Facilities
 - Category A
 - Channel
 - Stormdrain
 - Category B
 - Channel
 - Stormdrain



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

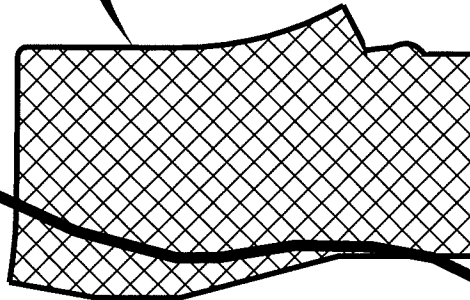
NO.	DESCRIPTION	DATE	BY	APP.	DATE

NINETY-FIVE MANAGEMENT, LLC
SKYE CANYON PARCEL 2.23B
2013 CCRFCD MPU FACILITIES MAP

DATE: SEPT 2016
DRAFTER: JSR
DESIGNER: JSR
CHECKED: SOA
PROJECT NO.
OLY1607-003
EXHIBIT C
SHEET C OF 1

155

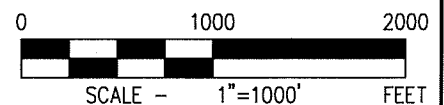
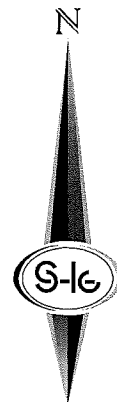
PROJECT SITE



191

GRAND TETON DR

SHAUMBER RD



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

NINETY-FIVE MANAGEMENT, LLC
SKYE CANYON PARCEL 2.23B
SOILS MAP

DATE: SEPT 2016
DRAFTER: JSR
DESIGNER: JSR
CHECKED: SOA

PROJECT NO.
OLY1607-003
EXHIBIT D
SHEET D OF 1

APPENDIX B

Hydrologic Computations

Curve Number & Soils Data

Rainfall and Precipitation Computation

Project Name: Skye Canyon Parcel 2.23b

Date: 10/25/2016

File Name: OLY1607-003 TDS Precipitation Calcs.xls

By: JSR

Data:

Project is located in: Township: 19 S. Range: 59 E. Section: 12

Reference:

APN Map

Site is NOT located in the McCarran Airport Rainfall Area

Figure 513*

Rainfall Depth-Duration-Frequency 10-Year, 6-Hour: 1.35 inches

Figure 503*

Rainfall Depth-Duration-Frequency 100-Year, 6-Hour: 2.10 inches

Figure 506*

Precipitation Adjustment Ratios:

10-Year: 1.24

Table 501*

100-Year: 1.43

Table 501*

Six Hour Depth Area Reduction Factors (DARF):

Area (gross acres): 16.7 = 0.0261 square miles

Table 502*

DARF = 1.00

Calculations:

$P_{10} = 1.67$ 10-Year Precipitation (in)

$P_{100} = 3.00$ 100-Year Precipitation (in)

$P_{10}/P_{100} = 0.56$ HEC-1 Multiple Ratio Value

Equations:

$P = (\text{Rainfall}) * (\text{Precipitation Adjustment Ratio}) * (\text{Depth Area Reduction Factor})$

* Equations taken from the Clark County Regional Flood Control District - Hydrologic Criteria and Drainage De



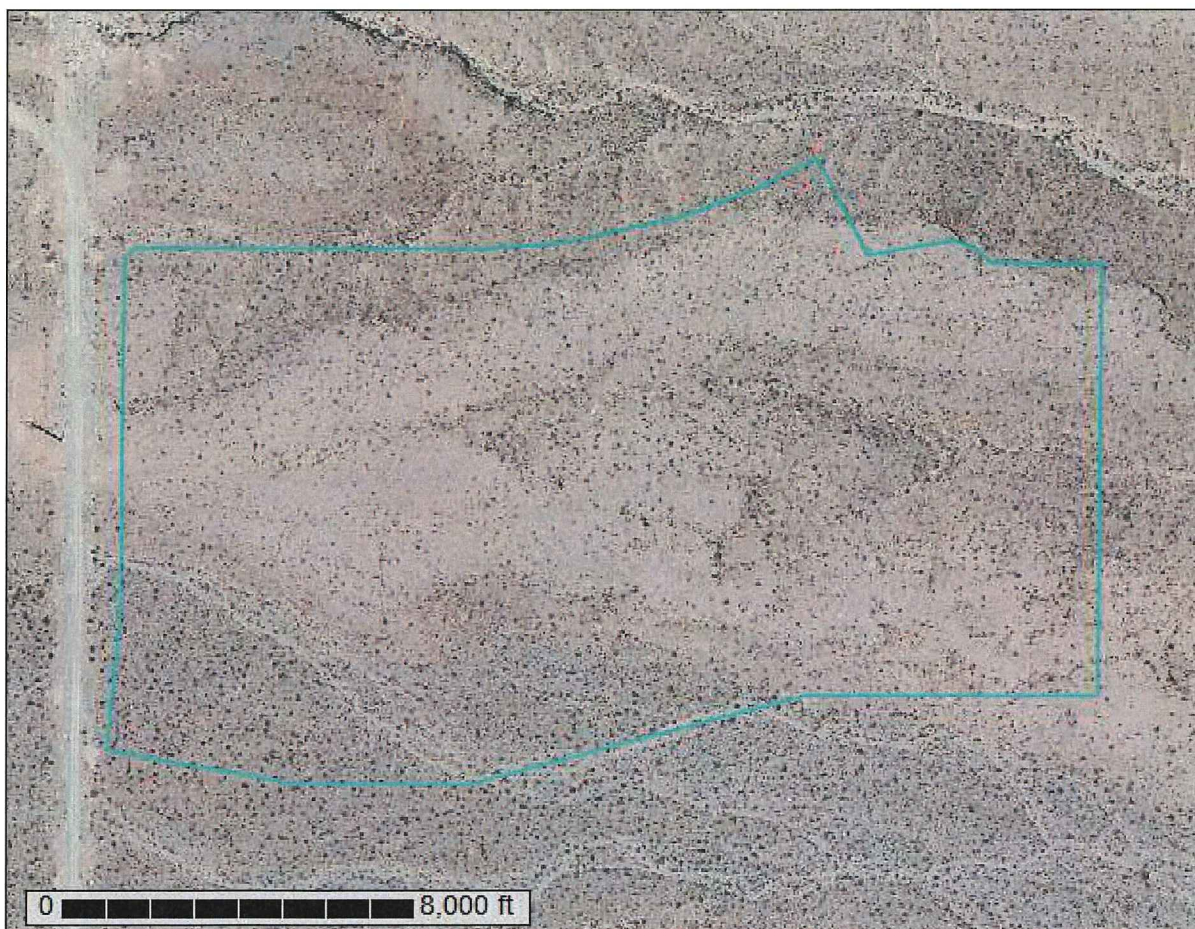
United States
Department of
Agriculture

NRCS

Natural
Resources
Conservation
Service

A product of the National
Cooperative Soil Survey,
a joint effort of the United
States Department of
Agriculture and other
Federal agencies, State
agencies including the
Agricultural Experiment
Stations, and local
participants

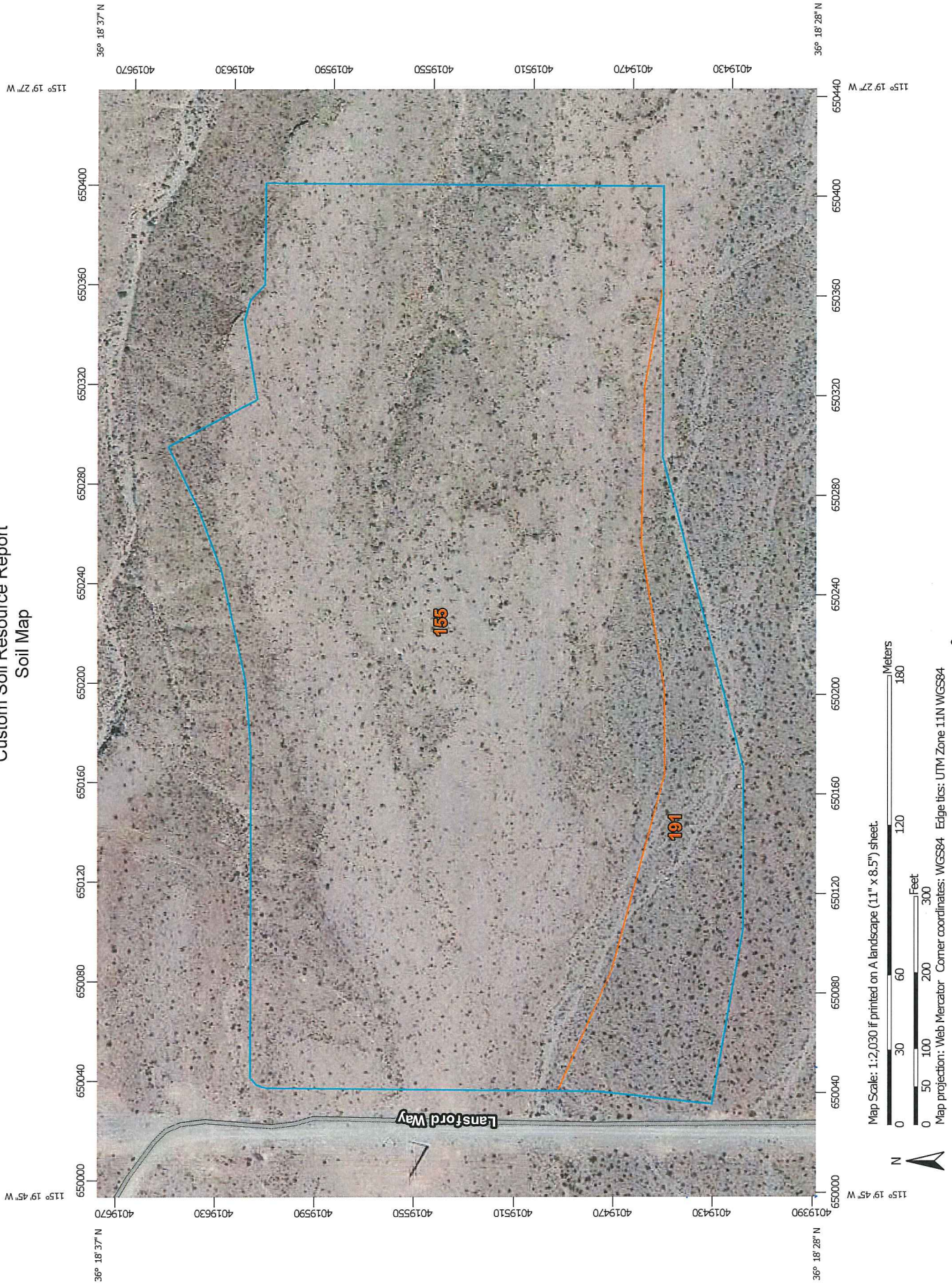
Custom Soil Resource Report for Las Vegas Valley Area, Nevada, Part of Clark County



Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map



MAP LEGEND

Area of Interest (AOI)		Area of Interest (AOI)		Spoil Area	
Soils		Soil Map Unit Polygons		Stony Spot	
		Soil Map Unit Lines		Very Stony Spot	
		Soil Map Unit Points		Wet Spot	
Special Point Features		Special Line Features		Other	
Water Features		Water Features		Special Line Features	
Blowout		Streams and Canals			
Borrow Pit		Transportation			
Clay Spot		Rails			
Closed Depression		Interstate Highways			
Gravel Pit		US Routes			
Gravelly Spot		Major Roads			
Landfill		Local Roads			
Lava Flow		Background			
Marsh or swamp		Aerial Photography			
Mine or Quarry					
Miscellaneous Water					
Perennial Water					
Rock Outcrop					
Saline Spot					
Sandy Spot					
Severely Eroded Spot					
Sinkhole					
Slide or Slip					
Sodic Spot					

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: <http://websoilsurvey.nrcs.usda.gov>
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Las Vegas Valley Area, Nevada, Part of Clark County
Survey Area Data: Version 10, Aug 22, 2014

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: May 7, 2011—Jun 2, 2011

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Las Vegas Valley Area, Nevada, Part of Clark County (NV788)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
155	Cave gravelly fine sandy loam, 4 to 15 percent slopes	14.5	86.5%
191	Dalian very cobbly fine sandy loam, 2 to 8 percent slopes	2.3	13.5%
Totals for Area of Interest		16.8	100.0%

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If

Custom Soil Resource Report

intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Soil Information for All Uses

Soil Reports

The Soil Reports section includes various formatted tabular and narrative reports (tables) containing data for each selected soil map unit and each component of each unit. No aggregation of data has occurred as is done in reports in the Soil Properties and Qualities and Suitabilities and Limitations sections.

The reports contain soil interpretive information as well as basic soil properties and qualities. A description of each report (table) is included.

Water Features

This folder contains tabular reports that present soil hydrology information. The reports (tables) include all selected map units and components for each map unit. Water Features include ponding frequency, flooding frequency, and depth to water table.

Hydrologic Soil Group and Surface Runoff

This table gives estimates of various soil water features. The estimates are used in land use planning that involves engineering considerations.

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The four hydrologic soil groups are:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Custom Soil Resource Report

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas.

Surface runoff refers to the loss of water from an area by flow over the land surface. Surface runoff classes are based on slope, climate, and vegetative cover. The concept indicates relative runoff for very specific conditions. It is assumed that the surface of the soil is bare and that the retention of surface water resulting from irregularities in the ground surface is minimal. The classes are negligible, very low, low, medium, high, and very high.

Report—Hydrologic Soil Group and Surface Runoff

Absence of an entry indicates that the data were not estimated. The dash indicates no documented presence.

Hydrologic Soil Group and Surface Runoff—Las Vegas Valley Area, Nevada, Part of Clark County			
Map symbol and soil name	Pct. of map unit	Surface Runoff	Hydrologic Soil Group
155—Cave gravelly fine sandy loam, 4 to 15 percent slopes			
Cave	100	Very high	D
191—Dalian very cobbly fine sandy loam, 2 to 8 percent slopes			
Dalian	100	Low	A

References

American Association of State Highway and Transportation Officials (AASHTO). 2004. Standard specifications for transportation materials and methods of sampling and testing. 24th edition.

American Society for Testing and Materials (ASTM). 2005. Standard classification of soils for engineering purposes. ASTM Standard D2487-00.

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deep-water habitats of the United States. U.S. Fish and Wildlife Service FWS/OBS-79/31.

Federal Register. July 13, 1994. Changes in hydric soils of the United States.

Federal Register. September 18, 2002. Hydric soils of the United States.

Hurt, G.W., and L.M. Vasilas, editors. Version 6.0, 2006. Field indicators of hydric soils in the United States.

National Research Council. 1995. Wetlands: Characteristics and boundaries.

Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_054262

Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service, U.S. Department of Agriculture Handbook 436. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053577

Soil Survey Staff. 2010. Keys to soil taxonomy. 11th edition. U.S. Department of Agriculture, Natural Resources Conservation Service. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053580

Tiner, R.W., Jr. 1985. Wetlands of Delaware. U.S. Fish and Wildlife Service and Delaware Department of Natural Resources and Environmental Control, Wetlands Section.

United States Army Corps of Engineers, Environmental Laboratory. 1987. Corps of Engineers wetlands delineation manual. Waterways Experiment Station Technical Report Y-87-1.

United States Department of Agriculture, Natural Resources Conservation Service. National forestry manual. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/home/?cid=nrcs142p2_053374

United States Department of Agriculture, Natural Resources Conservation Service. National range and pasture handbook. <http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/landuse/rangepasture/?cid=stelpdb1043084>

Custom Soil Resource Report

United States Department of Agriculture, Natural Resources Conservation Service. National soil survey handbook, title 430-VI. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/scientists/?cid=nrcs142p2_054242

United States Department of Agriculture, Natural Resources Conservation Service. 2006. Land resource regions and major land resource areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053624

United States Department of Agriculture, Soil Conservation Service. 1961. Land capability classification. U.S. Department of Agriculture Handbook 210. http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_052290.pdf

HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL

RUNOFF CURVE NUMBERS (URBAN AREAS¹)

Cover description		Curve numbers for hydrologic soil group—			
Cover type and hydrologic condition	Average percent impervious area ²	A	B	C	D
<i>Fully developed urban areas (vegetation established)</i>					
Open space (lawns, parks, golf courses, cemeteries, etc.): ³					
Poor condition (grass cover < 50%)		68	79	86	89
Fair condition (grass cover 50% to 75%)		49	69	79	84
Good condition (grass cover > 75%)		39	61	74	80
Impervious areas:					
Paved parking lots, roofs, driveways, etc. (excluding right-of-way)		98	98	98	98
Streets and roads:					
Paved; curbs and storm sewers (excluding right-of-way)		98	98	98	98
Paved; open ditches (including right-of-way)		83	89	92	93
Gravel (including right-of-way)		76	85	89	91
Dirt (including right-of-way)		72	82	87	89
Western desert urban areas:					
Natural desert landscaping (pervious areas only) ⁴ ...		63	77	85	88
Artificial desert landscaping (impervious weed barrier, desert shrub with 1- to 2-inch sand or gravel mulch and basin borders)		96	96	96	96
Urban districts:					
Commercial and business	85	89	92	94	95
Industrial	72	81	88	91	93

Residential districts by average lot size:

See Table 602A

Developing urban areas

Newly graded areas (pervious areas only, no vegetation) ⁵	77	86	91	94
--	----	----	----	----

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

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

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

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

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

Revision	Date

HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL

RUNOFF CURVE NUMBERS - RESIDENTIAL DISTRICTS

Average Lot Size or Usage ¹	Percent Impervious ²	Curve Number for Hydrologic Soil Groups			
		A	B	C	D
Apartments/Condos	72	81	88	91	93
Townhouses/6,000 sq ft lots or less ³	69	80	87	90	92
7,000 sq ft lots	63	76	84	89	91
8,000 sq ft lots	58	73	82	88	90
10,000 sq ft lots	38	61	75	83	87
14,000 sq ft lots	30	57	72	81	86
20,000 sq ft lots	25	54	70	80	85
40,000 sq ft lots	20	51	68	79	84
80,000 sq ft lots	12	46	65	77	82

1 Lot size should represent the size of the average lot and not the gross acreage divided by the number of lots.

2 Actual percent impervious value should be compared to selected land use type.

3 In cases where average residential lots are smaller than 6,000 sq ft, commercial/business/industrial land use should be used.

Revision	Date

REFERENCE:

TABLE 602A

Soil Data & Curve Number Computation

Project Name: Skye Canyon Parcel 2.23b

Date: 9/28/2016

File Name: OLY1607-003 TDS Curve Number Calcs.xlsx

By: JSR

Data:

Reference:

Exhibit D
NRCS Soil Data

Soil Type - Soil Survey Area & Version, Soil Description

		A	B	C	D
LV	Las Vegas Valley 2014	0%	0%	0%	100%
LV	Las Vegas Valley 2014	100%	0%	0%	0%

Land Use	A	B	C	D
Residential (<6,000 sf)*	89	92	94	95
Commercial	89	92	94	95

*Commercial land use per Note 3

EXISTING CONDITION

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	86.5%	Residential (<6,000 sf)*	0%	0%	0%	100%	89	92	94	95	14.50	82.14
	LV	191	13.5%	Residential (<6,000 sf)*	100%	0%	0%	0%	89	92	94	95	2.27	12.05
		TOTAL PERCENT	100.0%										16.77	94.2

TOTAL AREA & COMPOSITE CURVE NUMBER:

Lag Time Data



Developed Condition HEC-1 Model


```

1*****
*
* FLOOD HYDROGRAPH PACKAGE (HEC-1)
* JUN 1998
* VERSION 4.1
*
* RUN DATE 20OCT16 TIME 10:14:19
*
*****

```

DEV.OUT

```

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

```

```

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

```

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

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

1 HEC-1 INPUT PAGE 1

```

LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10
1          *DIAGRAM
2          ID      SLATER HANIFAN GROUP
3          ID      SKYE CANYON PARCEL 2.23b
4          ID      DEVELOPED CONDITION
5          ID      RETURN PERIOD ----- 100-YR & 10-YR
6          ID      DISTRIBUTION ----- 6-HOUR SDN3
7          ID      PROJECT NO. ----- OLY1607.003
8          ID      FILENAME ----- DEV.H1
9          ID      DATE ----- 10/19/2016
10         ID      MODELED BY ----- JSR
11         ID
12         ID      PRECIPITATION STORM EVENT RATIOS
13         ID      STORM EVENT          RATIO
14         ID      10-YR                0.56
15         ID      100-YR               1
16         ID
17         IT      5      0      0      300
18         IO      5      0      0
19         IN      5      0      0
20         JR      PREC 1.00 0.56
21         *
22         KK      ON1
23         KM      DEVELOPED ONSITE BASIN
24         BA      0.0262
25         PB      3.00
26         PC      0      0.020 0.057 0.070 0.087 0.108 0.124 0.130 0.130 0.130
27         PC      0.130 0.130 0.130 0.133 0.140 0.142 0.148 0.158 0.172 0.181
28         PC      0.190 0.197 0.199 0.200 0.201 0.204 0.214 0.229 0.241 0.249
29         PC      0.251 0.256 0.270 0.278 0.281 0.283 0.295 0.322 0.352 0.409
30         PC      0.499 0.590 0.710 0.744 0.781 0.812 0.819 0.835 0.851 0.856
31         PC      0.860 0.868 0.876 0.888 0.910 0.926 0.937 0.950 0.970 0.976
32         PC      0.982 0.985 0.987 0.989 0.990 0.993 0.993 0.994 0.995 0.998
33         PC      0.998 0.999 1
34         LS      0
35         UD      0.095
36         *
37         ZZ

```

```

1
SCHEMATIC DIAGRAM OF STREAM NETWORK
INPUT LINE (V) ROUTING (--->) DIVERSION OR PUMP FLOW
NO. (.) CONNECTOR (<---) RETURN OF DIVERTED OR PUMPED FLOW
21 ON1

```

(***) RUNOFF ALSO COMPUTED AT THIS LOCATION

```

1*****
*
* FLOOD HYDROGRAPH PACKAGE (HEC-1)
* JUN 1998
* VERSION 4.1
*
* RUN DATE 20OCT16 TIME 10:14:19
*
*****

```

```

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

```

SLATER HANIFAN GROUP
 SKYE CANYON PARCEL 2.23b
 DEVELOPED CONDITION

RETURN PERIOD ----- 100-YR & 10-YR

DISTRIBUTION ----- 6-HOUR SDN3
 PROJECT NO. ----- OLY1607.003
 FILENAME ----- DEV.H1
 DATE ----- 10/19/2016
 MODELED BY ----- JSR

DEV.OUT

PRECIPITATION STORM EVENT RATIOS
 STORM EVENT RATIO
 10-YR 0.56
 100-YR 1

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

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

COMPUTATION INTERVAL .08 HOURS
 TOTAL TIME BASE 24.92 HOURS

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

JP MULTI-PLAN OPTION
 NPLAN 1 NUMBER OF PLANS

JR MULTI-RATIO OPTION
 RATIOS OF PRECIPITATION
 1.00 .56

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	.56
HYDROGRAPH AT					
+	ON1	.03	1 FLOW	53.	26.
			TIME	3.50	3.50

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

APPENDIX C

Hydraulic Computations

Interior Street Flow Computations

SECTION 1 Interior 49' ROW - Roll Curb Min%

Project Description

Friction Method Manning Formula
Solve For Normal Depth

Input Data

Channel Slope 0.55 %
Discharge 53.00 ft³/s
Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.48
0+05.00	0.38
0+05.38	0.38
0+06.50	0.00
0+07.50	0.08
0+07.50	0.12
0+24.50	0.44
0+41.50	0.12
0+41.50	0.08
0+42.50	0.00
0+43.62	0.38
0+44.00	0.38
0+49.00	0.48

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 0.48)	(0+07.50, 0.08)	0.013
(0+07.50, 0.08)	(0+41.50, 0.08)	0.016
(0+41.50, 0.08)	(0+49.00, 0.48)	0.013

Options

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

SECTION 1 Interior 49' ROW - Roll Curb Min%

Results

Normal Depth		0.62	ft
Elevation Range	0.00 to 0.48 ft		
Flow Area		15.63	ft ²
Wetted Perimeter		49.49	ft
Hydraulic Radius		0.32	ft
Top Width		49.00	ft
Normal Depth		0.62	ft
Critical Depth		0.63	ft
Critical Slope		0.48591	%
Velocity		3.39	ft/s
Velocity Head		0.18	ft
Specific Energy		0.80	ft
Froude Number		1.06	
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	0.55	%
Critical Slope	0.48591	%

SECTION 1 Interior 49' ROW - Roll Curb Min%

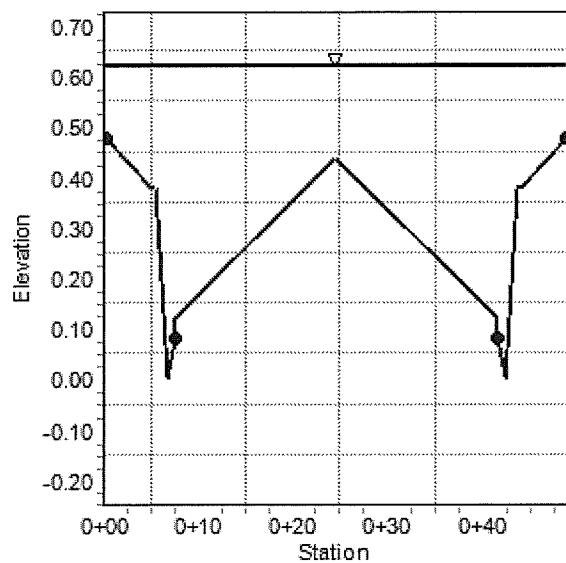
Project Description

Friction Method Manning Formula
Solve For Normal Depth

Input Data

Channel Slope 0.55 %
Normal Depth 0.62 ft
Discharge 53.00 ft³/s

Cross Section Image



SECTION 1 Interior 49' ROW - Roll Curb Max%

Project Description

Friction Method Manning Formula
Solve For Normal Depth

Input Data

Channel Slope 6.13 %
Discharge 53.00 ft³/s
Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.48
0+05.00	0.38
0+05.38	0.38
0+06.50	0.00
0+07.50	0.08
0+07.50	0.12
0+24.50	0.44
0+41.50	0.12
0+41.50	0.08
0+42.50	0.00
0+43.62	0.38
0+44.00	0.38
0+49.00	0.48

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 0.48)	(0+07.50, 0.08)	0.013
(0+07.50, 0.08)	(0+41.50, 0.08)	0.016
(0+41.50, 0.08)	(0+49.00, 0.48)	0.013

Options

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

SECTION 1 Interior 49' ROW - Roll Curb Max%

Results

Normal Depth	0.45	ft
Elevation Range	0.00 to 0.48 ft	
Flow Area	7.42	ft ²
Wetted Perimeter	46.09	ft
Hydraulic Radius	0.16	ft
Top Width	45.87	ft
Normal Depth	0.45	ft
Critical Depth	0.63	ft
Critical Slope	0.49486	%
Velocity	7.14	ft/s
Velocity Head	0.79	ft
Specific Energy	1.24	ft
Froude Number	3.13	
Flow Type	Supercritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.45	ft
Critical Depth	0.63	ft
Channel Slope	6.13	%
Critical Slope	0.49486	%

SECTION 1 Interior 49' ROW - Roll Curb Max%

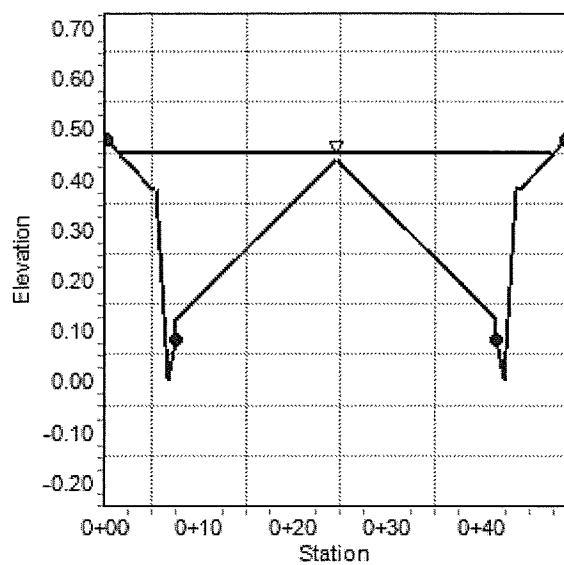
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	6.13 %
Normal Depth	0.45 ft
Discharge	53.00 ft ³ /s

Cross Section Image



Weir Computations

Worksheet for Section W1 - 16' Weir @ Basin ON1 (Normal Depth)

Project Description

Friction Method Manning Formula
Solve For Normal Depth

Input Data

Channel Slope 1.00 %
Discharge 53.00 ft³/s

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	1.00
0+00.33	0.00
0+16.33	0.00
0+16.66	1.00

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 1.00)	(0+16.66, 1.00)	0.037

SEE NOTE ON PAGE 2.

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 0.91 ft
Elevation Range 0.00 to 1.00 ft
Flow Area 14.92 ft²
Wetted Perimeter 17.93 ft
Hydraulic Radius 0.83 ft
Top Width 16.60 ft
Normal Depth 0.91 ft
Critical Depth 0.70 ft
Critical Slope 2.44842 %

Worksheet for Section W1 - 16' Weir @ Basin ON1 (Normal Depth)

Results

Velocity	3.55	ft/s
Velocity Head	0.20	ft
Specific Energy	1.11	ft
Froude Number	0.66	
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	0.91	ft
Critical Depth	0.70	ft
Channel Slope	1.00	%
Critical Slope	2.44842	%

Messages

* Notes *

Manning's Roughness Coefficient = 0.037 for D50 = 8-inch Rip-rap

Worksheet for Section W1 - 16' Weir @ Basin ON1 (Weir)

Project Description

Solve For Headwater Elevation

Input Data

Discharge		53.00	ft³/s
Crest Elevation		0.00	ft
Tailwater Elevation		0.91	ft
Crest Surface Type	Paved		
Crest Breadth		5.00	ft
Crest Length		16.00	ft

Results

Headwater Elevation	1.06	ft
Headwater Height Above Crest	1.06	ft
Tailwater Height Above Crest	0.91	ft
Weir Coefficient	3.07	US
Submergence Factor	0.99	
Adjusted Weir Coefficient	3.03	US
Flow Area	16.98	ft²
Velocity	3.12	ft/s
Wetted Perimeter	18.12	ft
Top Width	16.00	ft

Cross Section for Section W1 - 16' Weir @ Basin ON1 (Weir)

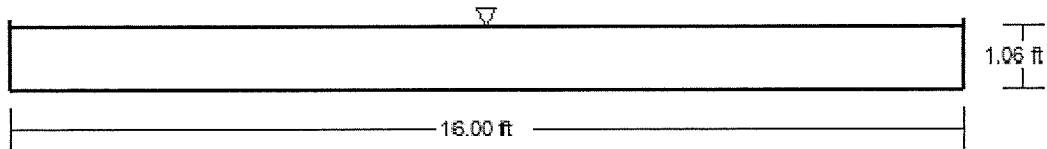
Project Description

Solve For Headwater Elevation

Input Data

Discharge	53.00	ft ³ /s
Headwater Elevation	1.06	ft
Crest Elevation	0.00	ft
Tailwater Elevation	0.91	ft
Crest Surface Type	Paved	
Crest Breadth	5.00	ft
Crest Length	16.00	ft

Cross Section Image



V: 1
H: 1

Rip Rap Sizing Computation

Project Name: Skye Canyon Parcel 2.23b

Date: 11/1/2016

File Name: OLY1607-003 TDS Riprap Sizing Calcs.xls

By: JSR

Location:

Discharge of Basin ON1

Known Information:

Reference:

Rip Rap protection at

V = Velocity (fps)	3.55	WSPG Hydraulic / Flowmaster Calculations
S _g = Specific Gravity of Rock (typ=2.5)	2.5	Use Typical
s = Longitudinal Channel Slope (ft/ft)	0.01	Grading Plan

Solve For:

d ₅₀ = 0.13 ft	- Average Rock Size
d ₅₀ = 2 in	- Average Rock Size
Thickness = 4 in	- Thickness of Rip Rap protection
Manning's 'n' = 0.029	- Roughness Coefficient

Equations:

Based upon a Stable Channel Lining

$$d_{50} = ((vel * S^{0.17}) / (3 * (S_g - 1)))^2 \quad \text{Equation 734*}$$

$$n = 0.0395(d_{50})^{1/6} \quad \text{Equation 732*}$$

Recommendations:

Minimum D₅₀ = 8-inch size rip rap at thickness = 16-inches

* Equations taken from the Clark County Regional Flood Control District - Hydrologic Criteria and Drainage Design Manual

APPENDIX D

Finish Floors Analysis

SKYE CANYON PARCEL 2.23B FINISH FLOOR - CITY OF LAS VEGAS JURISDICTION											
INPUT INFORMATION				FINISHED FLOORS					NOTES		
Lot Number	Hydraulic Section Utilized	T/C ¹ (ft)	F/L ² (ft)	D ₁₀₀ (ft)	Flowline F.F. _{min} ³ (ft)	T/C + 6" F.F. _{min} ⁴ (ft)	F.F. _{Design} (ft)	Flowline Check	T/C + 6" Check	See References on Last Sheet	
1	1	2991.82	2991.44	0.62	2992.68	2992.32	2993.6	OK	OK		
2	1	2994.05	2993.67	0.62	2994.91	2994.55	2995.8	OK	OK		
3	1	2996.04	2995.66	0.62	2996.90	2996.54	2997.8	OK	OK		
4	1	2998.13	2997.75	0.62	2998.99	2998.63	2999.9	OK	OK		
5	1	2999.79	2999.41	0.62	3000.65	3000.29	3001.5	OK	OK		
6	1	3001.16	3000.78	0.62	3002.02	3001.66	3002.9	OK	OK		
7	1	3002.49	3002.11	0.62	3003.35	3002.99	3004.2	OK	OK		
8	1	3003.82	3003.44	0.62	3004.68	3004.32	3005.6	OK	OK		
9	1	3005.16	3004.78	0.62	3006.02	3005.66	3006.9	OK	OK		
10	1	3006.34	3005.96	0.62	3007.20	3006.84	3008.1	OK	OK		
11	1	3009.27	3008.89	0.62	3010.13	3009.77	3010.9	OK	OK		
12	1	3008.58	3008.20	0.62	3009.44	3009.08	3010.3	OK	OK		
13	1	3007.86	3007.48	0.62	3008.72	3008.36	3009.6	OK	OK		
14	1	3008.24	3007.86	0.62	3009.10	3008.74	3010.0	OK	OK		
15	1	3008.73	3008.35	0.62	3009.59	3009.23	3010.5	OK	OK		
16	1	3009.38	3009.00	0.62	3010.24	3009.88	3011.1	OK	OK		
17	1	3009.95	3009.57	0.62	3010.81	3010.45	3011.7	OK	OK		
18	1	3010.52	3010.14	0.62	3011.38	3011.02	3012.3	OK	OK		
19	1	3011.12	3010.74	0.62	3011.98	3011.62	3012.9	OK	OK		
20	1	3011.71	3011.33	0.62	3012.57	3012.21	3013.5	OK	OK		
21	1	3012.30	3011.92	0.62	3013.16	3012.80	3014.0	OK	OK		
22	1	3012.90	3012.52	0.62	3013.76	3013.40	3014.6	OK	OK		
23	1	3013.49	3013.11	0.62	3014.35	3013.99	3015.2	OK	OK		
24	1	3014.11	3013.73	0.62	3014.97	3014.61	3015.9	OK	OK		
25	1	3011.61	3011.23	0.62	3012.47	3012.11	3013.4	OK	OK		
26	1	3010.49	3010.11	0.62	3011.35	3010.99	3012.2	OK	OK		
27	1	3008.75	3008.37	0.62	3009.61	3009.25	3010.5	OK	OK		
28	1	3006.65	3006.27	0.62	3007.51	3007.15	3008.4	OK	OK		
29	1	3004.54	3004.16	0.62	3005.40	3005.04	3006.3	OK	OK		
30	1	3002.58	3002.20	0.62	3003.44	3003.08	3004.3	OK	OK		
31	1	3000.35	2999.97	0.62	3001.21	3000.85	3002.1	OK	OK		
32	1	2997.85	2997.47	0.62	2998.71	2998.35	2999.6	OK	OK		
33	1	2995.28	2994.90	0.62	2996.14	2995.78	2997.0	OK	OK		
34	1	2992.71	2992.33	0.62	2993.57	2993.21	2994.5	OK	OK		

SKYE CANYON PARCEL 2.23B FINISH FLOOR - CITY OF LAS VEGAS JURISDICTION											
INPUT INFORMATION				FINISHED FLOORS					NOTES		
Lot Number	Hydraulic Section Utilized	T/C ¹ (ft)	F/L ² (ft)	D ₁₀₀ (ft)	Flowline F.F. ³ -min (ft)	T/C + 6" F.F. ⁴ -min (ft)	F.F. Design (ft)	Flowline Check	T/C + 6" Check	See References on Last Sheet	
35	1	2990.43	2990.05	0.62	2991.29	2990.93	2992.2	OK	OK		
36	1	2988.63	2988.25	0.62	2989.49	2989.13	2990.4	OK	OK		
37	1	2987.19	2986.81	0.62	2988.05	2987.69	2988.9	OK	OK		
38	1	2985.78	2985.40	0.62	2986.64	2986.28	2987.5	OK	OK		
39	1	2984.36	2983.98	0.62	2985.22	2984.86	2986.1	OK	OK		
40	1	2980.80	2980.42	0.62	2981.66	2981.30	2982.5	OK	OK		
41	1	2978.59	2978.21	0.62	2979.45	2979.09	2980.3	OK	OK		
42	1	2976.26	2975.88	0.62	2977.12	2976.76	2978.0	OK	OK		
43	1	2973.83	2973.45	0.62	2974.69	2974.33	2975.6	OK	OK		
44	1	2972.21	2971.83	0.62	2973.07	2972.71	2974.0	OK	OK		
45	1	2971.34	2970.96	0.62	2972.20	2971.84	2973.5	OK	OK		
46	1	2971.64	2971.26	0.62	2972.50	2972.14	2973.8	OK	OK		
47	1	2970.90	2970.52	0.62	2971.76	2971.40	2972.7	OK	OK		
48	1	2970.52	2970.14	0.62	2971.38	2971.02	2972.4	OK	OK		
49	1	2970.27	2969.89	0.62	2971.13	2970.77	2972.2	OK	OK		
50	1	2970.00	2969.62	0.62	2970.86	2970.50	2971.9	OK	OK		
51	1	2969.72	2969.34	0.62	2970.58	2970.22	2971.6	OK	OK		
52	1	2969.44	2969.06	0.62	2970.30	2969.94	2971.3	OK	OK		
53	1	2969.13	2968.75	0.62	2969.99	2969.63	2971.0	OK	OK		
54	1	2968.81	2968.43	0.62	2969.67	2969.31	2970.9	OK	OK		
55	1	2969.24	2968.86	0.62	2970.10	2969.74	2971.2	OK	OK		
56	1	2969.42	2969.04	0.62	2970.28	2969.92	2971.3	OK	OK		
57	1	2969.66	2969.28	0.62	2970.52	2970.16	2971.5	OK	OK		
58	1	2969.91	2969.53	0.62	2970.77	2970.41	2971.8	OK	OK		
59	1	2970.19	2969.81	0.62	2971.05	2970.69	2972.0	OK	OK		
60	1	2970.48	2970.10	0.62	2971.34	2970.98	2972.3	OK	OK		
61	1	2971.22	2970.84	0.62	2972.08	2971.72	2973.0	OK	OK		
62	1	2983.01	2982.63	0.62	2983.87	2983.51	2985.0	OK	OK		
63	1	2982.86	2982.48	0.62	2983.72	2983.36	2984.8	OK	OK		
64	1	2982.61	2982.23	0.62	2983.47	2983.11	2984.5	OK	OK		
65	1	2982.32	2981.94	0.62	2983.18	2982.82	2984.1	OK	OK		
66	1	2981.98	2981.60	0.62	2982.84	2982.48	2983.7	OK	OK		
67	1	2981.14	2980.76	0.62	2982.00	2981.64	2982.9	OK	OK		
68	1	2982.22	2981.84	0.62	2983.08	2982.72	2984.0	OK	OK		

SKYE CANYON PARCEL 2.23B FINISH FLOOR - CITY OF LAS VEGAS JURISDICTION											
INPUT INFORMATION				FINISHED FLOORS					NOTES		
Lot Number	Hydraulic Section Utilized	T/C ¹ (ft)	F/L ² (ft)	D ₁₀₀ (ft)	Flowline F.F. ³ (ft)	T/C + 6" F.F. ⁴ (ft)	F.F. ^{Design} (ft)	Flowline Check	T/C + 6" Check	See References on Last Sheet	
69	1	2982.44	2982.06	0.62	2983.30	2982.94	2984.2	OK	OK		
70	1	2982.69	2982.31	0.62	2983.55	2983.19	2984.5	OK	OK		
71	1	2983.19	2982.81	0.62	2984.05	2983.69	2984.9	OK	OK		
72	1	2983.19	2982.81	0.62	2984.05	2983.69	2985.3	OK	OK		
73	1	2989.39	2989.01	0.62	2990.25	2989.89	2991.1	OK	OK		
74	1	2991.42	2991.04	0.62	2992.28	2991.92	2993.2	OK	OK		
75	1	2993.89	2993.51	0.62	2994.75	2994.39	2995.6	OK	OK		
76	1	2996.46	2996.08	0.62	2997.32	2996.96	2998.2	OK	OK		
77	1	2999.07	2998.69	0.62	2999.93	2999.57	3000.0	OK	OK		
78	1	3001.21	3000.83	0.62	3002.07	3001.71	3003.0	OK	OK		
79	1	3000.89	3000.51	0.62	3001.75	3001.39	3002.7	OK	OK		
80	1	3000.68	3000.30	0.62	3001.54	3001.18	3002.4	OK	OK		
81	1	3000.22	2999.84	0.62	3001.08	3000.72	3002.0	OK	OK		
82	1	2994.11	2993.73	0.62	2994.97	2994.61	2995.9	OK	OK		
83	1	2992.39	2992.01	0.62	2993.25	2992.89	2994.1	OK	OK		
84	1	2990.64	2990.26	0.62	2991.50	2991.14	2992.4	OK	OK		
85	1	3000.42	3000.04	0.62	3001.28	3000.92	3002.4	OK	OK		
86	1	3000.66	3000.28	0.62	3001.52	3001.16	3002.6	OK	OK		
87	1	3000.92	3000.54	0.62	3001.78	3001.42	3002.8	OK	OK		
88	1	3001.13	3000.75	0.62	3001.99	3001.63	3003.0	OK	OK		
89	1	3001.35	3000.97	0.62	3002.21	3001.85	3003.2	OK	OK		
90	1	3001.57	3001.19	0.62	3002.43	3002.07	3003.4	OK	OK		
91	1	3002.60	3002.22	0.62	3003.46	3003.10	3005.3	OK	OK		
92	1	3011.96	3011.58	0.62	3012.82	3012.46	3014.7	OK	OK		
93	1	3011.55	3011.17	0.62	3012.41	3012.05	3013.3	OK	OK		
94	1	3010.96	3010.58	0.62	3011.82	3011.46	3012.7	OK	OK		
95	1	3010.36	3009.98	0.62	3011.22	3010.86	3012.1	OK	OK		
96	1	3009.72	3009.34	0.62	3010.58	3010.22	3011.5	OK	OK		
97	1	3009.07	3008.69	0.62	3009.93	3009.57	3010.8	OK	OK		
98	1	3008.43	3008.05	0.62	3009.29	3008.93	3010.2	OK	OK		
99	1	2974.33	2973.95	0.62	2975.19	2974.83	2976.1	OK	OK		
100	1	2977.02	2976.64	0.62	2977.88	2977.52	2978.8	OK	OK		
101	1	2980.11	2979.73	0.62	2980.97	2980.61	2981.9	OK	OK		
102	1	2983.23	2982.85	0.62	2984.09	2983.73	2984.1	OK	OK		

SKYE CANYON PARCEL 2.23B										
FINISH FLOOR - CITY OF LAS VEGAS JURISDICTION										
INPUT INFORMATION				FINISHED FLOORS				NOTES		
Lot Number	Hydraulic Section Utilized	T/C ¹ (ft)	F/L ² (ft)	D ₁₀₀ (ft)	Flowline F.F. _{-min} ³ (ft)	T/C + 6" F.F. _{-min} ⁴ (ft)	F.F. _{-Design} (ft)	Flowline Check	T/C + 6" Check	See References on Last Sheet
Where: 1: Top of Curb at High Side of Lot 2: TC-0.38 (For Roll Curb) 3: Minimum Allowable Finished Floor Elevation above flowline elevation @ high side of lot = (2 x D ₁₀₀) + F/L 4: City of Las Vegas minimum allowable finished floor elevation = T.C. @ high side of lot + 6-inches 5: These lots have an adjacent solid grouted wall that protects the FF.										
City of Las Vegas Finished Floor Criteria: -The finished floor shall be set a vertical distance above the gutter flowline of at least twice the depth of flow in the gutter flowline up to a maximum of 18 inches above the WSEL in the street. -The finished floor shall be set a vertical distance of at least 6-inches above the highest adjacent top of curb.										

Supplemental Finish Floor Checks

Drainage Easements Check

Lot Number	High TC/FL ¹	Section	Flow Depth ²	Min FF ³	Design FF	Check	Solid Grout
54	2968.51	W1	1.07	2971.08	2971.10	OK	No

1: High TC/FL is at the high side of the drainage easement flowline or the highest TC adjacent to the easement if flow is weiring over the curb.

2: Flow depth is either normal depth or weir depth (whichever is higher).

3: Min FF is the High TC/FL plus the Flow Depth plus 18 inches.

Specific Energy Check

Lot Number	High TC ¹	High FL ²	Section	Specific Energy ³	Min FF ⁴	Design FF	Check
5	2999.79	2999.41	1.00	1.24	3000.65	3001.50	OK
6	2999.79	2999.41	1.00	1.24	3000.65	3002.90	OK
54	2968.51	2968.13	1.00	1.24	2969.37	2970.90	OK
101	2980.11	2979.73	1.00	1.24	2980.97	2981.90	OK
102	2980.11	2979.73	1.00	1.24	2980.97	2984.10	OK

1: High TC is the elevation at the high side of the adjacent perimeter street

2: 0.38-ft is subtracted from the High TC to obtain the High FL elevation

3: Specific energy depth is taken from FlowMaster calculation for street directing flow toward lot.

4: Min FF is the High FL plus the specific energy depth.

Adjacent/Perimeter Street Check									
Lot Number	Street	High TC ¹	High FL ²	Section	Flow Depth ³	Min FF ⁴	Design FF	Check	Solid Grout
1	EAGLE CANYON	2994.32	2993.82	ECA1	0.48	2994.78	2993.6	CHECK	Yes
2	EAGLE CANYON	2996.78	2996.28	ECA1	0.48	2997.24	2995.8	CHECK	Yes
3	EAGLE CANYON	2996.78	2996.28	ECA1	0.48	2997.24	2997.8	OK	No
4	EAGLE CANYON	2999.21	2998.71	ECA1	0.48	2999.67	2999.9	OK	No
5	EAGLE CANYON	3001.72	3001.22	ECA1	0.48	3002.18	3001.5	CHECK	Yes
6	EAGLE CANYON	3001.72	3001.22	ECA1	0.48	3002.18	3002.9	OK	No
7	EAGLE CANYON	3004.03	3003.53	ECA1	0.48	3004.49	3004.2	CHECK	Yes
8	EAGLE CANYON	3005.89	3005.39	ECA1	0.48	3006.35	3005.6	CHECK	Yes
9	EAGLE CANYON	3007.29	3006.79	ECA1	0.48	3007.75	3006.9	CHECK	Yes
10	EAGLE CANYON	3007.60	3007.10	ECA1	0.48	3008.06	3008.1	OK	No
11	EAGLE CANYON	3010.33	3009.83	ECA1	0.48	3010.79	3010.9	OK	No
11	SHAUMBER	3011.60	3011.10	SHA	0.33	3011.76	3010.9	CHECK	Yes
12	SHAUMBER	3012.64	3012.14	SHA	0.33	3012.80	3010.3	CHECK	Yes
13	SHAUMBER	3014.40	3013.90	SHA	0.33	3014.56	3009.6	CHECK	Yes
14	SHAUMBER	3015.57	3015.07	SHA	0.33	3015.73	3010.0	CHECK	Yes
15	SHAUMBER	3016.22	3015.72	SHA	0.33	3016.38	3010.5	CHECK	Yes
16	SHAUMBER	3017.30	3016.80	SHA	0.33	3017.46	3011.1	CHECK	Yes
17	SHAUMBER	3018.60	3018.10	SHA	0.33	3018.76	3011.7	CHECK	Yes
18	SHAUMBER	3019.73	3019.23	SHA	0.33	3019.89	3012.3	CHECK	Yes
19	SHAUMBER	3019.73	3019.23	SHA	0.33	3019.89	3012.9	CHECK	Yes
20	SHAUMBER	3020.55	3020.05	SHA	0.33	3020.71	3013.5	CHECK	Yes
21	SHAUMBER	3021.55	3021.05	SHA	0.33	3021.71	3014.0	CHECK	Yes
22	SHAUMBER	3021.60	3021.10	SHA	0.33	3021.76	3014.6	CHECK	Yes
23	SHAUMBER	3021.60	3021.10	SHA	0.33	3021.76	3015.2	CHECK	Yes
24	SHAUMBER	3021.70	3021.20	SHA	0.33	3021.86	3015.9	CHECK	Yes
55	INTERIOR	2974.23	2973.85	1	0.62	2975.09	2971.2	CHECK	Yes
61	INTERIOR	2977.64	2977.26	1	0.62	2978.50	2973.0	CHECK	Yes
62	INTERIOR	2981.55	2981.17	1	0.62	2982.41	2985.0	OK	No
67	INTERIOR	2977.89	2977.51	1	0.62	2978.75	2982.9	OK	No
68	INTERIOR	2988.51	2988.13	1	0.62	2989.37	2984.0	CHECK	Yes
72	INTERIOR	2983.14	2982.76	1	0.62	2984.00	2985.3	OK	No
77	INTERIOR	3001.69	3001.31	1	0.62	3002.55	3000.0	CHECK	Yes
81	INTERIOR	2997.55	2997.17	1	0.62	2998.41	3002.0	OK	No
85	INTERIOR	3003.78	3003.40	1	0.62	3004.64	3002.4	CHECK	Yes
91	INTERIOR	3008.39	3008.01	1	0.62	3009.25	3005.3	CHECK	Yes
92	INTERIOR	3011.77	3011.39	1	0.62	3012.63	3014.7	OK	No
98	INTERIOR	3006.34	3005.96	1	0.62	3007.20	3010.2	OK	No
99	EAGLE CANYON	2979.59	2979.09	ECA1	0.48	2980.05	2976.1	CHECK	Yes
100	EAGLE CANYON	2982.03	2981.53	ECA1	0.48	2982.49	2978.8	CHECK	Yes
101	EAGLE CANYON	2984.50	2984.00	ECA1	0.48	2984.96	2981.9	CHECK	Yes
102	EAGLE CANYON	2986.69	2986.19	ECA1	0.48	2987.15	2984.1	CHECK	Yes

1: High TC is the elevation at the high side of the adjacent perimeter street

2: 0.50-ft is subtracted from the High TC to obtain the High FL elevation for Shaumber Road and Eagle Canyon Sections.

0.38-ft is subtracted from the High TC to obtain the High FL elevation for interior roadways.

3: Flow depth is the normal depth in adjacent perimeter street

4: Min FF is the High FL plus twice the depth of flow.

APPENDIX E

Reference Material

Technical Drainage Study for Skye Canyon – Phase 2 Infrastructure, by SHG

TECHNICAL DRAINAGE STUDY UPDATE No.2

**Skye Canyon
(Phase 2 Infrastructure)**

City of Las Vegas, Nevada

Job No.: OLY1501.001

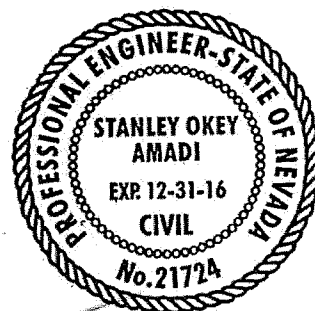
Date: May 2016

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:

Ninety-Five Management, LLC
11411 Southern Highlands Parkway, Suite 300
Las Vegas, NV 89141
Phone: 702-220-6565 • Fax: 702-220-6566



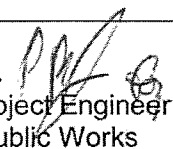
A handwritten signature in black ink, appearing to read "Stanley Okey Amadi".

05/12/16

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

Assisted by: Erick Mata, E.I

Approval Letter

CITY OF LAS VEGAS		DATE:
INTER-OFFICE MEMORANDUM		REVISED
		June 21, 2016
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 Infrastructure	
Cross Streets:	NWC of Grand Teton Blvd. & Hualapai Way	COPIES TO:
File Number:	F:\Depot\DSMemos\DS4739E Revised.doc	Slater Hanifan Group, Inc.
Parcel Number:	Portion of 126-12-000-001	Section 12, LLC / Ninety Five Mgmt.
Zoning Action:	TMP-58560	Bart Anderson, P.E., DevCo
FEMA Flood Zone	YES	NO X
Proposed Storm Drain	YES X	NO
		CCRFC

HISTORY	DATE RECEIVED	DATE REVIEWED	COMMENTS	REVIEW FEES	FEES PAID Payment Trn #
1 st Submittal & Supplemental	6/18/2015, 8/4/2015	8/26/2015	Not Approved	\$400.00	402578: \$400
2 nd Submittal	10/19/2015	11/02/2015	Not Approved	\$400.00	419048: \$400
3 rd Submittal	11/19/2015 & Supplemental	1/7/2016	Conditional Approval	\$400.00	423549: \$400
4 th Submittal	4/4/2016	4/13/2016	Conditional Approval	\$100.00	438958: \$100
5 th Submittal & CCRFC	5/12/2016 & 5/16/2016	6/8/2016 & 6/21/2016	See Comments Below	\$100.00	443735: \$100
			TOTAL FEES (LDDRS):	\$1,400.00	----

REMARKS: Revised Memo, Approved "At Risk".

5th Submittal: Update #2 and CCRFC concurrence received

4th Submittal: Update #1 - Widen bike lane within Shaumber Road & Egan Crest Way from 4' to 5'

Supplemental impacts to study from the National Monument and the Detention Basin #1 study.

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

	is approved subject to conformance to all City standards and the following conditions:
	must be resubmitted or supplemented including the following:
	is conditionally approved subject to Clark County Regional Flood Control District concurrence.
X	is approved "At Risk" subject to the final approval of the Revised Master Drainage Study.

The City of Las Vegas will not allow further residential building permits for development outside of the limits of Phase I at this time based upon the current MPU impacts from the National Monument. This is a temporary hold of further residential building permits outside of Phase I until the National Monument Grant issues are resolved and/or alternative regional facilities are proposed and constructed to mitigate the development. The City will continue to work with the Developer and CCRFC to help identify and alleviate these impacts.

- Note that the ***Skye Canyon Master Drainage Study*** has not been approved in the current stage. The subject ***Skye Canyon Infrastructure Phase 2*** drainage study is approved "At Risk" until the final

approval of the Master Drainage Study. Any changes required by the Master Drainage Study shall require a drainage study update to the **Phase 2 Infrastructure Study** and any required facility changes to the Phase 2 Infrastructure shall be provided at the developers' cost.

2. The **Skye Canyon Phase 2 Development** is based on the sole protection of a planned **Skye Canyon Detention Basin #1** from major storm flood events. The Detention Basin #1 drainage study has been approved.
3. No Building Permits for onsite developments within Phase 2 will be issued prior to the construction and substantial completion of the **Skye Canyon Detention Basin #1**. The notice of Substantial Completion from the City of Las Vegas, Department of Public Works is required for the release of Building Permits.
4. The site is adjacent to or crosses an existing or proposed *Clark County Regional Flood Control District* (CCRFCD) master planned facility. CCRFCD concurrence has been provided for the Phase 2 Infrastructure.
5. The impacts to existing downstream neighborhoods of the long term discharge from the detention basin(s) without the associated regional outfall facilities is a major concern of both the City and the Clark County Regional Flood Control District. Flood Control understands that these impacts are being addressed with Skye Canyon Detention Basin #1. The proposed impact solution was included as a part of the Skye Canyon Detention Basin #1 improvements until the overall Skye Canyon MPU facilities are completed.
6. The drainage study for Phase 2 Infrastructure assumes that the project will be constructed in one phase. It was noted within this Addendum response that the developer desires to phase the construction of the improvements. If improvement plans are submitted to break the Phase 2 Infrastructure into separate phases, a drainage study update will be required for each phase addressing the interim condition.
7. The provided Phase 2 Infrastructure plans only show the proposed drainage facilities. The complete improvement plans will require additional review for impacts with other needed infrastructure; i.e. sanitary sewer, water, gas, etc. Any changes to the proposed storm drain system shall require a drainage study update.
8. The Storm Drain Plans have been revised to accommodate the proposed cross fall street sections and include added nuisance inlets at low points within the intersections.
9. The plans show preliminary mass grading with collection facilities within the parcels to intercept the flows prior to entering the infrastructure roadway improvements. It was noted that the inlet collection system needs to incorporate stormwater quality (SWQ) features and Best Management Practices (BMP's) at these interim collection points. This information will be provided and shown on the SWPPP, a copy of which shall be provided to Flood Control prior to permits. Additionally, the mass grading plan (Sheet GR-03) shows sheet flow from Basin ON2-IB discharging directly onto Hualapai Way without any interim collection. Revise to incorporate interim collection.
10. All drainage facilities proposed in this **Phase 2 Infrastructure Study** are considered interim facilities and must be maintained by the Master Developer until the facilities are dedicated to and formally accepted by the *City of Las Vegas*.
11. Since the streets network and the associated storm drain facilities will eventually be accepted by the City, the engineer must coordinate with *City of Las Vegas Streets & Sanitation Department* for their review and approval prior to the final approval of the subject drainage study.
12. The provided WSPG Model shows that the storm drain in *Eagle Canyon Avenue* exceeds the maximum allowed velocity (25 fps) per the *CCRFCD Hydrologic & Hydraulic Design Manual*. A *Special Construction Note* has been added to the plan & profile sheets that call out the special construction requirement and the required special inspection for the additional sacrificial concrete.
13. Structural plans for the storm drain improvements must be submitted for review. Provide a soil report, structural calculations and specifications, wet stamped structural sets and a grading plan to

the *City of Las Vegas Building Department* for processing (call *Building Department* to confirm their submittal requirements). The engineer must provide a copy of *Building Department* approval of the structures to *City Flood Control Section* prior to the final acceptance of the technical drainage study.

14. The project proposes to build temporary drainage berms/swales over the *Phase 2* site. Prior to final plan approval the developer must complete a ***Maintenance and Liability Agreement*** for the interim drainage improvements and post a minimum maintenance bond of \$50,000 or 50-percent of the construction cost for the improvements, whichever is greater. The engineer must submit an estimate of the quantities for construction the facility and an exhibit that adequately shows the location and limits of the drainage facility to *City Flood Control* for approval. Once the drainage study is conditionally approved, the engineer/developer should contact the *City's Land Development Section* (702-229-6371) to begin the agreement process.

In order for the maintenance bond to be released in the future, a drainage update/letter will be required to justify that the berms/swales are no longer necessary and can be removed.

15. Technical drainage studies are required for each of the future PODs. The technical drainage studies for the PODs may not be submitted until the conditional approval of the pertinent infrastructure drainage study is obtained. Final approval for the infrastructure study must be obtained prior to conditional approval of the impacted POD drainage studies.
16. No Building Permits for the homes within the individual PODs will be issued prior to the construction and substantial completion of the ***Skye Canyon Detention Basin #1***. Additionally, Building permits for the homes within the individual PODs will not be issued until construction of the streets and flood control infrastructure around the POD is substantially complete or interim protection is provided per the approved technical drainage study.
17. A note on the Grading Plans has been provided that "*Property Owner is responsible to maintain the best management practices such as but not limited to the removal of accumulated sediment and debris and care of the vegetation.*"
18. Provide numbering system for the manholes and inlets. It was noted in the response that the project may be divided into additional phases. The numbering system is still needed.
19. Show the size of all the proposed riprap areas. The rip-rap pads are shown on the GR-Sheets and some of the SD-Sheets include the pad size. Add the pad size to the grading plans and revise all pertinent plans and callouts accordingly.
20. Revise the pipe penetration detail to include a concrete collar with dowelled rebar connections. The detail has not been provided at this time and was noted that it will be a part of the Structural Details.
21. Provide details for the transition structure modifications to accommodate the 66"-RCP connection and the removal of the existing facilities to allow construction of the proposed improvements. The detail has not been provided at this time and was noted that it will be a part of the Structural Details.

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/PBJ

T/R/S: T19S/R59E/12
AREA F-12

Referenced Drainage Figures

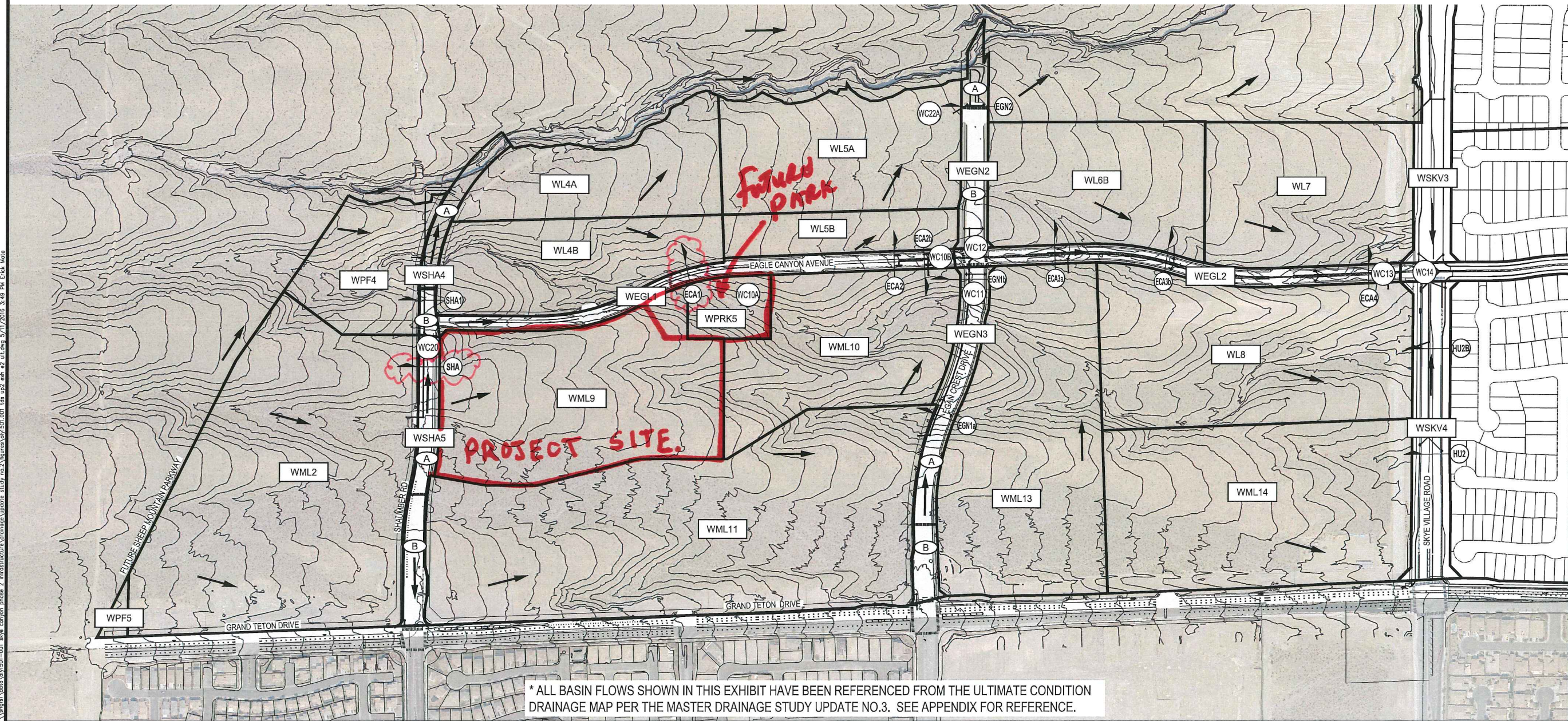
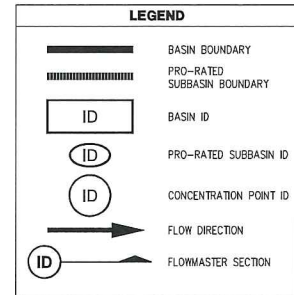
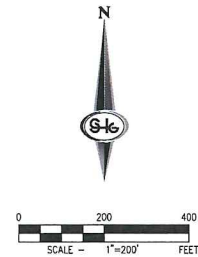
Ultimate Condition						
Cross Section	Slope (ft)	Q _{ave} (cfs)	Depth (ft)	Velocity (fps)	Dx/V	
ECA1	4.90	38	0.48	6.4	3.0	
ECA2	4.90	44	0.50	6.5	3.2	
ECA2b	2.00	14	0.41	3.6	1.5	
ECA3a	4.94	6	0.29	4.2	1.2	
ECA3b	4.94	28	0.44	5.9	2.6	
ECA4	4.90	39	0.66	2.9	1.9	
EGN1a	2.46	4	0.29	2.9	0.8	
*EGN1b	0.50	2.5	0.38	1.6	0.6	
EGN2	0.50	4	0.35	1.6	0.5	
*SHA	2.75	4	0.33	3.3	1.1	
*SHA (West Half)	2.75	4	0.28	2.5	0.7	
SHA1	2.75	3	0.26	2.9	0.7	
*HU2	0.57	59	0.92	3.8	3.5	
*HU2B	0.57	43	0.83	3.5	2.9	

* Modeled as Half Streets

Referenced Ultimate Condition Flow Rate Summary				
Concentration Points				
Basin/Concentration Point ID	Area (sq. mi)	Q ₁₀₀ (cfs)	Q ₅₀ (cfs)	
WC10A Q = WML5 + WRR5	0.03	60	30	
WC10B Q = WC10A + WL4B + WEG1	0.05	99	48	
WC11 Q = WC12 + WEG3B	0.07	127	61	
WC12 Q = WC10B + WC11	0.11	226	109	
WC13 Q = WC12 + WL6B + WL7 + WML13 + WEG2	0.17	352	170	
WC14 Q = WML14 + WL5B + WSKV3 + WSKV4	0.24	485	236	
WC20 Q = WPP5 + WML2 + WSH45	0.05	86	42	
WC22A Q = WL4A + WL5A + WL5B	0.05	67	43	

Ultimate Condition Prorated Flow Summary			
Basin	Q ₂₀₀ (cfs)	Area (acres)	Unit Flow (cfs/acre)
WSHA4	6	1.4	4.2
WSHA5	6	2.4	3.4
WEGN2	6	2.1	3.0
WEGN3	10	3.3	3.0
Subbasin	Q ₁₀₀ (cfs)	Area (acres)	Unit Flow (cfs/acre)
WSHA4-A	5	1.1	4.2
WSHA4-B	1	0.3	4.2
TOTAL	6	1.4	
WSHA5-A	4	1.1	3.4
WSHA5-B	4	1.3	3.4
TOTAL	6	2.4	
WEGN2-A	2	0.6	3.0
WEGN2-B	4	1.5	3.0
TOTAL	6	2.1	
WEGN3-A	8	2.5	3.0
WEGN3-B	2	0.8	3.0
TOTAL	10	3.3	

Referenced Ultimate Condition Flow Rate Summary			
Basin/Concentration Point ID	Area (ac)	Q ₁₀₀ (cfs)	Q ₁₀ (cfs)
WL4A	8.0	23	10
WL4B	8.9	27	12
WL5A	10.9	32	15
WL5B	3.8	12	5
WL6B	10.6	30	14
WL7	11.5	34	16
WL8	17.4	48	22
WML10	11.6	38	19
WML11	16.0	48	23
WML13	16.4	49	25
WML14	19.2	59	29
WML2	14.2	78	38
WML9	16.4	55	28
WPF4	5.7	19	9
WPF5	4.0	1	0
WPRK5	2.0	5	2
WEST ROADWAY BASINS			
WEG1	3.4	12	6
WEG2	3.3	12	7
WEGN2	2.1	2	1
WEGN3	3.3	10	6
WSHA4	1.4	6	3
WSHA5	2.4	8	5
WSKV3	4.2	14	7
WSKV4	4.5	15	8



Referenced Hydraulic Data

Section - ECA1 (Ultimate Condition)

Worksheet for Irregular Channel

Project Description	
Worksheet	Section - ECA1 (Ultimate Condition)
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data	
Channel Slope	4.90 %
Discharge	38.00 cfs

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

Results	
Mannings Coefficient	0.016
Water Surface Elevation	0.48 ft
Elevation Range	0.00 to 0.56
Flow Area	6.0 ft ²
Wetted Perimeter	34.86 ft
Top Width	33.81 ft
Actual Depth	0.48 ft
Critical Elevation	0.64 ft
Critical Slope	0.59 %
Velocity	6.35 ft/s
Velocity Head	0.63 ft
Specific Energy	1.10 ft
Froude Number	2.66
Flow Type	Supercritical

Calculation Messages:
Flow is divided.

Roughness Segments		
Start Station	End Station	Mannings Coefficient
0+00.00	0+43.00	0.016

Natural Channel Points	
Station (ft)	Elevation (ft)
0+00.00	0.50
0+00.50	0.48
0+00.50	0.00
0+02.00	0.13
0+02.00	0.17
0+21.50	0.56
0+41.00	0.17
0+41.00	0.13
0+42.50	0.00
0+42.50	0.48
0+43.00	0.50

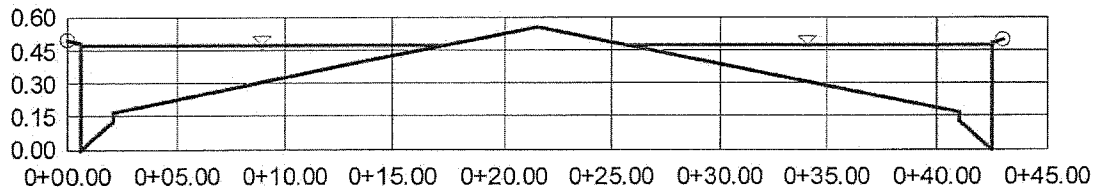
Section - ECA1 (Ultimate Condition) Worksheet for Irregular Channel

Notes: Q=38 cfs being WL4B + Half of WEGL1 + WPRK5

Section - ECA1 (Ultimate Condition) Cross Section for Irregular Channel

Project Description	
Worksheet	Section - ECA1 (Ultimate Condition)
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

Section Data	
Mannings Coefficient	0.016
Channel Slope	4.90 %
Water Surface Elevation	0.48 ft
Elevation Range	0.00 to 0.56
Discharge	38.00 cfs



V: 10.0
H: 1
NTS

Section - SHA

Worksheet for Irregular Channel

Project Description	
Worksheet	Section - SHA
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data	
Channel Slope	2.75 %
Discharge	4.00 cfs

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

Results	
Mannings Coefficient	0.016
Water Surface Elevation	0.33 ft
Elevation Range	0.00 to 0.55
Flow Area	1.2 ft ²
Wetted Perimeter	12.26 ft
Top Width	11.88 ft
Actual Depth	0.33 ft
Critical Elevation	0.38 ft
Critical Slope	0.77 %
Velocity	3.30 ft/s
Velocity Head	0.17 ft
Specific Energy	0.50 ft
Froude Number	1.82
Flow Type	Supercritical

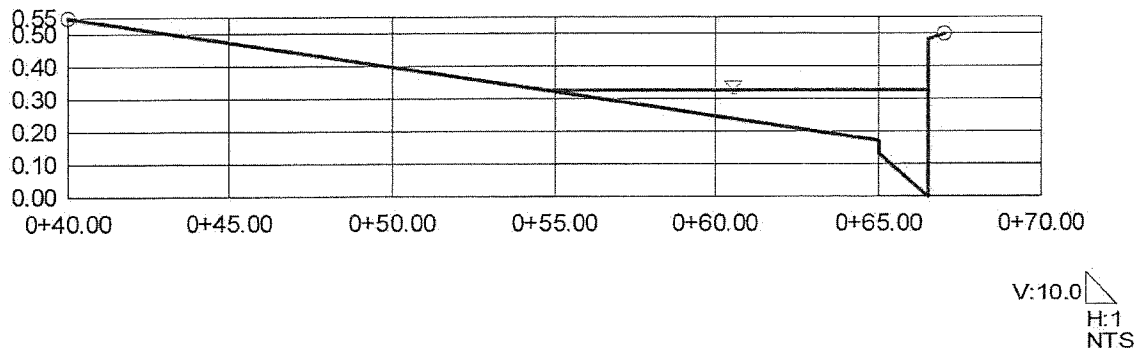
Roughness Segments		
Start Station	End Station	Mannings Coefficient
0+40.00	0+67.00	0.016

Natural Channel Points	
Station (ft)	Elevation (ft)
0+40.00	0.55
0+65.00	0.17
0+65.00	0.13
0+66.50	0.00
0+66.50	0.48
0+67.00	0.50

Section - SHA Cross Section for Irregular Channel

Project Description	
Worksheet	Section - SHA
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

Section Data	
Mannings Coefficient	0.016
Channel Slope	2.75 %
Water Surface Elevation	0.33 ft
Elevation Range	0.00 to 0.55
Discharge	4.00 cfs



APPENDIX F

Reference Material

Master Drainage Study for Skye Canyon, by SHG

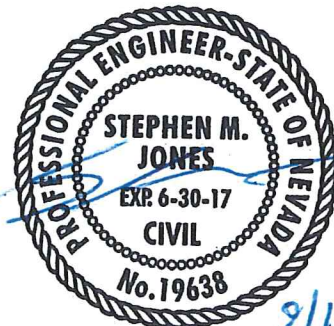
**MASTER DRAINAGE STUDY
UPDATE #3
(SUPPLEMENT to CLV CONDITIONS)**

Skye Canyon
City of Las Vegas, Nevada

Job No.: OLY1603.000
Date: September 2016

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
11411 Southern Highlands Parkway, Suite 300
Las Vegas, NV 89141
Phone: 702-220-6565 • Fax: 702-220-6566



Steve Jones, P.E.
NV Professional Engineer No. 19638

Assisted by: Cameron Bencini, EI
Jonathan Rocha, EI

Approval Letter

CITY OF LAS VEGAS INTER-OFFICE MEMORANDUM			DATE: August 15, 2016
TO: Land Development Services Department of Public Works			FROM: Oh Sang Kwon, P.E. Flood Control Section Department of Public Works
SUBJECT: Drainage Study for: Skye Canyon Master Drainage Study – Update #3			COPIES TO: Slater Hanifan Group
Cross Streets:	Fort Apache Road & Moccasin Road		KAG Development South, LLC
File Number:	F:\Depot\DSMemos\DS4420N.doc		Bart Anderson, P.E., DevCo
Parcel Number:	125-06-001-001		CCRFCFCD
Zoning Action:			CCPW
FEMA Flood Zone	YES	NO X	NDOT; NV Energy
Proposed Storm Drain	YES X	NO	PB America, Inc.

HISTORY	DATE RECEIVED	DATE REVIEWED	COMMENTS	REVIEW FEES	FEES PAID Transaction #
1 st Submittal	6/22/2010	7/13/2010	Not Approved	\$1,000.00	147216: \$1000
2 nd Submittal	9/17/2010	10/4/2010	Not Approved	\$400.00	153788: \$400
3 rd Submittal	10/15/2011	11/14/2011	Not Approved	\$400.00	153788: \$400
4 th Submittal	2/13/2012	3/1/2012	Conditional Approval	\$400.00	274196: \$400
CCRFCFCD	5/23/2012	5/24/2012	Concurrence Recv'd	N/C	N/C
5 th Submittal NDOT Comments	9/10/2012	9/19/2012	Conditional Approval	N/C	N/C
6 th Submittal	12/4/2014	12/30/2014	Conditional Approval	\$400.00	378889: \$400
7 th Submittal	2/17/2015	3/3/2015	Conditional Approval	\$400.00	385987: \$400
8 th Submittal	3/16/2015	4/6/2015	See Comments Below	\$400.00	388961: \$400
CCRFCFCD	4/2/2015	4/6/2015	Concurrence Recv'd	N/C	N/C
9 th Submittal	6/23/2015	7/21/2015	See Comments Below	\$400.00	403025: \$400
Revised Memo	8/12/2015	8/12/2015	See Comments Below	N/A	N/A
10 th Submittal	10/19/2015	11/23/2015	Conditional Approval	\$400.00	N/A
11 th Submittal	4/19/2016	5/16/2016 & 8/15/2016	See Comments Below	\$400.00	440941: \$400
			TOTAL FEES (LDDRS):	\$4,600.00	----

REMARKS: 11th Submittal: Update # 3 – Overall Master Plan Revision of Skye Canyon development. The proposed size and location of MPU facilities are being changed with the concept of allowing development without impacting the National Monument.

Skye Canyon Master Drainage Study Update #3 proposes substantial changes to amend the previously approved Master Plan Amendment (MPA). A new MPA must be submitted to City of Las Vegas and CCRFCFCD for approval and shall be adopted by the City of Las Vegas City Council prior to the final approval of the subject Master Study Update #3.

The City of Las Vegas will not allow further residential development outside of the limits of Phase 2 at this time until the New Master Plan is approved.

10th Submittal - Phase 2 interim impacts.

Revised Memo – National Monument Drainage Impacts

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

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

1. The overall concept presented in the Master Plan Update #3 for Skye Canyon appears to satisfy the intent of providing regional connectivity of proposed Master Planned facilities without impacting the National Monument. Specific Technical Drainage Studies shall be required to address the specific impacts of each proposed Master Planned facility and the interaction with proposed facilities needed for each phase of development.
2. The Regional Flood Control District has requested that engineering consultants utilize the latest NRCS soils data as a part of the drainage study parameters. The Master Plan Update shall discuss the soil data used in the analysis and discuss the impacts on the overall hydraulic analysis. Provide an updated HEC-1 analysis and address local and MPU facility size modifications, if necessary based upon the revised Soil Survey data. Update the NRCS soils data in the References (Section 7). Review and revise Exhibit & Figures accordingly. This needs to be addressed as supplemental information prior to the MPA approval.
3. The Master Plan shall clearly define when the proposed interim facilities will be taken out of service and the construction of the required MPU facilities. A complete Phasing Plan shall be updated and approved by the City of Las Vegas and Regional Flood Control prior to the approval of the MPA.
4. This Update proposes to construct the *Log Cabin Detention Basin #3* with flows that will increase the runoff volume routed towards the *Tule Springs North Environmental Detention Basin* (TSNEDB). The engineer proposes to modify the TSNEDB by removing the orifice plate at the detention basin outfall pipe to increase the outflow. Detention basin design uses the orifice plate to insure that the basin outfall remains under inlet control parameters per the HCDDM, Section 1200. Discuss the impact of removing the orifice plate and provide calculations verifying that the existing outfall will convey the proposed 78 cfs under inlet control conditions. Discuss the drain time impacts to the TSNEDB and the impacts to the downstream development. Alternatively, the TSNEDB may need modifications to meet the HCDDM requirements. This could include the expansion of the TSNEDB basin to increase the storage volume accordingly or replacement of the TSNEDB outfall. These or other modifications need to be conceptually addressed as supplemental information prior to the MPA approval.
5. The premise of the Master Plan Update #3 for Skye Canyon is to add two (2) new CCRFCD Master Plan Detention Basins that are located outside of the Skye Canyon development. The City of Las Vegas is in the process of applying for BLM grants for these detention basin sites. These ultimate facilities shall be included in the MPA as CCRFCD facilities. The intent of the Detention Basin (157DB) is to reduce developed flows to maintain the existing condition flow rate in the ultimate condition and reduce the size of the downstream regional facilities. The intent of the Log Cabin Detention Basin (DB3) is to reduce developed flows to reduce the size of the downstream regional facilities that impact the TSNEDB. The concept for the addition of these two detention basins to the CCRFCD Master Plan is acceptable and will require the submittal of technical studies to refine the facility parameters. The construction of DB3 shall be the responsibility of the Skye Canyon

development and will be of sufficient size to reduce the flow impacts to development downstream and ultimately the TSNEDB.

6. This Master Study notes that drainage study updates for both Phase 1 and Phase 2 to accommodate the increased system flows impacting these Phases are necessary. A detailed analysis & review of the required updates will determine the system impacts and if any needed system upgrades are necessary to maintain HCDDM criteria.
7. **Exhibit 1:** The developed condition Exhibit 1 shall be updated to include the coordinated Kyle Canyon Interchange drainage improvements. The size of the downstream facilities shall be reviewed based upon the interchange improvements.
8. **Exhibit 1:** The developed condition Exhibit 1 shows that a portion of the developed flows will drain north of Moccasin into the BLM land and the National Monument to mimic existing drainage patterns. Concentrated flow discharges to the north shall require BLM and National Park Service concurrence.
9. **Exhibit J:** The proposed facility 14 that drains from EC18 easterly to the proposed DB3 shall be a permanent facility meeting the requirements of Title 20 and shall be constructed as a permanent MPU facility with this development.
10. **Exhibit J:** The proposed onsite DB1 & DB2 facilities shall include the collection facilities as a part of the detention basins areas.
11. **Exhibit J:** The proposed changes to DB1 will impact the alignment and size of the ultimate collection facility that drains to DB1. The proposed facility shall remain an open channel to allow flow interception from the west in this undeveloped drainage.
12. The **Master Land Use Plan** has been provided however, any further changes to the adopted Master Land Use Plan shall require a complete update to the Master Drainage Study.
13. A copy of the approved 404 Permit from the Army Corps of Engineers has been provided.
14. The Phasing Plan for Phase 1 & 2 have addressed the interim condition and associated downstream impacts to address the impact of the long term discharge from the outfall of the Detention Basin #1. This includes upgrading the existing storm drain system near the intersection of Brent Lane and Fort Apache. These improvements have been included in the Detention Basin #1 improvements.
15. Flood Control requires an interim condition drainage analysis in support of the Phasing Plan that clearly shows the impacts to each Phase, existing washes, upstream concentration points and the downstream concentration points. Flood Control needs to make sure that each Phase of Development is protected during the interim and full build-out of this overall project. The current Phasing Plan does not adequately address these issues beyond Phase 2.
16. The interim conditions of the Phasing Plan need to address the impact of the long term discharge from the outfall of any future detention basins. It is noted that Only Detention Basin #1 has been reviewed. The technical review of Detention Basin #2 will determine the impacts downstream along the Iron Mountain Road alignment and/or other needed facilities to mitigate that impact. The provided Basin Attenuated Outfall Exhibit is only conceptual in nature and is subject to further review as a part of the technical reviews. Existing flow conditions do not have a drawn out discharge from a detention basin. This discharge impact must be accounted for in the interim condition without negatively impacting the existing downstream neighborhoods.
17. CCRFCD concurrence has previously been provided. A new concurrence for Update #3 shall be provided from CCRFCD after Conditional Approval by the City of Las Vegas.

18. CCPW concurrence has previously been provided. A new concurrence for Update #3 shall be provided from CCPW after Conditional Approval by the City of Las Vegas.
19. NDOT concurrence has previously been provided. A new concurrence for Update #3 shall be provided from NDOT after Conditional Approval by the City of Las Vegas.

The following comments are repeated until they are complete:

1. Please note that the Traffic Study must be approved prior to final approval of the Master Drainage Study. If the street layout does not match the Master Drainage Study, an update to the Master Drainage Study must be submitted to address the changes.
2. Per a meeting held in August 18, 2011 between the developer and the *City of Las Vegas*, it was agreed that NV Energy's approval of any proposed drainage facilities within their access easements (such as the proposed detention basins) must be obtained prior to the final approval of the Master Drainage Study. Please provide documentation for such approval or acknowledgment.
3. Please note that any future technical drainage study submittals that differ from the Master Drainage Study (ie. Changes in pods, infrastructure, flows etc.) will require an update to the Master Drainage Study and this update must be approved by the *City of Las Vegas Flood Control Section* prior to final approval of technical drainage study.
4. The proposed detention basins will require coordination with the State of Nevada, Division of Water Resources Dam Safety and will require the State's approval prior to permitting.
5. Please note that the proposed 100-year flood protection facilities identified on Exhibit J must be constructed by the Master Developer as a part of the master planned infrastructure. Technical drainage studies are required for each phase of the master planned infrastructure improvements. The technical drainage studies for the infrastructure improvements may be submitted with conditional approval of this Master Drainage Study. However, final approval for the Master Drainage Study must be obtained prior to conditional approval of the infrastructure drainage studies.
6. Technical drainage studies are required for each of the Pod's. The technical drainage studies for the Pod's may not be submitted until the conditional approval of the pertinent infrastructure drainage study is obtained. Final approval for the infrastructure drainage study must be obtained prior to conditional approval of the impacted Pod drainage studies.
7. Building permits for the homes within the individual Pod's will not be issued until construction of the street and flood control infrastructure around the Pod is substantially complete or interim protection is provided per the approved technical drainage study.
8. The design of debris basins at all major culvert entrances to limit the amount of sediment and debris entering the storm drain facilities will be required in a future infrastructure study.
9. Please note that all detention basins must be designed per CCRFCD criteria including a low flow facility around the detention basin.
10. Please note that all proposed interim facilities must be maintained by the master developer.
11. Provide a legal description of the proposed detention basins prior to recordation of the parent final map.
12. Coordinate the proposed drainage facilities with *Sheep Mountain Parkway* project. Please contact Greg McDermott, P.E., at 702-229-2143 to coordinate the proposed drainage facilities.

NOTE: Any future changes to the proposed design (or design assumptions) as outlined in the approved master drainage study and attached preliminary grading plan which affect drainage must be addressed in a Drainage Study Amendment and accepted by the *City of Las Vegas Flood Control Section*. Additionally, conditional acceptance of a drainage study is valid for a period of one (1)

year. If the proposed construction has not been completed in that time period, the *City of Las Vegas* reserves the right to require additional conditions and/or submission and acceptance of a complete drainage study update prior to further construction of a project.

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

END OF REMARKS

Osk/pbj

T/R/S: T19S/R60E/6 & 7
AREA G-6, 7, & F-12

Referenced Report Excerpt

Comparative Summary of Hydrologic Soil Groups			
Previous Soils Data		Current Soils Data	
Soil Number	Predominant Hydrologic Soil Group	Soil Number	Predominant Hydrologic Soil Group
155	D	155	D
191	B	191	A
400	D	400	D
540	B	314	A

Inspection of the revised Exhibit A reveals that Soils 155 and 400 have remained the same boundary and predominant soil group; therefore, it is anticipated little to no change occurs to the hydrologic analysis presented by this study. The previous Soil 191 that comprises the a small portion in the very far southwest corner of the site remains the same type but has changed to an improved hydrologic soil group "A" from the previous 'B' type. The previous Soil 540 that encompasses a majority of the east half of Skye Canyon, has been changed to Soil 314 which is considered a new soil type; however, its predominant soil group of 'A' allows for a better drainage class than the previous hydrologic group of 'B' for the same area. The Weiser portion of the composition has been re-defined to the lower 'A' hydrologic soil group. After further review of the soils composition between the two surveys, there are characteristics of the former 540 soil that are similar to the newly described 314 soil such as its alluvium formation and its sandy loam make-up that would allow for a well-drained drainage class. The new 314 soil composition shows that the restrictive layer is almost 6.5-ft deep before it can impede drainage and is described as "very rarely flooded". In conclusion, the change to 'A' soil per the new soil survey is considered acceptable; 'A' group, creates a hydrologic condition where storm runoff will not increase and in most cases improve or lessen the runoff produced by the subbasins in this study.

Through the above summary table and discussion, it is concluded that it is not necessary for this Master Drainage Study to revise its hydrologic and hydraulic analyses. It is also noted upon technical studies, that the new soils will be considered and may be utilized for design purposes. Additionally, the technical studies addressing the regional detention basin improvements for updated Detention Basin 1 (DS4698) and Detention Basin 2 (DS4813) include the new soils information in hydrologic design.

3. **Comment:** *The Master Plan shall clearly define when the proposed interim facilities will be taken out of service and the construction of the required MPU facilities. A complete Phasing Plan shall be updated and approved by the City of Las Vegas and Regional Flood Control prior to the approval of the MPA.*

Response: It is the developer's plan to construct the ultimate condition MPU facilities shown on Exhibits J and K in yellow color with cost sharing participation from the City of Las Vegas for the Log Cabin regional alignment east of Skye Village Road per the approved Development Agreement between the City and Skye Canyon. Excerpts from the development agreement have been included in Appendix E. The interim facilities that perpetuate flows across US-95 in a historic manner, and the accepting facilities remain shown on Exhibit H, however it is not the intent of the developer to construct these facilities in accordance with the language herein the Development agreement for the community.

Referenced Drainage Figures

Referenced Hydrologic Data

1.6 Reference Studies

As a result of this study acting as Update #3, the previous indicated reference materials remain applicable to this study. A large basis of this Update #3, as described in Section 3, is the existing condition analysis from the previous GCW Master Drainage Study; therefore, its HEC-1 and drainage maps have been included in Appendix I for reference.

Additional information regarding areas of facility impacts have been included, as applicable, in Appendix E, F and G. Detailed discussion regarding each of these materials is included in this report:

- Sheep Mountain Parkway preliminary concept
- Existing Phase 1 Infrastructure
- Existing Detention Basin 1 Infrastructure
- Existing Silverstone Ranch

2 METHODOLOGY

2.1 Compliance

The methodologies utilized in the preparation of this study are in compliance with the Clark County Regional Flood Control District's Hydrologic and Drainage Design Manual (CCRFCD Manual, Reference 2).

2.2 Hydrologic Modeling

Modeling: The SCS Unit Hydrograph Method (SCS Method) was utilized to determine peak flow rates. The SCS Method utilizes precipitation, drainage area, curve number and lag time parameters to determine peak flow rates. The SCS Method routine within the U.S. Army Corp of Engineers HEC-1 Flood Hydrograph Package program was utilized to model the drainage basins analyzed by this study. The Modified Puls routing method within HEC-1 was utilized for analyzing detention basin stage-storage-discharge.

100-year and 10-year Precipitation: The Skye Canyon site is located both inside and outside the McCarran Rainfall Area, as determined from the CCRFCD Manual Figure 513. Precipitation values have been obtained by selection from CCRFCD Manual Figures 503 and 506 and applying the adjustment ratios from CCRFCD Manual Table 501. The below precipitation values are the same as previously presented in the Master Drainage Study:

- REFERENCED
PRECIPITATION →
- West Property – West of Skye Village Road, 3.00 (100-yr) and 1.67 (10-yr) inches.
 - West and East Property – East of Skye Village Road and south of Iron Mountain Road, 2.93 (100-yr) and 1.61 (10-yr) inches.
 - West and East Property – North of Iron Mountain Road, 2.77 (100-yr) and 1.58 (10-yr) inches.

Note that the offsite basins analyzed in this study are primarily referenced from GCW or the MPU hydrologic models; therefore, those precipitation values have also been referenced.

Computations and relevant tables and figures from the CCRFCD Manual have been included in Appendix B.

Data:

Project is located in the following soil types:
155 Cave, gravelly fine sandy loam
191 Dalen, very cobbly fine sandy loam
400 Terrace, Very gravelly fine sandy loam
540 Welser

Soil Group:
D
B
D

SCS Soil Data
Exhibit A

Reference

Land Use	(L) Low Residential (5.5 Units/Acre)	(M) Medium Low Residential (6.5 Units/Acre)	(ML) Medium Low Attached Residential (18.0 Units/Acre)	(AA) Active Adult (6.5 Units/Acre)	(G/C/ED) General Commercial, Galleria	(SCH) School	(PRK) Park	(PF) Public Facilities	(ARR) Arroyo	Roadway	Unimproved Sheep Mountain Parkway	Improved Sheep Mountain Parkway
CORFCD Manual CN	Commercial	Commercial	Commercial	Commercial	Commercial	50% Impervious, 50% Open Space - Fair Condition	Open Space - Fair Condition	Newly Graded	Desert Shrub - Poor Condition	Paved Streets & Roads	Desert Shrub - Poor Condition	60% Paved Street, 40% Natural Desert Landscaping
A	80	89	89	89	89	73.5	49	77	63	98	63	86
B	87	92	92	92	92	83.5	69	86	77	98	77	91
C	90	94	94	94	94	88.5	79	91	85	98	85	91
D	92	95	95	95	95	91	84	94	88	98	88	94

SKYECANYON WEST												
Subbasin	Soil Type	% Area	CN	Area (Acres)	Composite CN							
WL1A	155	100.0%	92.0	29.8	92.0	92.0	92.0	92.0	92.0	92.0	92.0	92.0
WL1B	155	100.0%	92.0	29.8	92.0	92.0	92.0	92.0	92.0	92.0	92.0	92.0
WL2	155, 400	100.0%	92.0	29.0	92.0	92.0	92.0	92.0	92.0	92.0	92.0	92.0
WL3	400	100.0%	92.0	15.7	92.0	92.0	92.0	92.0	92.0	92.0	92.0	92.0
WL4A	155	100.0%	92.0	24.9	92.0	92.0	92.0	92.0	92.0	92.0	92.0	92.0
WL4B	155	100.0%	92.0	8.0	92.0	92.0	92.0	92.0	92.0	92.0	92.0	92.0
WL5A	155	100.0%	92.0	8.9	92.0	92.0	92.0	92.0	92.0	92.0	92.0	92.0
WL5B	155	100.0%	92.0	10.9	92.0	92.0	92.0	92.0	92.0	92.0	92.0	92.0
WL6A	155	100.0%	92.0	3.8	92.0	92.0	92.0	92.0	92.0	92.0	92.0	92.0
WL6B	155	100.0%	92.0	6.2	92.0	92.0	92.0	92.0	92.0	92.0	92.0	92.0
WL7	155	100.0%	92.0	10.6	92.0	92.0	92.0	92.0	92.0	92.0	92.0	92.0
WL8	155	100.0%	92.0	11.5	92.0	92.0	92.0	92.0	92.0	92.0	92.0	92.0
WL9A	155	100.0%	92.0	17.4	92.0	92.0	92.0	92.0	92.0	92.0	92.0	92.0
WL9B	155	100.0%	92.0	18.2	92.0	92.0	92.0	92.0	92.0	92.0	92.0	92.0
WL10A	155, 400	100.0%	92.0	14.4	92.0	92.0	92.0	92.0	92.0	92.0	92.0	92.0
WL10B	155, 400	100.0%	92.0	17.1	92.0	92.0	92.0	92.0	92.0	92.0	92.0	92.0
WL11	155, 400	100.0%	92.0	18.3	92.0	92.0	92.0	92.0	92.0	92.0	92.0	92.0
WL12	155, 400	100.0%	92.0	36.7	92.0	92.0	92.0	92.0	92.0	92.0	92.0	92.0
WML1	155, 400	100.0%	92.0	31.4	92.0	92.0	92.0	92.0	92.0	92.0	92.0	92.0
WML2	155	100.0%	92.0	16.0	92.0	92.0	92.0	92.0	92.0	92.0	92.0	92.0
WML3	155	49.7%	95.0	13.6	95.0	95.0	95.0	95.0	95.0	95.0	95.0	95.0
WML4	155, 400	48.7%	187.0	27.4	187.0	187.0	187.0	187.0	187.0	187.0	187.0	187.0
WML5	155	100.0%	95.0	17.3	95.0	95.0	95.0	95.0	95.0	95.0	95.0	95.0
WML6	155	100.0%	95.0	25.1	95.0	95.0	95.0	95.0	95.0	95.0	95.0	95.0
WML7	155	100.0%	95.0	27.3	95.0	95.0	95.0	95.0	95.0	95.0	95.0	95.0
WML8	155	100.0%	95.0	27.8	95.0	95.0	95.0	95.0	95.0	95.0	95.0	95.0
WML9	155	100.0%	95.0	20.5	95.0	95.0	95.0	95.0	95.0	95.0	95.0	95.0
WML10	155	100.0%	95.0	16.8	95.0	95.0	95.0	95.0	95.0	95.0	95.0	95.0
WML11	155	100.0%	95.0	10.3	95.0	95.0	95.0	95.0	95.0	95.0	95.0	95.0
WML12	155	3.0%	92.0	0.5	92.0	92.0	92.0	92.0	92.0	92.0	92.0	92.0
WML13	155	100.0%	95.0	16.4	95.0	95.0	95.0	95.0	95.0	95.0	95.0	95.0
WML14	155	100.0%	95.0	11.6	95.0	95.0	95.0	95.0	95.0	95.0	95.0	95.0
WML15	155	24.4%	95.0	7.0	95.0	95.0	95.0	95.0	95.0	95.0	95.0	95.0
WML16	155	75.6%	92.0	21.7	92.0	92.0	92.0	92.0	92.0	92.0	92.0	92.0
WML17	155, 400	100.0%	187.0	26.7	187.0	187.0	187.0	187.0	187.0	187.0	187.0	187.0
WML18	155, 400	100.0%	95.0	16.4	95.0	95.0	95.0	95.0	95.0	95.0	95.0	95.0
WML19	155, 400	100.0%	95.0	16.4	95.0	95.0	95.0	95.0	95.0	95.0	95.0	95.0
WML20	155, 400	100.0%	95.0	19.2	95.0	95.0	95.0	95.0	95.0	95.0	95.0	95.0
WML21	155	100.0%	95.0	12.3	95.0	95.0	95.0	95.0	95.0	95.0	95.0	95.0
WML22	155	100.0%	95.0	11.2	95.0	95.0	95.0	95.0	95.0	95.0	95.0	95.0
WML23	155, 400	100.0%	95.0	22.2	95.0	95.0	95.0	95.0	95.0	95.0	95.0	95.0
WML24	155	100.0%	95.0	6.5	95.0	95.0	95.0	95.0	95.0	95.0	95.0	95.0
WML25	155	100.0%	95.0	30.4	95.0	95.0	95.0	95.0	95.0	95.0	95.0	95.0
WML26	155	100.0%	95.0	30.4	95.0	95.0	95.0	95.0	95.0	95.0	95.0	95.0
WML27	155	100.0%	95.0	11.5	95.0	95.0	95.0	95.0	95.0	95.0	95.0	95.0
WML28	155	100.0%	95.0	8.3	95.0	95.0	95.0	95.0	95.0	95.0	95.0	95.0
WML29	155	100.0%	95.0	8.3	95.0	95.0	95.0	95.0	95.0	95.0	95.0	95.0
WML30	155	100.0%	95.0	30.4	95.0	95.0	95.0	95.0	95.0	95.0	95.0	95.0
WML31	155	100.0%	95.0	30.4	95.0	95.0	95.0	95.0	95.0	95.0	95.0	95.0
WML32	155	100.0%	95.0	3.9	95.0	95.0	95.0	95.0	95.0	95.0	95.0	95.0
WML33	155	13.8%	92.0	24.5	92.0	92.0	92.0	92.0	92.0	92.0	92.0	92.0
WML34	155	86.2%	95.0	28.4	95.0	95.0	95.0	95.0	95.0	95.0	95.0	95.0
WML35	155	100.0%	95.0	7.6	95.0	95.0	95.0	95.0	95.0	95.0	95.0	95.0
WML36	155	31.7%	92.0	3.6	92.0	92.0	92.0	92.0	92.0	92.0	92.0	92.0
WML37	155	100.0%	95.0	11.5	95.0	95.0	95.0	95.0	95.0	95.0	95.0	95.0
WML38	155	100.0%	95.0	39.4	95.0	95.0	95.0	95.0	95.0	95.0	95.0	95.0
WML39	155	100.0%	95.0	39.4	95.0	95.0	95.0	95.0	95.0	95.0	95.0	95.0
WML40	155	100.0%	95.0	11.5	95.0	95.0	95.0	95.0	95.0	95.0	95.0	95.0
WML41	155	100.0%	95.0	11.5	95.0	95.0	95.0	95.0	95.0	95.0	95.0	95.0
WML42	155	100.0%	95.0	2.4	95.0	95.0	95.0	95.0	95.0	95.0	95.0	95.0
WML43	155	100.0%	95.0	3.2	95.0	95.0	95.0	95.0	95.0	95.0	95.0	95.0
WML44	155	100.0%	95.0	1.8	95.0	95.0	95.0	95.0	95.0	95.0	95.0	95.0
WML45	155	100.0%	95.0	1.8	95.0	95.0	95.0	95.0	95.0	95.0	95.0	95.0
WML46	155	100.0%	95.0	1.0	95.0	95.0	95.0	95.0	95.0	95.0	95.0	95.0
WML47	155	100.0%	95.0	2.0	95.0	95.0	95.0	95.0	95.0	95.0	95.0	95.0
WML48	155	100.0%	95.0	13.2	95.0	95.0	95.0	95.0	95.0	95.0	95.0	95.0
WML49	155	100.0%	95.0	13.2	95.0	95.0	95.0	95.0	95.0	95.0	95.0	95.0
WML50	155	100.0%	95.0	3.0	95.0	95.0	95.0	95.0	95.0	95.0	95.0	95.0
WML51	155	100.0%	95.0	10.0	95.0	95.0	95.0	95.0	95.0	95.0	95.0	95.0
WML52	155	100.0%	95.0	20.2	95.0	95.0	95.0	95.0	95.0	95.0	95.0	95.0
WML53	155	100.0%	95.0	20.2	95.0	95.0	95.0	95.0	95.0	95.0	95.0	95.0
WML54	155	100.0%	95.0	18.9	95.0	95.0	95.0	95.0	95.0	95.0	95.0	95.0
WML55	155	100.0%	95.0	3.1	95.0	95.0	95.0	95.0	95.0	95.0	95.0	95.0
WML56	155	100.0%	95.0	4.6	95.0	95.0	95.0	95.0	95.0	95.0	95.0	95.0
WML57	155	100.0%	95.0	5.7	95.0	95.0	95.0	95.0	95.0	95.0	95.0	95.0
WML58	155	100.0%	95.0	0.4	95.0	95.0	95.0	95.0	95.0	95.0	95.0	95.0
WML59	155	100.0%	95.0	1.0	95.0	95.0	95.0	95.0	95.0	95.0	95.0	95.0
WML60	155	100.0%	95.0	4.5	95.0	95.0	95.0	95.0	95.0	95.0	95.0	95.0
WML61	155	100.0%	95.0	4.5	95.0	95.0	95.0	95.0	95.0	95.0	95.0	95.0
WML62	155	100.0%	95.0	3.6	95.0	95.0	95.0	95.0	95.0	95.0	95.0	95.0
WML63	155	100.0%	95.0	2.8	95.0	95.0	95.0	95.0	95.0	95.0	95.0	95.0
WML64	155	100.0%	95.0	2.8	95.0	95.0	95.0	95.0	95.0	95.0	95.0	95.0
WML65	155	100.0%	95.0	7.1	95.0	95.0	95.0	95.0	95.0	95.0	95.0	95.0
WML66	155	100.0%	95.0	7.1	95.0	95.0	95.0	95.0	95.0	95.0	95.0	95.0

PROJECT SITE. w/ ML Landuse.

```

1*****
* FLOOD HYDROGRAPH PACKAGE (HEC-1) *
* JUN 1998 *
* VERSION 4.1 *
* RUN DATE 12APR16 TIME 18:43:45 *
*****

Ultimate3-TULEDB.OUT

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

```

```

      X  X  XXXXXX  XXXXX  X
      X  X  X  X  X  X  XX
      X  X  X  X  X  X  X
      XXXXXX  XXXX  X  XXXXX  X
      X  X  X  X  X  X  X
      X  X  XXXXXX  XXXXX  XXX

```

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

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

1 HEC-1 INPUT PAGE 1

```

LINE ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10
1 *DIAGRAM
2 ID SLATER HANIFAN GROUP
3 ID OLYMPIA COMPANIES
4 ID SKYE CANYON
5 ID MASTER DRAINAGE STUDY 2016
6 ID ULTIMATE DRAINAGE CONDITION - REVISED TO TULE SPRINGS NORTH ENV. DB
7 ID
8 ID RETURN PERIOD ----- 100-YEAR
9 ID DISTRIBUTION ----- 6-HOUR SDN3
10 ID PROJECT NO. ----- OLY1603.000
11 ID FILENAME ----- Ultimate3-TULEDB.H1
12 ID DATE ----- April 2016
13 ID MODELED BY ----- SMJ/JSR
14 ID
15 ID SIX HOUR DEPTH-AREA REDUCTION FACTORS
16 ID DRAINAGE AREA (MI^2) DARE
17 ID 0.0-0.49 1.00
18 ID 0.5-0.99 0.98
19 ID 1.0-1.99 0.97
20 ID 2.0-3.99 0.93
21 ID 4.0-5.99 0.91
22 ID 6.0-7.99 0.90
23 ID
24 IT 5 0 0 2000
25 IO 5 0 0
26 IN 5 0 0
27 JK PREC 1.00 0.98 0.97 0.93 0.91 0.90
28 *
29 KK WUS95
30 KM KYLE CANYON INTERCHANGE - WEST HALF
31 BA .0133
32 PB 2.77
33 PC 0 0.020 0.057 0.070 0.087 0.108 0.124 0.130 0.130 0.130
34 PC 0.130 0.130 0.130 0.133 0.140 0.142 0.148 0.158 0.172 0.181
35 PC 0.190 0.197 0.199 0.200 0.201 0.204 0.214 0.229 0.241 0.249
36 PC 0.251 0.256 0.270 0.278 0.281 0.283 0.295 0.322 0.352 0.409
37 PC 0.499 0.590 0.710 0.744 0.781 0.812 0.819 0.835 0.851 0.856
38 PC 0.860 0.868 0.876 0.888 0.910 0.926 0.937 0.950 0.970 0.976
39 PC 0.982 0.985 0.987 0.989 0.990 0.993 0.993 0.994 0.995 0.998
40 PC 0.998 0.999 1.000
41 LS 0 98.0
42 UD 0.082
43 *
44 KK DHD01B
45 KM FACILITY E-9
46 KM FLOW SPLIT AT VTN CULVERT 1
47 KM FLOW SPLITS TO BETWEEN NB AND SB ROADS OF US-95
48 KM REFERENCED FROM GCW MASTER DRAINAGE STUDY
49 DT DCHD1B
50 DI 0 133 187 250
51 DQ 0 120 135 150
52 *

```

1 HEC-1 INPUT PAGE 2

```

LINE ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10
49 KK DHD02B
50 KM FACILITY E-10
51 KM FLOW SPLIT AT VTN CULVERT 2
52 KM FLOW SPLITS TO BETWEEN NB AND SB ROADS OF US-95
53 KM REFERENCED FROM GCW MASTER DRAINAGE STUDY
54 DT DCHD2B
55 DI 0 100 138
56 DQ 0 99 135
57 *
58 KK WML15A
59 KM WEST BASIN, WEST OF SKYE PARK DRIVE
60 BA .0193
61 PB 2.93
62 LS 0 95.0
63 UD 0.084
64 *
65 KK WSPD1
66 KM WEST BASIN, SKYE PARK DRIVE
67 BA .0011
68 PB 2.93
69 LS 0 98.0
70 UD 0.055
71 *
72 KK WC1
73 KM FAR NW OF IRON MT/GRAND CANYON INTERSECTION
74 KM COMBINE WML15A, WSPD1
75 HC 2
76 *
77 KK WIRN4
78 KM WEST BASIN, IRN MT ROAD
79 BA .0042
80 PB 2.93
81 LS 0 98.0
82 UD 0.079
83 *

```

431 UD 0.079
 432 KK ON4D
 433 BA .0041
 434 LS 0 95
 435 UD 0.096
 *
 436 KK CP3
 437 KM COMBINE ON1D AND ON4D
 438 HC 2
 *
 439 KK CP4
 440 KM COMBINE CP2 AND CP3
 441 KM END GRAND CANYON APARTMENTS HEC-1 DATA
 442 HC 2
 *
 443 KK CENGCA
 444 KM COMBINE DRCD1C, C9, CP4
 445 KM CD1C IS DIVERSION OF FLOW ON TEE PEE FROM CENTENNIAL POINT
 446 KM CP4 AND C9 ARE ENDING OF THE APARTMENT COMPLEX AND DEVELOPMENT
 447 HC 4
 *

1

HEC-1 INPUT

PAGE 13

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

448 KK WML9
 449 KM WEST BASIN, WEST OF EGAN CREST DRIVE
 450 BA .0257
 451 PB 3.00
 452 LS 0 94.9
 453 UD 0.083
 *
 454 KK WPRK5
 455 KM WEST BASIN, WEST OF EGAN CREST DRIVE
 456 BA .0031
 457 PB 3.00
 458 LS 0 84.0
 459 UD 0.064
 *
 460 KK WC10A
 461 KM FAR W OF EAGLE CANYON/EGAN CREST INTERSECTION
 462 KM COMBINE WML9, WPRK5
 463 HC 2
 *
 464 KK WEGL1
 465 KM WEST BASIN, EAGLE CANYON AVE
 466 BA .0052
 467 PB 3.00
 468 LS 0 98.0
 469 UD 0.083
 *
 470 KK WL4B
 471 BA .0140
 472 PB 3.00
 473 LS 0 92.0
 474 UD 0.093
 *
 475 KK WC10B
 476 KM W OF EAGLE CANYON/EGAN CREST INTERSECTION
 477 HC 3
 *
 478 KK WML10
 479 KM WEST BASIN, WEST OF EGAN CREST DRIVE
 480 BA .0181
 481 PB 3.00
 482 LS 0 95.0
 483 UD 0.092
 *

1

HEC-1 INPUT

PAGE 14

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

484 KK WEGN3
 485 KM WEST BASIN, EGAN CREST DRIVE
 486 BA .0051
 487 PB 3.00
 488 LS 0 98.0
 489 UD 0.136
 *
 490 KK WML11
 491 KM WEST BASIN, WEST OF EGAN CREST DRIVE
 492 BA .0448
 493 PB 3.00
 494 LS 0 92.7
 495 UD 0.121
 *
 496 KK WC11
 497 KM W OF EAGLE CANYON/EGAN CREST INTERSECTION
 498 KM COMBINE WML10, WEGN3, WML11
 499 HC 3
 *
 500 KK WC12
 501 KM W OF EAGLE CANYON/EGAN CREST INTERSECTION
 502 KM COMBINE WC10B, WC11
 503 HC 2
 *
 504 KK WL6B
 505 KM WEST BASIN, WEST OF SKY VILLAGE ROAD
 506 BA .0165
 507 PB 3.00
 508 LS 0 92.0
 509 UD 0.106
 *
 510 KK WL7
 511 KM WEST BASIN, WEST OF SKY VILLAGE ROAD
 512 BA .0180
 513 PB 3.00
 514 LS 0 92.0
 515 UD 0.095
 *
 516 KK WML13
 517 KM WEST BASIN, WEST OF SKY VILLAGE ROAD
 518 BA .0256
 519 PB 3.00
 520 LS 0 95.0
 521 UD 0.117
 *

1

HEC-1 INPUT


```

439                                     Ultimate3-TULEDB.OUT
443                                     CP4.....
448
454                                     WPRK5
460                                     WC10A.....
464                                     WEGL1
470                                     WL4B
475                                     WC10B.....
478                                     WML10
484                                     WEGN3
490                                     WML11
496                                     WC11.....
500                                     WC12.....
504                                     WL6B
510                                     WL7
516                                     WML13
522                                     WEGL2
528                                     WC13.....
532                                     WML14
538                                     WL8
544                                     WSKV3
550                                     WSKV4
556                                     WC14.....
560                                     WL9B
566                                     WSPD4
572                                     WC15.....
576                                     WL11
582                                     WPRK8
588                                     WPRK9
594                                     WMTL1
600                                     WC16.....
604                                     WEGL3
610                                     WL10B
616                                     WC17.....
620                                     WL12
626                                     WGRClB
632                                     WC18.....
636                                     CCP4.....
638                                     OFF21B
645                                     COF21B.....
652                                     <----- DOFF23
649                                     ROFF23
653                                     OFF23
659                                     COFF23.....
663                                     OFFU
668 CPCULV.....

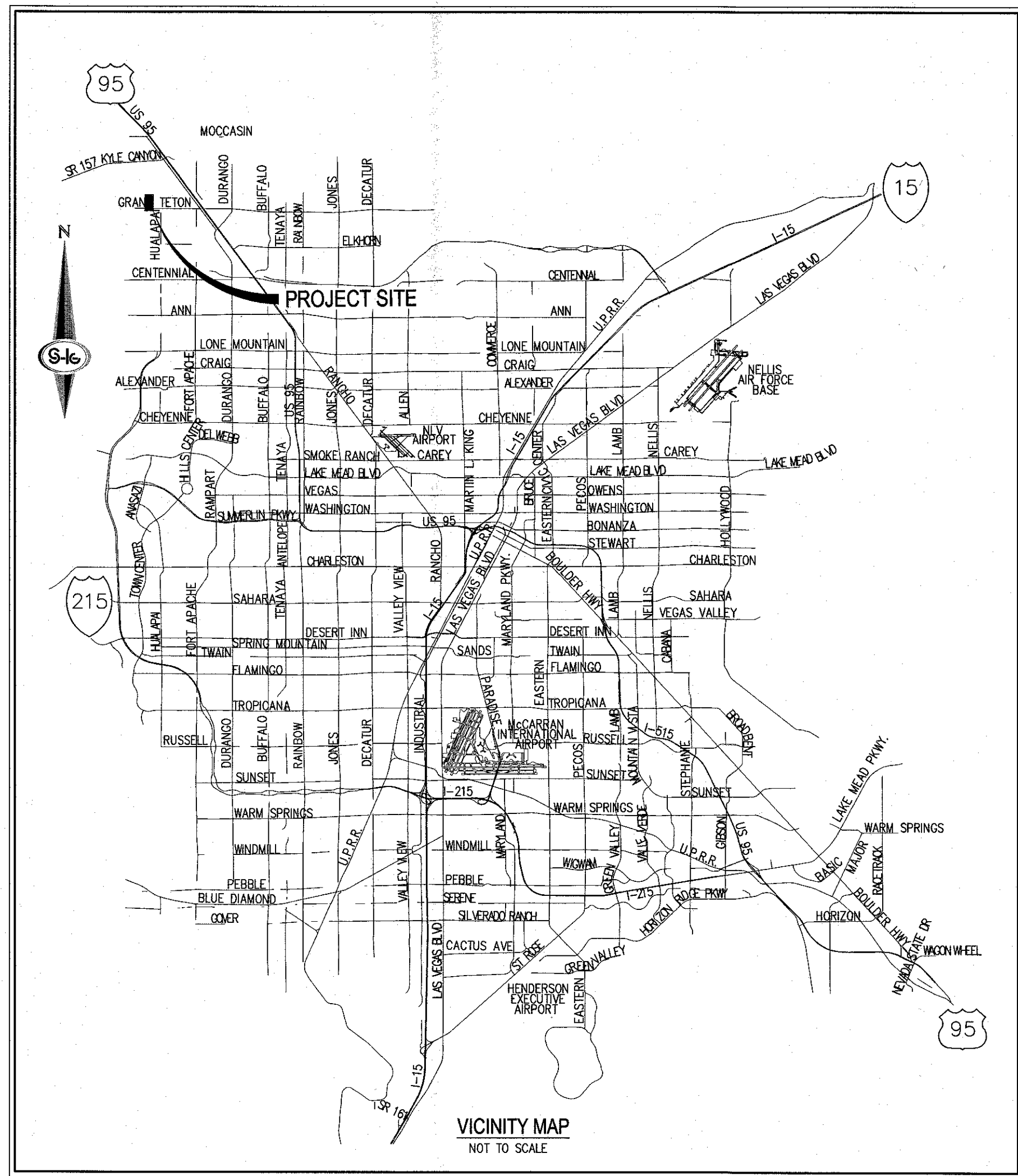
```

Ultimate3-TULEDB.OUT

HYDROGRAPH AT	ON7	.01	1	FLOW TIME	14. 3.50	13. 3.50	13. 3.50	12. 3.50	12. 3.50	12. 3.50
+ 3 COMBINED AT	C8	.01	1	FLOW TIME	51. 3.50	50. 3.50	49. 3.50	47. 3.50	45. 3.50	45. 3.50
HYDROGRAPH AT	RET1A	.00	1	FLOW TIME	13. 3.50	12. 3.50	12. 3.50	12. 3.50	11. 3.50	11. 3.50
+ HYDROGRAPH AT	RET1B	.00	1	FLOW TIME	20. 3.50	20. 3.50	20. 3.50	19. 3.50	18. 3.50	18. 3.50
+ HYDROGRAPH AT	RET1C	.00	1	FLOW TIME	7. 3.50	7. 3.50	7. 3.50	6. 3.50	6. 3.50	6. 3.50
+ 3 COMBINED AT	C9	.00	1	FLOW TIME	40. 3.50	39. 3.50	38. 3.50	36. 3.50	35. 3.50	35. 3.50
+ HYDROGRAPH AT	ON2D	.01	1	FLOW TIME	21. 3.50	21. 3.50	20. 3.50	19. 3.50	19. 3.50	19. 3.50
+ HYDROGRAPH AT	ON5D	.00	1	FLOW TIME	8. 3.50	8. 3.50	8. 3.50	8. 3.50	7. 3.50	7. 3.50
+ 2 COMBINED AT	CP1	.01	1	FLOW TIME	29. 3.50	29. 3.50	28. 3.50	27. 3.50	26. 3.50	26. 3.50
+ HYDROGRAPH AT	ON3D	.00	1	FLOW TIME	7. 3.50	7. 3.50	7. 3.50	7. 3.50	7. 3.50	7. 3.50
+ 2 COMBINED AT	CP2	.02	1	FLOW TIME	37. 3.50	36. 3.50	36. 3.50	34. 3.50	33. 3.50	33. 3.50
+ HYDROGRAPH AT	ON1D	.01	1	FLOW TIME	16. 3.50	15. 3.50	15. 3.50	15. 3.50	14. 3.50	14. 3.50
+ HYDROGRAPH AT	ON4D	.00	1	FLOW TIME	8. 3.50	8. 3.50	8. 3.50	8. 3.50	7. 3.50	7. 3.50
+ 2 COMBINED AT	CP3	.01	1	FLOW TIME	24. 3.50	23. 3.50	23. 3.50	22. 3.50	21. 3.50	21. 3.50
+ 2 COMBINED AT	CP4	.03	1	FLOW TIME	61. 3.50	59. 3.50	59. 3.50	56. 3.50	55. 3.50	54. 3.50
+ 4 COMBINED AT	CENGCA	.08	1	FLOW TIME	152. 3.50	148. 3.50	146. 3.50	139. 3.50	135. 3.50	134. 3.50
+ HYDROGRAPH AT	WML9	.03	1	FLOW TIME	55. 3.50	54. 3.50	53. 3.50	51. 3.50	50. 3.50	49. 3.50
+ HYDROGRAPH AT	WPRK5	.00	1	FLOW TIME	5. 3.50	5. 3.50	5. 3.50	4. 3.50	4. 3.50	4. 3.50
+ 2 COMBINED AT	WC10A	.03	1	FLOW TIME	60. 3.50	59. 3.50	58. 3.50	55. 3.50	54. 3.50	53. 3.50
+ HYDROGRAPH AT	WGL1	.01	1	FLOW TIME	12. 3.50	12. 3.50	11. 3.50	11. 3.50	11. 3.50	11. 3.50
+ HYDROGRAPH AT	WL4B	.01	1	FLOW TIME	27. 3.50	26. 3.50	26. 3.50	25. 3.50	24. 3.50	24. 3.50
+ 3 COMBINED AT	WC10B	.05	1	FLOW TIME	99. 3.50	97. 3.50	95. 3.50	91. 3.50	89. 3.50	88. 3.50
+ HYDROGRAPH AT	WML10	.02	1	FLOW TIME	38. 3.50	37. 3.50	37. 3.50	35. 3.50	34. 3.50	34. 3.50
+ HYDROGRAPH AT	WEGN3	.01	1	FLOW TIME	10. 3.58	10. 3.58	10. 3.58	9. 3.58	9. 3.58	9. 3.58
+ HYDROGRAPH AT	WML11	.04	1	FLOW TIME	81. 3.58	79. 3.58	78. 3.58	74. 3.58	72. 3.58	71. 3.58
+ 3 COMBINED AT	WC11	.07	1	FLOW TIME	127. 3.50	124. 3.50	123. 3.50	117. 3.50	114. 3.50	112. 3.50
+ 2 COMBINED AT	WC12	.12	1	FLOW TIME	226. 3.50	221. 3.50	218. 3.50	208. 3.50	202. 3.50	200. 3.50
+ HYDROGRAPH AT	WL6B	.02	1	FLOW TIME	30. 3.50	29. 3.50	29. 3.50	28. 3.50	27. 3.50	26. 3.50
+ HYDROGRAPH AT	WL7	.02	1	FLOW TIME	34. 3.50	33. 3.50	33. 3.50	31. 3.50	31. 3.50	30. 3.50
+ HYDROGRAPH AT	WML13	.03	1	FLOW TIME	49. 3.50	48. 3.50	47. 3.50	45. 3.50	44. 3.50	44. 3.50
+ HYDROGRAPH AT	WGL2	.01	1	FLOW TIME	12. 3.50	12. 3.50	12. 3.50	11. 3.50	11. 3.50	11. 3.50
+ 5 COMBINED AT	WC13	.18	1	FLOW TIME	352. 3.50	343. 3.50	339. 3.50	323. 3.50	315. 3.50	311. 3.50
+ HYDROGRAPH AT	WML14	.03	1	FLOW TIME	59. 3.50	57. 3.50	57. 3.50	54. 3.50	53. 3.50	52. 3.50
+ HYDROGRAPH AT	WL8	.03	1	FLOW TIME	48. 3.58	47. 3.58	46. 3.58	44. 3.58	43. 3.58	42. 3.58

APPENDIX G

Electronic Files (CD) & Improvement Plans

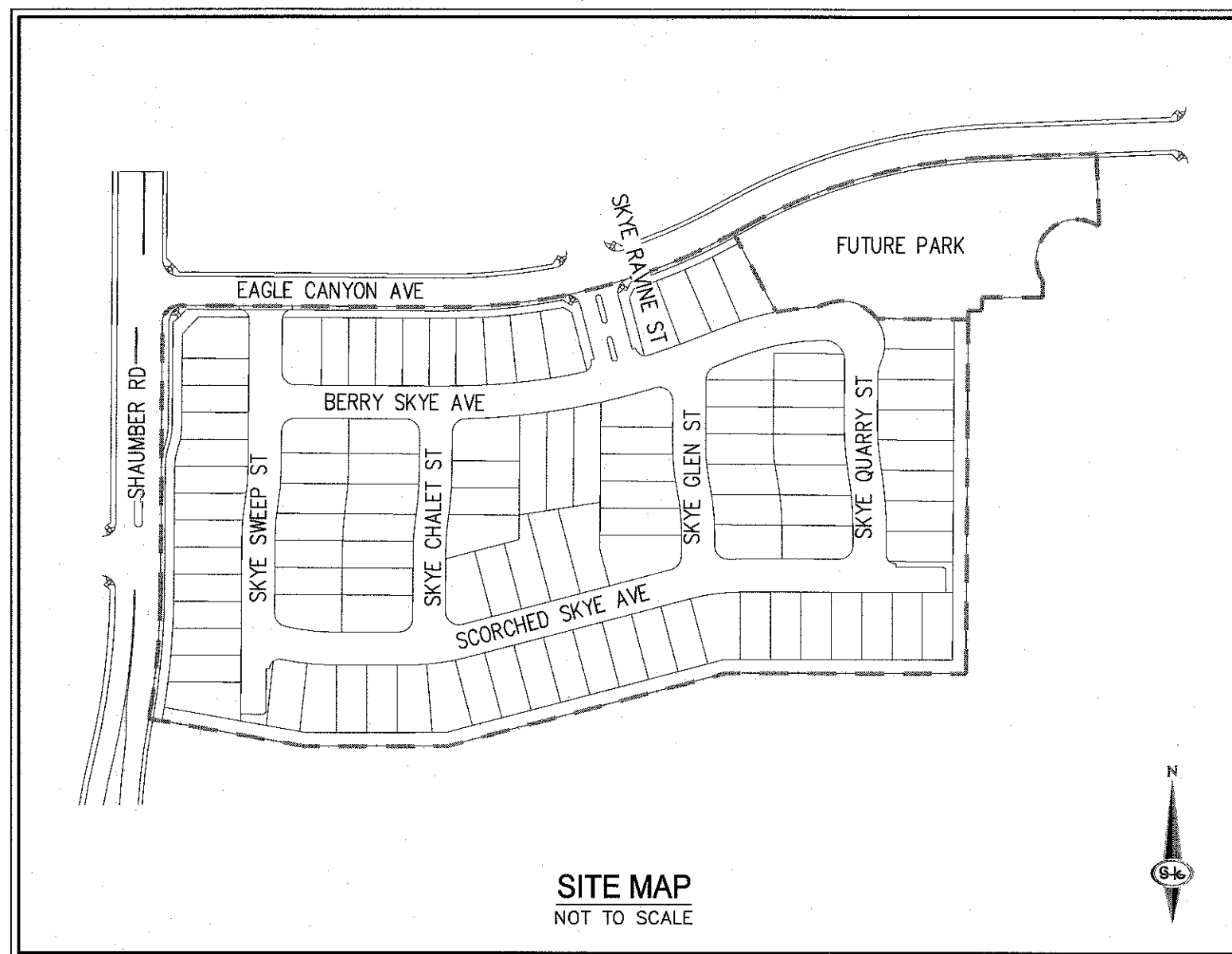


IMPROVEMENT PLANS FOR SKYE CANYON PARCEL 2.23B

CITY OF LAS VEGAS, NEVADA
RESIDENTIAL SUBDIVISION
A PORTION OF APN: 126-12-000-001



SHEET LIST TABLE		
NO.	SHEET	TITLE
1	C-1	COVER SHEET
2	C-2	GENERAL NOTES
3	C-3	GENERAL NOTES AND QUANTITIES
4	G-1	GRADING PLAN - I
5	G-2	GRADING PLAN - II
6	G-3	GRADING PLAN - III
7	G-4	GRADING PLAN - IV
8	G-5	GRADING PLAN - V
9	G-6	GRADING PLAN - VI
10	G-7	GRADING PLAN - VII
11	D-1	GRADING SECTIONS AND DETAILS I
12	D-2	GRADING SECTIONS AND DETAILS II
13	D-3	GRADING SECTIONS AND DETAILS III
14	PP-1	PLAN AND PROFILE - 1
15	PP-2	PLAN AND PROFILE - 2
16	PP-3	PLAN AND PROFILE - 3
17	PP-4	PLAN AND PROFILE - 4
18	PP-5	PLAN AND PROFILE - 5
19	PP-6	PLAN AND PROFILE - 6
20	PP-7	PLAN AND PROFILE - 7
21	PP-8	PLAN AND PROFILE - 8
22	PP-9	PLAN AND PROFILE - 9
23	PP-10	PLAN AND PROFILE - 10
24	PP-11	PLAN AND PROFILE - 11



PROJECT INFORMATION	
ACREAGE (GROSS):	= 20.14 AC
ACREAGE (NET):	= 18.94 AC
DENSITY (LOTS/NET ACRE):	= 5.404 DU/NET AC
ZONING:	= T-D
TOTAL NO. OF RESIDENTIAL LOTS	= 102
TOTAL NO. OF COMMON ELEMENTS *	= 10
MINIMUM LOT SIZE	= 3944.8 SF±
MAXIMUM LOT SIZE	= 7083.0 SF±
PROVIDED OPEN SPACE	= 69,351.5 SF±
EARTHWORK SUMMARY (UNADJUSTED)	
CUT	16,579 CY
FILL	113,586 CY

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/BMP/STORMD.HTM . PROJECTS THAT DISTURB MORE THAN ONE ACRE OF LAND MUST SUBMIT TO NDEP A "NOTICE OF INTENT" FOR INCLUSION UNDER STORMWATER PERMIT NO. NVR100000 ALONG WITH THE APPROPRIATE FILLING FEE.

GEOTECHNICAL ENGINEER
PREPARED BY: GEOTECH RESIDENTIAL, LLC ADDRESS: 6835 ESCONDIDO ST. # A LAS VEGAS, NV 89119 PHONE: 702-897-1424 PROJECT NO. 12208-LVR DATED: MARCH 30, 2016

FAST
Call before you UnderGround
1-702-432-5300
FREEWAY & ARTERIAL SYSTEM OF TRANSPORTATION (F.A.S.T.)

AVOID HITTING OVERHEAD POWER LINES. IT'S COSTLY.
CALL BEFORE YOU DO OVERHEAD
1-702-227-2929

Call before you Dig
AVOID CUTTING UNDERGROUND UTILITY LINES. IT'S COSTLY.
Call 811
OR
1-800-227-2600

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
THIS PLAN MEETS THE APPLICABLE STANDARDS OF THE PLANNING DEPARTMENT.	
CHRIS KNIGHT, DIRECTOR BUILDING AND SAFETY	DATE
THE AFFIRMED 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.	
CENTRAL TELEPHONE CO. DBA CENTURYLINK	DATE
APPROVED FOR CONSTRUCTION	
LAS VEGAS VALLEY WATER DISTRICT ENGINEERING SERVICES MANAGER PROJECT NO. ADD FIELD DATE: 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	DATE

OWNER/DEVELOPER	ENGINEER
K.A.G. LLC / NINETY-FIVE MANAGEMENT LLC 11411 SOUTHERN HIGHLANDS PARKWAY, SUITE 300 LAS VEGAS, NV 89118 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: TIM MULROONEY

LEGAL DESCRIPTION
BEING A PORTION OF ALL OF GOVERNMENT LOTS 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15 AND 16 OF SECTION 12, TOWNSHIP 19 SOUTH, RANGE 59 EAST, M.D.M., CITY OF LAS VEGAS, CLARK COUNTY, NEVADA.

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 3252761750E DATED SEPTEMBER 27, 2002.

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

NINETY-FIVE MANAGEMENT L L C
SKYE CANYON PARCEL 2.23B
COVER SHEET

DATE: 11/02/16
DRAFTER: DNP
DESIGNER: BCC
CHECKED: STS
PROJECT NO. OLY1607-003

ENGINEER
TIMOTHY M. MULROONEY
Exp. 12/31/2011
CIVIL
No. 22938
11/2/16

C-1
SHEET 1 OF 24

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

(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 FROM THE PROJECT AREA. THIS MAY BE ACCOMPLISHED BY ANY OF THE VARIOUS METHODS OF WAYS OF CLARK COUNTY AS A RESULT OF CONSTRUCTION ACTIVITIES ASSOCIATED WITH THIS SITE DEVELOPMENT OR CONSTRUCTION PROJECT. SUCH MATERIAL SHALL BE PREVENTED FROM ENTERING THE STORM SEWER SYSTEM.
2. ADDITIONAL CONSTRUCTION SITE DISCHARGE BEST MANAGEMENT PRACTICES MAY BE REQUIRED BY THE OWNER AND/OR THE COUNTY OF CLARK IF THE PROJECT ENCOUNTERS PROBLEMS 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 POSSIBLE AFTER THE END OF THE CONSTRUCTION PERIOD OR AFTER THE CONSTRUCTION ACTIVITY IN THIS PORTION OF THE SITE HAS TEMPORARILY OR PERMANENTLY CEASED. SOME EXCEPTIONS MAY APPLY; REFER TO NEVADA STORMWATER GENERAL PERMIT FOR CONSTRUCTION ACTIVITY NVTW00000, 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 POLLUTION, INCLUDING BUT NOT LIMITED TO LOCATION, AND ALL BAYS, WELLS, 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 TO REFLECT ANY CHANGES IN INSPECTION AND REPORTING, SUCH AS SUSPENSION OF LAND DISTURBANCE ACTIVITIES. REFER TO NEVADA STORMWATER GENERAL PERMIT FOR CONSTRUCTION ACTIVITY NVTW00000, 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, HOWEVER IS SMALLER. SEDIMENT SHALL BE REMOVED WHEN BMP DESIGN CAPACITY HAS BEEN REDUCED BY 50 PERCENT OR MORE.

BEING A PORTION OF ALL OF GOVERNMENT LOTS 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14,
AND 16 OF SECTION 12, TOWNSHIP 19 SOUTH, RANGE 59 EAST, M.D.M., CITY OF LAS VEGAS,
CLARK COUNTY, NEVADA.

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, NEVADA, AS SHOWN BY MAP THEREOF IN FILE 151, PAGE 14 OF SURVEYS IN THE CLARK COUNTY RECORDER'S OFFICE, NEVADA.

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.

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, SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO BE AWARE OF THE CONTENTS OF THE ABOVE SPECIFICATIONS.
2. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO PERFORM CONSTRUCTION AS PER PLANS, ANY ADDITIONS, DELETIONS, OR CHANGES SHALL FIRST MEET WITH THE APPROVAL OF THE CITY ENGINEER.
3. CHISEL "S" OR "G" IN CURBS WHERE SEWER OR GAS LATERALS PASS UNDER THE CURB.
4. POLYVINYL (PVC) SEWER PIPE SHALL MEET ASTM D-3034 SDR 35 SPECIFICATIONS, INSTALLED WITH SAND BEDDING AND BACKFILL OF TYPE II AGGREGATE BASE.
5. ALL MANHOLES PAVED IN STREETS EIGHTY (80') FOOT R/W AND LARGER SHALL HAVE CONCRETE COLLARS. STREETS LESS THAN EIGHTY (80') FOOT R/W WILL REQUIRE RETROFIT 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 LVWD STANDARDS WHENEVER A SEWER MAIN CROSSES OVER A WATER MAIN OR THE SEWER IS LESS THAN EIGHTEEN INCH (18") UNDER A WATER MAIN.
8. ALL CONTRACTORS INSTALLING SEWER MAINS THAT WILL BE UNDER THE JURISDICTION OF THE CITY OF LAS VEGAS MUST BE STATE OF NEVADA CLASS "A" CONTRACTORS.
9. THE CITY OF LAS VEGAS WILL NOT ACCEPT ANY SEWER MAINS WHICH HAVE A VERTICAL DEFLECTION OF MORE THAN ONE TENTH (0.1) OF A FOOT FROM THE APPROVED CONSTRUCTION PLANS AT ANY LOCATION. SEWER MAINS FOUND TO EXCEED THIS TOLERANCE WILL HAVE TO BE REPAIRED OR REMOVED OR RETURNED 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.

LWWD PROJECT # ADD FIELD

1. NO WORK SHALL BEGIN UNTIL THE WATER PLANS HAVE BEEN APPROVED FOR CONSTRUCTION BY THE LVVMD. FOLLOWING WATER PLAN APPROVAL, NOTICE SHALL BE GIVEN TO THE LVVMD COMMUNICATION SUPPORT CENTER (CSC) BY THE CONTRACTOR (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 LVVMD INSPECTION. WHEN REQUESTING INSPECTIONS, PLEASE REFER TO THE PROJECT # IDENTIFIED ABOVE.
2. ALL WORK SHALL CONFORM TO LVVMD STANDARD PLATES, 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 DRAFT OR EDITION OF THE UNIFORM STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION OFFSITE IMPROVEMENT, CLARK COUNTY AREA.
4. A SINGLE PIPE MATERIAL SHALL BE USED THROUGHOUT THE PROJECT UNLESS OTHERWISE APPROVED BY THE LVVMD.
5. ALL SERVICE LATERALS TWO (2) INCHES IN DIAMETER AND SMALLER SHALL BE TYPE K COPPER TUBING WITH LVVMD APPROVED SERVICE SADDLE.
6. ALL WATER METER BOXES SHALL BE LOCATED OUTSIDE OF DRIVEWAY AREAS.
7. ALL VALVES SHALL BE LOCATED OUTSIDE OF DRIVEWAYS, VALLEY AND CURB GUTTERS.
8. ALL WATER AND STORM DRAIN OR SANITARY SEWER CROSSINGS 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 LVVMD DISTRIBUTION SYSTEM.
10. THE CONTRACTOR MUST OBTAIN ALL METERS TWO (2) INCHES AND SMALLER FROM LVVMD CENTRAL STORES. TELEPHONE 268-3152 OR 268-3802, 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 LVVMD OPERATIONS 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 LVVMD 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.

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 ABUTTING A PUBLIC OR PRIVATE STREET, IF DISTURBED BY THE LVVMD DURING THE REPAIR OR OPERATION OF ITS FACILITIES, WILL BE REPLACED BY LVVMD WITH AN APPROPRIATELY SIZED PLAIN FINISH CONCRETE PATCH. THE LVVMD WILL NOT RESTORE, AND WILL NOT BE RESPONSIBLE FOR THE RESTORATION OF, ANY DECORATIVE PAVING SURFACE WITHIN THE STREET. THE LVVMD WILL NOT ATTEMPT TO MATCH COLOR OR FINISH OF ANY ADJACENT MATERIALS.

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 ROUGH 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.

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 SET. 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. SOLS REPORT PREPARED BY GEOTEK RESIDENTIAL, LLC, PROJECT NO. 12209-LVR, DATED FEBRUARY 9, 2015.
6. EARTHWORK QUANTITIES (RAW):
 - OUT = 16,579 CUBIC YARDS
 - FILL = 113,596 CUBIC YARDS
- A) THE ABOVE QUANTITIES DO NOT REFLECT LOSSES DUE TO SUBSIDENCE OR SHRINKAGE.
- B) THE ABOVE QUANTITIES DO REFLECT USING NATIVE MATERIAL IN LIEU OF TYPE 1 GRAVEL BASE MATERIAL FOR STREET SECTIONS.
- C) THE ABOVE QUANTITIES DO NOT REFLECT ANY EARTHWORK WHICH MAY BE REQUIRED BY THE ENGINEER TO CONSTRUCT ADDITIONAL PROTECTIVE DITCHES OR BERMS NOT SHOWN ON THESE DRAWINGS.

1. ALL WORK SHALL BE DONE IN STRICT ACCORDANCE WITH THE LAS VEGAS FIRE AND RESCUE ADOPTED FIRE CODE ORDINANCE # 6325, FOR HYDRANT SPECIFICATIONS, 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 [FC 105.7.12]

1. ALL WORK SHALL BE DONE IN STRICT ACCORDANCE WITH THE LAS VEGAS FIRE AND RESCUE ADOPTED FIRE CODE ORDINANCE # 6325, FOR HYDRANT SPECIFICATIONS, AND HYDRANT INSTALLATION SPECIFICATIONS.
2. ONLY FIRE HYDRANTS THAT ARE ON THE LAS VEGAS VALLEY WATER DISTRICTS' - 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 HYDRANT WORK. THE DESIGN PROTECTORS/ENGINEER SHALL PROVIDE THE TEST CERTIFICATE FOR HYDRANT PIPING SHALL BE OBTAINED FROM THE FIRE PROTECTION ENGINEER BEFORE COMMENCEMENT OF WORK [FSC 105.7.12]
4. ON ANT 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 WILL BE ON 600 WORKING ORDER AND SHALL BE CAPABLE OF DELIVERING THE REQUIRED FIRE FLOW. [FSC 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. [FSC 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. (CROWN LOADING IS ACCEPTABLE FOR THE HYDRO TESTS WITH PRIOR FIRE PREVENTION APPROVAL. [FSC 106.3]
7. ALL ON-SITE UNDERGROUND WATER MAINS AND MANHOLES SHALL BE U/L LISTED, A.W.W.A APPROVED AND SHALL BE COVERED WITH A MINIMUM OF 18" OF CONCRETE PRESSURE. [FSC 507.2.1, NEPA 24]
8. PAINTING OF CURBS, FIRE HYDRANTS, PADS, PROTECTION OF FIRE HYDRANTS FROM PHYSICAL DAMAGE, AND ALL OTHER WORK NECESSARY PER PLANS SHALL BE COMPLETED BEFORE LAS VEGAS FIRE AND RESCUE FIRE PREVENTION DIVISION. [FSC 507]
9. PRIVATE HYDRANTS SHALL BE PAINTED RED. [FSC 507.5.1.1]
10. PRIOR TO THE FINAL OCCUPANCY, A FIRE FLOW TEST SHALL BE WITNESSED BY LAS VEGAS FIRE AND RESCUE, FIRE PREVENTION DIVISION TO VERIFY AVALIABILITY OF THE REQUIRED FIRE FLOW. [FSC 507]
11. FIRE HYDRANT SPACING SHALL BE AS FOLLOWS: [FSC C102]
 - RESIDENTIAL- 500 FT UNSPRINKLERED; 600 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 HYDRANT SPACING IS NOT NEEDED FOR PROTECTION OF THE STRUCTURES, FIRE HYDRANTS SHALL BE INSTALLED AT MAXIMUM OF 1,000 FOOT 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 COUN OF MORE THAN 5000 VEH PER DAY, HYDRANTS ARE REQUIRED ON EACH SIDE OF THE STREET SPACED AT 500 FT ON AN ALTERNATING BASIS. [FSC C102.6]
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. [FSC 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. [FSC C102.4]
16. THE MAXIMUM DISTANCE FROM A FIRE HYDRANT TO A COMMERCIAL CONNECTION (FCD) SHALL NOT EXCEED 100 FT, AS MEASURED BY AN APPROVED ROUTE. [FSC C102.7]
17. THE MAXIMUM DISTANCE FROM A HYDRANT TO THE END OF A DEAD-END STREET SHALL NOT EXCEED 200 FT. [FSC C102.6]
18. THE TWO (2) SOURCES OF SUPPLY ARE REQUIRED WHENEVER THERE IS A BREAK OR MORE FIRE HYDRANTS/SPRINKLER LEADS ARE LOCATED IN THE SAME STREET. SIGNAGE SHALL BE PLACED ON BOTH SIDES OF AN ACCESS ROADWAY SO THAT NO MORE THAN 2 FIRE HYDRANTS CAN GO OUT OF SERVICE DUE TO A BREAK IN A WATER MAIN. [FSC 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. [FSC 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% FOR 25 FEET PRIOR TO OR AFTER THE GRADE CHANGE. ADJACENT TO THE STRUCTURES GRADIENT SHALL NOT EXCEED 6%. [FSC 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 RADII. [FSC 503.2.4]
22. VERTICAL CLEARANCE OF ALL FIRE APPARATUS ACCESS ROADS SHALL NOT BE LESS THAN 13 FT 6 INS. [FSC 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 LANE WIDTHS BETWEEN LOT LINES SHALL BE NOT LESS THAN 24 FT. [FSC 503.11.1]
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. [FSC 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 AREA. [FSC 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 ARROUND HAVING A MINIMUM DIAMETER OF 80 FT. [FSC 503.2.5]
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. THE SIGNS SHALL BE PLACED AT THE BEGINNING OF THE FIRE LANE AND AT THE END OF AN ACCESS ROADWAY IF NEEDED TO PREVENT PARKING ON EITHER SIDE. SIGNS TO BE INSTALLED NO HIGHER THAN 10 FEET OR LESS THAN 6 FEET FROM THE ROADWAY LEVEL. THE CURB ALONG OR ON THE PAVEMENT OR CEMENT (IF NO CURB IS PROVIDED) SHALL BE PAINTED WITH A RED WEAR RESISTANT PAINT IN ADDITION TO THE SIGNS. [FSC 503.3]
28. ELECTRICALLY CONTROLLED ACCESS GATES SHALL BE PROVIDED WITH AN APPROVED EMERGENCY VEHICLE AND FIRE DEPARTMENT/RECEIVER SYSTEM. SAID SYSTEM SHALL BE INSTALLED IN ACCORDANCE WITH THE FCS 503.6 AND FCS APPENDIX M.

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.

1. IN THE EVENT THAT ANY UNFORESEEN CONDITIONS NOT COVERED BY THESE NOTES ARE ENCOUNTERED DURING GRADING OPERATION, THE OWNER/ENGINEER SHALL BE IMMEDIATELY NOTIFIED FOR DIRECTION.
2. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO PERFECTLY FORM 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 EXCESSIVE 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:

1. ALL CONSTRUCTION AND MATERIALS SHALL BE IN ACCORDANCE WITH THE "UNIFORM STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION OFF-SITE IMPROVEMENTS, CLARK COUNTY AREA NEVADA", LATEST EDITION; THE "UNIFORM STANDARD DRAWINGS FOR PUBLIC WORKS CONSTRUCTION, CLARK COUNTY AREA NEVADA", LATEST REVISED EDITION; THE "SUMMERLIN IMPROVEMENT STANDARDS" FOR WORK IN THE SUMMERLIN AREA; AND OTHER APPLICABLE APPROVED STANDARDS ISSUED BY THE CONTROLLING AGENCY; THE UNIFORM BUILDING CODE; AND ALL LOCAL CITY CODES AND ORDINANCES APPLICABLE, EXCEPT AS NOTED ON THIS SHEET AS "DEVIATIONS FROM STANDARDS".

1. ALL CONSTRUCTION AND MATERIALS SHALL BE IN ACCORDANCE WITH THE "UNIFORM STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION OFF-SITE IMPROVEMENTS, CLARK COUNTY (CLV) AREA NEVADA", LATEST EDITION, THE "UNIFORM STANDARD DRAWINGS FOR PUBLIC WORKS CONSTRUCTION, CLARK COUNTY AREA NEVADA", LATEST REVISED EDITION; THE "SUMMERLIN IMPROVEMENT STANDARDS" FOR WORK IN THE SUMMERLIN AREA; AND ANY APPLICABLE APPROVED STANDARDS ISSUED BY THE CONTROLLING AGENCY. THE UNIFORM STANDARD SPECIFICATIONS, UNIFORM STANDARD DRAWINGS, AND STANDARDS, IF APPLICABLE, EXCEPT AS NOTED ON THIS SHEET AS "DEVIATIONS FROM STANDARDS".
2. THE EXISTENCE AND LOCATION OF ANY OVERHEAD OR UNDERGROUND UTILITY LINES, PIPES, OR STRUCTURES SHOWN ON THESE PLANS ARE OBTAINED BY A RESEARCH OF THE AVAILABLE RECORDS. EXISTING UTILITIES AS SHOWN FROM CLV PLANS LIBRARY ARE APPROXIMATE, AND FOR RECORD PURPOSES. EXISTING UTILITIES ARE LOCATED ON PLANS BY THE CITY ENGINEER OR HIS DESIGNATED REPRESENTATIVE. 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 WORK. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL UTILITIES 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 UTILITIES AND STRUCTURES FROM DAMAGE. THE CONTRACTOR SHALL BE RESPONSIBLE IN PLACE, FROM DAMAGE, AND ALL SUCH IMPROVEMENTS OR STRUCTURES DAMAGED BY THE CONTRACTOR'S OPERATIONS SHALL BE REPAIRED OR REPLACED SATISFACTORY 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 PROPER WRITTEN APPROVAL OF THE CITY ENGINEER.
5. TYPE V MINIMUM SHALL BE USED IN ALL OFF-SITE CONCRETE WORK. CONCRETE TO BE 3000 PSI MINIMUM. ALL PLAYS MAY 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 EXTENDED-TYPE CURB.
8. AS PAVEMENT TO BE ONE-HALF INCH (1/2") ABOVE TOP OF ALL UTILITY CUTTERS AT CURB, EXCEPT AT SIDEWALK RAMPS) AND CROSS UP ALL CUTTERS.
9. CURB AND GUTTER SHOULD 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 TO PREVENT DAMAGE TO EXISTING 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 GEO. REPORT #ADD FIELD, ADD FIELD APPROVED BY THE CITY ENGINEER, AND AS SHOWN ON THESE PLANS.
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 PAVEMENT. PAVED SURFACES SHALL BE PROTECTED BY SHIELDING SHALL BE REPAIRED AND ADJUSTED PER AVAILABLE RECORDS IN ACCORDANCE WITH N.R.S. STATUTE NO. 625.380 & CITY OF LAS VEGAS TITLE 18, APPENDIX D.
15. UTILITY COMPANY METER BOXES, MANHOLE LIDS, VALVE COVERS, ETC., SHALL BE LOCATED OUT OF DRIVEWAYS, DRIVEWAY APPROACHES, FLOWLINES, AND CROSS GUTTERS. WRITTEN APPROVAL IS GRANTED BY THE UTILITY COMPANY AND THE CITY ENGINEER.

WALL NOTES:

- ALL WELLS, NEW OR EXISTING, ARE ONLY ALLOWED ON CIVIL PLANS FOR THE PURPOSE OF CONDUCTING INVESTIGATIONS, FLOOD CONTROL, AND SIGHT DISTANCE AT INTERSECTIONS. NEW EXISTING REQUIRE A SEPARATE FLOOD AND INSPECTION OF THE BUILDING DEPARTMENT.
17. ASPHALT MIX DESIGN MUST BE SUBMITTED AND APPROVED BY THE CITY ENGINEER PRIOR TO THE PLACEMENT OF ASPHALT WITHIN CITY RIGHT OF WAY.
18. CONTRACTOR SHALL ADJUST ALL NEW EXISTING RIGIDS, VALVE BOXES, MANHOLE RISERS, AND SEWER CLEAN OUTS, ETC. TO FINISH GRADE AS APPLICABLE WHETHER OR NOT THEY ARE SHOWN ON THE PLANS AND VERIFIED TO BE IN GOOD WORKING CONDITION PRIOR TO THE CONSTRUCTION OF ANY ROAD BASE.
19. MATERIALS, HANDLING AND PLACEMENT OF PORTLAND CEMENT CONCRETE SHALL BE IN ACCORDANCE WITH APPLICABLE SECTIONS OF NDOT OR THE CLARK COUNTY AREA SPECIFICATIONS (AS APPLICABLE) AND THE PLANS AND DETAILS SHOWN HEREON.
20. WHEN INSTALLING UNDERGROUND FACILITIES THAT REQUIRE UNDERGROUND LOCATING DEVICES SUCH AS MARKER BAILS, LOCATING RIBBON, ETC., THE CONTRACTOR SHALL PROVIDE WRITTEN DOCUMENTATION TO OFFSITE INSPECTION AND TESTING CERTIFYING THAT ALL DEVICES HAVE BEEN INSTALLED AND VERIFIED TO BE IN GOOD WORKING CONDITION PRIOR TO THE CONSTRUCTION OF ANY ROAD BASE.
21. SANITARY SEWER AND STORM DRAIN FINAL LOCATION MAP(S) SHALL BE PROVIDED TO THE CITY AND APPROVED PRIOR TO ACCEPTANCE OF FACILITY WDEO INSPECTION. THE MAP(S) SHALL INCLUDE THE HORIZONTAL AND VERTICAL (INVERT) LOCATION OF PUBLIC MANHOLES, STORM DRAIN MANHOLES, STORM DRAIN STRUCTURES, STORM DRAIN LATERALS AT THE CONNECTION TO THE STORM DRAIN MAIN AND AT THE CONNECTION TO A DROP INLET, THE CONNECTION OF SEWER SERVICE LATERALS TO THE SEWER MAIN AND WEDER SERVICE LATERALS TO THE SEWER MAIN, THE LOCATION OF RIGHT-OF-WAY, AND STORM DRAIN MAIN ALIGNMENT, INCLUDING DEFLECTION POINTS. THE LOCATION SHALL BE DESCRIBED BY COORDINATES WHICH SHALL BE BASED ON THE OFFICIAL HORIZONTAL AND VERTICAL CONTROL NETWORKS OF THE STATE OF NEVADA. THE LOCATION MAP(S) SHALL BE SEALED AND CERTIFIED BY A NEVADA PROFESSIONAL LAND SURVEYOR TO HAVE POSITIONAL CERTAINTIES OF ± 0.09 METERS (± 0.3 FEET) HORIZONTALLY AND VERTICALLY. A SEPARATE ELECTRONIC COMMA DELIMITED FILE FOR THE SANITARY SEWER AND STORM DRAIN COORDINATES SHALL ALSO ACCOMPANY THE SANITARY SEWER AND STORM DRAIN FINAL LOCATION MAP(S).
- OR
22. SANITARY SEWER AND STORM DRAIN FACILITIES SHOWN ON THESE PLANS SHALL BE USED TO MEET THE REQUIREMENTS OF NRS 455 AND SHALL SHOW AT A MINIMUM THE HORIZONTAL AND VERTICAL (INVERT) LOCATION OF PUBLIC MANHOLES, STORM DRAIN MANHOLES, STORM DRAIN LATERALS, AND THE CONNECTION OF SEWER SERVICE LATERALS TO THE SEWER MAIN AND STORM DRAIN LATERALS TO THE STORM DRAIN LATERAL. ANY DEVIATIONS FROM THE INFORMATION SHOWN SHALL BE NOTED AND SUBMITTED AS A REVISION TO THE PLANS AND APPROVED PRIOR TO THE CONSTRUCTION OF FACILITY.
23. CCTV VIDEO INSPECTION IS REQUIRED FOR ALL SEWER AND STORM DRAINS. THE CCTV VIDEO INSPECTIONS NEED TO BE PERFORMED PER THE DESIGN AND CONSTRUCTION STANDARDS FOR WASTEWATER COLLECTION SYSTEMS LATEST ADDITION.
24. A SEPARATE BORING PERMIT IS REQUIRED FOR ALL BORING ACTIVITIES.

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.

1. THE STREET SIGN CONTRACTOR SHALL CONFORM TO ALL CITY OF LAS VEGAS TRAFFIC SIGNALING, BARRELCADING, AND TRAFFIC DELINEATION SHALL CONFORM TO THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES", LATEST EDITION.
2. THE STREET SIGN CONTRACTOR SHALL BARRICADE STREET NAMES AND BLOCK NUMBERING FROM THE WORK ZONE THROUGH TRAFFIC TO DEVIATIONS.
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 AND ALL EXISTING "CROSSING ROAD" MAINTAINANCE SIGNS MUST BE ACCOMPLISHED, AND SHALL MAINTAIN SADS UPHOLD SIGNS UNTIL PERMANENT SIGNS ARE INSTALLED.
4. WHEN A DESIGNATED "SAFE ROUTE TO SCHOOL" IS ENCLOSED UPON BY A CONSTRUCTION WORK ZONE AND PUBLIC WORKS STAFF IDENTIFIES A NEED FOR STUDENTS TO BE ASSISTED IN THE SAFE CROSSING THROUGH THAT WORK ZONE, THE CONTRACTOR SHALL BE REQUIRED TO PROVIDE A QUALIFIED "CROSSING GUARD" WHO WILL BE PRESENT FOR THE FULL DURATION OF THE 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 MARKINGS MUST 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 VPI TYPE 30 REFLECTIVE SURFACES. ALL EXISTING SIGNAL, ALL NEW TRAFFIC SIGNS EXCEPT STREET NAME AND SCHOOL SPEED LIMIT SIGNED PLAN, SHALL HAVE 3M SERIES 1160 OR APPROVED EQUIVALENT ANTI-GRAFFITI PROTECTIVE OVERLAY FILMS. SCHOOL ZONE SIGNS SHALL HAVE 3M SERIES 1150 OR APPROVED EQUIVALENT ANTI-GRAFFITI PROTECTIVE OVERLAY FILMS. 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 SIGNPOST SHALL BE MOUNTED ON THE PERMANENT TRAFFIC STANDARD AND THE SIGNPOST SHALL BE ELIMINATED.
8. ALL PERMANENT TRAFFIC STANDARD DEVICES CALLED FOR HEREON SHALL BE IN PLACE AND IN FINAL POSITION PRIOR TO ALLOWING ANY PUBLIC TRAFFIC INTO THE PORTIONS OF THE ROADWAY BEING CONSTRUCTED. THE CONTRACTOR SHALL OWNERS OF COMMERCIAL PROPERTY ADJACENT TO THE SITE OF IMPROVEMENTS CONTACTED FOR 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 SIGNS AND FLAGGERS TO INSURE THE SAFETY OF THE PUBLIC IN OR AROUND THE WORK AREA. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING, HARKENING AND TRAFFIC SIGNS IN ACCORDANCE WITH CITY SET UP, MAINTAIN AND/OR REMOVE ALL TRAFFIC SIGNS IN THE CITY OF LAS VEGAS RIGHT OF WAY.
11. WORK IN PUBLIC STREETS, OPEN BEGINN, SHALL BE EXPEDITED TO COMPLETION SO AS TO PROVIDE MINIMUM NIGHT INTERRUPTS) ADEQUATE PROTECTION BUS STOP OR HAS AN ADVISORY STREET BUS SERVICE ON THAT STREET TO ARRANGE FOR TEMPORARY RELOCATION OF TRANSIT.
12. GUARDS SHALL BE OBTAINED BY CONTACTING THE METROPOLITAN POLICE DEPARTMENT SPECIAL EVENTS UNIT (PHONE # 828-3442) WHO WILL PROVIDE OFFICERS PROPERLY TRAINED IN TRAFFIC MANAGEMENT AND CROWD CONTROL. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PAYMENT MADE TO THE CONTRACTOR. THE CONTRACTOR IS RESPONSIBLE FOR ALL ARRANGEMENTS WITH METRO.
13. ANY WORK WITHIN 300' OF A SIGNALIZED INTERSECTION WILL BE NIGHT WORK, UNLESS OTHERWISE DIRECTED BY THE CITY OF LAS VEGAS TRAFFIC ENGINEER.
14. THE CONTRACTOR SHALL CONTACT THE TRAFFIC ENGINEERING DIVISION (TRANSPORTATION SECTION) THROUGH THE PROJECT'S GTSITE INSPECTOR PRIOR TO INITIATING PAVING TO RECEIVE DIRECTION FOR ANY PERMANENT OR TEMPORARY MODIFICATIONS TO THE APPROVED DRAWINGS REGARDING DRIVEWAYS, SIDEWALKS, TRANSVERSE MARKINGS AND SIGNS. THE USE REQUIRED TO MATCH ADJACENT ROADWAY SEGMENTS. THE CONTRACTOR SHALL PROVIDE A WRITING FOR APPROVAL BY THE TRAFFIC ENGINEERING DIVISION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL PAVEMENT MARKINGS AND SIGNAGE, WHICH MAY INCLUDE OUTLINES, ADDING OR MODIFYING PAVEMENT MARKINGS AND TRAFFIC CONTROL SIGNS SUCH THAT ADEQUATE TRANSITION AND LINE TERMINATIONS BETWEEN ADJACENT ROADWAY SEGMENTS OR SECTIONS ARE CONSTRUCTED.

1. ALL STREET LIGHTING INSTALLATIONS SHALL BE IN ACCORDANCE WITH THE STREET LIGHTING PLANS THE "UNIFORM STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION OFF-SITE IMPROVEMENTS, CLARK COUNTY AREA, NEVADA", LATEST REVISION, AND THE "UNIFORM STANDARD DRAWINGS FOR PUBLIC WORKS CONSTRUCTION OFF-SITE IMPROVEMENTS, CLARK COUNTY AREA, NEVADA", LATEST REVISION, AND ANY ADOPTED SPECIAL AREA STANDARDS.

1. ALL STREET LIGHTING INSTALLATIONS SHALL BE IN ACCORDANCE WITH THE STREET LIGHTING STANDARDS' "UNIFORM STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION OFF-SITE IMPROVEMENTS, CLARK COUNTY, NEVADA," LATEST REVISION, AND ANY ADDED SPECIAL AREA STANDARDS.
2. NO DEVIATION OF STREET LIGHT: PULL BOX, CONDUCITS (E.T.C.) LOCATIONS SHALL BE PERMITTED WITHOUT WRITTEN APPROVAL OF TRAFFIC ENGINEERING AND THE CITY ENGINEER.
3. ALL EXISTING STREET LIGHTING SHALL REMAIN OPERATIONAL DURING CONSTRUCTION.
4. ALL STREET LIGHTING CONDUCITS SHUB SHALL HAVE AT LEAST ONE GREEN #8 THW WIRE INSTALLED AS TRACER M/W. WHEN "EMPTY" CONDUIT IS COMPLETELY INSTALLED FROM PB TO PB, IT SHALL HAVE MINIMUM OF 2 #4 AND 10 THW WIRE WITH THE ENDS TAPED OR "SAFE OFF" TO PREVENT FIRE HAZARD.
5. ANY STRUCTURE SUCH AS BLOCK WALLS, CHAIN LINK FENCES, RETAINING WALLS, ETC., SHALL LEAVE A MINIMUM CLEARANCE IN ACCORDANCE WITH THE USD NO. 320A.
6. AS-BUILT DRAWINGS NEED BE SUPPLIED TO THE TFO PRIOR TO ANY PRE-FINAL INSPECTION. THE ASBUILT DRAWINGS NEEDS TO BE STAMPED AS-BUILT AND SIGNED BY THE PREPARER.
7. SERVICE POINT SHALL BE COORDINATED WITH NV ENERGY COMPANY; AND WHEREVER POSSIBLE, BE ON THE CORNER NEAR THE CENTER OF THE CIRCUIT. SERVICE POINTS SHALL BE SHOWN ON THE CIVIL PLANS.
8. IT SHALL BE ASSUMED THAT IN THE ABSENCE OF AN EXISTING, WORKABLE CIRCUIT TO ATTACH TO, ALL INSTALLATIONS SHALL REQUIRE A NEW SERVICE FOR OPERATION OF THE CIRCUIT.
9. WHEREVER THERE IS AN OVERHEAD UTILITY THAT MAY CONFLICT WITH THE INSTALLATION OF STREET LIGHTING CIRCUITS AND/OR POLES, THESE CONFLICTS MUST BE RESOLVED BETWEEN THE DEVELOPER AND THE UTILITY INVOLVED, AT NO EXPENSE TO THE CITY OF LAS VEGAS, BEFORE STREETLIGHT BASES ARE INSTALLED.
10. THE CONTRACTOR SHALL FURNISH COMPLETE SERVICE TO TRANSFORMERS AND CONTROL SYSTEMS IF REQUIRED BY OWNER.
11. THE DEVELOPER/OWNER WILL BE REQUIRED TO SUPPLY POWER TO ALL NEW PUBLIC STREET LIGHTS INSTALLED UNDER THIS DESIGN PRIOR TO BOND RELEASE, OR PROJECT COMPLETION. THE DEVELOPER/OWNER WILL BE RESPONSIBLE FOR THE OBTAINING OF LATEST REVISION, AND THE "UNIFORM STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION OFF-SITE IMPROVEMENTS, CLARK COUNTY, NEVADA," LATEST REVISION, AND ANY ADDED SPECIAL AREA STANDARDS. THE DEVELOPER/OWNER SHALL BE RESPONSIBLE FOR THE OBTAINING OF LATEST REVISION, AND THE "UNIFORM STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION OFF-SITE IMPROVEMENTS, CLARK COUNTY, NEVADA," LATEST REVISION, AND ANY ADDED SPECIAL AREA STANDARDS. THE DEVELOPER/OWNER SHALL BE RESPONSIBLE FOR THE OBTAINING OF LATEST REVISION, AND THE "UNIFORM STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION OFF-SITE IMPROVEMENTS, CLARK COUNTY, NEVADA," LATEST REVISION, AND ANY ADDED SPECIAL AREA STANDARDS. THE DEVELOPER/OWNER SHALL BE RESPONSIBLE FOR THE OBTAINING OF LATEST REVISION, AND THE "UNIFORM STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION OFF-SITE IMPROVEMENTS, CLARK COUNTY, NEVADA," LATEST REVISION, AND ANY ADDED SPECIAL AREA STANDARDS.

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

NONE

LAS VEGAS VALLEY WATER DISTRICT ENGINEERING SERVICES MANAGER

DATE _____ PROJECT No. INSERT FIELD
LVVWD APPROVED FIRE FLOW INSERT FIELD GPM AT 20 PSI RESIDUAL _____



Call before you Dig
AVOID CUTTING UNDERGROUND
UTILITY LINES. IT'S COSTLY.
Call
811
OR
1-800-227-2600

NINETY-FIVE MANAGEMENT L L C		CITY OF LAS VEGAS, NEVADA		NO.		DESCRIPTION		DATE		BY		APP. DATE	
SKYE CANYON PARCEL 2.23B				GENERAL NOTES									
 SLATER HANIFAN GROUP CONSULTING ENGINEERS & PLANNERS 5740 S. ARVILLE STREET #216, LAS VEGAS, NV 89118 PHONE (702) 284-5300 FAX (702) 284-5399													

12 S E
19 S E
59 S E

DATE: 11/02/16

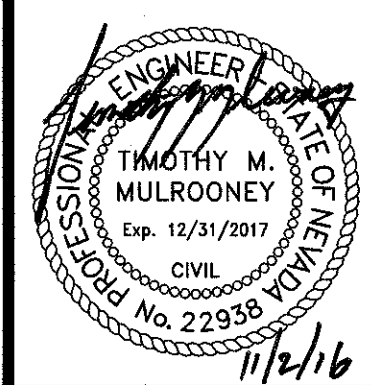
DRAFTER: DNF

DESIGNER: BCO

CHECKED: STS

PROJECT NO.

OLY1607-003



C-2

EET 2 OF 24

AC	ASPHALTIC CONCRETE OR ACRE
AGG	AGGREGATE BASE
APPN	ASSESSORS PARCEL NUMBER
APPROX OR ~	APPROXIMATE
AVE	AVENUE
AT	AT
BC	BEGIN CURVE OR BACK OF CURB
BOR	BEGINNING OF CURB RETURN
BHW	BOTTOM OF HEADWALL
BLDG	BUILDING
BLVD	BULEVARD
BENCH	BENCHMARK
BVC	BEGIN VERTICAL CURVE
BACK	BACK WIND VALVE
CC	CLARK COUNTY
CAUSED	CLARK COUNTY AREA UNIFORM STANDARD DRAWINGS
CPW	CLARK COUNTY PUBLIC WORKS
CLARK	CLARK COUNTY REGIONAL FLOOD DISTRICT
CWARD	CLARK COUNTY WATER RECLAMATION DISTRICT
CE	COMMON ELEMENT
CEN	CENTERLINE
CL/C	CLEAR OR CLEARANCE
CLR	CLEAR
CLSM	CONTROLLED LOW STRENGTH MATERIAL
CEM&G	CEMENT & GROUT LINED AND COATED
CONC	CONCRETE MASONRY UNIT
CONC	CONCRETE
CY	CUBIC YARD
CU	CURB
DWCS	DESIGN AND CONSTRUCTION FOR WASTEWATER COLLECTION SYSTEMS
DET	DETAIL
DI	DUCTILE IRON OR DRAIN INLET
DIA. Ø	DIAMETER
DIP	DUCTILE IRON PIPE
DRIVE	DRIVE
DWG(S)	DRAWING
DWY	DRIVEWAY
EA	EACH
EOR	END CURB RETURN
EG	EXISTING GROUND
EL	ELEVATION
ESMT	EASEMENT
EPG	EDGE OF PAVEMENT
ENC	END VERTICAL CURVE
EX OR EXIST	EXISTING
FC	FACE OF CURB
FF	FINISHED FLOOR
FG	FINISHED GRADE
FGL	FINISHED GRADE, HIGH SIDE
FQH	FINISHED GRADE, LOW SIDE
FI	FIRE HYDRANT
FL	FLOWING
FT	FEET OR FOOT

FUTD	FUTURE
GRD	GRADE OR GROUND
GB	GRADE BREAK OR GRADE CHANGE
GV	GATE VALVE
HDPE	HIGH DENSITY POLYETHYLENE
HOA	HOME OWNERS ASSOCIATION
HORIZ	HORIZONTAL
HPZ	HIGH POINT
HWL	HIGH WATER LEVEL
HWL/ OR HW	HEADWALL
HYD	HYDRAULIC OR HYDRANT
ID	INSIDE DIAMETER
INCH	INCH
INT	INTERSECTION
INV	INVERT ELEVATION
IRRG	IRON PIPE
IRRIG	IRRIGATION
LF	LINEAR FEET
LT	LEFT
L	LAS VEGAS VALLEY WATER DISTRICT
LW	LOW WATER LEVEL
MAX	MAXIMUM
MCH	MECHANICAL
MIN	MINIMUM
MISC	MISCELLANEOUS
MUNE	MUNICIPAL UTILITY EASEMENT
NDOT	NEVADA DEPARTMENT OF TRANSPORTATION
NPD	NEVADA POWER COMPANY
NS	NOT SCALE
NUE	NONEXCLUSIVE UTILITY EASEMENT
OC	ON CENTER
OD	OUTSIDE DIAMETER OR OVERALL DIMENSION
OTF	OFF
ORIG	ORIGINAL
PAE	POINT OF PEDESTRIAN ACCESS EASEMENT
PB	PULL BOX
PC	PUBLIC OR CURVE
PCC	POINT OF COMPOUND CURVE
PDC	PUBLIC DRAINAGE EASEMENT
OR PL	PROPERTY LINE
POB	POINT OF BEGINNING
POC	POINT OF CURVATURE
POC	POINT ENDING
PRC	POINT OF REVERSE CURVATURE
PRELIM	PRELIMINARY
PROP	PROPOSED
PRV	PRESSURE REDUCING VALVE
PUE	PUBLIC UTILITY EASEMENT
PT	POINT OF TANGENT OR POINT
PVC	POLYVINYL CHLORIDE
PVI	POINT OF VERTICAL INTERSECTION

QTY	QUANTITY
R	RADIUS
RCA	REINFORCED CONCRETE ARCH
REB	REINFORCED CONCRETE BOX
RPC	REINFORCED CONCRETE PIPE
RD	ROAD
RDWAY ESMT	ROADWAY EASEMENT
REGD	REQUIRED
REV	REVISION
RG	ROUGH GRADE
RT OR R	RIGHT
R/W, ROW	RIGHT OF WAY
S	SLOPE
SCH	SCHEDULE
SD	STORM DRAIN
SDDI	STORM DRAIN DROP INLET
SDMH	STORM DRAIN MANHOLE
SEC	SECTION
SF	SQUARE FEET
SHT	SHEET
SOUTH	SOUTHERN NEVADA WATER AUTHORITY
SPECS	SPECIFICATIONS
ST	STREET
STMH	STATION SEWER MANHOLE
STA	STATION
STD	STEEL
STL	STEAD OR STREET LIGHT
SW	SIDEWALK
SWG	SOUTHWEST GAS
SWR OR SS	SANITARY SEWER
SY	SQUARE YARD
TAN	TANGENT
TC	TOP OF CURB
TCD	TRAFFIC CONTROL DEVICE
TF	TOP OF FLOOR OR TOP OF FOOTING
TG	TOP OF GRATE
THRU	THROUGH
THW	TOP OF HEADWALL
TP	TOP OF PIPE
TW	TOP OF WALL
TRW	TOP OF RETAINING WALL
TSW	TOP OF SCREEN WALL
TYP	TYPICAL
UDACS	UNIFORM DESIGN AND CONSTRUCTION STANDARDS
VERT	VERTICAL CURVE
VC	VERTICAL
VGUT	VALLEY GUTTER
WI	WROUGHT IRON
WL	WATER LINE
WPR	WATER PRESSURE ZONE
WT	WEIGHT
WZ	WATER LINE

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.

—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 COMMENCEMENT OF 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

EXISTING	PROPOSED	DESCRIPTION
		5' CONTOUR
		1' CONTOUR
		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	PROPOSED	DESCRIPTION
		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/FLY 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

EXISTING	PROPOSED	DESCRIPTION
		PROPOSED SCARP AREA
		DRIVEWAY
		PROPOSED RIP RAP
		SIGHT VISIBILITY ZONE PER STD DWG NO. 201.2
		HANDICAP RAMP

DRAINAGE		
1.	60" TYPE III STORM DRAIN MANHOLE	EA -- --
2.	5.0" TYPE "CM2" DROP INLET	EA -- --
3.	10.0" TYPE "CM2" DROP INLET	EA -- --
4.	12.5" TYPE "CM2" DROP INLET	EA -- --
5.	20.0" TYPE "CM2" DROP INLET	EA -- --
6.	18" RCP CLASS IV STORM DRAIN	LF -- --
7.	24" RCP CLASS IV STORM DRAIN	LF -- --
8.	30" RCP CLASS IV STORM DRAIN	LF -- --
9.	36" RCP CLASS IV STORM DRAIN	LF -- --
10.	RIPRAP D50=8", THK=16"	SF 999 --
11.	8" WIDE CONCRETE VALLEY GUTTER W/10" TYPE I AGGREGATE BASE	SF 3,810 --
12.	SIDEWALK UNDER DRAIN	EA 1 --
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/6" GATE VALVE PER UDACS PLATE NO. 40	EA -- --
2.	6" 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 13,714 --
2.	STANDARD 18" TYPE "I" CURB & GUTTER W/6" TYPE I AGGREGATE BASE	LF 225 --
3.	STANDARD 8" TYPE "A" ISLAND CURB W/6" TYPE I AGGREGATE BASE	LF 178 --
4.	STANDARD 30" TYPE "ROLL" CURB & GUTTER W/6" TYPE I AGGREGATE BASE	LF 6,510 --
5.	4" WIDE CONCRETE SIDEWALK W/4" TYPE II AGGREGATE BASE	SF 30,726 --
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 (SLT)	EA -- --
6.		

[illegible]

NINETY-FIVE MANAGEMENT LLC

SKYE CANYON PARCEL 2.23B
GENERAL NOTES AND QUANTITIES

DATE: 11/02/16

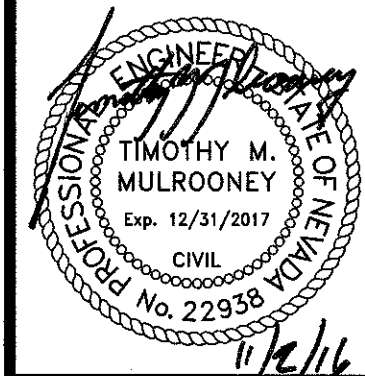
DRAFTER: DNP

DESIGNER: BCC

CHECKED: STS

PROJECT NO.

OLY1607-003



C-3

SHEET 3 OF 24

APPROVED FOR CONSTRUCTION

LAS VEGAS VALLEY WATER DISTRICT ENGINEERING SERVICES MANAGER

DATE _____ PROJECT No. _____
LVVWD APPROVED FIRE FLOW 1,500 GPM AT 20 PSI RESIDUAL

all before you Dig
D CUTTING UNDERGROUND
ILITY LINES. IT'S COSTLY.

Call

811



OR
800-227-2600

FAST
Call before you
Underground
1-702-432-5300
FREEWAY & ARTERIAL SYSTEM
OF TRANSPORTATION (F.A.S.T.)

**AVOID HITTING OVERHEAD
POWER LINES. IT'S
COSTLY.**

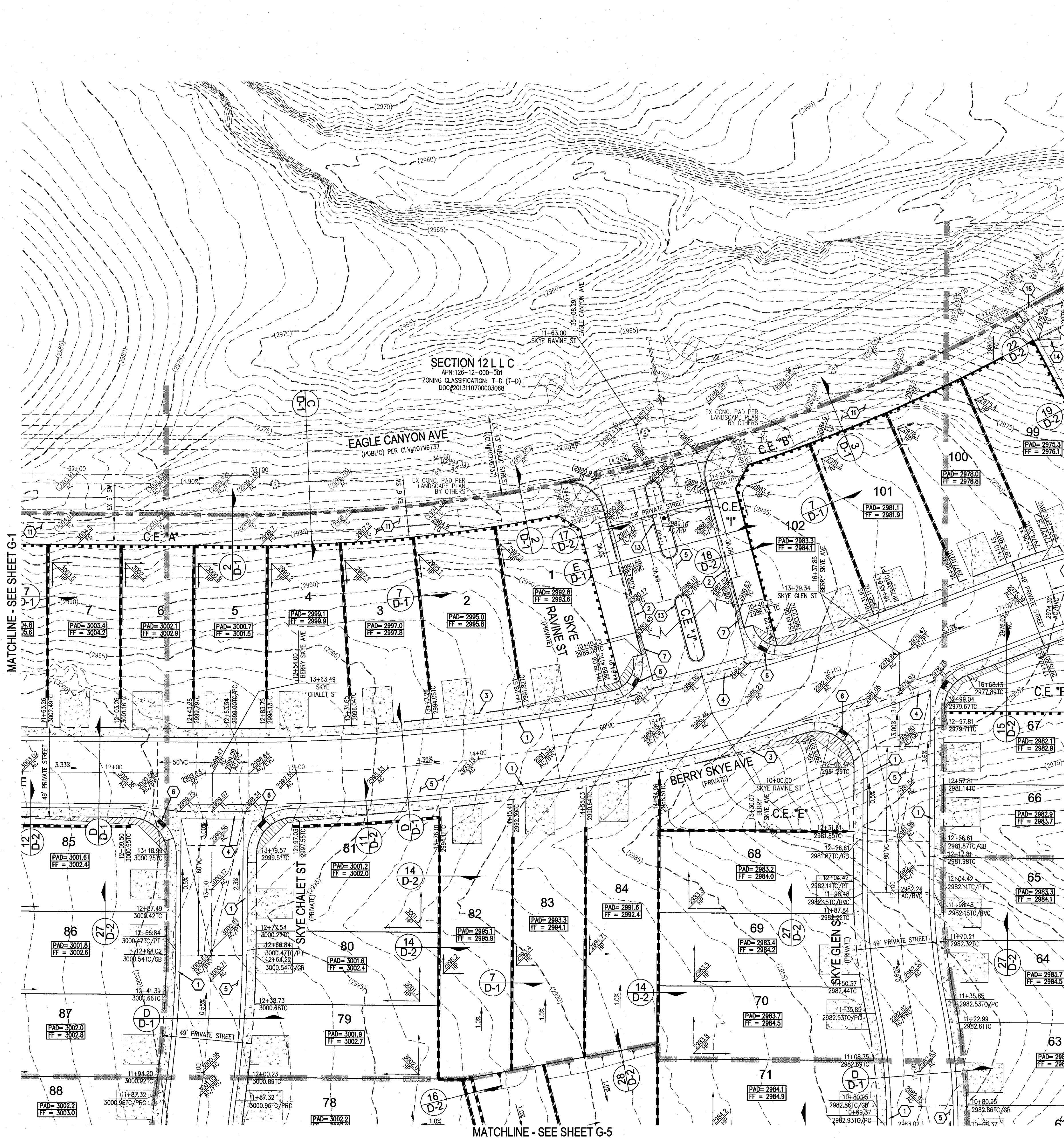
**CALL BEFORE
YOU DO
OVERHEAD**



1-702-227-2929

Call before you Dig
AVOID CUTTING UNDERGROUND
UTILITY LINES. IT'S COSTLY.

Call
811
OR
1-800-227-2600



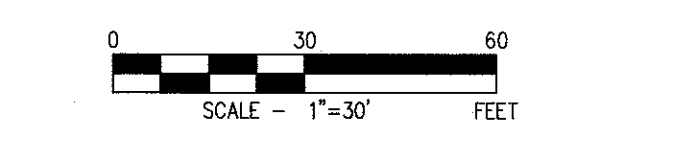
CALL SOUTHWEST GAS AT 702-651-2111 FOR STANDBY WHEN EXCAVATING OVER OR NEAR HIGH PRESSURE GAS LINES

SURVEY NOTE
OWNER RESPONSIBLE TO PROVIDE SURVEY MONUMENTATION AS SHOWN AND TO REPLACE ALL SURVEY MONUMENTATION DAMAGED, DISTURBED, DESTROYED, OR OBLISCURED DURING CONSTRUCTION.

LEGAL DESCRIPTION
BEING A PORTION OF ALL OF GOVERNMENT LOTS 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15 AND 16 OF SECTION 12, TOWNSHIP 19 SOUTH, RANGE 59 EAST, M.D.M., CITY OF LAS VEGAS, CLARK COUNTY, NEVADA.

SOILS REPORT
SOILS REPORT BY: GEOTEK RESIDENTIAL, LLC
PHONE: (702) 897-1424
PROJECT NO. 12209-LVR DATED: FEBRUARY 9, 2015
UPDATED SOILS REPORT BY: GEOTEK RESIDENTIAL, LLC
PHONE: (702) 897-1424
PROJECT NO. 12209-LVR DATED: MARCH 30, 2016

EARTHWORKS
EARTHWORK QUANTITIES (RAW):
CUT = 18,579 CU YDS
FILL = 113,396 CU YDS
EXPORTED MATERIAL TO BE DISPOSED OF AT AN APPROVED LICENSED DISPOSAL FACILITY OR AT A SITE WITH AN APPROVED AND ACTIVE GRADING PERMIT.



DISCLAIMER NOTE

1) EXISTING UTILITY LOCATIONS SHOWN HEREON 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 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 UP OR CURB PRIOR 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.

GRADING NOTES

1. FINAL GRADES 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 CLARK COUNTY 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/OWNER SHALL BE NOTIFIED OF PROPOSED DAMAGE TO EXISTING FACILITIES PRIOR TO CONSTRUCTION. CONTRACTOR WILL BE RESPONSIBLE FOR REPAIR/REPLENISHING FACILITIES IF ENGINEER/OWNER IS NOT NOTIFIED OF EXISTING DAMAGE PRIOR TO CONSTRUCTION COMMENCING.

9. NO STRUCTURE, VEGETATION, OR OBJECTS OF ANY KIND IS PERMITTED OVER TWENTY-FOUR (24) INCHES IN HEIGHT (MEASURED FROM THE TOP OF THE ADJACENT CURB IF CURB EXISTS) WITHIN THE SIGHT VISIBILITY ZONES.

LAS VEGAS VALLEY CONSTRUCTION SITE BMP GUIDELINES
(REQUIRED FOR ALL SITES GREATER THAN 1 ACRE (43,560 SQ.FT.))

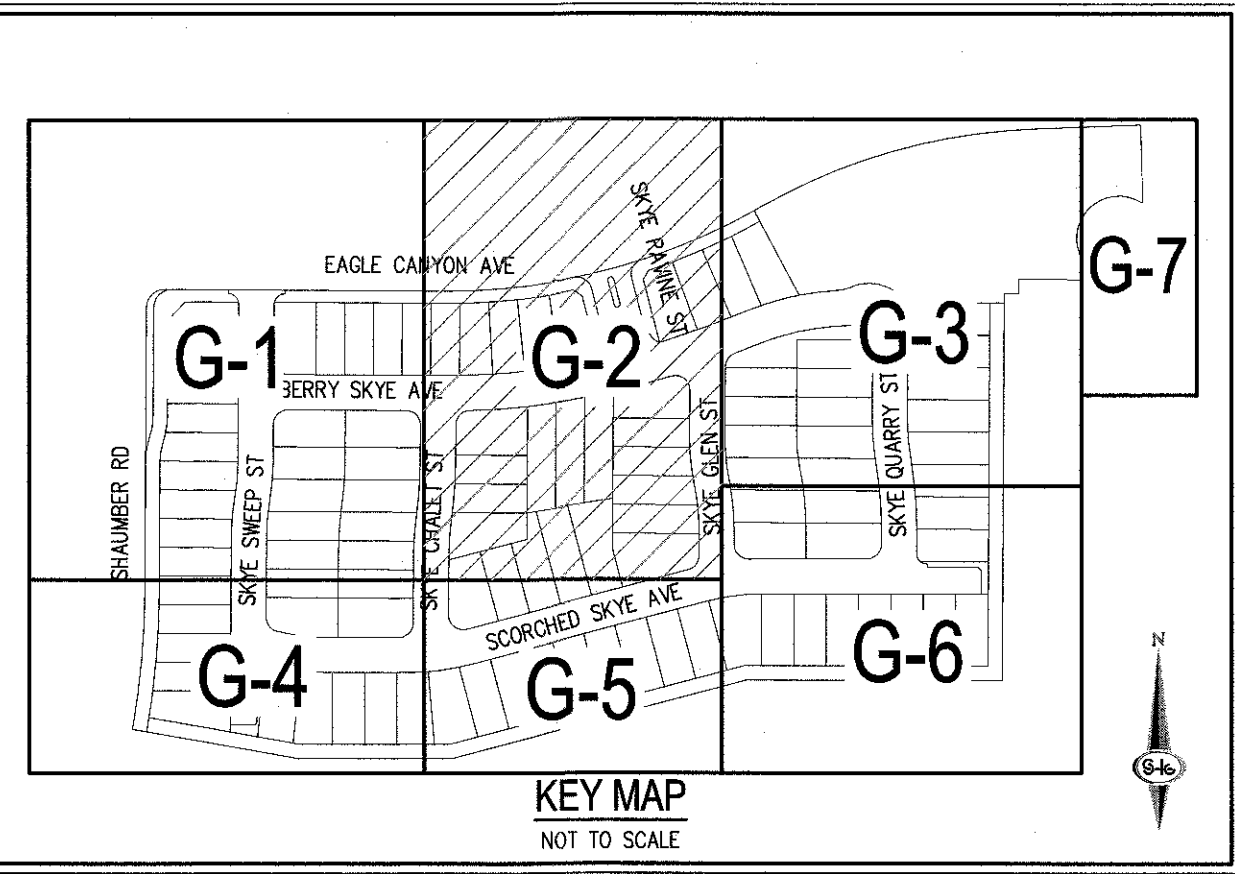
1. THE OWNER, SITE DEVELOPER, CONTRACTOR, AND/OR THEIR AUTHORIZED AGENTS SHALL EACH DAY REMOVE ALL SEDIMENT, MUD, CONSTRUCTION DEBRIS, OR OTHER POTENTIAL POLLUTANTS THAT MAY HAVE BEEN DISCHARGED TO, OR ACCUMULATED IN, THE PUBLIC RIGHTS OF WAY OF CLARK COUNTY AS A RESULT OF CONSTRUCTION ACTIVITIES ASSOCIATED 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 CLARK COUNTY TITLE 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 NVRI00000, 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 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 THE NEVADA STORMWATER GENERAL PERMIT FOR CONSTRUCTION ACTIVITY NVRI00000, 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.



GRADING NOTES

1) INSTALL 30" ROLL CURB PER CCAUSD NO. 217.S1 OVER 6" TYPE II AGGREGATE BASE

2) INSTALL "L" TYPE CURB AND GUTTER PER CCAUSD #216

3) INSTALL 5" WIDE CONCRETE SIDEWALK (5" THICK OVER 6" TYPE II AGGREGATE BASE) PER CCAUSD #234

4) INSTALL 8'-FT CROSS GUTTER PER DETAIL 29 ON SHEET D-3

5) INSTALL 2" ASPHALT PAVEMENT OVER 4" TYPE II AGGREGATE BASE

6) CONSTRUCT SIDEWALK RAMP USING ARMOR TILE TRUNCATED DOMES OR EQUIVALENT CCAUSD NO. 235, CASE 1 & 2.5.1

7) CONSTRUCT 10' TRANSITION FROM "L" CURB TO ROLL CURB PER DETAIL 30 ON SHEET D-3

8) CONSTRUCT 10' ROLL CURB TRANSITION PER DETAIL 23 ON SHEET D-2

9) INSTALL SIDEWALK DRAIN PER CCAUSD #236

10) INSTALL REMOVABLE BOLLARD PER DETAIL 25 ON SHEET D-2

11) PERIMETER LANDSCAPE TO BE CONSTRUCTED BY MASTER DEVELOPER

12) INSTALL WROUGHT IRON FENCE WITH PEDESTRIAN ACCESS

13) INSTALL "A" TYPE ISLAND CURB PER CCAUSD NO. 219

14) INSTALL 24" WIDE GATE PER DETAIL 24 ON SHEET D-2 OR APPROVED EQUAL

15) INSTALL 24" WIDE CRUSHED ROCK ACCESS ROAD

16) INSTALL DRIVEWAY PER CCAUSD #223

17) INSTALL 4" CONCRETE PAD OVER 6" AGGREGATE BASE

18) INSTALL 8" WIDE DECOMPOSED GRANITE TRAIL

19) INSTALL PEDESTRIAN GATE PER DETAIL 32 ON SHEET D-3 OR APPROVED EQUAL

20) INSTALL STAIRS PER LANDSCAPE PLANS BY OTHERS

21) INSTALL 30"x30" RIPRAP PAD (D50=8", T=16")

OWNER/DEVELOPER
K.A.G. LLC / NINETY-FIVE MANAGEMENT LLC
11411 SOUTHERN HIGHLANDS PARKWAY,
SUITE 300
LAS VEGAS, NV 89118
PH: 702-220-6565
FX: 702-220-6568
CONTACT: BOBBY WILLIAMSON

ENGINEER
SLATER HANIFAN GROUP, INC.
5740 S. ARVILLE STREET, SUITE 216
LAS VEGAS, NV 89118
PH: (702) 284-5300
FX: (702) 284-5399
CONTACT: TIM MULROONEY

BENCHMARK
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

BASIS OF BEARINGS
THE BASIS OF BEARING IS SOUTH 0°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 32527B1752E DATED SEPTEMBER 27, 2002.

FLOOD CERTIFICATION
I CERTIFY THAT THIS GRADING PLAN IS IN CONFORMANCE WITH THE APPROVED TECHNICAL DRAINAGE STUDY ON FILE AT CITY OF LAS VEGAS DS # _____ FOR THE SUBJECT PROJECT.
TIMOTHY M. MULROONEY, P.E. 22938 DATE _____

FAST
Call before you dig
UnderGround
1-702-432-5300
FREEWAY & ARTERIAL SYSTEM OF TRANSPORTATION (F.A.S.T.)

AVOID HITTING OVERHEAD POWER LINES. IT'S COSTLY.
CALL BEFORE YOU DO OVERHEAD
1-702-227-2929

Call before you dig
AVOID CUTTING UNDERGROUND UTILITY LINES. IT'S COSTLY.
Call 811
OR
1-800-227-2600

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

NINETY-FIVE MANAGEMENT L L C
SKYE CANYON PARCEL 2.23B
GRADING PLAN - I

DATE: 11/02/16
DRAFTER: DNP
DESIGNER: BCC
CHECKED: STS
PROJECT NO. OLY1607-003

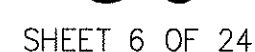
ENGINEER
TIMOTHY M. MULROONEY
Exp. 12/31/2017
CIVIL
Professional No. 22938
11/2/16

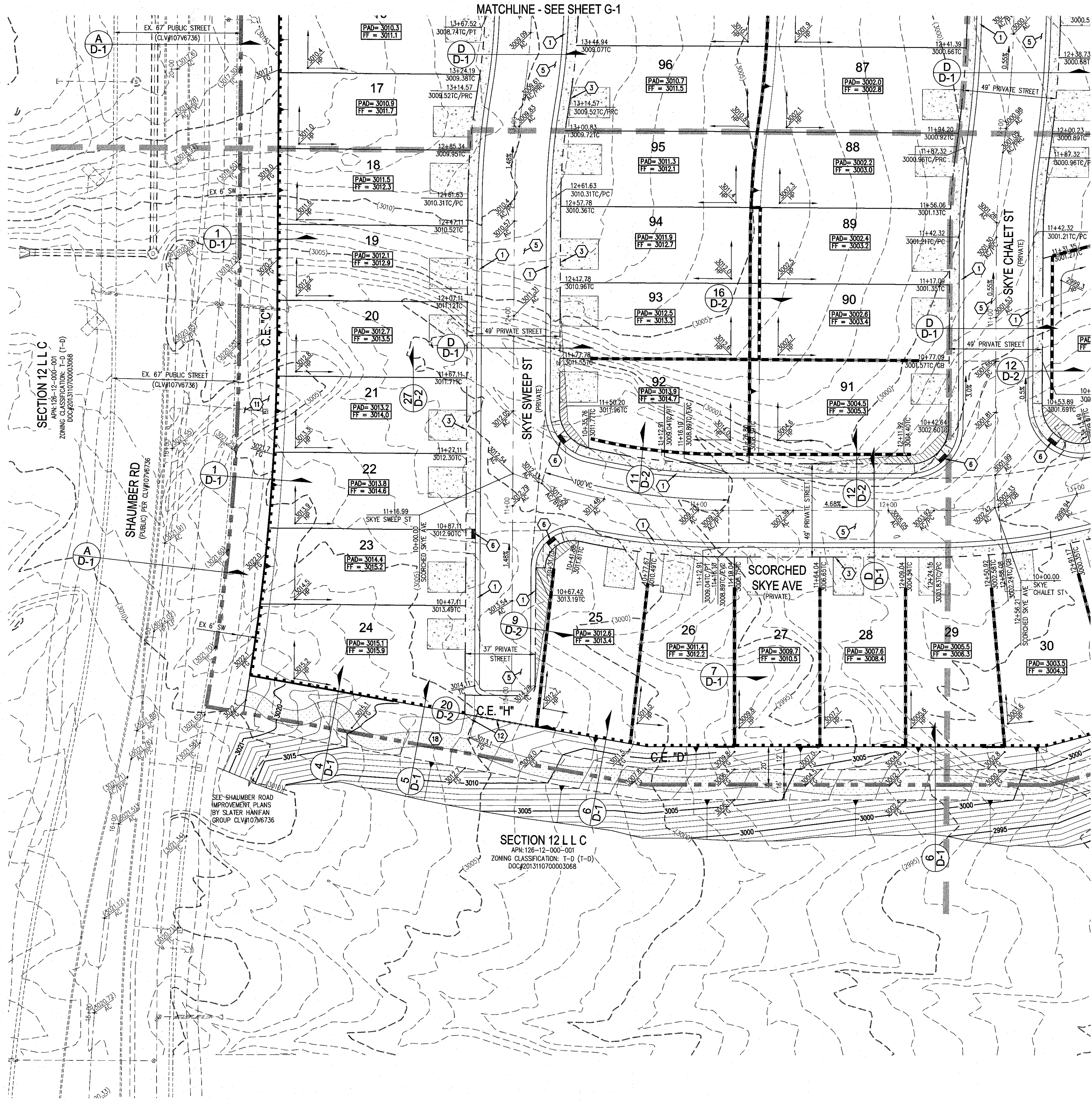
G-2
SHEET 5 OF 24



Call before you Dig
AVOID CUTTING UNDERGROUND
UTILITY LINES. IT'S COSTLY.
Call

OR
1-800-227-2600





CALL SOUTHWEST GAS AT 702-651-2111 FOR STANDBY WHEN EXCAVATING OVER OR NEAR HIGH PRESSURE GAS LINES

SURVEY NOTE
OWNER RESPONSIBLE TO PROVIDE SURVEY MONUMENTATION AS SHOWN AND TO REPLACE ALL SURVEY MONUMENTATION DAMAGED, DISTURBED, DESTROYED, OR OBSOLETE DURING CONSTRUCTION.

LEGAL DESCRIPTION
BEING A PORTION OF ALL OF GOVERNMENT LOTS 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15 AND 16 OF SECTION 12, TOWNSHIP 19 SOUTH, RANGE 59 EAST, M.D.M., CITY OF LAS VEGAS, CLARK COUNTY, NEVADA.

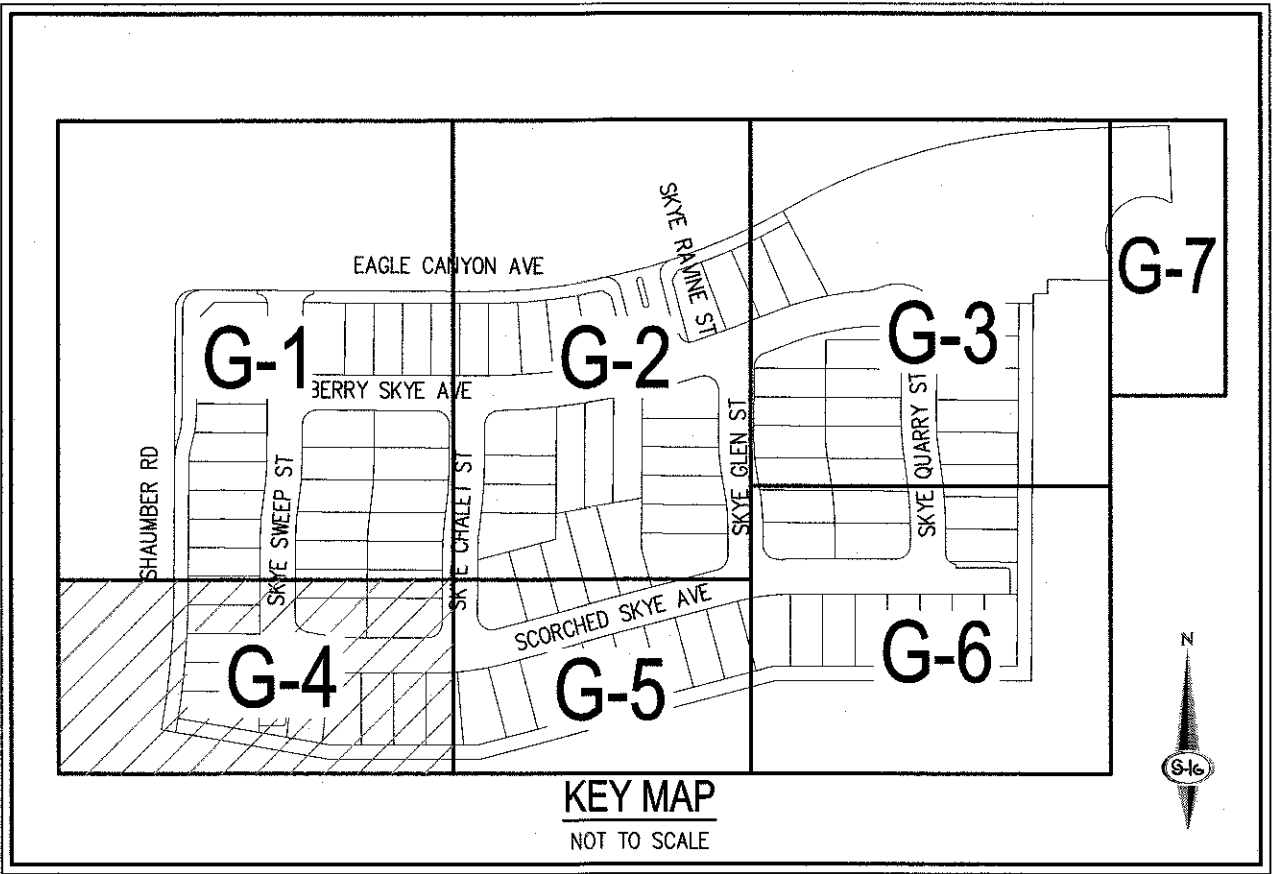
SOILS REPORT
SOILS REPORT BY: GEOTEK RESIDENTIAL, LLC
PHONE: (702) 897-1424
PROJECT NO. 12209-LVR DATED: FEBRUARY 9, 2015
UPDATED SOILS REPORT BY: GEOTEK RESIDENTIAL, LLC
PHONE: (702) 897-1424
PROJECT NO. 12209-LVR DATED: MARCH 30, 2016

EARTHWORKS
EARTHWORK QUANTITIES (RAW):
CUT = 16,579 CU YDS
FILL = 11,586 CU YDS
EXPORTED MATERIAL TO BE DISPOSED OF AT AN APPROVED LICENSED DISPOSAL FACILITY OR AT A SITE WITH AN APPROVED AND ACTIVE GRADING PERMIT.

DISCLAIMER NOTE
1) EXISTING UTILITY LOCATIONS SHOWN HEREON 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 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 TOP OF CURB PRIOR 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.

GRADING NOTES
1. FINAL GRADES 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 CLARK COUNTY 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/OWNER SHALL BE NOTIFIED OF PRIOR DAMAGE TO EXISTING FACILITIES PRIOR TO CONSTRUCTION. CONTRACTOR WILL BE RESPONSIBLE FOR REPAIR/REPLETING FACILITIES IF ENGINEER/OWNER IS NOT NOTIFIED OF EXISTING DAMAGE PRIOR TO CONSTRUCTION COMMENCING.
9. NO STRUCTURE, VEGETATION, OR OBJECTS OF ANY KIND IS PERMITTED OVER TWENTY-FOUR (24) INCHES IN HEIGHT MEASURED FROM THE TOP OF THE ADJACENT CURB IF CURB EXISTS WITHIN THE SIGHT VISIBILITY ZONES.

LAS VEGAS VALLEY CONSTRUCTION SITE BMP GUIDELINES
(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 ACCUMULATED IN, THE PUBLIC RIGHTS OF WAY 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 CLARK COUNTY TITLE 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 NVRI00000, 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 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 THE NEVADA STORMWATER GENERAL PERMIT FOR CONSTRUCTION ACTIVITY NVRI00000, 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.



GRADING NOTES
1) INSTALL 30" ROLL CURB PER CCAUSD NO. 217.51 OVER 6" TYPE II AGGREGATE BASE
2) INSTALL "L" TYPE CURB AND GUTTER PER CCAUSD #216
3) INSTALL 5" WIDE CONCRETE SIDEWALK (5" THICK OVER 6" TYPE II AGGREGATE BASE) PER CCAUSD #234
4) INSTALL 8-FT CROSS GUTTER PER DETAIL 29 ON SHEET D-3
5) INSTALL 2" ASPHALT PAVEMENT OVER 4" TYPE II AGGREGATE BASE
6) CONSTRUCT SIDEWALK RAMPS USING ARMOR TILE TRUNCATED DOMES OR EQUIVALENT CCAUSD NO. 235, CASE 1 & 2.5.1
7) CONSTRUCT 10' TRANSITION FROM "L" CURB TO ROLL CURB PER DETAIL 30 ON SHEET D-3
8) CONSTRUCT 10' ROLL CURB TRANSITION PER DETAIL 23 ON SHEET D-2
9) INSTALL SIDEWALK DRAIN PER CCAUSD #236
10) INSTALL REMOVABLE BOLLARD PER DETAIL 25 ON SHEET D-2
11) PERIMETER LANDSCAPE TO BE CONSTRUCTED BY MASTER DEVELOPER
12) INSTALL WROUGHT IRON FENCE WITH PEDESTRIAN ACCESS
13) INSTALL "A" TYPE ISLAND CURB PER CCAUSD NO. 219
14) INSTALL 24" WIDE GATE PER DETAIL 24 ON SHEET D-2 OR APPROVED EQUAL
15) INSTALL 24" WIDE CRUSHED ROCK ACCESS ROAD
16) INSTALL DRIVEWAY PER CCAUSD #223
17) INSTALL 4" CONCRETE PAD OVER 6" AGGREGATE BASE
18) INSTALL 8" WIDE DECOMPOSED GRANITE TRAIL
19) INSTALL PEDESTRIAN GATE PER DETAIL 32 ON SHEET D-3 OR APPROVED EQUAL
20) INSTALL STAIRS PER LANDSCAPE PLANS BY OTHERS
21) INSTALL 30"x30" RIPRAP PAD (D50=8", T=16")

OWNER/DEVELOPER
K.A.G. LLC / NINETY-FIVE MANAGEMENT LLC
11411 SOUTHERN HIGHLAND PARKWAY,
SUITE 300
LAS VEGAS, NV 89118
PH: 702-220-6565
FX: 702-220-6566
CONTACT: BOBBY WILLIAMSON

ENGINEER
SLATER HANIFAN GROUP, INC.
5740 S. ARVILLE STREET, SUITE 216
LAS VEGAS, NV 89118
PH: (702) 284-5300
FX: (702) 284-5399
CONTACT: TIM MULROONEY

BENCHMARK
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

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.M., CITY OF LAS VEGAS, CLARK COUNTY, NEVADA, AS SHOWN BY MAP THEREOF IN FILE NO. 3252761750E DATED SEPTEMBER 27, 2002.
RECORDERS 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 3252761750E DATED SEPTEMBER 27, 2002.

FLOOD CERTIFICATION
I CERTIFY THAT THIS GRADING PLAN IS IN CONFORMANCE WITH THE APPROVED TECHNICAL DRAINAGE STUDY ON FILE AT CITY OF LAS VEGAS DS # _____ FOR THE SUBJECT PROJECT.
TIMOTHY M. MULROONEY, P.E. 22938 DATE _____

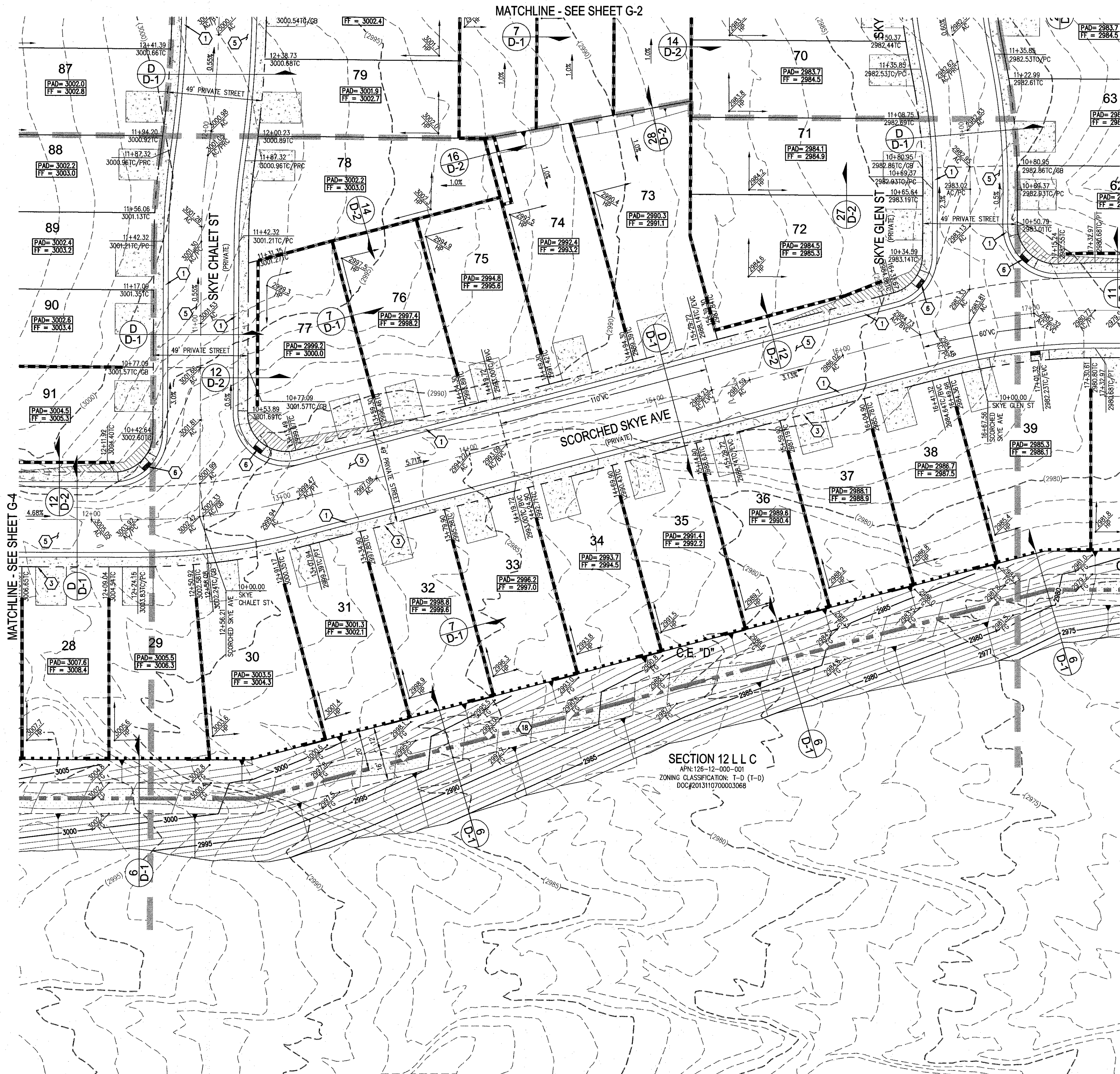
SLATER HANIFAN GROUP
CONSULTING ENGINEERS & PLANNERS
5740 S. ARVILLE STREET #216, LAS VEGAS, NV 89118
PHONE (702) 284-5300
FAX (702) 284-5399

DATE: 11/02/16
DRAFTER: DNP
DESIGNER: BCC
CHECKED: STS
PROJECT NO. OLY1607-003

ENGINEER
TIMOTHY M. MULROONEY
Exp. 12/31/2017
CIVIL
No. 22938
11/2/16
G-4
SHEET 7 OF 24

CITY OF LAS VEGAS, NEVADA
NINETY-FIVE MANAGEMENT L L C
SKYE CANYON PARCEL 2.23B
GRADING PLAN - IV





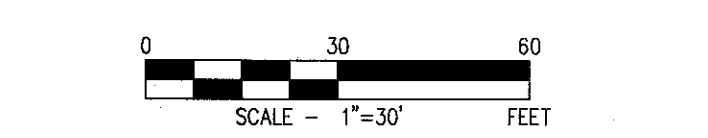
CALL SOUTHWEST GAS AT 702-651-2111 FOR STANDBY WHEN EXCAVATING OVER OR NEAR HIGH PRESSURE GAS LINES

SURVEY NOTE
OWNER RESPONSIBLE TO PROVIDE SURVEY MONUMENTATION AS SHOWN AND TO REPLACE ALL SURVEY MONUMENTATION DAMAGED, DISTURBED, DESTROYED, OR OBLITERATED DURING CONSTRUCTION.

LEGAL DESCRIPTION
BEING A PORTION OF ALL OF GOVERNMENT LOTS 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15 AND 16 OF SECTION 12, TOWNSHIP 19 SOUTH, RANGE 39 EAST, M.D.M., CITY OF LAS VEGAS, CLARK COUNTY, NEVADA.

SOILS REPORT
SOILS REPORT BY: GEOTEK RESIDENTIAL, LLC
PHONE: (702) 897-1424
PROJECT NO. 12209-LVR DATED: FEBRUARY 9, 2015
UPDATED SOILS REPORT BY: GEOTEK RESIDENTIAL, LLC
PHONE: (702) 897-1424
PROJECT NO. 12209-LVR DATED: MARCH 30, 2015

EARTHWORKS
EARTHWORK QUANTITIES (RAW):
CUT = 16,579 CU YDS
FILL = 113,586 CU YDS
EXPORTED MATERIAL TO BE DISPOSED OF AT AN APPROVED LICENSED DISPOSAL FACILITY OR AT A SITE WITH AN APPROVED AND ACTIVE GRADING PERMIT.



DISCLAIMER NOTE

1) EXISTING UTILITY LOCATIONS SHOWN HEREON 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 IN THEIR PROPER LOCATION.

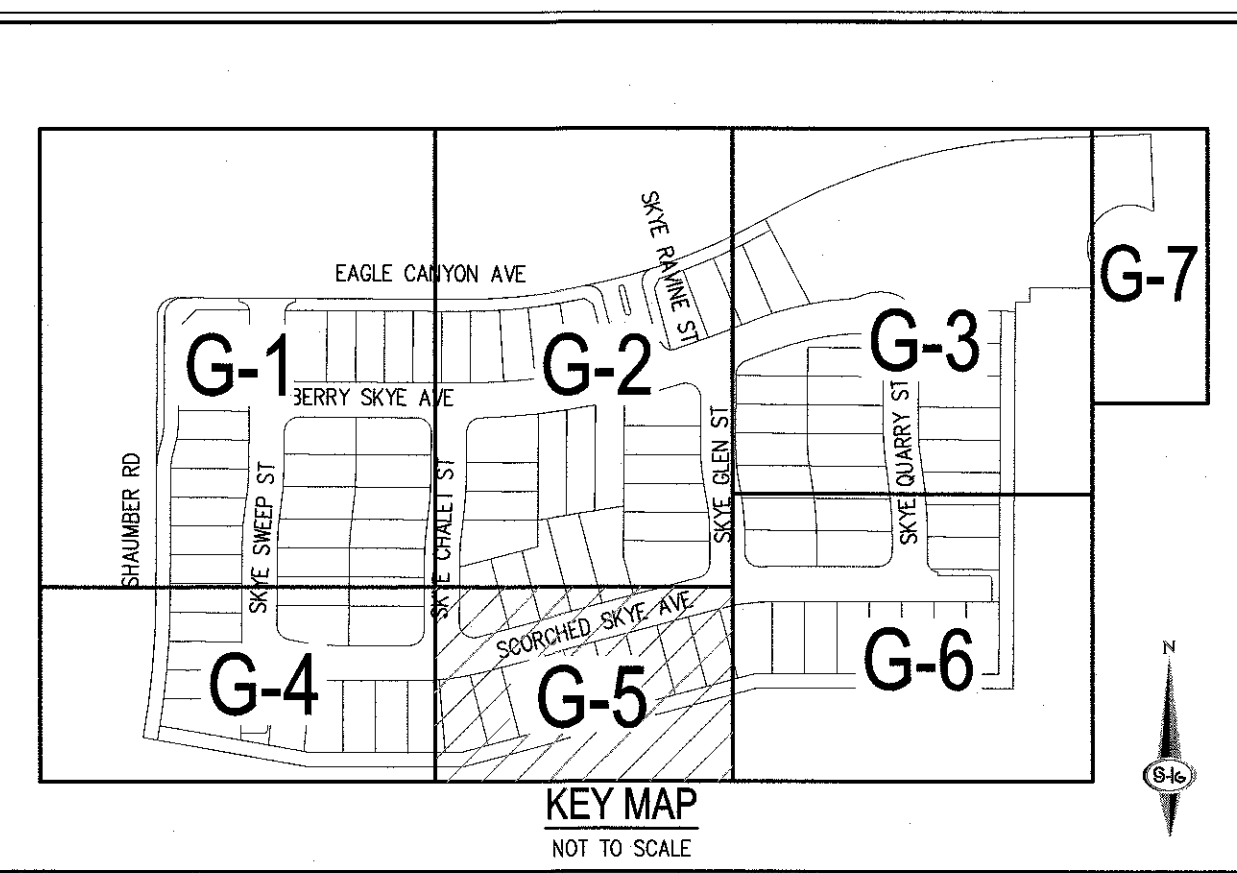
2) FOR ROADWAY WIDENING AND HALF STREET IMPROVEMENTS THE CONTRACTOR SHALL VERIFY CROSS SLOPES FROM EXISTING PAVEMENT SAWCUT LINE TO PROPOSED EDGE OF PAVEMENT OR PROJECTED LIP OF CURB PRIOR TO SUBGRADE PREPARATION AND CONSTRUCTION OF PROPOSED CURB LINE. IF MINIMUM OR MAXIMUM CROSS SLOPES DO NOT MEET AGENCY STANDARDS THE CONTRACTOR SHALL NOTIFY THE ENGINEER.

GRADING NOTES

- FINAL GRADES ADJACENT TO STRUCTURES SHALL BE IN CONFORMANCE WITH IBC 2012, SECTION 2304.11.2.2.
- THE CONTRACTOR SHALL VERIFY ALL CONDITIONS AND DIMENSIONS AND REPORT ALL DISCREPANCIES TO THE ENGINEER.
- ALL IMPROVEMENTS TO BE PROTECTED FROM EROSION BY SWPPP.
- MAXIMUM/MINIMUM SLOPES AND MINIMUM STREET SECTIONS NOT TO EXCEED THAT SHOWN ON GEOTECH REPORT.
- SEE DETAIL SHEET FOR STREET SECTIONS AND DETAILS.
- ALL PUBLIC AND PRIVATE DRAINAGE IMPROVEMENTS TO BE BONDED FOR AND INSPECTED.
- CONSTRUCTION OF BLOCK WALLS REQUIRES A SEPARATE BUILDING PERMIT AND APPROVAL BY THE CLARK COUNTY BUILDING DEPARTMENT.
- 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/OWNER SHALL BE NOTIFIED OF PRIOR DAMAGE TO EXISTING FACILITIES PRIOR TO CONSTRUCTION. CONTRACTOR WILL BE RESPONSIBLE FOR REPAIR/REPLENISHING FACILITIES IF ENGINEER/OWNER IS NOT NOTIFIED OF EXISTING DAMAGE PRIOR TO CONSTRUCTION COMMENCING.
- NO STRUCTURE, VEGETATION, OR OBJECTS OF ANY KIND IS PERMITTED OVER TWENTY-FOUR (24) INCHES IN HEIGHT (MEASURED FROM THE TOP OF THE ADJACENT CURB IF CURB EXIST) WITHIN THE SIGHT VISIBILITY ZONES.

LAS VEGAS VALLEY CONSTRUCTION SITE BMP GUIDELINES
(REQUIRED FOR ALL SITES GREATER THAN 1 ACRE (43,560 SQ.F.T.))

- 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 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.
- 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 CLARK COUNTY TITLE 24.40 AND IN THE LAS VEGAS VALLEY CONSTRUCTION SITE BMP GUIDANCE MANUAL.
- 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 NVR100000, SECTION III.A.5.
- 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 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 THE NEVADA STORMWATER GENERAL PERMIT FOR CONSTRUCTION ACTIVITY NVR100000, SECTION III.A.12.
- 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.



GRADING NOTES

- INSTALL 30" ROLL CURB PER CCAUSD NO. 217.S1 OVER 6" TYPE II AGGREGATE BASE
- INSTALL 1" TYPE CURB AND GUTTER PER CCAUSD #216
- INSTALL 5' WIDE CONCRETE SIDEWALK (5" THICK OVER 6" TYPE II AGGREGATE BASE) PER CCAUSD #234
- INSTALL 8-FT CROSS GUTTER PER DETAIL 29 ON SHEET D-3
- INSTALL 2" ASPHALT PAVEMENT OVER 4" TYPE II AGGREGATE BASE
- CONSTRUCT SIDEWALK RAMP USING ARMOR TILE TRUNCATED DOMES OR EQUIVALENT CCAUSD NO. 235, CASE 1 & 235.1
- CONSTRUCT 10' TRANSITION FROM 1" CURB TO ROLL CURB PER DETAIL 30 ON SHEET D-3
- CONSTRUCT 10' ROLL CURB TRANSITION PER DETAIL 23 ON SHEET D-2
- INSTALL SIDEWALK DRAIN PER CCAUSD #236
- INSTALL REMOVABLE BOLLARD PER DETAIL 25 ON SHEET D-2
- PERIMETER LANDSCAPE TO BE CONSTRUCTED BY MASTER DEVELOPER
- INSTALL WROUGHT IRON FENCE WITH PEDESTRIAN ACCESS
- INSTALL "A" TYPE ISLAND CURB PER CCAUSD NO. 219
- INSTALL 24" WIDE GATE PER DETAIL 24 ON SHEET D-2 OR APPROVED EQUAL
- INSTALL 24" WIDE CRUSHED ROCK ACCESS ROAD
- INSTALL DRIVEWAY PER CCAUSD #223
- INSTALL 4" CONCRETE PAD OVER 6" AGGREGATE BASE
- INSTALL 8' WIDE DECOMPOSED GRANITE TRAIL
- INSTALL PEDESTRIAN GATE PER DETAIL 32 ON SHEET D-3 OR APPROVED EQUAL
- INSTALL STAIRS PER LANDSCAPE PLANS BY OTHERS
- INSTALL 30"x30" RIPRAP PAD (150x8", T=16")

OWNER/DEVELOPER
K.A.G. LLC / NINETY-FIVE MANAGEMENT LLC
11411 SOUTHERN HIGHLANDS PARKWAY,
SUITE 300
LAS VEGAS, NV 89118
PH: 702-220-6565
FX: 702-220-6566
CONTACT: BOBBY WILLIAMSON

ENGINEER
SLATER HANIFAN GROUP, INC.
5740 S. ARVILLE STREET, SUITE 216
LAS VEGAS, NV 89118
PH: (702) 284-5300
FX: (702) 284-5399
CONTACT: TIM MULROONEY

BENCHMARK
USDA BRASS CAP ON AN IRON PIPE, 140' SOUTHWEST OF TELEPHONE POLE #289941, 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 39 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 3252761750E DATED SEPTEMBER 27, 2002.

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

TIMOTHY M. MULROONEY, P.E. 22938 DATE _____

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

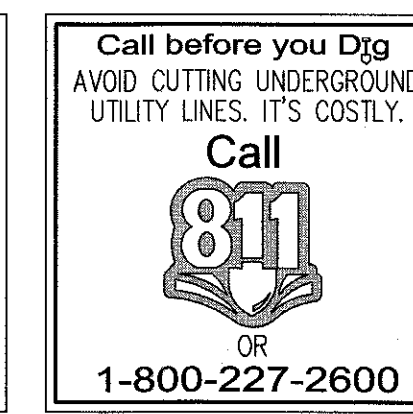
DATE: 11/02/16
DRAFTER: DNP
DESIGNER: BCC
CHECKED: STS
PROJECT NO. OLY1607-003

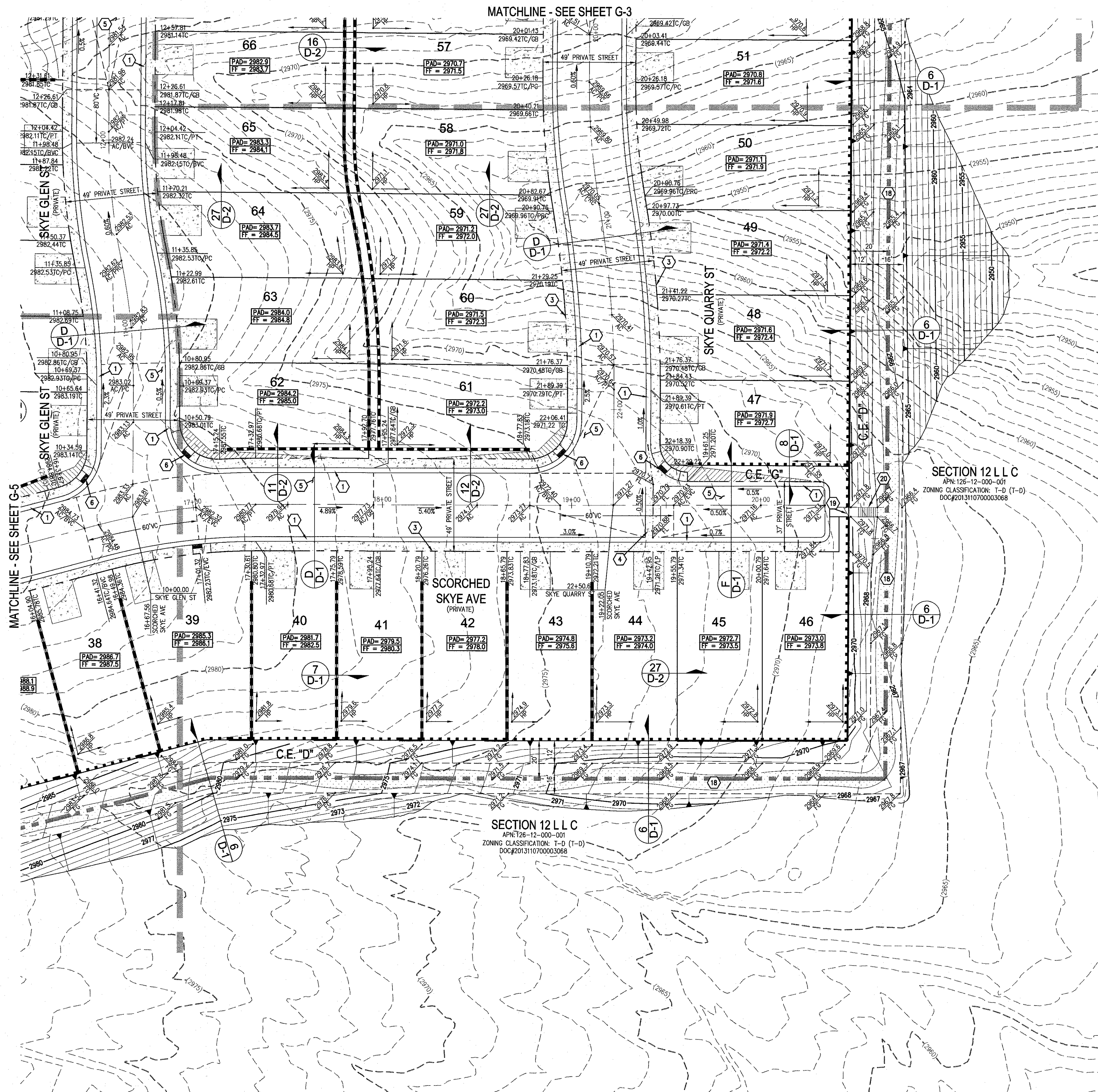
ENGINEER
TIMOTHY M. MULROONEY
Exp. 12/31/2017
CIVIL
No. 22938
11/6/16

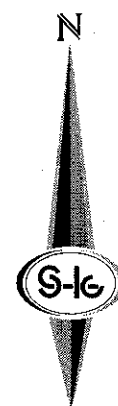
G-5
SHEET 8 OF 24

NINETY-FIVE MANAGEMENT L L C
SKYLE CANYON PARCEL 2.23B
GRADING PLAN - V

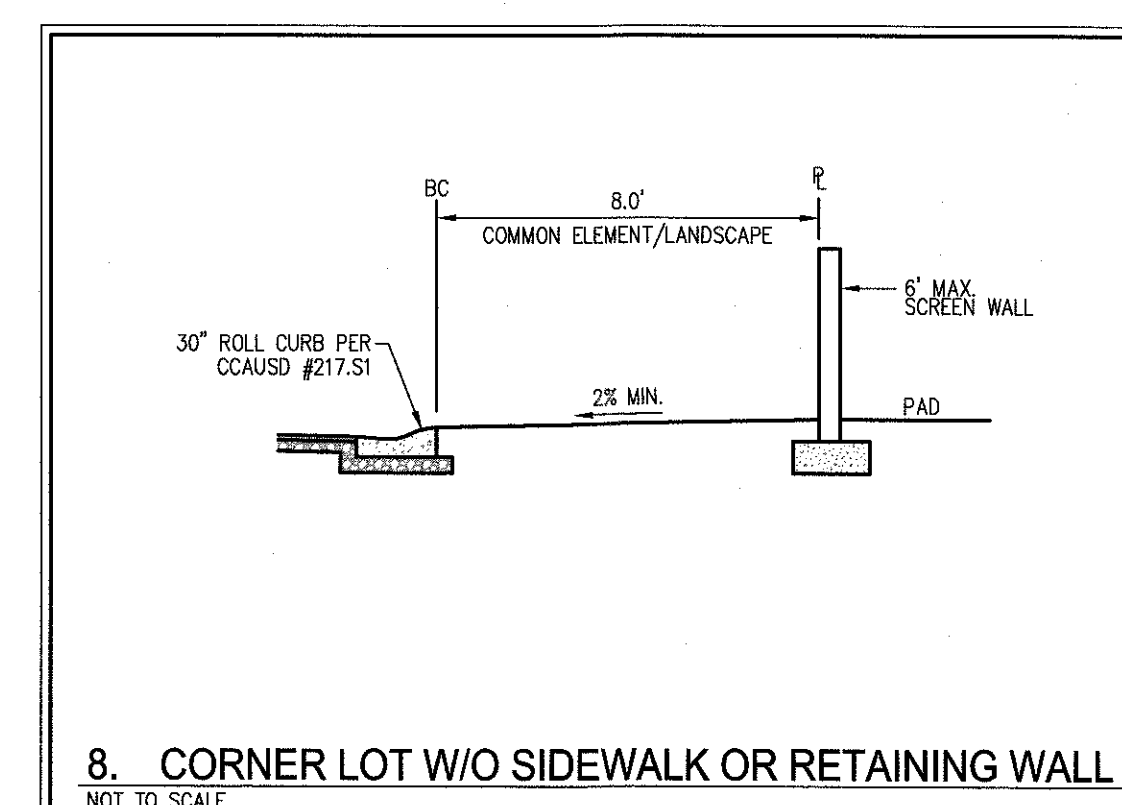
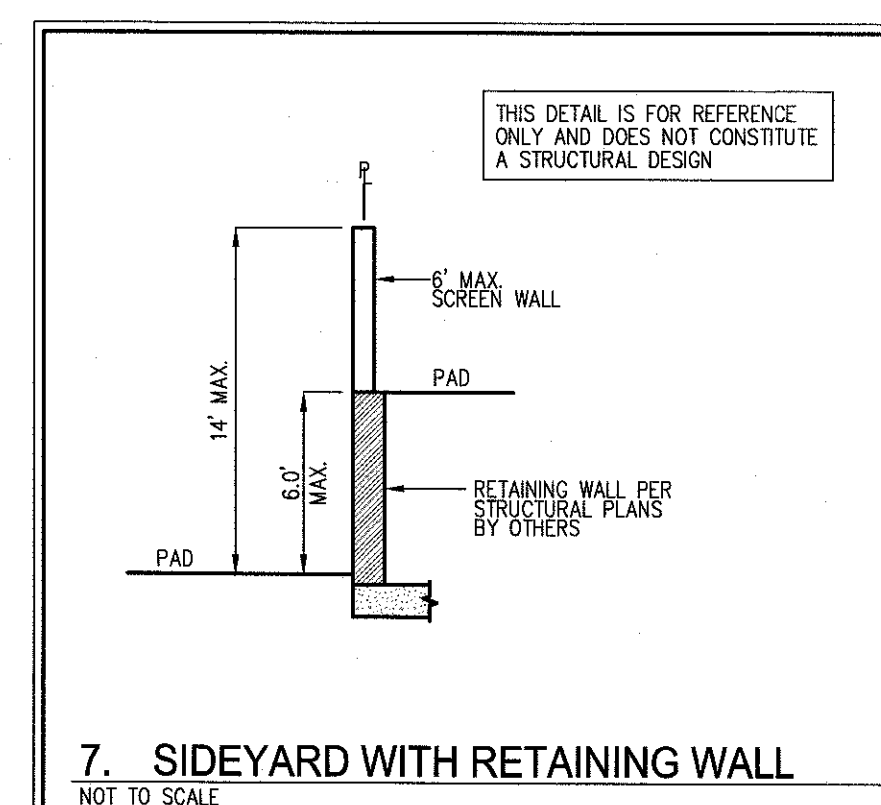
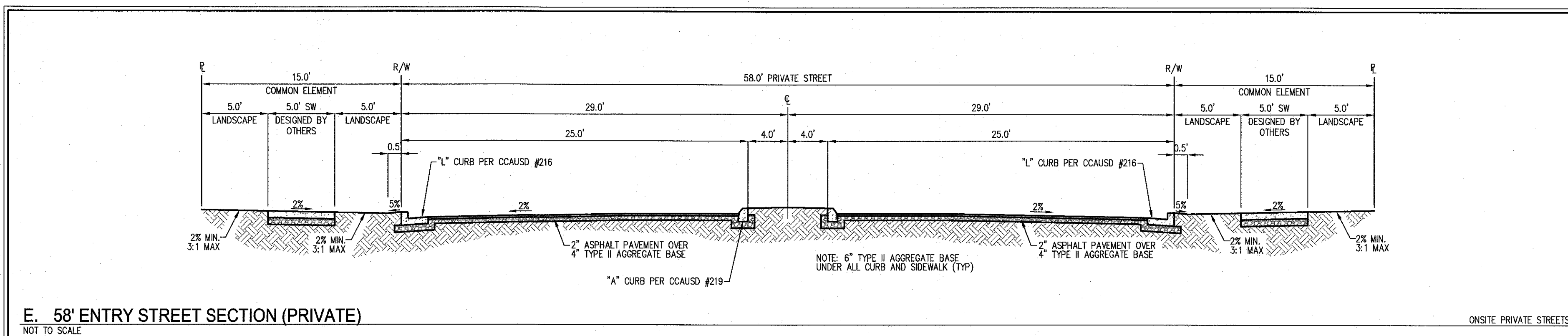
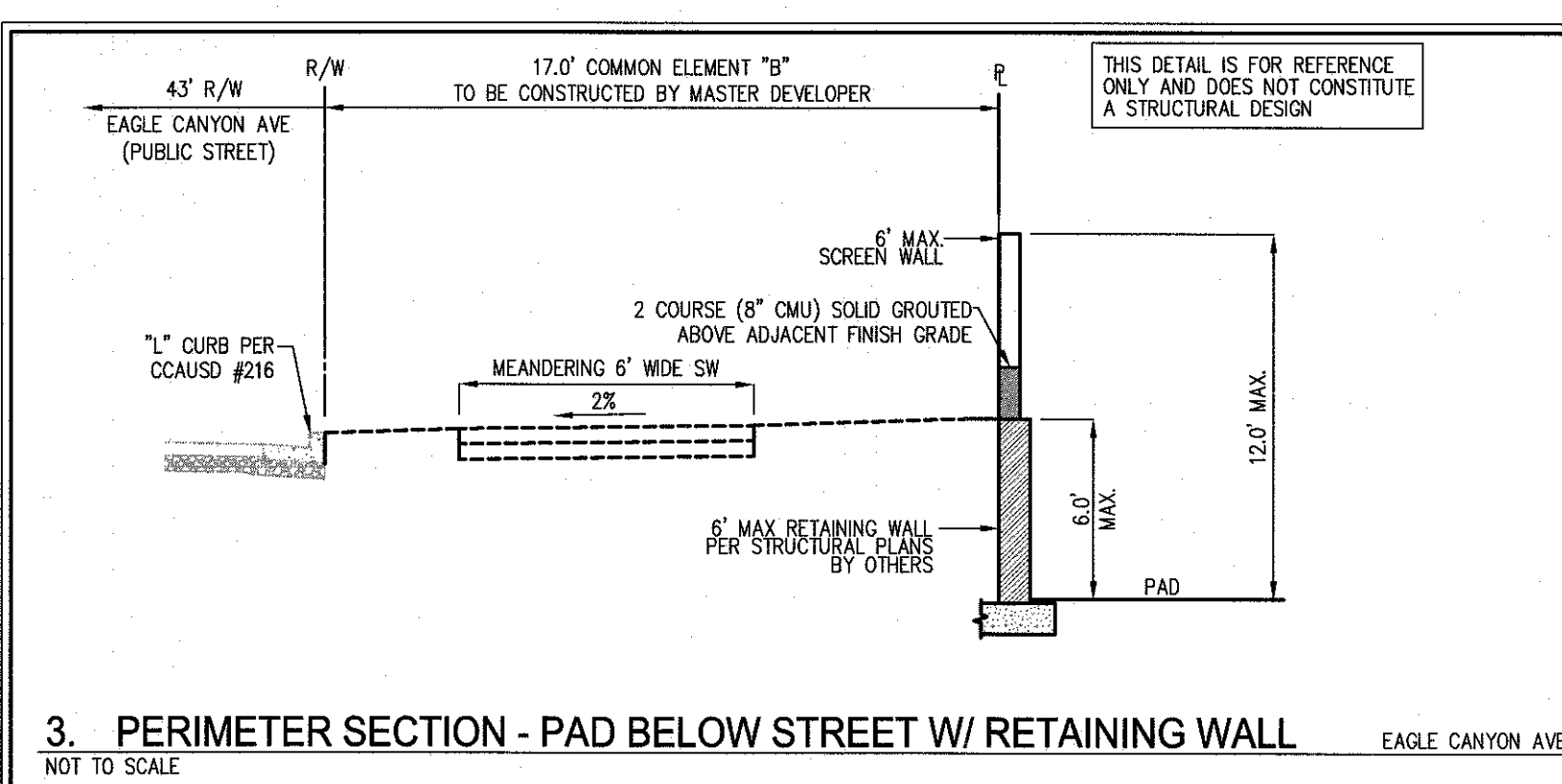
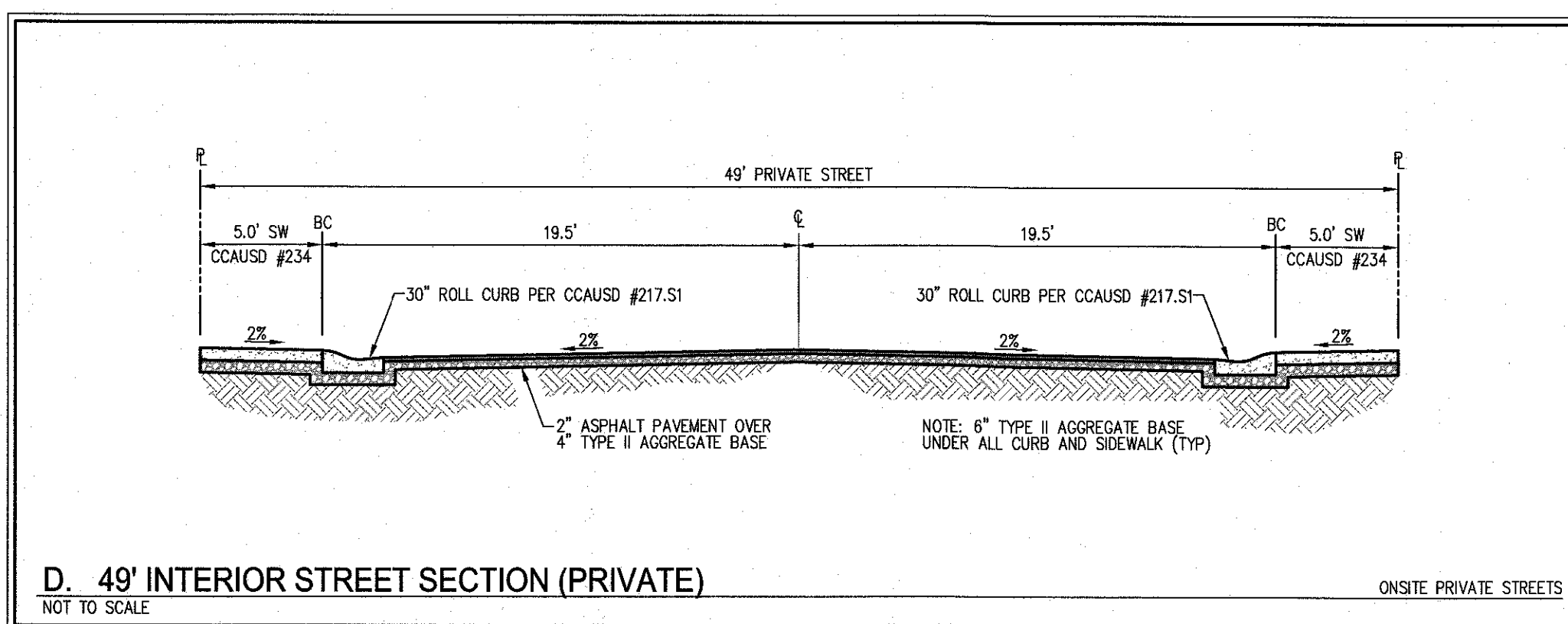
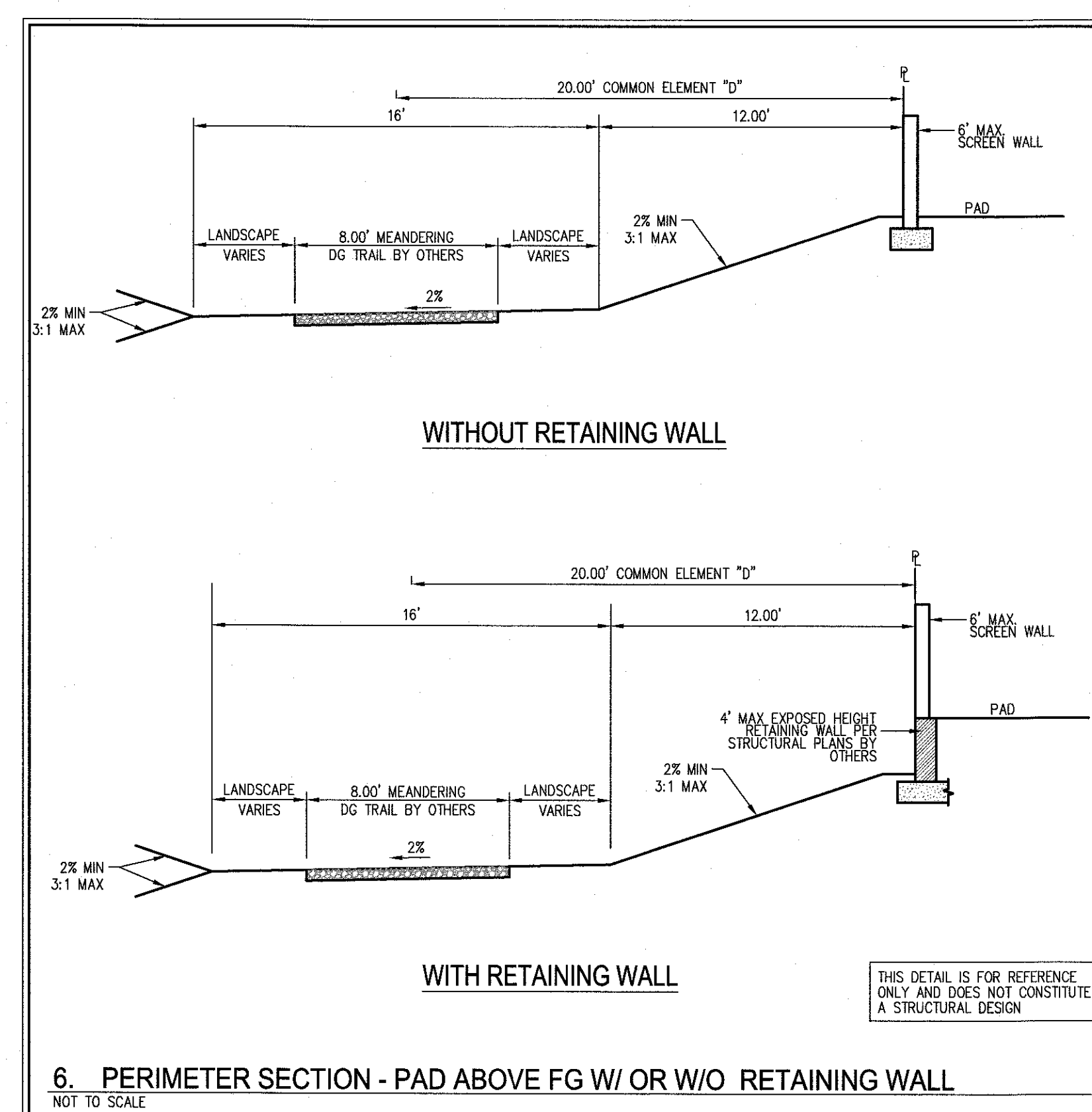
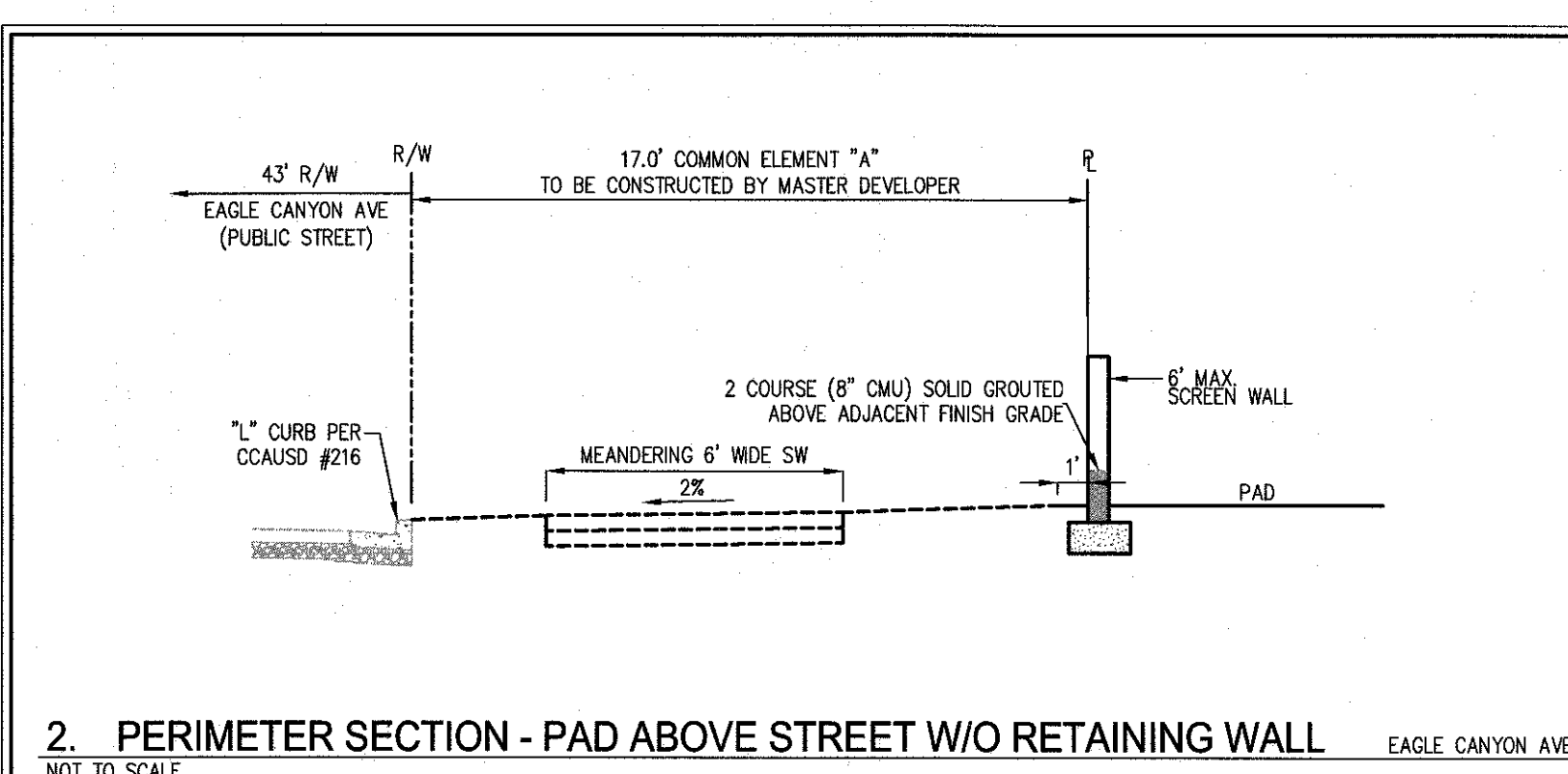
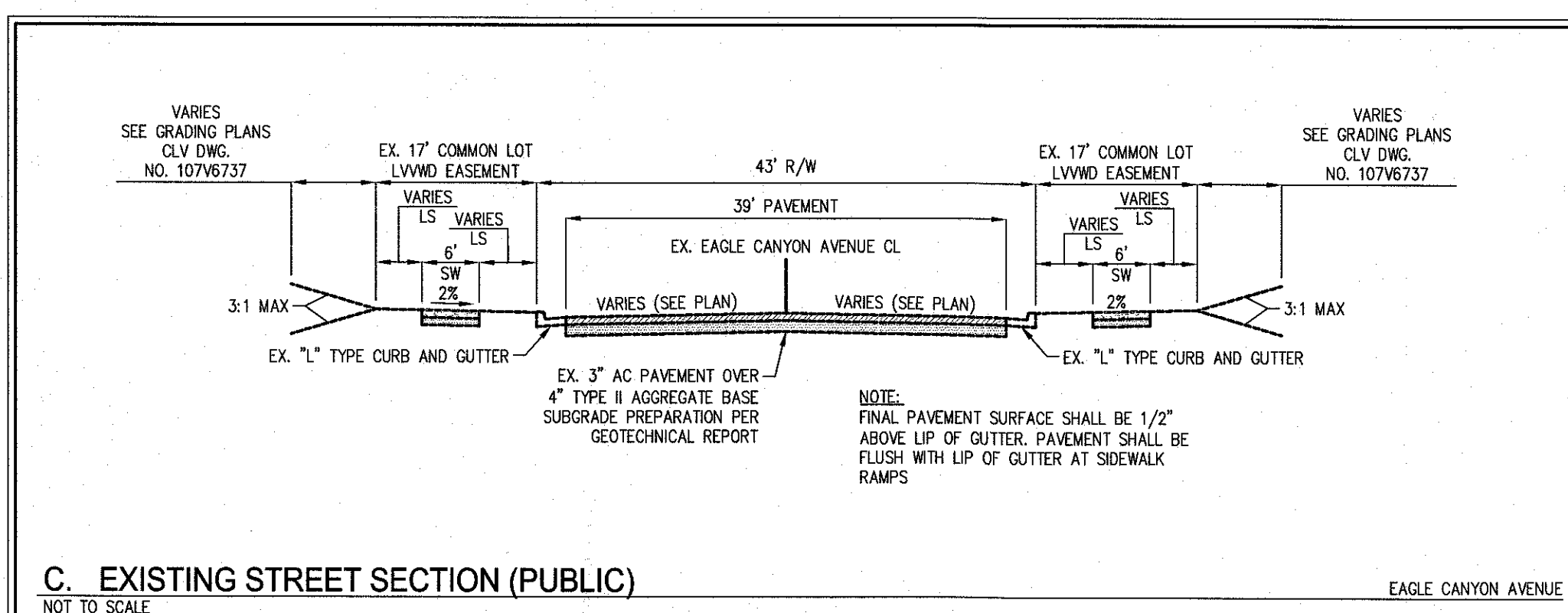
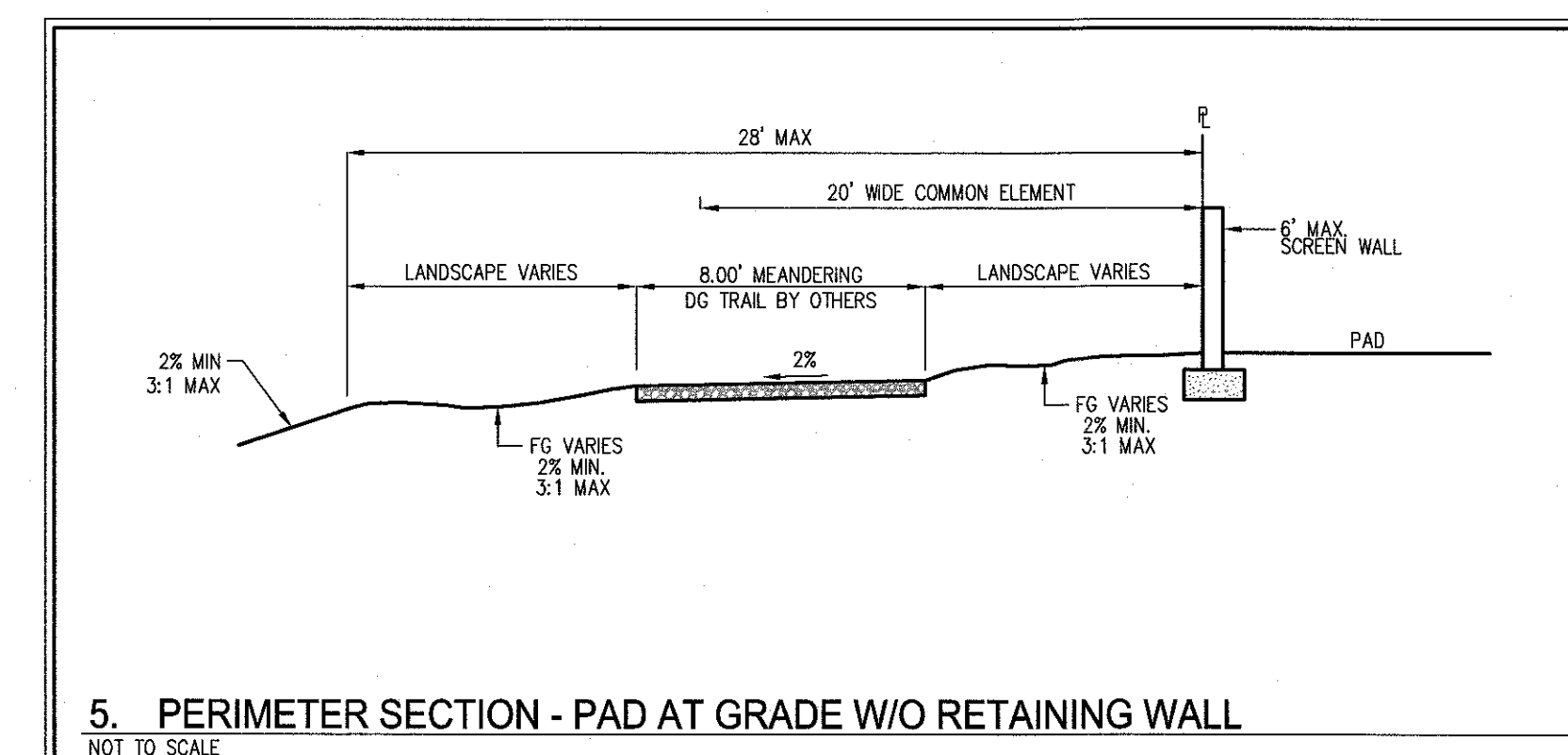
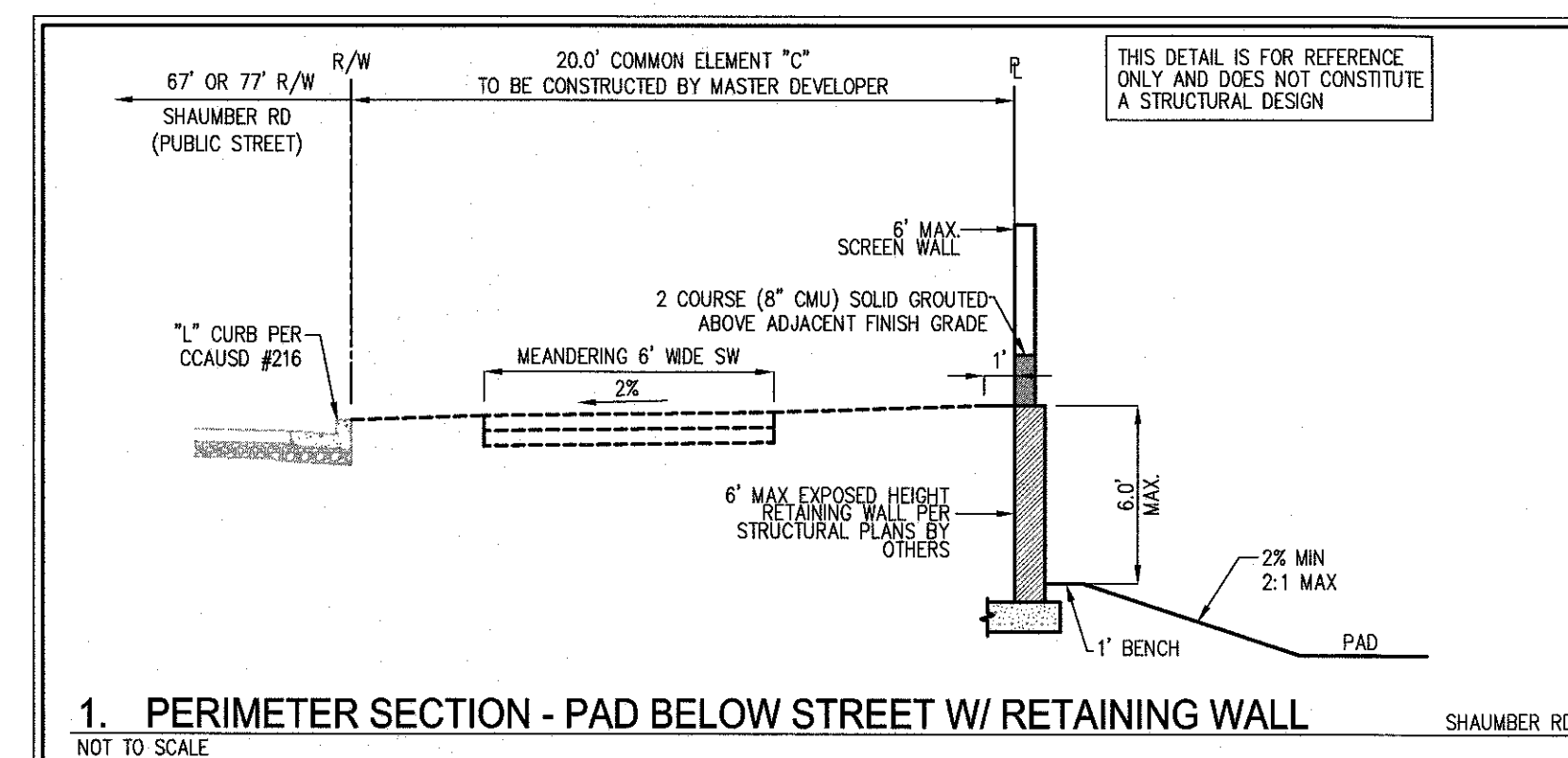
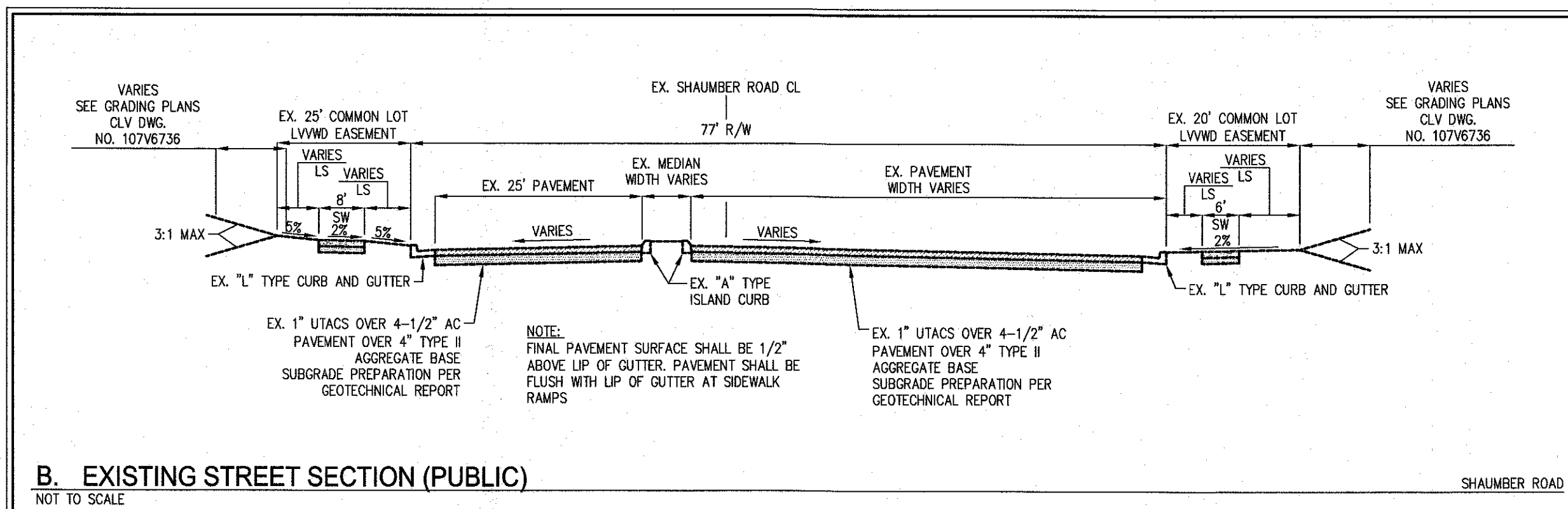
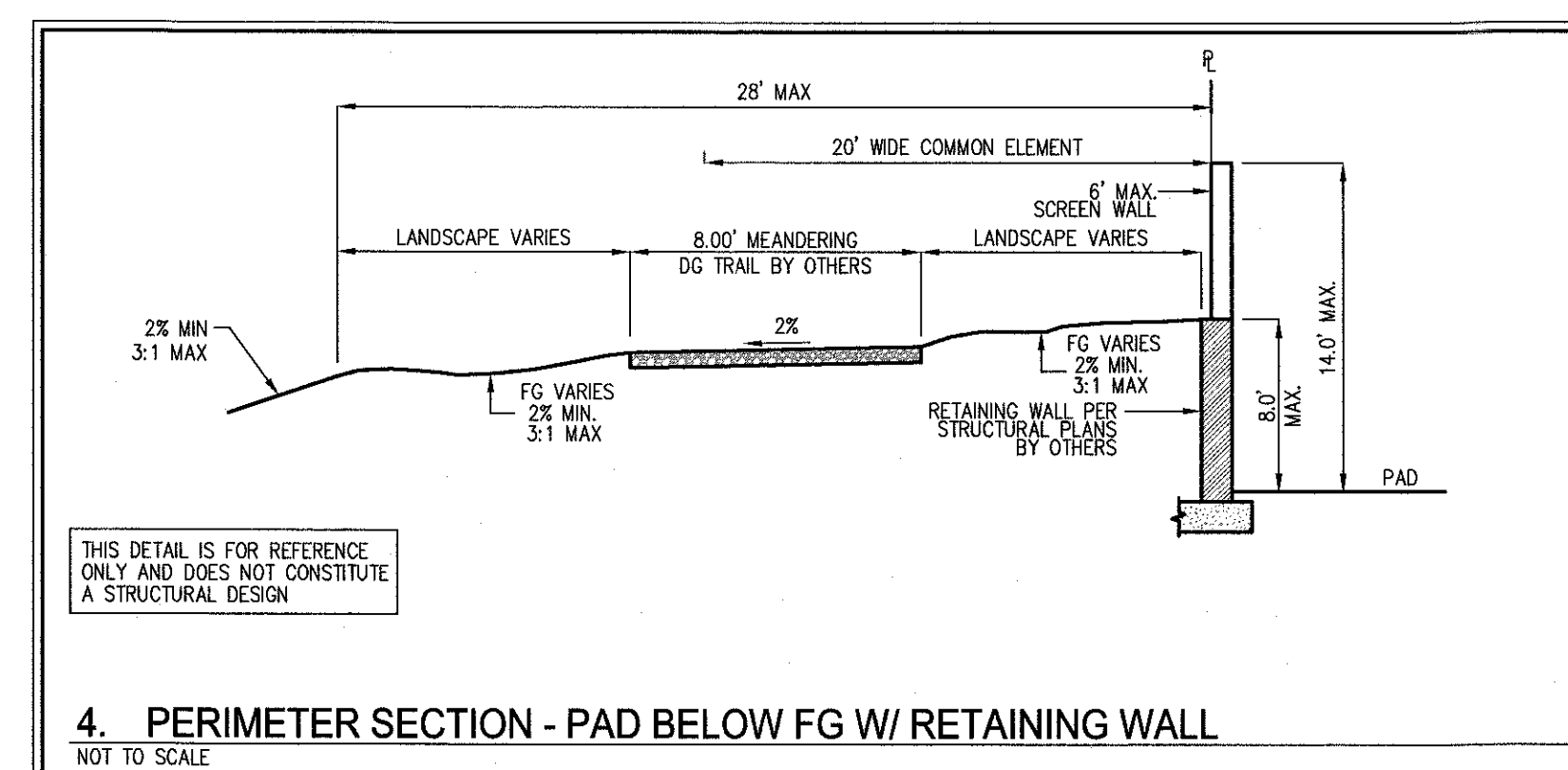
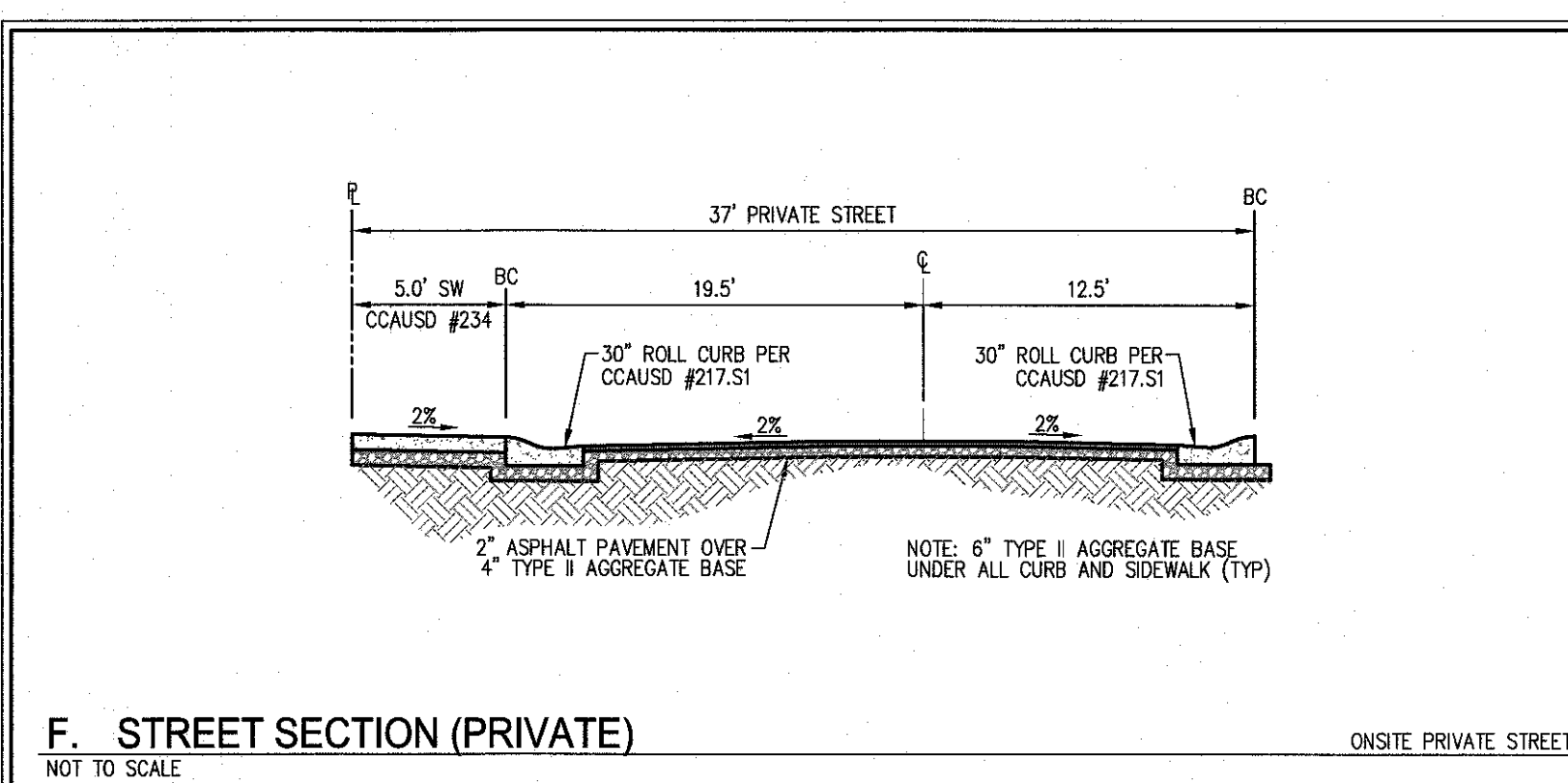
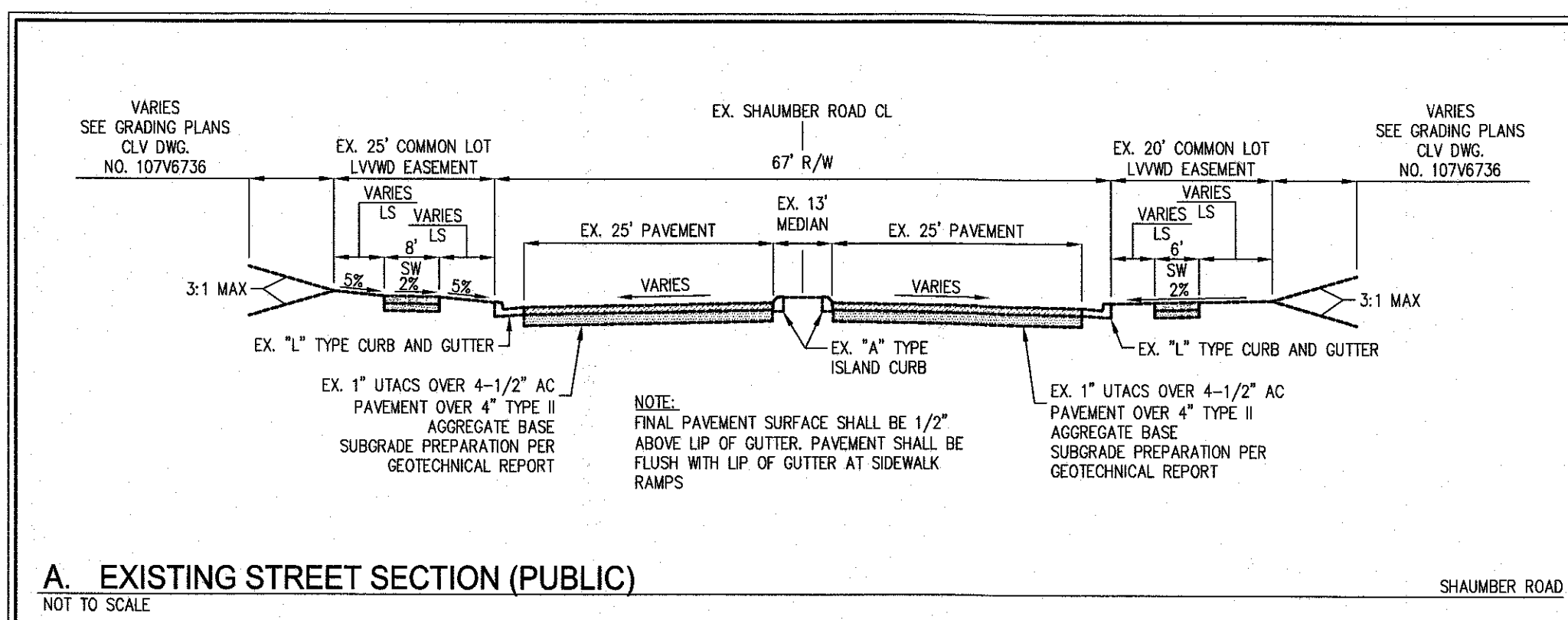
11/6/16

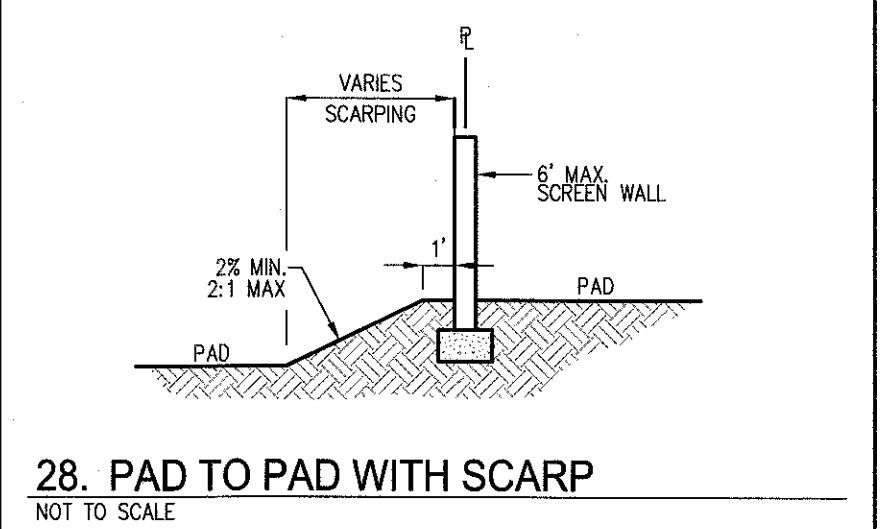
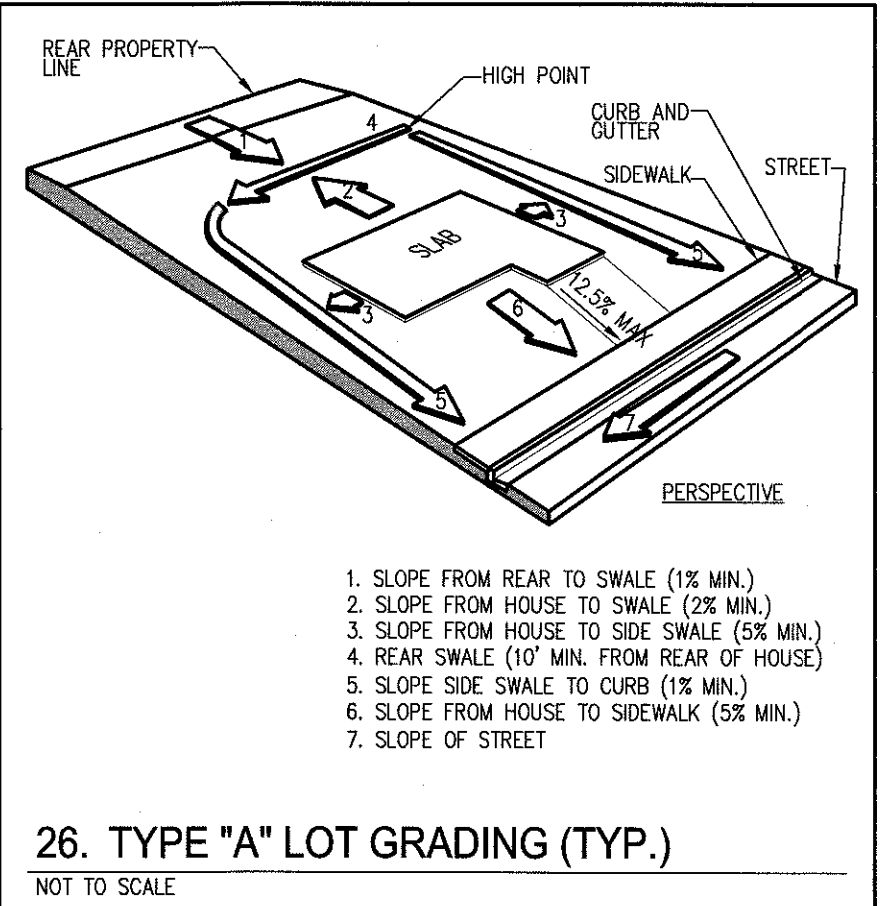
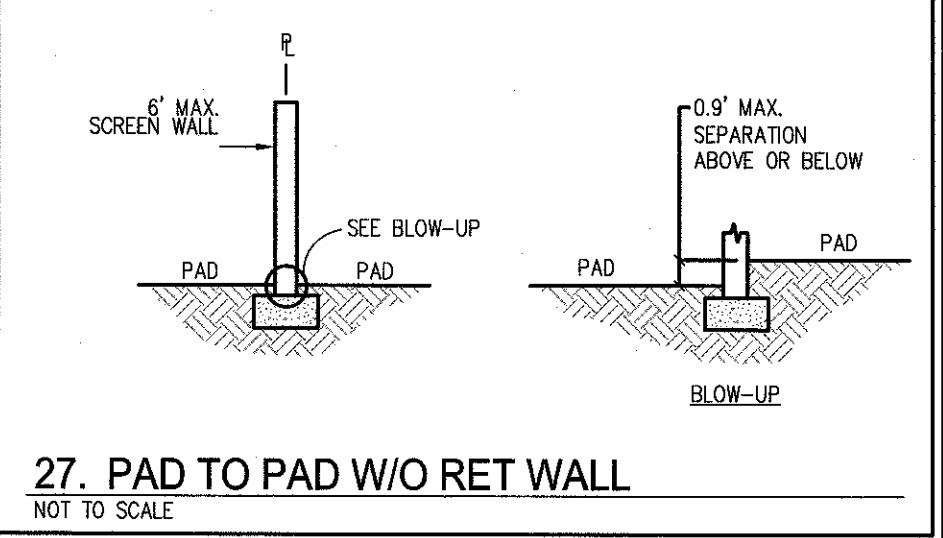
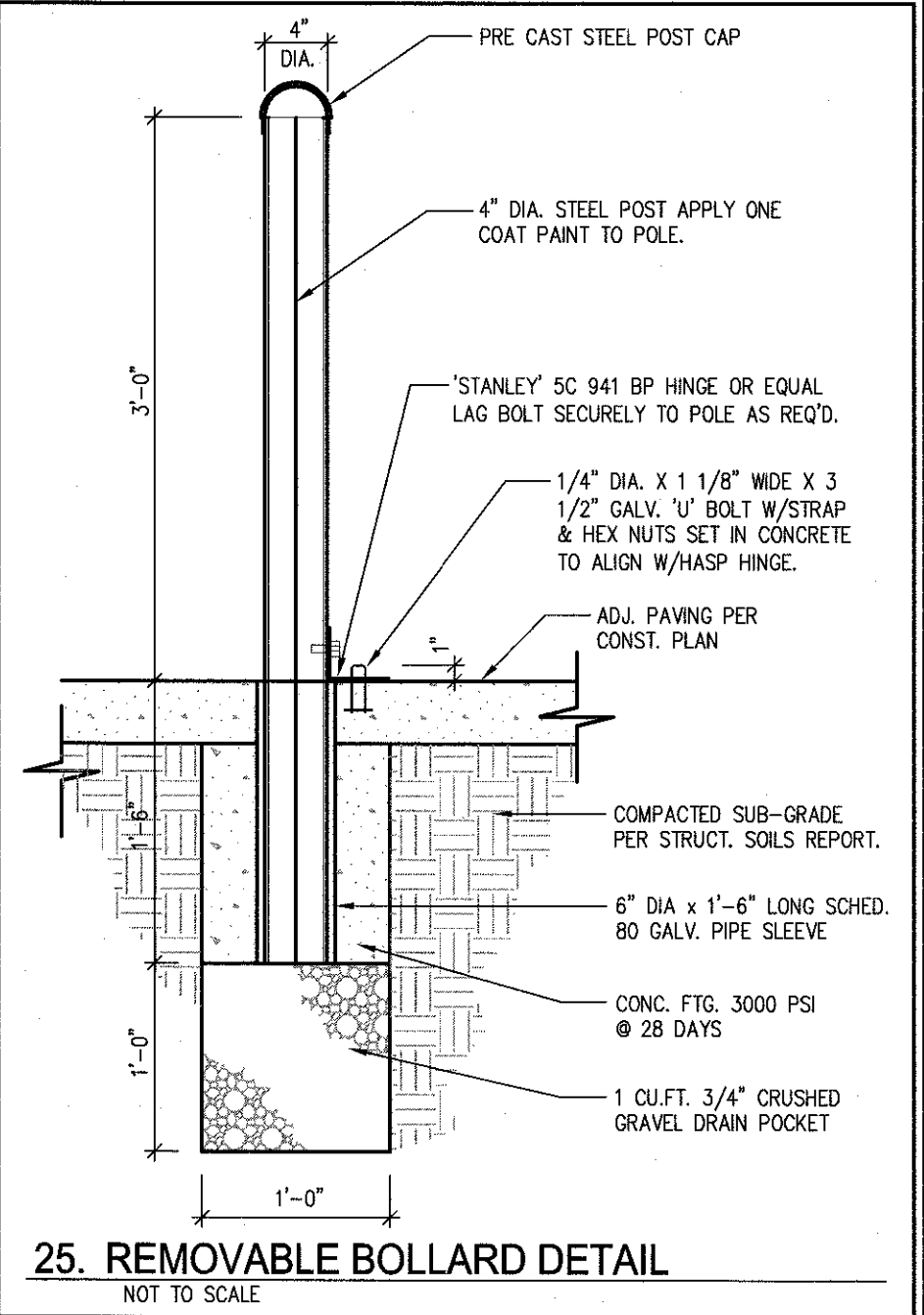
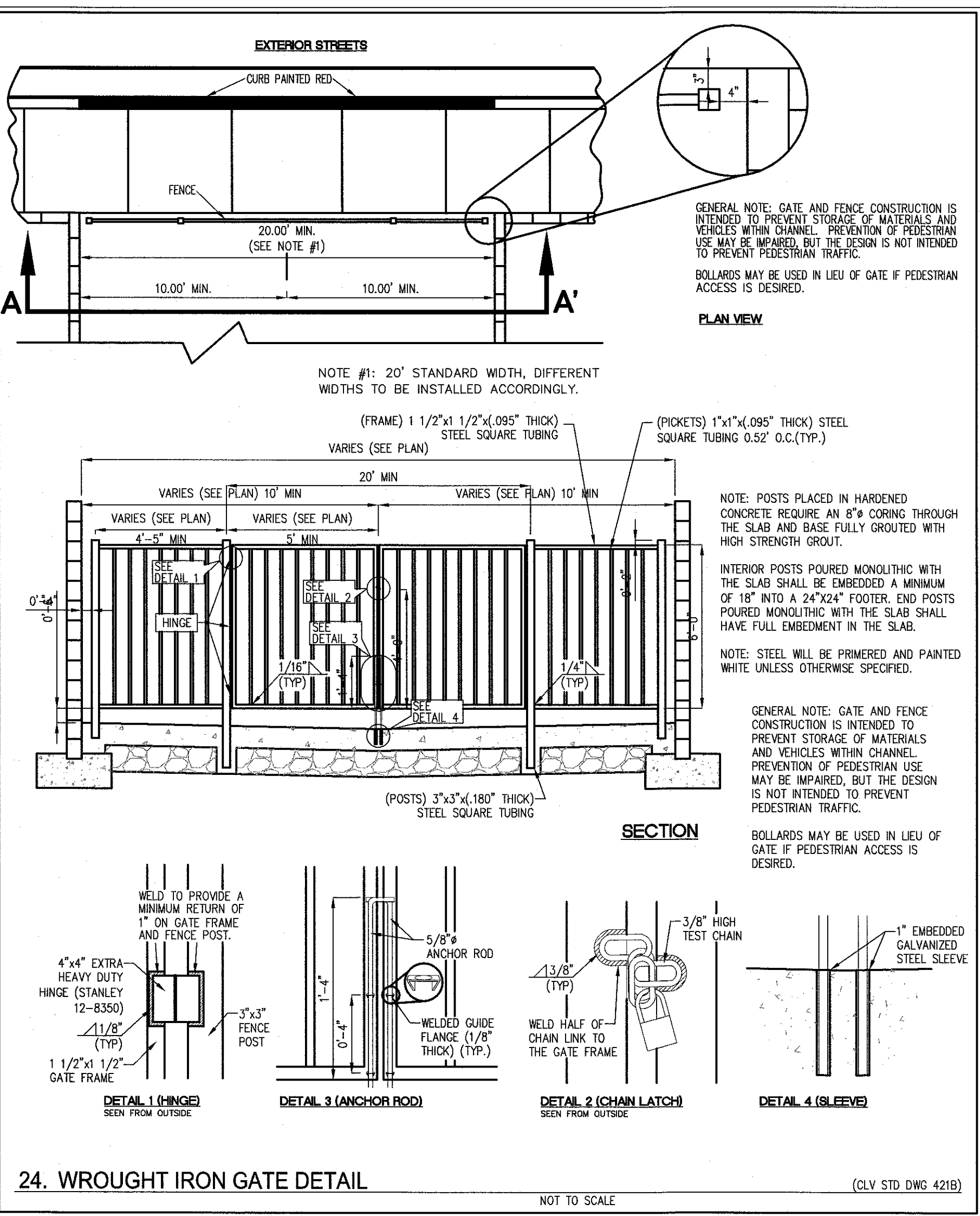
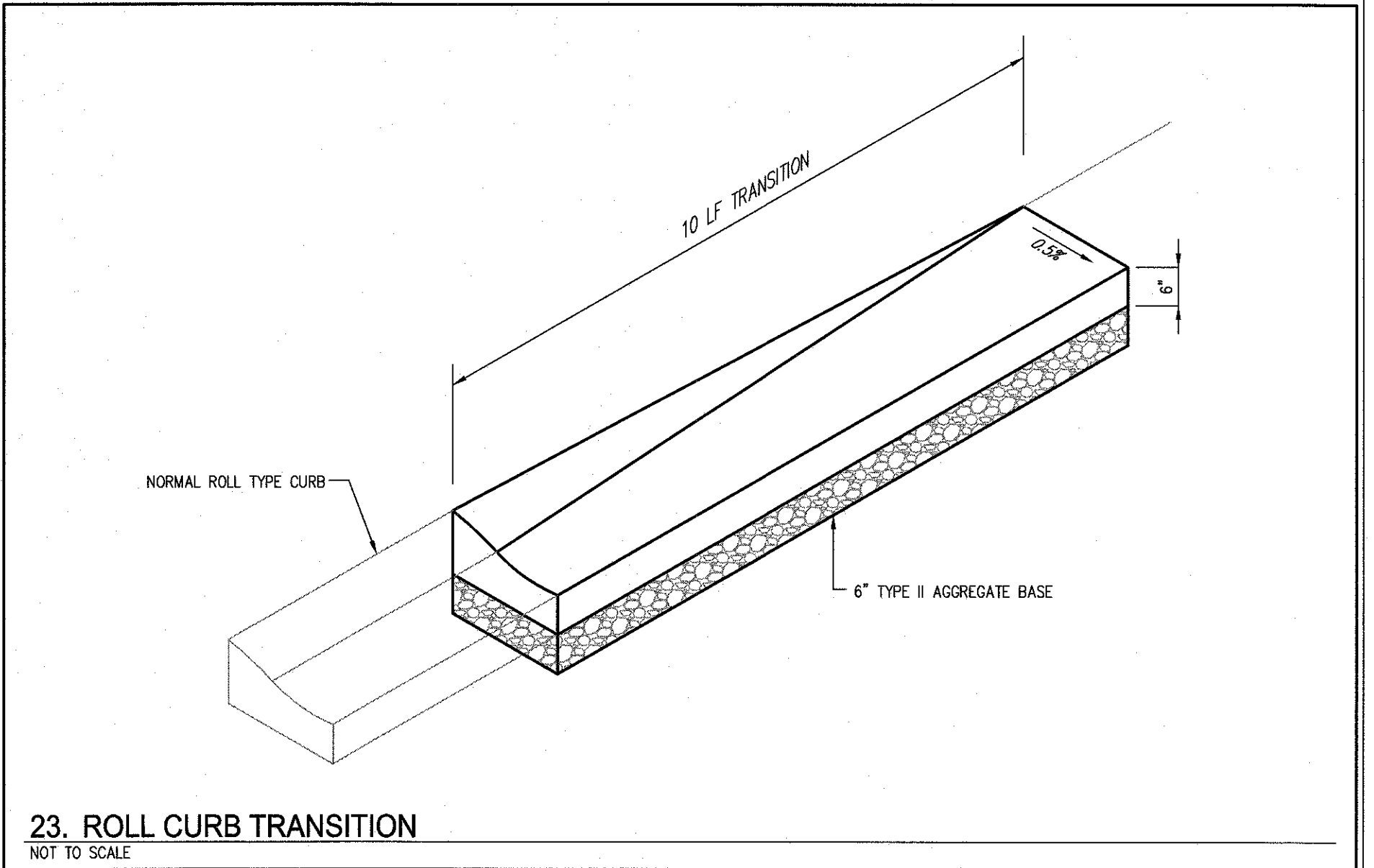
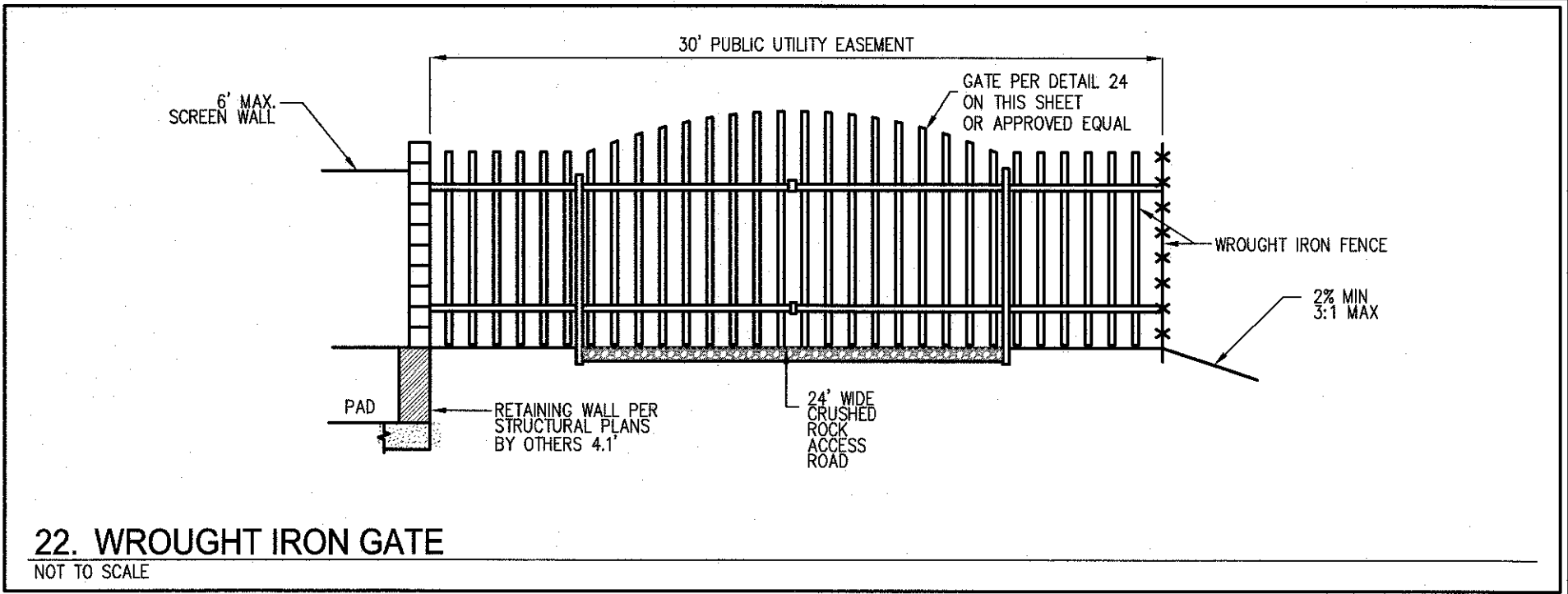
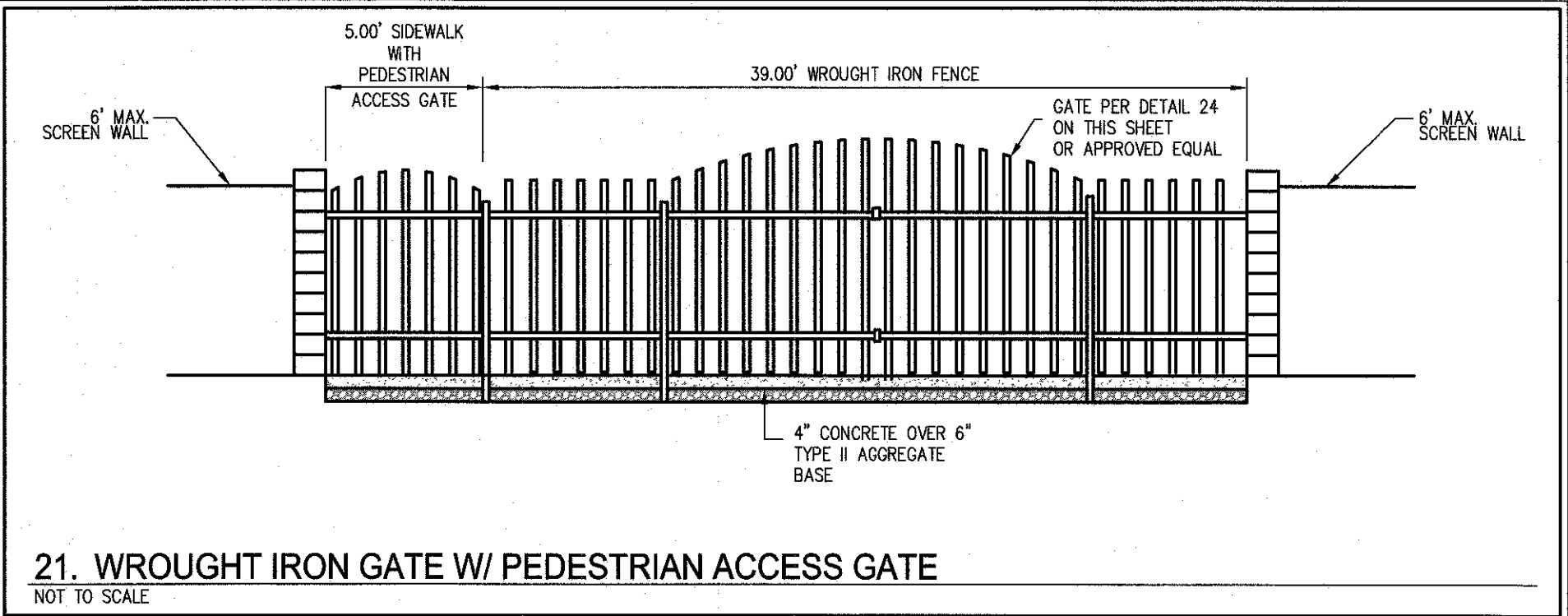
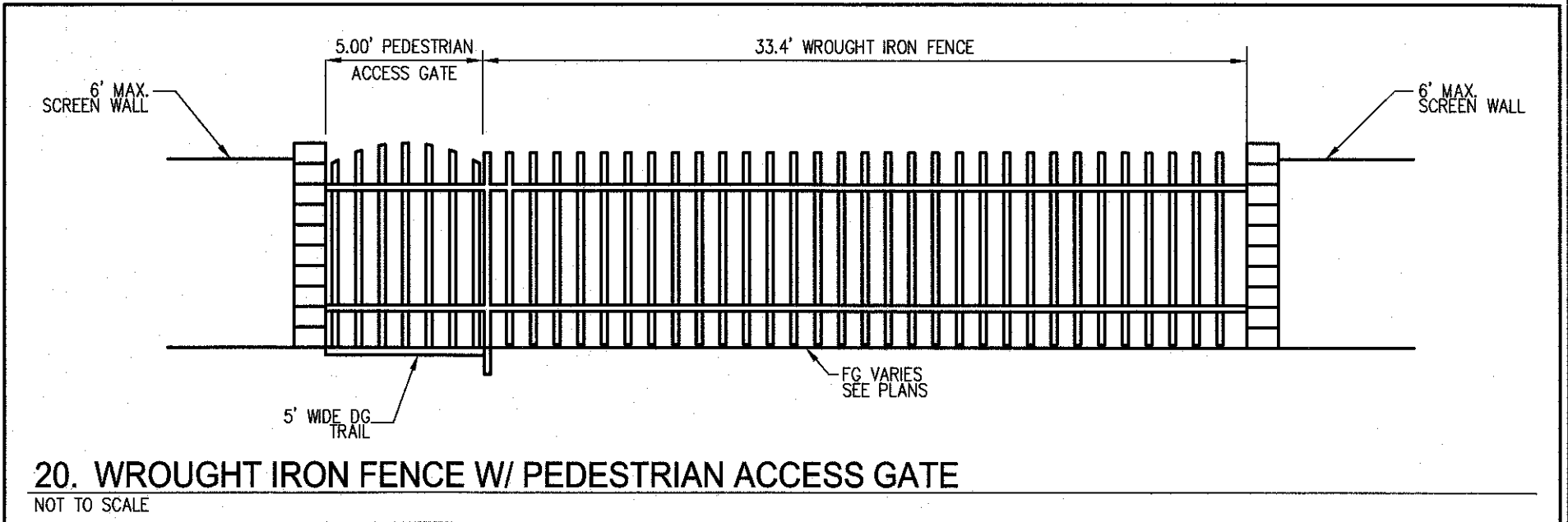
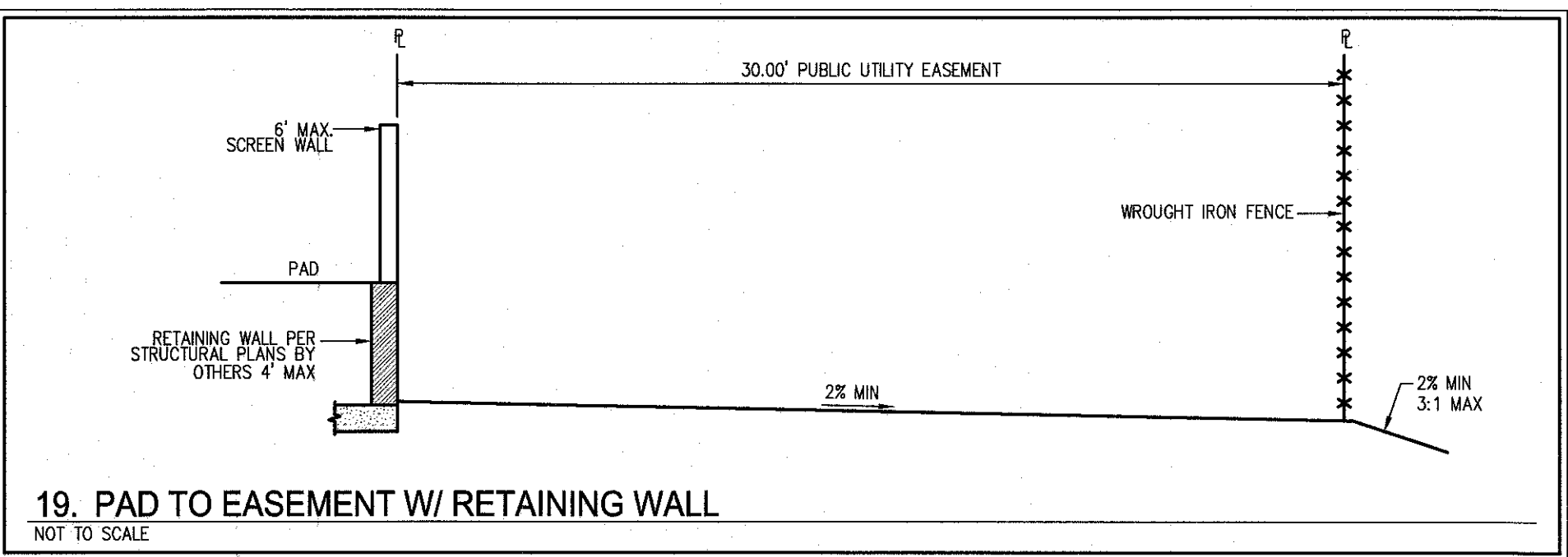
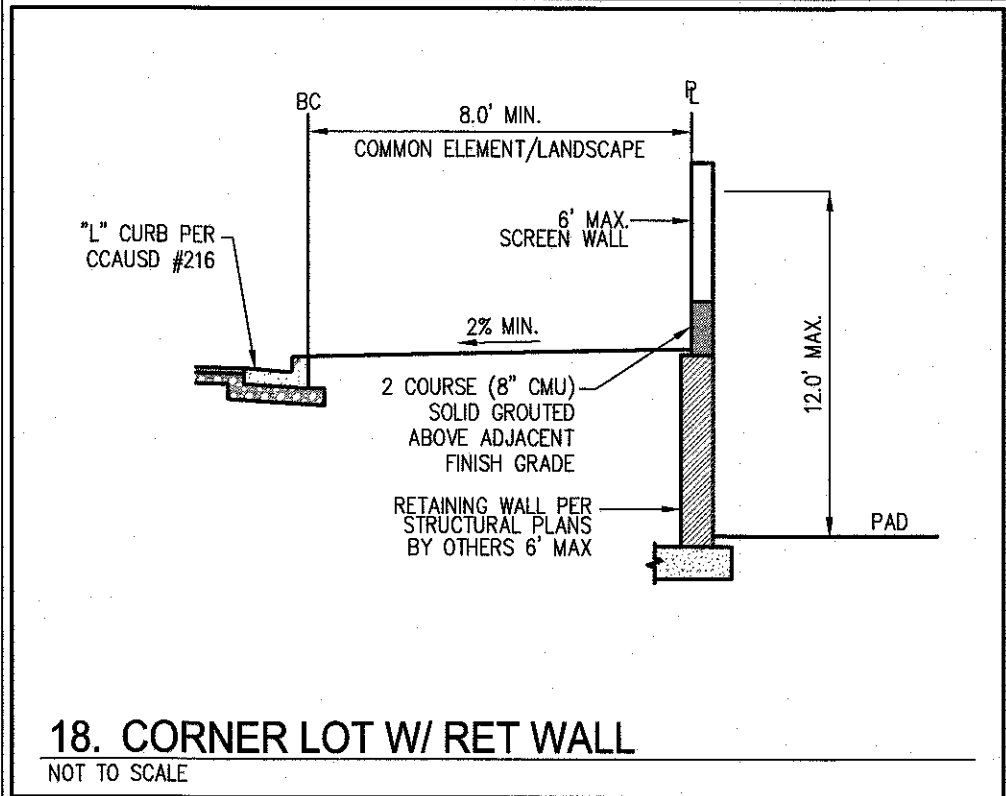
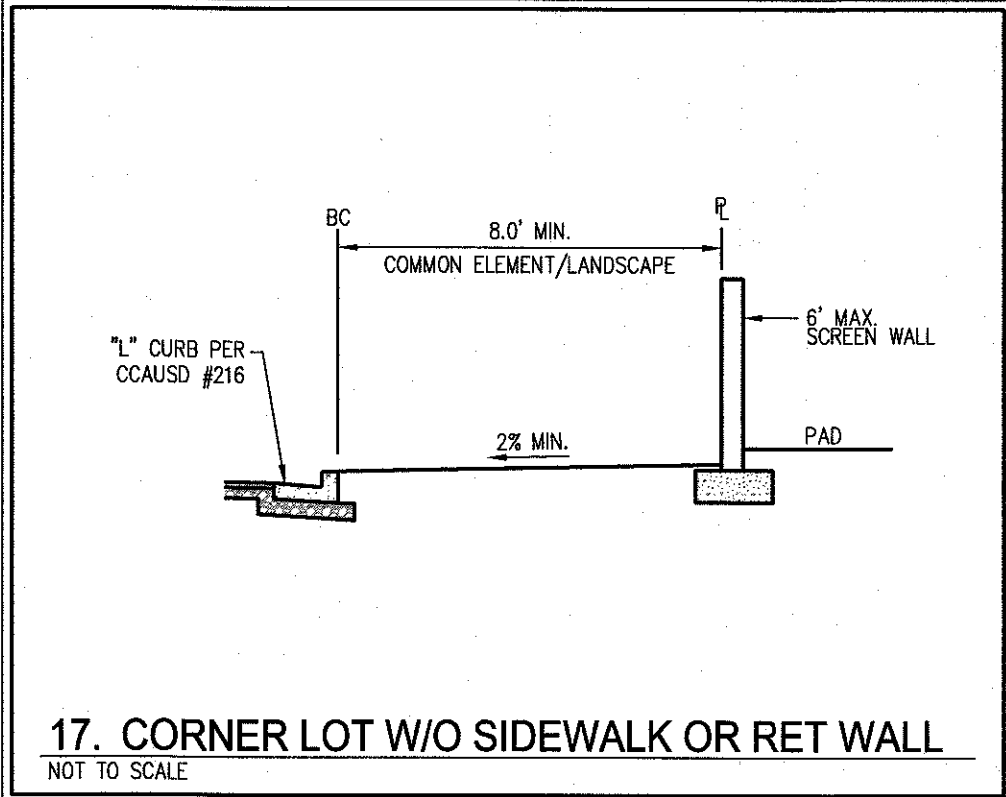
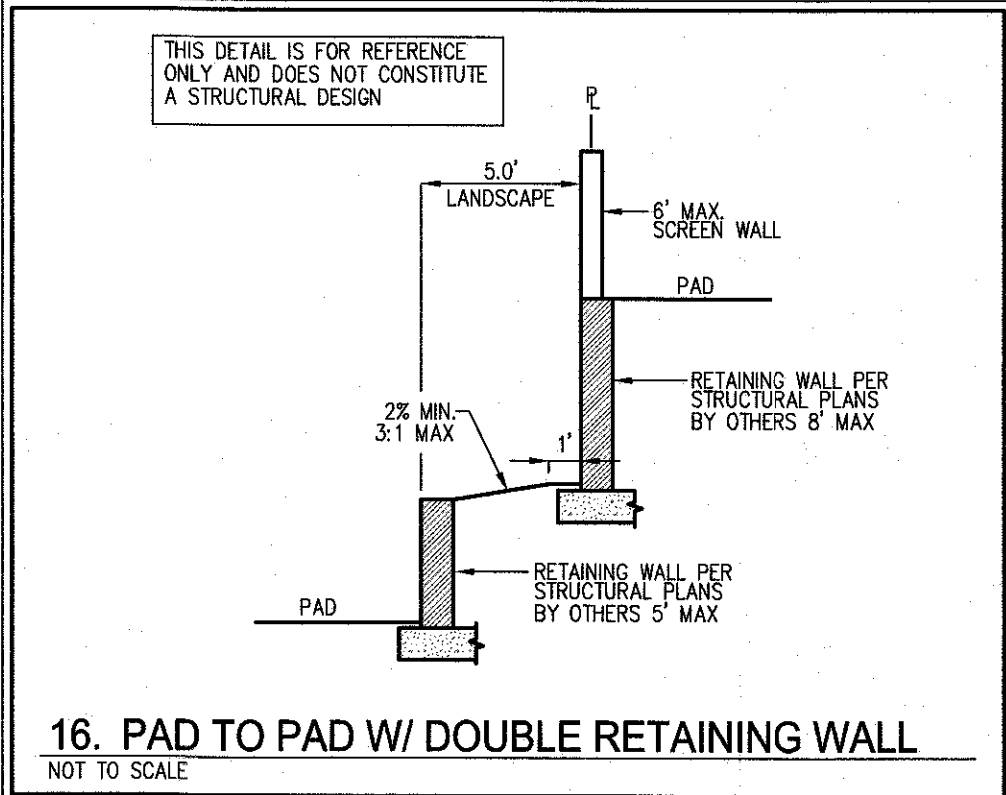
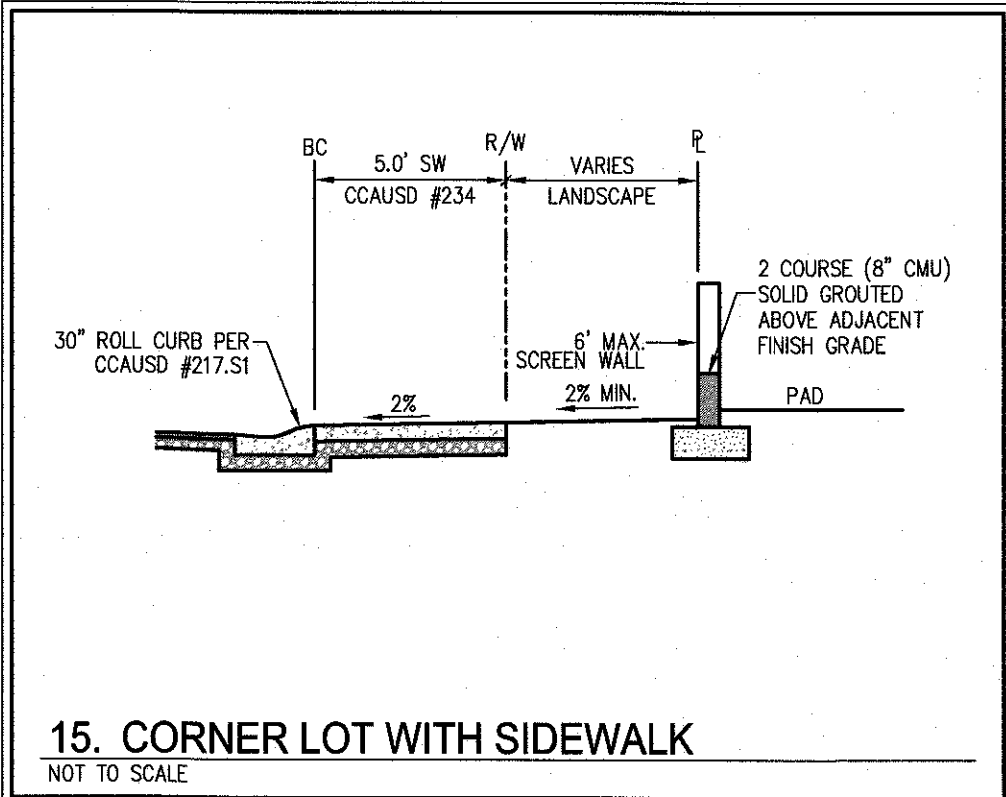
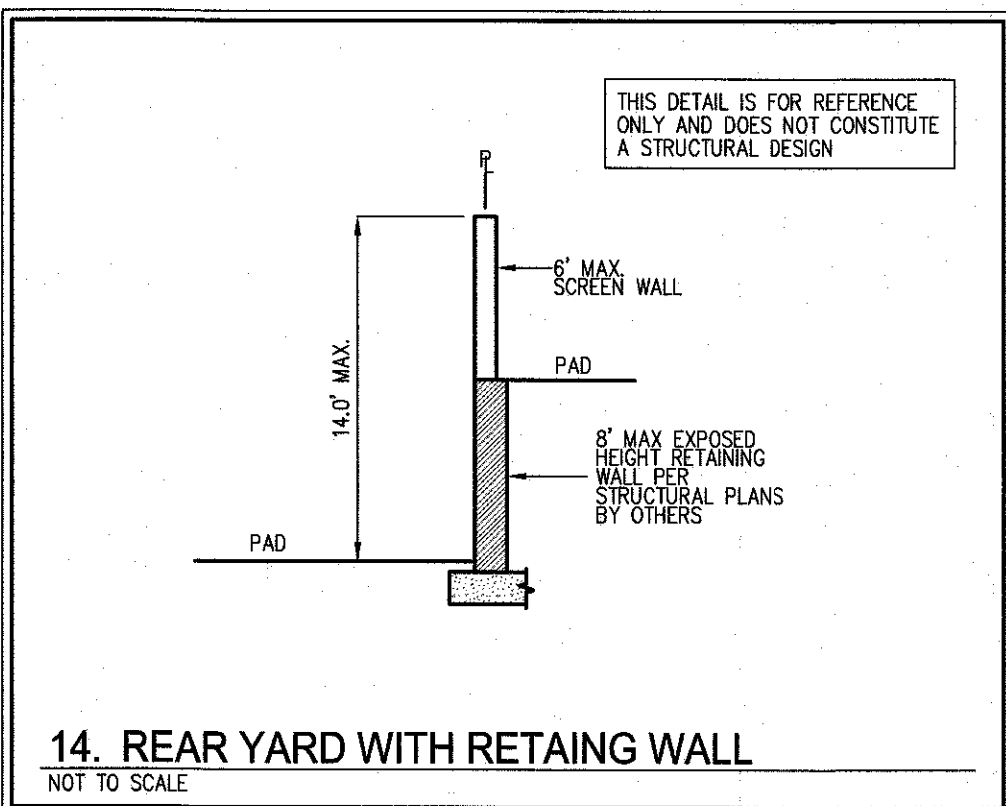
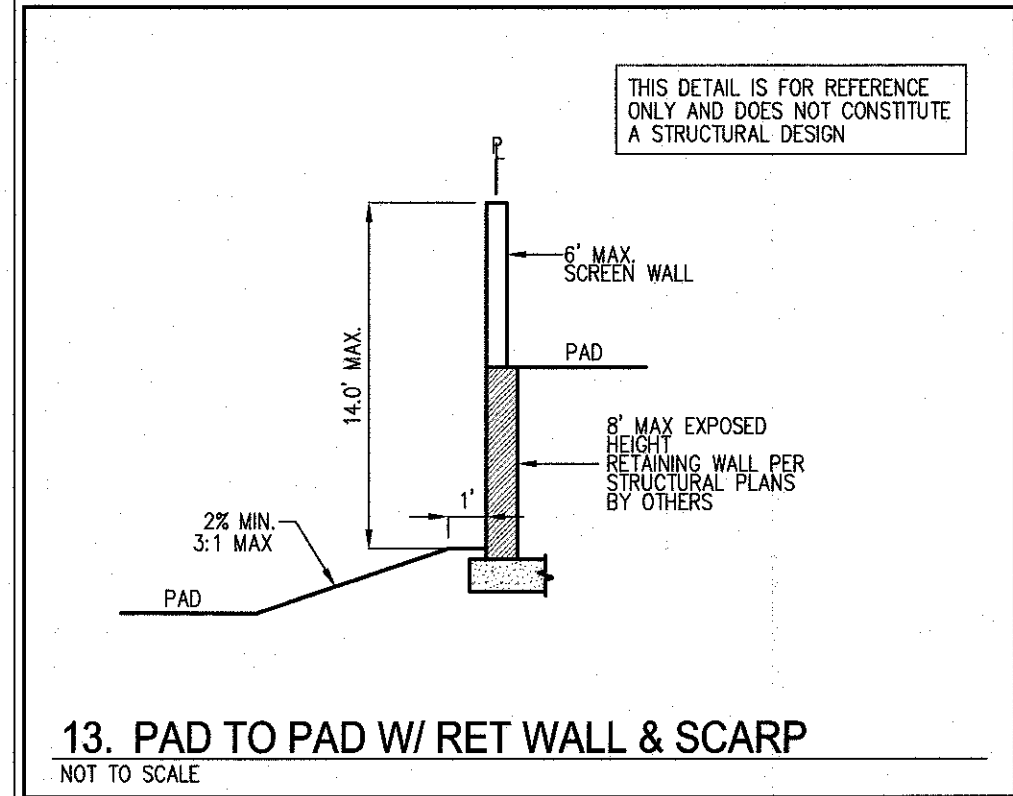
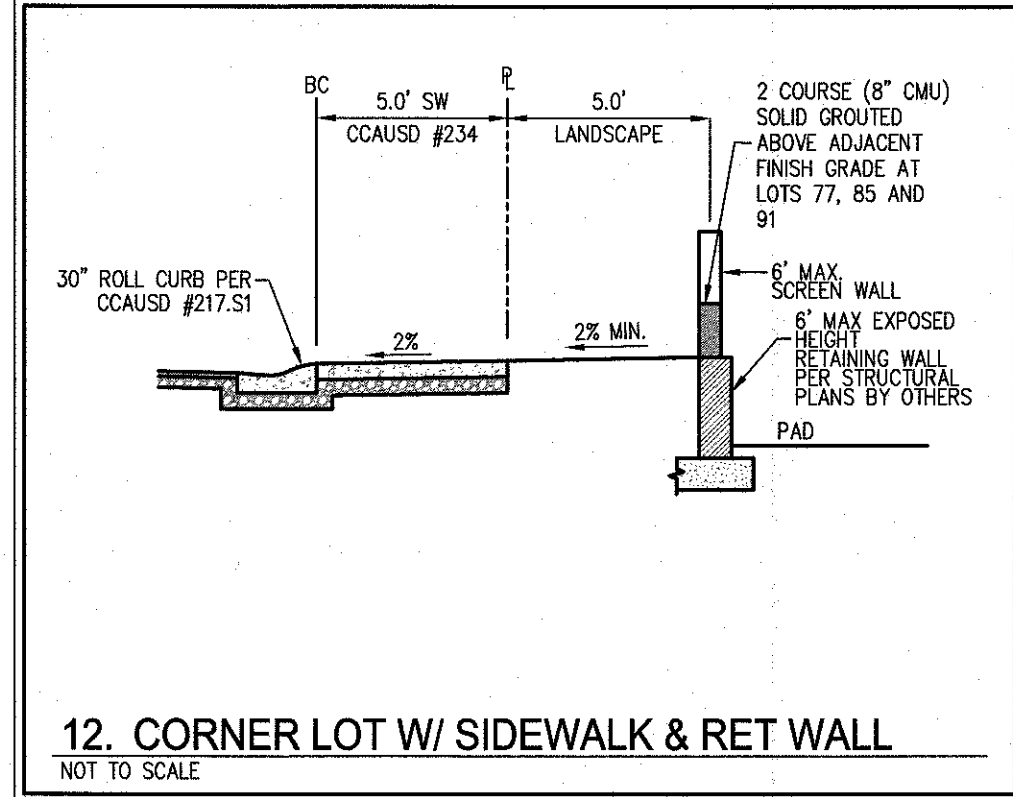
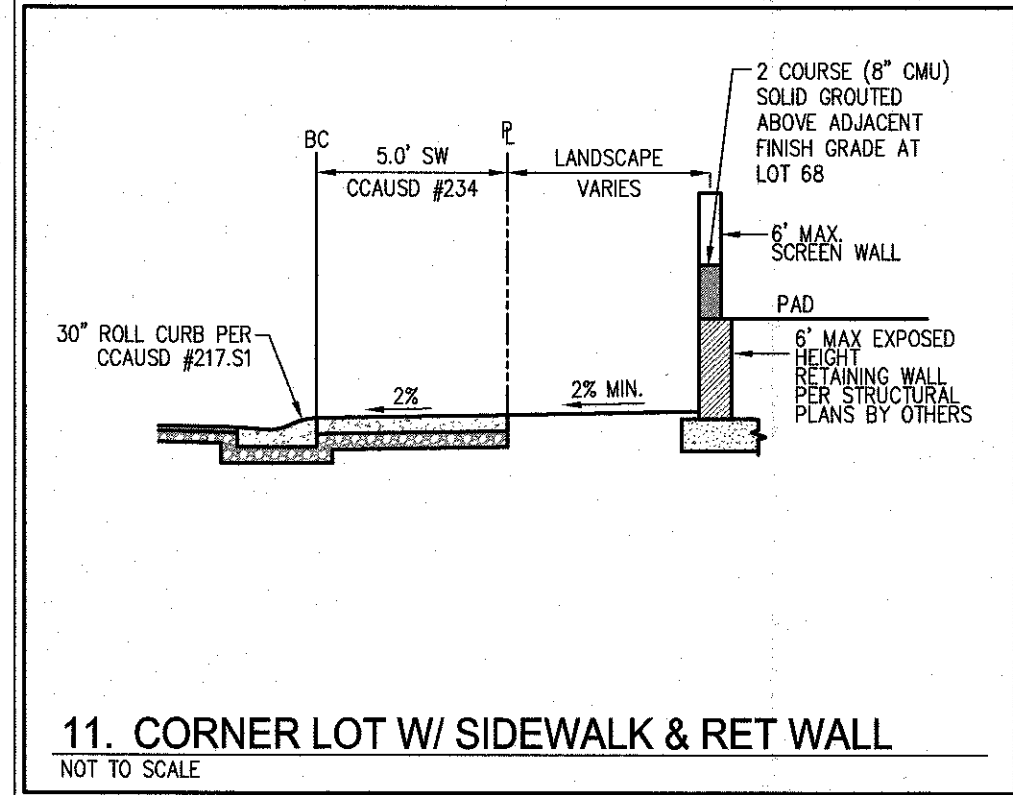
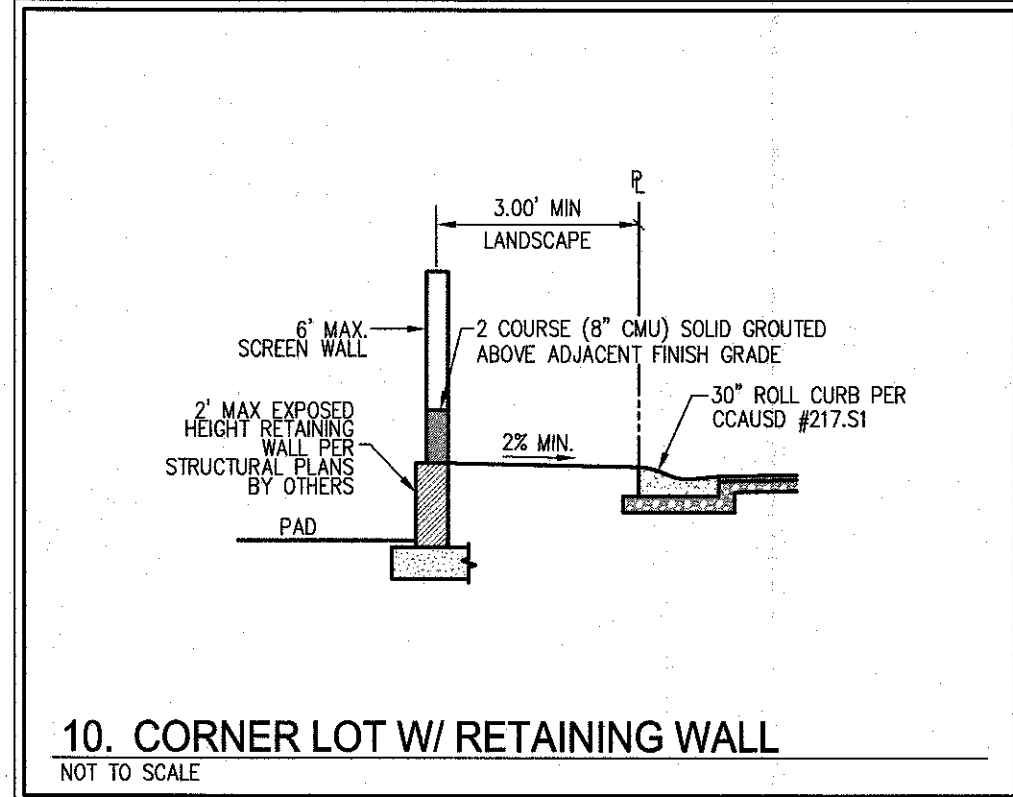
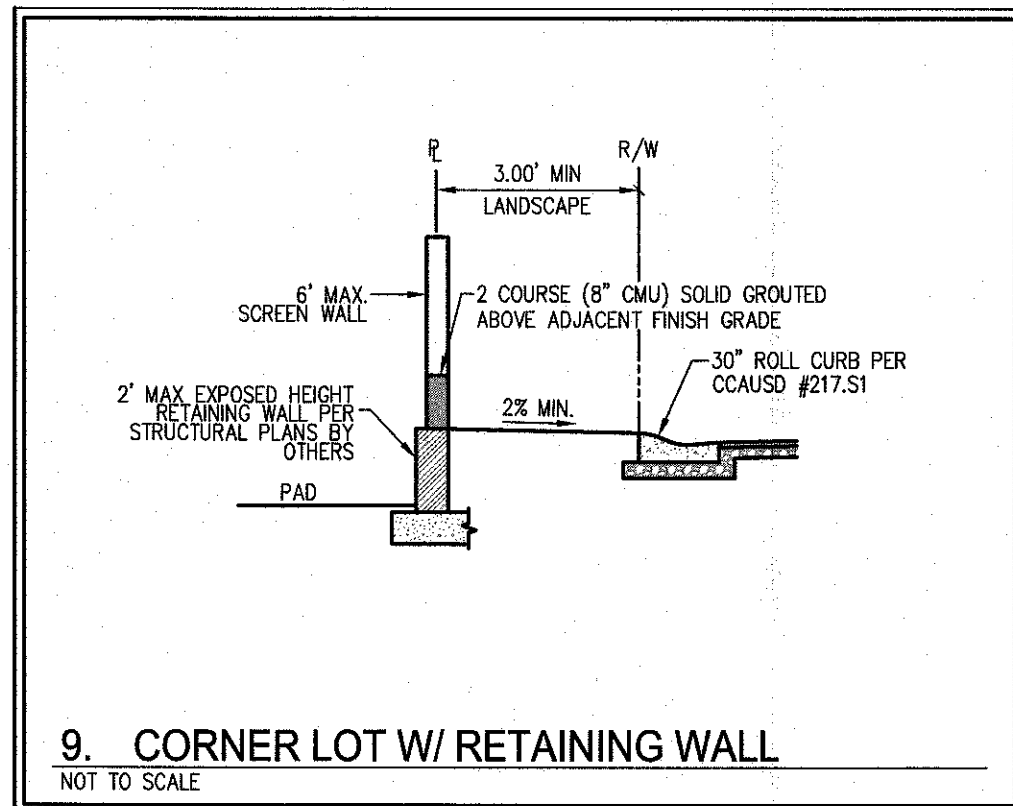






SHEET 10 OF 24





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

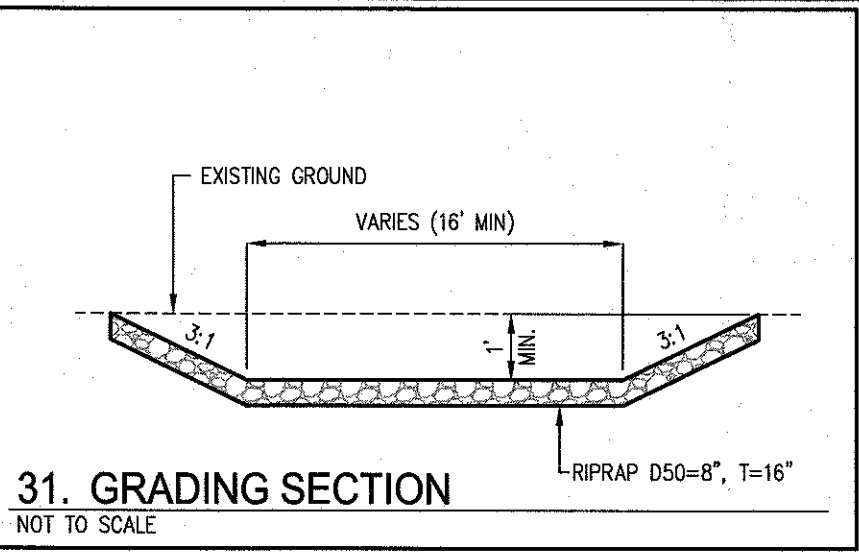
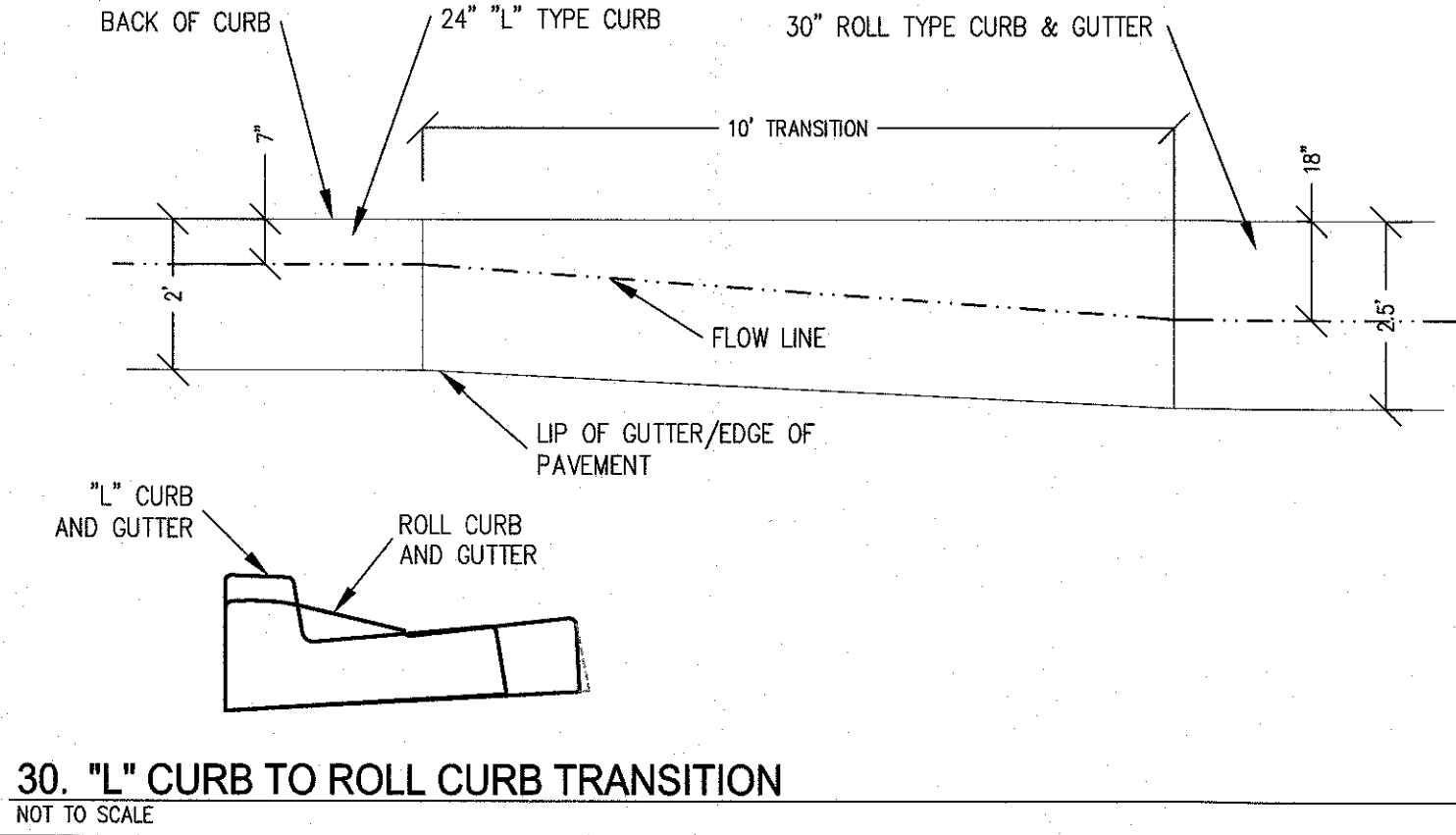
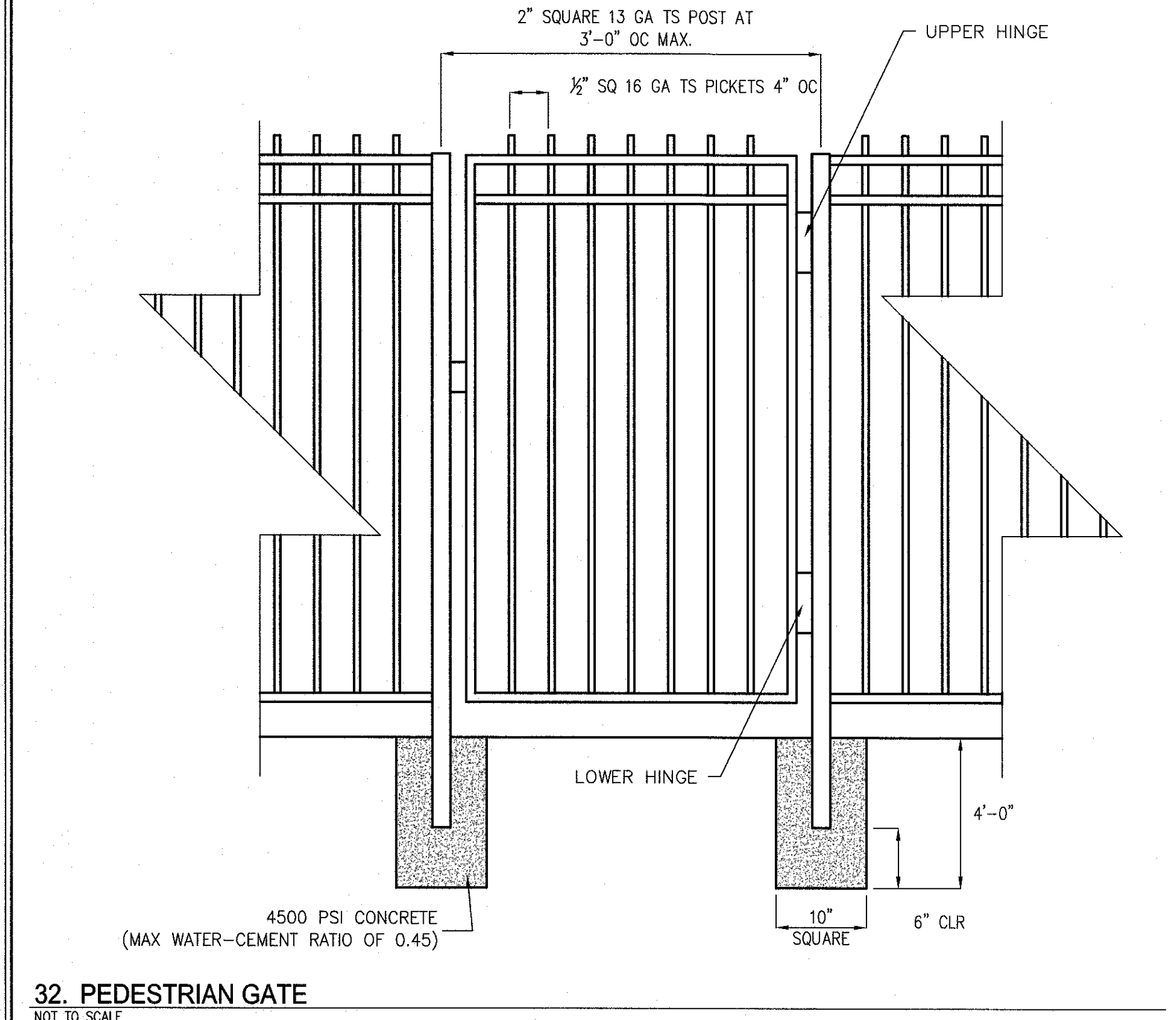
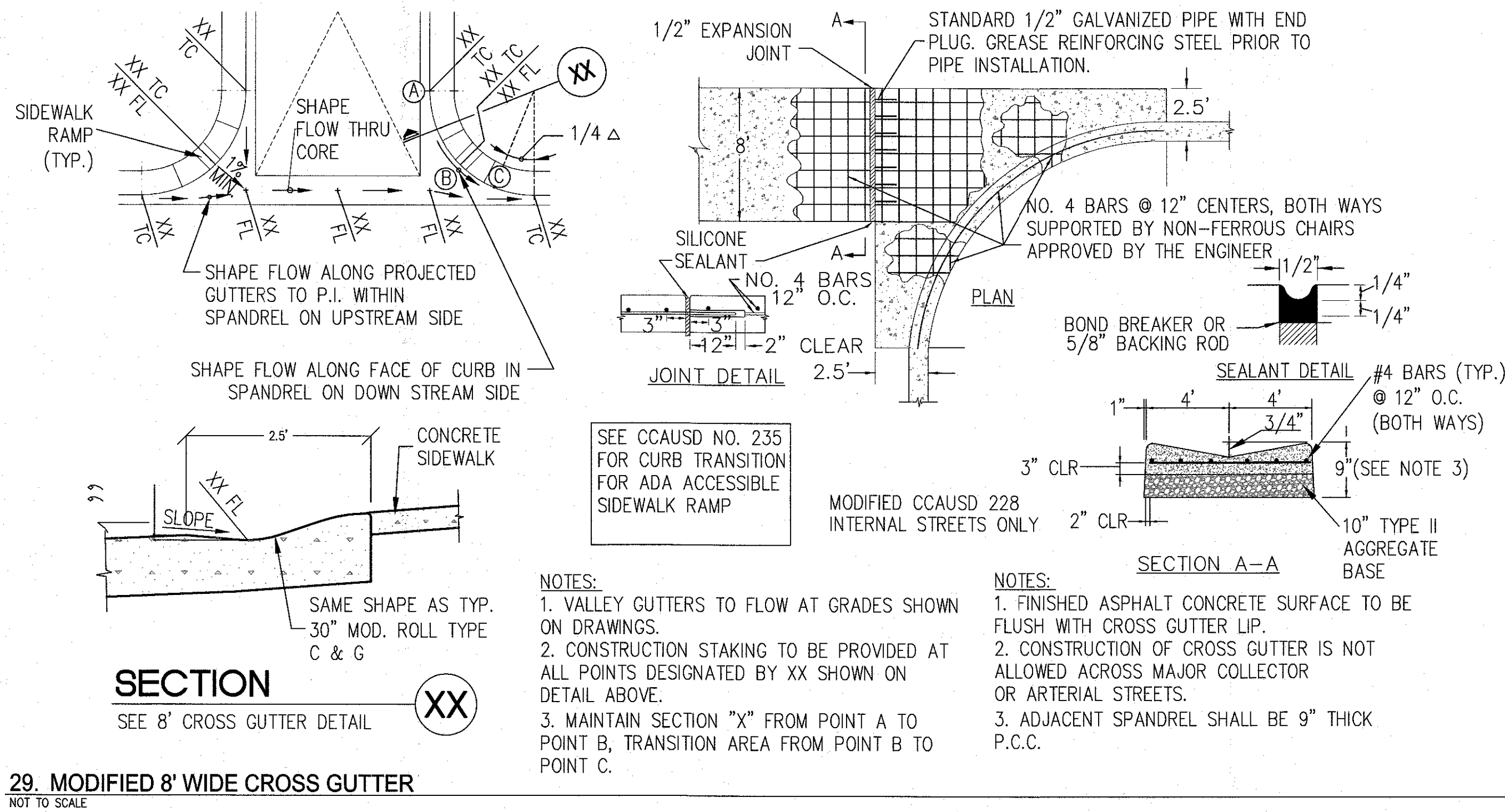
CITY OF LAS VEGAS, NEVADA
NINETY-FIVE MANAGEMENT L L C
SKYE CANYON PARCEL 2.23B
GRADING SECTIONS AND DETAILS II

\$12,185
R 39E

DATE: 11/02/16
DRAFTER: DNP
DESIGNER: BCC
CHECKED: STS
PROJECT NO. OLY1607-003

ENGINEER
TIMOTHY M. MULROONEY
Exp. 12/31/2017
CIVIL
No. 22938

D-2
SHEET 12 OF 24



NO.	DESCRIPTION	DATE	BY	APP. DATE

