

DS #: 4684

APN: 125-07-401-001

PROJECT: Skye Canyon - Parcel 1.3

SUBMITTAL: 1st

SCANNED BY/DATE:

CHECKED BY/DATE:





CITY OF LAS VEGAS			DATE:			
INTER-OFFICE MEMORANDUM			August 11, 2014			
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 1.3			COPIES TO: Slater Hanifan Group			
Cross Streets: NEC Grand Teton Drive & Hualapai Way			K A G Development South, LLC / Ninety-Five Management, LLC			
File Number: F:\Depot\DSMemos\DS4684A.doc			Bart Anderson, P.E., DevCo			
Parcel Number: 125-07-401-001			CCRFCD			
Zoning Action: TMP-53908						
FEMA Flood Zone		YES			NO	X
Proposed Storm Drain		YES			X	NO

HISTORY	DATE RECEIVED	DATE REVIEWED	COMMENTS	REVIEW FEES	FEES PAID Payment Trn #
1 st Submittal	6/30/2014	8/7/2014	See Comments Below	\$400.00	361819: \$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.
	is conditionally approved subject to Clark County Public Works Department concurrence.

1. The subject drainage study is based on the condition that the **Skye Canyon Phase 1 Infrastructure** and the perimeter streets (*Racel Street, Hualapai Way, Grand Teton Drive and Conquistador Street*) are fully improved for onsite major storm events protection. The perimeter streets and all the associated storm drain facilities must be completed prior to the issuance of building permits for the subject development.
2. This drainage study for **Parcel 1.3** will not be approved prior to the final approval of the **Skye Canyon Phase 1 Infrastructure** study.
3. Provide a copy of the zoning/planning conditions associated with this site (**TMP-53908**) 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.
4. In all grading plans, label the existing storm drain systems in the perimeter streets with *City of Las Vegas* drawing numbers. If the infrastructure plans have not been approved yet and therefore no recorded drawing numbers have been issued at current time, label with "per *City of Las Vegas Plan # xxxxx*". Once the drawing numbers are available, label the pertinent plans with the actual numbers.

5. **Grading Plans G-1 and G-2:** In a worst case scenario that the 100-year flow depth of 1.77' in *Racel Street*, **Entry 1 Street** appears to overflow some of the flood in *Racel* split into the onsite development and continue east on **Street 3A**. Provide hydraulic calculation to quantify how much flow will split into the site downstream of the intersection of **Entry 1 Street** and **Street 3A** under the worst case situation. Address whether the proposed finished floor elevations of those impacted lots are still above the worst case flood.
6. **Grading Plan G-2:** In **Street 3C**, a bypassed flow of 17.5 cfs (29.5 cfs – 12 cfs at D.I. #5) will go east and impacting Lots 55 – 57. It is recommended to provide another equal length D.I. about 20' downstream of D.I. #5 to reduce the flow draining in front of the three lots. Review and revise accordingly.

Address during a worst case scenario, the ponding depth at the sump is less than 1' for it to overflow into **Street E** for discharge.

Dedicate the piece of land between the end of **Street 3C** and the right-of-way line of **Street E** as a common lot and public drainage easement (privately maintained by the HOA) on the grading plan and the final map.

7. **Grading Plans G-3 and G-4:** Dedicate the piece of land between the east end of **Street 3I Court** and the bulb of cul-de-sac of **Street 3J Court** as a common lot and public drainage easement (privately maintained by the HOA) on the grading plan and the final map.

G-4: Label finished floor elevations of the lots in the adjacent **Parcel 1.4** to the east.

8. The **City Council** of the **City of Las Vegas** recently adopted an amendment to Title 20 of the Municipal Code in which Section 20.10.030 requires all public drainage easements to be concrete lined. Revise the grading plan, *Detail Sections* and all pertinent plans and construction notes accordingly.
9. **Detail Sheet D-2: Sections 2/D-2, 3/D-2, 4/D-2, 5/D-2, 6/D-2, 7/D-2 and 9/D-2** all indicate that the proposed pad and finished floor elevations are below the corresponding street grade. Revise those sections to solid grout a minimum of 3-courses of 8"-CMU above the adjacent grade.
10. Any proposed wrought iron fence in the public drainage easements must utilize *City of Las Vegas* Standard Drawing 421B. Contact Raul Cruz at 229-3224 for the AutoCAD details (421 series) to be included with the improvement plans.
11. This drainage study assumes that the project will be constructed in one phase. If improvement plans are submitted to break the project into separate phases, a drainage study update will be required for each phase addressing the interim condition.
12. 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.

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/R60E/07
AREA G-07

 *** FAX TX REPORT ***

TRANSMISSION OK

JOB NO. 4310
 DESTINATION ADDRESS 7022845399
 PSWD/SUBADDRESS
 DESTINATION ID
 ST. TIME 08/11 11:28
 USAGE T 00' 41
 PGS. 2
 RESULT OK

CITY OF LAS VEGAS INTER-OFFICE MEMORANDUM

DATE:

August 11, 2014

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 1.3

COPIES TO:

Slater Hanifan Group

Cross Streets:

NEC Grand Teton Drive & Hualapai Way

K A G Development South, LLC /
 Ninety-Five Management, LLC

File Number:

F:\Depot\DSMemos\DS4684A.doc

Bart Anderson, P.E., DevCo

Parcel Number:

125-07-401-001

CCRFCD

Zoning Action:

TMP-53908

FEMA Flood Zone

YES

NO

X

Proposed Storm Drain

YES

X

NO

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- This drainage study for **Parcel 1.3** will not be approved prior to the final approval of the **Skye Canyon Phase 1 Infrastructure** study.
- Provide a copy of the zoning/planning conditions associated with this site (**TMP-53908**) with the next

TECHNICAL DRAINAGE STUDY

Skye Canyon

Parcel 1.3

City of Las Vegas, Nevada

Job No.: OLY1401.002

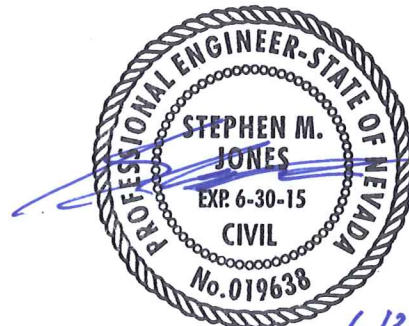
Date: June 2014

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



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

Assisted by: Brian Churchill, P.E.
Andrew Howard, P.E.

HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL
DRAINAGE STUDY INFORMATION FORM

Name of Development: Skye Canyon – Parcel 1.3 Date: June 2014
Location of Development: a) Descriptive (Cross Streets): North/South: Hualapai Way
East/West: Grand Teton Drive
b) Section: 7 Township: 19 South Range: 60 East
c) APN: 125-07-401-001

Name of Owner/Developer: K A G Development South, LLC / 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 89141

Contact Person – Name: Steve Jones, P.E. Telephone No.: 702-284-5300
*E-mail Address: sjones@shg-inc.com Fax No.: 702-284-5399
Firm: Slater Hanifan Group
Address: 5740 S. Arville Street, Suite 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: 45.08 Acres Being Developed/Disturbed: 38.42 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: 0 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 1 Infrastructure (SHG, DS4661)
7. If known, please briefly identify the proposed discharge point(s) of runoff from the site: Conquistador local storm drain
8. Briefly describe your proposed schedule for the subject project: 1 Phase after completion of Phase 1 Infrastructure (DS4661)



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: SHG Job No. OLY1401.002

STANDARD FORM 1

Updated 05/01/2008

HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL

DRAINAGE SUBMITTAL CHECKLIST

Project Name: Skye Canyon – Parcel 1.3		Map ID:
Firm Name: Slater Hanifan Group (SHG)		
Address: 5740 S. Arville St., Suite 216		
City: Las Vegas	State: Nevada	Zip: 89118
Phone Number: 702-284-5300	Fax Number: 702-284-5399	
Property Owner/Developer: K A G Development South, LLC / Ninety-Five Management, LLC		
Address: 11411 Southern Highlands Parkway, Suite 300		
City: Las Vegas	State: NV	Zip: 89141
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:

Yes	No	
X		Design Manual Standard Form 1 with the engineer's seal and signature.
X		Design Manual Standard Form 4 .
X		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.
Reference:		STANDARD FORM 2

HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL

DRAINAGE SUBMITTAL CHECKLIST

II. MAPS AND EXHIBITS

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.
☒	☐	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.
☒	☐	Off-site drainage basin maps for existing, interim and future conditions showing the existing topography, basin boundaries, concentration points, and flows in cfs.

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.

REFERENCE:

STANDARD FORM 2

HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL

DRAINAGE SUBMITTAL CHECKLIST

III. DRAINAGE PLAN (Continued)

Yes	No	
☒	☐	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.
☐	☒	N/A Streets with off-set crowns.
☒	☐	Proposed contours or spot elevations in sufficient detail to exhibit intended drainage patterns and slopes.
☒	☐	Property lines.
☒	☐	Right-of-way lines and widths, existing and proposed.
☒	☐	Existing improvements and their elevations.
☒	☐	Delineation of proposed on-site drainage basins indicating area and 10-year and 100-year storm peak flows at basin concentration points.
☒	☐	Concentration points and drainage flow direction with Q_{100} and V_{100} and D_{100} in streets.
☒	☐	Cumulative flows, velocity, and direction of flow at upstream and downstream ends of site for the 10-year and 100-year flows.
☒	☐	Location and cross-section of street capacity calculations.
☒	☐	Cross-sectional detail for channels, including cutoff wall locations.
☒	☐	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.
☒	☐	Existing and proposed drainage easements and widths shown with sufficient detail. A cross sectional detail must be provided that shows appropriate lining and reinforcement.
☐	☒	N/A Location and detail of existing, proposed, and future block wall openings. Minimum size is 16"x48". Wrought iron gate is required for flows > 10 cfs.
☒	☐	Location and detail of flood walls illustrating depth of flow, proposed grouting height, etc.

REFERENCE:

STANDARD FORM 2

HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL

DRAINAGE SUBMITTAL CHECKLIST

III. DRAINAGE PLAN (Continued)

Yes	No	
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.
	N/A	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.
	X	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. (see report for discussion)
X		Street slopes for perimeter and interior streets. The minimum slope is 0.4 percent.

IV. HYDROLOGIC ANALYSIS

Yes	No	
X		Appropriate soil information and Soils Map for existing and future conditions with subbasins and property delineated.
X		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.
X		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.
X		Use of correct precipitation values in and around the McCarran Airport Rainfall Area.
X		A discussion in the text of the hydrologic analysis justifying subbasin boundaries and cutoffs, supporting assumptions, and calculations.
X		A summary table of storm water flows showing basin area, Q ₁₀ and Q ₁₀₀ for both individual basins and combined basin flows, where acceptable.
X		Copies of supporting technical information referenced from a previously approved study and a statement accepting these results.
X		On-site facilities must perpetuate flows through or around the site without significantly impacting adjacent property owners in accordance with current Nevada Drainage Law.

REFERENCE:

STANDARD FORM 2

HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL

DRAINAGE SUBMITTAL CHECKLIST

V. HYDRAULIC ANALYSIS

Yes	No	
X		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, which ever 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.
X		Provide a 50 percent clogging factor in the capacity calculation for drop inlets.
X		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.

REFERENCE:

STANDARD FORM 2



CITY OF LAS VEGAS

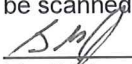
MINIMUM DRAINAGE STUDY CRITERIA STANDARD FORM 2 CHECKLIST SUPPLEMENT

(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.  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	
X	-	Proposed on-site and off-site storm drains and other flood control facilities with plan and profile sheets for public storm drains showing the class of pipe, (Class III, IV, V, etc.), design hydraulic grade line, (HGL) and 100 year storm flow. A public drainage easement must be provided over on-site storm drains conveying off-site flows. An overflow path must be provided over all storm drains.
X	-	All existing and "to be constructed" walls with cross-sections showing wall type, (e.g. block wall, retaining wall, flood wall, etc.), with limits clearly defined, adjacent ground elevations. Wall heights must meet current ordinances and in no case exceed 14 feet above the adjacent property.
X	-	Street slopes for both interior and perimeter streets. Note: The minimum slope for a roadway is 0.4 percent, a minimum 18-inch storm drain must be provided where minimum slopes cannot be met.
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	
X	-	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.
X	-	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.

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1 INTRODUCTION

1.1 Project Overview & Study Purpose

Ninety-Five Management, LLC is proposing a single-family residential development, identified as *Skye Canyon Parcel 1.3*, within the city limits of Las Vegas, Nevada. The proposed development is approximately 39.0 acres in area, and located at the northeast corner of the intersection of Grand Teton Drive and Hualapai Way.

The proposed development is located within the master planned Skye Canyon property and specifically in the Phase 1 area supported by the *Technical Drainage Study for Skye Canyon – Phase 1 Infrastructure* (DS4661). All roadways and perimeter drainage infrastructure required for development of Parcel 1.3 has been technically addressed in the Phase 1 Infrastructure drainage study. Parcel 1.3 proposes utilization of drainage facilities provided by the Phase 1 Infrastructure. It is the objective of this study to show conformance to the drainage patterns assumed by the Phase 1 Infrastructure drainage study.

Additionally, the 1,662 acre Skye Canyon property has been master planned and a *Master Drainage Study for Kyle Canyon* (DS4420) has been conditionally approved by the City of Las Vegas. Proposed Parcel 1.3 has been proposed within the framework set forth in the Master Drainage Study.

1.2 Description of Improvements

The project is located within Township 19 South, Range 60 East and Section 7, generally within APN 125-07-401-001. Parcel 1.3 is bound by Racel Street, Conquistador Street, Grand Teton Drive, and Hualapai Way. 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 ranging in average area of less than 6,000 ft² and 6,000 ft², including all associated interior roadways. The typical onsite roadway is to be proposed as a 49-ft wide private street. The landscaping in the adjacent common elements between the infrastructure roadways and the subdivision is to be installed by Parcel 1.3. The adjacent perimeter roadways are to be installed by separate improvements and considered existing for development of Parcel 1.3.

Drainage improvements necessary to control storm runoff and satisfy local drainage criteria onsite have been proposed by Parcel 1.3. The proposed drainage improvements are intended to connect into the existing Phase 1 Infrastructure facilities.

1.3 FEMA Flood Zone Designation

The Parcel 1.3 site boundary has been delineated on current FEMA FIRM Panel Maps 32003C1745E and 32003C1750E, dated September 27, 2002, as Exhibit B included in Appendix A. Per the FIRM Panels, the project site is located within a FEMA designated Zone 'X', or outside the 500-year floodplain. A Zone 'X' is located outside 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. Per the 2013 MPU, the following CCRFCD regional facility alignment is considered pertinent to Parcel 1.3:

- CNKC 0050 within Racel Street. This facility is proposed as a part of the Phase 1 Infrastructure improvements as a 72-inch RCP adjacent to the site. A local storm drain facility in Conquistador that connects into the regional Racel facility is proposed as a part of the Phase 1 Infrastructure Study to collect the site flows.
- CNGT 0043 within Grand Teton Drive. This facility is existing as 8-ft x 6-ft RCB adjacent to the site.

Note that the above discussed alignments and facility types had been included in the *2013 Kyle Canyon Amendment to the 2008 Las Vegas Valley Master Plan Update* prepared by Slater Hanifan Group, and reflected in the currently issued 2013 MPU. This Master Plan Amendment remains pending City Council approval.

1.5 Referenced Documents

Technical Drainage Study for Skye Canyon – Phase 1 Infrastructure, prepared by Slater Hanifan Group (hereafter referred to as the Phase 1 Infrastructure Study, Reference 4), has technically designed the adjacent perimeter roadways and associated drainage infrastructure utilized by Parcel 1.3. The Phase 1 Infrastructure Study has been referenced to show Parcel 1.3 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 1 Infrastructure Study and included in Appendix G:

- The Phase 1 Infrastructure interim condition functions as Parcel 1.3 existing drainage condition.
- Hydraulic modeling of Conquistador storm drain for utilization in proposed Parcel 1.3 storm drain design.
- Offsite flow impacts from the adjacent perimeter roadways.

Master Drainage Study for Kyle Canyon, prepared by Slater Hanifan Group (hereafter referred to as the SHG Master Study, Reference 5), had conceptually planned drainage improvements required for the current land plan on the property. The referenced Phase 1 Infrastructure improvements were shown to be in conformance with the master drainage patterns per the SHG Master Study. Therefore, if this study shows Parcel 1.3 is in conformance with drainage patterns presented in the Phase 1 Infrastructure Study, then it is surmised that it is also in conformance with the SHG Master Study. As a result, no reference material from the SHG Master Study is necessary in preparation of this Parcel 1.3 technical study.

1.6 Correspondence with City of Las Vegas

Prior to submittal of this study, SHG and Olympia performed a kick-off meeting on 2/5/2014 with City of Las Vegas flood control staff discussing the processing of technical studies for development in the Phase 1 area.

Additionally, a separate *Justification Letter for Skye Canyon Phase 1 and Skye Canyon Development Phasing and Shadow of Protection Exhibit* prepared by SHG, dated 3/10/2014 and revised 5/5/2014, addressed that processing of Phase 1 technical studies and improvement plans is acceptable utilizing the current conditional approval of the SHG Master Study. A copy of these documents, including summary of the 2/5/2014 kick-off meeting with City staff, has been included in Appendix H.

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 Rainfall Area. Per CCRFCD Manual precipitation exhibits, the precipitation values utilized in this study's HEC-1 models are 2.93 and 1.61 inches for the 100-year and 10-year storm event, respectively. Note that the precipitation values are in conformance with the referenced Phase 1 Infrastructure Study. No drainage area exceeds 8 square miles, an SDN 3 design storm distribution referenced from Table 503 of the CCRFCD Manual is used. Relevant tables and figures from the CCRFCD Manual have been included in Appendix B.

Curve Number:

The SCS curve number loss rate methodology was utilized to approximate infiltration for the drainage basins. Per the SCS Soil Survey of the Las Vegas Valley Area (Soil Survey, Reference 3), this study's drainage basins lie within the following soil types delineated on Exhibit D, included in Appendix A:

- Soil 155 – Cave gravelly fine sandy loam, 4 to 15 percent slopes. This soil is composed of 5% HSG 'A', 5% HSG 'B' and 90% HSG 'D'.

- Soil 400 – Tencee very gravelly fine sandy loam, 2 to 8 percent slopes. This soil is composed of 10% HSG 'B' and 90% HSG 'D'.

A composite curve number for land uses utilized in this study's hydrologic analysis has been obtained utilizing the percentages identified above, and the computations are included in Appendix B.

Note that the following two separate land uses are proposed by the project:

- Basin ON1-D: Less than 6,000 ft² in average area which utilizes a "Commercial" type curve number per CCRFCD Manual Table 602A.
- Basin ON1-D: Residential 6,000 ft² in average area per CCRFCD Manual Table 602A.

A summary of the composite curve number calculated for the proposed Parcel 1.3 and the curve number utilized in the Phase 1 Infrastructure Study has been summarized in Table 1. In the Phase 1 Infrastructure Study, ON5-D was analyzed as "Less than 6,000 ft²" in average area which utilizes a "Commercial" type curve number per CCRFCD Manual Table 602A."

Table 1: Curve Number Comparison: Parcel 1.3 Study vs. Phase 1 Infrastructure Study			
Parcel 1.3 Study		Phase 1 Infrastructure Study	
Basin	Composite Curve Number	Basin	Composite Curve Number
ON1-D	92.7	ON5-D	94.6

Lag Time:

The lag time is defined as the time measured from the center of mass of effective 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 7.0 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.
- 100-year major storm event: maximum flow depth of 2-ft from gutter flowline, and depth times velocity factor (DxV) not exceeding 8.

Curb Inlets:

Curb inlets have been assessed using an in-house computation spreadsheet which utilizes equations outlined in Section 805 of the CCRFCD Manual, which includes a 50% clogging factor in determining sizes.

Storm Drains:

The hydraulic analysis for the proposed storm drain has been performed utilizing the Water Surface and Pressure Gradient (WSPG) Hydraulic Analysis System software by the Los Angeles County Department of Public Works. As outlined in the CCRFCD Manual, storm drain facilities are designed to maintain its hydraulic gradient line (HGL) minimum 1-ft below above finished grade and limit the flow velocities in the facility to less than 25 ft/s.

Drainage Easements:

Drainage easements are proposed by this project and have been analyzed utilizing Flowmaster Version 7.0 software by Haestad Methods. Weir depth computations and normal depth computations have been performed to adequately flood protect adjacent finished floors.

3 EXISTING DRAINAGE CONDITION

3.1 Definition of Existing Condition

The adjacent Phase 1 Infrastructure improvements are considered in place and functioning prior to development of Parcel 1.3. As a result, the existing drainage condition considers that the interim condition defined in the referenced Phase 1 Infrastructure study is valid as the existing condition of Parcel 1.3. Therefore, no additional analyses have been performed by this study to demonstrate an existing drainage condition for Parcel 1.3.

3.2 Discussion of Existing Condition

Refer to the Phase 1 Infrastructure Study's referenced Exhibit G – Interim Condition Drainage Map within Appendix G for demonstration of the existing condition drainage patterns occurring on the Parcel 1.3 site.

Parcel 1.3 is located within referenced Basin ON4-I and its runoff is conveyed to two storm drain openings provided from the Phase 1 Infrastructure Conquistador storm drain, via interim ditches. Note that in the developed condition, the site is designed to convey its runoff to the same storm drain openings from the Conquistador Street storm drain.

Offsite flows west of Hualapai are routed away from the project site via graded ditches to a regional facility in Racel Street which was proposed in the Phase 1 Infrastructure Study.

3.3 Summary of Existing Condition Flows

A summary of the existing condition runoff produced by Parcel 1.3, as referenced from the Phase 1 Infrastructure Study's interim condition, has been summarized below in Table 2.

Table 2: Summary of Existing Condition Flow Rates (Referenced from Phase 1 Infrastructure – Interim Condition)			
Basin ID	Area (acres)	Q₁₀₀ (cfs)	Q₁₀ (cfs)
ON4-I	39.1	90	33

4 DEVELOPED DRAINAGE CONDITION

4.1 Definition of Developed Condition

The developed condition considers Parcel 1.3 area developed, inclusive of the proposed interior roadway infrastructure. Also included in this project are the proposed drainage facilities required to collect and convey storm runoff produced by Parcel 1.3. Please note that the northeastern portion of Parcel 1.3 is planned as a park (by others) and its drainage had been accommodated in the Phase 1 Infrastructure Study improvements.

The offsite drainage areas are assumed to remain in their current state, unchanged from the existing condition.

4.2 Discussion of Developed Condition

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

In the developed condition, Parcel 1.3 is analyzed as one (1) basin, ON1-D. Basin ON1-D represents all of the project site.

Basin ON1-D generally conveys storm runoff via curb and gutter in an easterly direction towards the eastern entrance and toward the eastern end of Street 3C, where it is collected and conveyed by proposed onsite storm drain to the existing storm drain facility in Conquistador Street. The Phase 1 Infrastructure Study allowed for 4 cfs to drain from the site into Racel Street, but this design approach was not utilized. Per the Phase 1 Infrastructure Study, Racel Street at R1 has a half street flow of 8.5 cfs. Drop inlets intercept 3.5 cfs before (See the R2 Racel half street section for computations how this was determined). The depth of flow at R2 has been determined to be 0.34 feet and the flowline at the entrance to the site range from 29.12 at the upstream end to 27.71 at the median to 26.26 at the downstream end.

The site entry from Racel Street has been humped to maintain Racel Street flows offsite. A summary of how the hump height in Racel has been presented below in Table 3.

Table 3: Racel Hump Evaluation						
Location	Flowline (ft.)	Depth (ft.)	Water Surface Elevation (ft.)	Hump Elevation (ft.)	Adjustment	Freeboard
Upstream	29.12	0.33	29.45	30.29	29.79	0.34
Median	27.71	0.33	28.04	29.15	29.15	1.11
Downstream	26.26	0.33	26.59	28.67	28.17	1.58

Note that the humped site entry from Racel is approximately 0.34-feet above the 100-year flow depth in Racel Street at the western end, rather than the required 0.5-foot hump height. This proposed hump height is considered acceptable, considering where the eastward flowing velocities will not have an impact. Also note that due to the slope of Racel Street, the driveway does exceed City of Las Vegas freeboard criteria at the centerline of the driveway and at the downstream end.

The northeastern portion of the parcel will be developed in the future as a park (per the Phase 1 Infrastructure Study) and will be addressed in a future drainage study. Flows generated from the park site are conveyed east to Conquistador (approximately 4 cfs in the proposed conditions per the infrastructure study) via proposed site grading.

4.3 Summary of Developed Condition Flows

A summary of developed condition flow rates determined by this study has been presented below in Table 4, as demonstrated by the drainage patterns and basins depicted on Exhibit E. Refer to Appendix C for the applicable HEC-1 analysis.

Table 4: Summary of Developed Condition Flow Rates			
Basin ID	Area (acres)	Q ₁₀₀ (cfs)	Q ₁₀ (cfs)
ON1-D	37.3	103	48

Please note that the developed condition basin ON1-D is less than the existing condition basin ON4-I because this basin does not include the 1.8 acres in the northeast portion of the site which was analyzed as a park in the Phase 1 Infrastructure Study.

It is the main objective of this study to show conformance with the Phase 1 Infrastructure Study and show no adverse impacts to downstream property or facilities. Due to the design of the site, and the increased travel time, the peak flow rates from this project do not increase from the parameters set forth in the Phase 1 Infrastructure Study. Table 5 below summarizes and compares flow rates established in this study compared to the flow rates determined in the Phase 1 Infrastructure Study.

Table 5: Total Flow Rate Comparison: Parcel 1.3 Study vs. Phase 1 Infrastructure Study					
Parcel 1.3 Study			Phase 1 Infrastructure Study		
Contributing Source	Receiving Street	Q ₁₀₀ (cfs)	Contributing Source	Receiving Street	Q ₁₀₀ (cfs)
ON1-D	Conquistador Street	103	ON5-D	Conquistador Street	107
ON1-D	Racel Street	0	ON5-D	Racel Street	4

Review of Table 5 shows that developed condition onsite flow is less than the flow determined in the Phase 1 Infrastructure Study; therefore, the Parcel 1.3 development is considered in conformance with the Phase 1 Infrastructure Study's planned drainage patterns.

Table 6: Flow Rate Breakdown Comparison: Parcel 1.3 Study vs. Phase 1 Infrastructure Study						
Location	Parcel 1.3 Study			Phase 1 Infrastructure Study		
	Storm Drain Flow (cfs)	Surface Flow (cfs)	Total (cfs)	Storm Drain Flow (cfs)	Surface Flow (cfs)	Total (cfs)
Conquistador Tie-In to Racel	106	2	108	107	5	112

Review of Table 6 shows that the proposed storm drain system will intercept an equivalent amount of flow determined in the Phase 1 Infrastructure Study. It is noted that the Parcel 1.3 study shows a 1 cfs decrease in 100-year flow to the Conquistador Street storm drain system and overall Parcel 1.3 development is in conformance within the Infrastructure Study's planned designed drainage.

4.4 Summary of Developed Condition Street Flows

Hydraulic analysis shows that street flow criteria for onsite street improvements, as outlined in Section 2.3 of this report, are satisfied. The 100-year flows conveyed in the onsite streets also satisfy 10-year street flow criteria; therefore, only 100-year hydraulic sections were performed. Table 7 below provides a summary of the street flow hydraulic computations. Refer to Exhibit E for the location of analyzed street sections and refer to Appendix D for street flow calculations.

Table 7: Summary of 100-Year Onsite Street Flow Hydraulic Characteristics					
Cross Section	Contributing Source	Slope (%)	Q ₁₀₀ (cfs)	Depth, D ₁₀₀ (ft)	Velocity, V ₁₀₀ (fps)
A-1	ON1-D(A)	2.14	59	0.54	5.3
B-1	ON1-D(B1+B2)	1.50	44	0.52	4.3
E-1	½ ON1-D(B1+B2)	0.77	22	0.50	2.9

Please note that near B-1, the streets 3G and the Entry 4 Street intersect and each street is crowned. As a result, flows on the west half of 3G will be conveyed north while flows in the east half of 3G will reach the driveway at the entry and be conveyed east. Approximately 13 cfs will be intercepted (of the 22 cfs in the west half of 3G), resulting in 9 cfs continuing to flow north towards 3C, while 22 cfs will flow in the east half of 3G and towards the entry.

Per the Phase 1 Infrastructure Study, approximately 29 cfs is allotted for bypassing onsite facilities and flowing into Conquistador Way at the entrance. Parcel 1.3 discharges approximately 14 cfs out entrance driveway (22 cfs as discussed above minus 8 cfs which will be intercepted by two 5-ft Type CM2 Drop inlets in the entryway), which shows that overall Parcel 1.3 development is in conformance within the Phase 1 Infrastructure Study's planned drainage patterns.

Shortly after the flows leave the site and enter in Conquistador Street, two drop inlets intercept approximately 6 cfs each, leaving a remaining 2 cfs draining north in Conquistador. Continuing to flow north additional flows from the future park area (4 cfs per the Phase 1 Infrastructure Study) combine with these flows before two drop inlets intercept 2 cfs each leaving a total of 2 cfs of surface flow bypassing the storm drain in Conquistador. The Phase 1 Infrastructure Study allowed for a total flow of 5 cfs to bypass into Racel.

As a result of Parcel 1.3 conformance to drainage patterns established in the Phase 1 Infrastructure Study, perimeter street flow conditions have been referenced for Racel Street, Hualapai Way, and Grand Teton Drive. The referenced street flow characteristics in the adjacent perimeter streets have been summarized on Exhibit E, as determined by the Phase 1 Infrastructure Study. Note that all perimeter 100-year street flows have been

maintained below top of curb; therefore, perimeter flows are not anticipated to have any impact on the proposed onsite improvements.

4.5 Summary of Drainage Facilities

Refer to Exhibit E for locations of all proposed drainage facilities. Refer to Appendix D for a summary of drop inlet sizing computations, and Appendix E for a summary of storm drain hydraulic models.

Per the Phase 1 Infrastructure Study improvements, Conquistador Way has an existing 36-inch RCP. The Phase 1 Infrastructure Study modeled the storm drain in WSPG and installed two stub locations for future tie-ins at Stations 1451 and 1750 (Plan Stations 60+67.72 and 57+70.13, respectively). The WSPG model was set up under the scenario that when this project site was developed, Station 1451 (hereafter referred to north stub) would be abandoned and Station 1750 (hereafter referred to south stub) would be used as the tie-in for this project. This project proposes to tie into the existing storm drainage facility; however upon review of the site grading, it was determined to be more beneficial to utilize both tie-in locations.

Conquistador Trunk:

The Phase 1 Infrastructure Study modeled the existing 36-inch RCP in Conquistador in WSPG as Conquistador Trunk (hereafter referred to as CStrunk). CStrunk allowed for a total of 107 cfs to be inserted into the system at the south stub with no additional discharges at any point in the trunk. Due to site grading and proposed onsite facilities, discharge locations for the site generated flow changed from the WSPG model for the CStrunk. Also as discussed above in Section 4.3 of this report, site generated flows decreased by 4 cfs.

A comparison of the flows utilized in the CStrunk WSPG model is summarized below in Table 8.

Table 8: Summary of 100-Year WSPG Flow		
WSPG Station	Phase 1 Infrastructure Study	Parcel 1.3
1000	107	106
1057.5	107	106
1417 (North Stub)	107	101
1679	107	33
1750 (South Stub)	107	21

The north stub is at WSPG Station 1417 from WSPG and Plan Station 61+00.99. This 36-inch RCP stub was installed to catch and convey nuisance flows in the existing conditions for Parcel 1.3. The south stub is at WSPG Station 1750 and Plan Station 57+70.73. This 36-inch RCP stub was installed to convey site generated flows in the developed conditions.

At the south stub, approximately 21 cfs will be intercepted by the proposed onsite system, with the remaining 14 cfs as surface flow out the entry and into Conquistador. At 1679 two existing 15-ft Type CM2 drop inlets will intercept an additional 12 cfs into the storm drain. The north stub conveys an additional 68 cfs to CStrunk. Finally at 1057.5, two existing 10-

ft Type CM2 drop inlets add an additional 5 cfs before reaching the junction with the 72" RCP regional storm drain at Station 1000.

After the above modifications, the CStrunk facility remained meeting CCRFCD criteria as outlined in Section 2.3 of this report. The revised flow rates and resulting HGL have been annotated on the referenced profile sheet included in Appendix G.

South Stub:

The project site has been graded such that the southern portion of the site drains to the east and north to the proposed site entry from Conquistador. As flows approach the entryway (total flow of 44 cfs), half of the flow will remain in each the eastern and western halves of the street before flows can be intercepted. The South Stub Tie in to DI in 3G intercepts flow in the west half of 3G, while DI North and DI intercept flow draining out the entryway.

South Stub to DI in 3G:

The main line for the south stub utilizes a 12.5-ft Type CM2 drop inlet near the common lot CE-M to intercept the peak and nuisance flows on the western half of the street. The bypass flow not intercepted by the drop inlet will continue to flow north and will be caught by the north stub system.

A proposed 18-inch RCP routes the flows from the 12.5-ft Type CM2 drop inlet to a junction with two additional 18-inch RCP laterals from the 5-ft Type CM2 drop inlets. This combined flow then enters the existing 36-inch RCP which ties into the trunk Conquistador Storm Drain. A manhole has been proposed in the driveway to make the connection between the three (3) proposed and one (1) existing storm drains.

A WSPG model has been prepared to analyze the hydraulics of the proposed storm drain. The model extends from connection into the existing Conquistador trunk storm drain to the proposed drop inlet along the west curb of 3G Street. Additionally, the water surface elevation of 2790.017 feet (from CStrunk at WSPG Station 1750) was referenced as the starting HGL for the proposed WSPG models included in this study. All HGLs and flow velocities meet storm drain criteria set forth in Section 2.3 of this study.

South Stub to DI North in Entry:

This lateral line utilizes a 5-ft Type CM2 drop inlet in the north half of the entry to intercept the peak and nuisance flows on the northern half of the entryway. The flow which bypasses this inlet will flow in Conquistador Way and be intercepted by downstream existing facilities.

Flow on the eastern half of Street 3G will turn thru the entry as the crown of the entryway will prevent flows from traveling to the north stub. At the entryway, nuisance flows and a small portion of the peak flow (approximately 4 cfs at each drop inlet) will be picked up via a 5-ft Type CM2 drop inlet in the north half of the entryway. A proposed 18-inch RCP routes flows to a junction with the main line for the south stub.

A WSPG model has been prepared to analyze the hydraulics of the proposed storm drain. The model extends from connection into the existing Conquistador trunk storm drain to the proposed drop inlet along the north half of the entryway. Additionally, the water surface elevation of 2790.017 feet (from CStrunk at WSPG Station 1750) was referenced as the starting HGL for the proposed WSPG models included in this study. All HGLs and flow velocities meet storm drain criteria set forth in Section 2.3 of this study.

South Stub to DI South in Entry:

This lateral line utilizes a 5-ft Type CM2 drop inlet in the south half of the entry to intercept the peak and nuisance flows on the northern half of the entryway. The flow which bypasses this inlet will flow in Conquistador Way and be intercepted by downstream existing facilities.

Flow on the eastern half of Street 3G will turn thru the entry as the crown of the entryway will prevent flows from traveling to the north stub. At the entryway, nuisance flows and a small portion of the peak flow (approximately 4 cfs at each drop inlet) will be picked up via a 5-ft Type CM2 drop inlet in the north half of the entryway. A proposed 18-inch RCP routes flows to a junction with the main line for the south stub.

A WSPG model has been prepared to analyze the hydraulics of the proposed storm drain. The model extends from connection into the existing Conquistador trunk storm drain to the proposed drop inlet along the north half of the entryway. Additionally, the water surface elevation of 2790.017 feet (from CStrunk at WSPG Station 1750) was referenced as the starting HGL for the proposed WSPG models included in this study. All HGLs and flow velocities meet storm drain criteria set forth in Section 2.3 of this study.

North Stub:

The project site has been graded such that the northern portion of the site drains east to the proposed stub street between lots 54 and 55. At Section A-1, approximately 59 cfs flows east in 3C. North of the entry, 9 cfs (non-intercepted flow from south storm drain system) flows north in 3G which will combine with non-intercepted flow from 3C and drain east to a sump inlet.

North Stub to Sump DI:

The main line for the south stub utilizes a 20-ft Type CM2 drop inlet near the common lot CE-S to intercept the peak and nuisance flows which were not intercepted by upstream facilities. Bypassed flow upstream is approximately 44 cfs; however this facility has been designed to capture up to 48 cfs.

A proposed 30-inch RCP routes the flows from the 20-ft Type CM2 drop inlet (in sump) to a junction with one 24-inch RCP lateral. This combined flow then enters the existing 36-inch RCP which ties into the trunk Conquistador Storm Drain. A manhole has been proposed in the road to make the connection between the two (2) proposed and one (1) existing storm drains.

A WSPG model has been prepared to analyze the hydraulics of the proposed storm drain. The models extend from connection into the existing Conquistador trunk storm drain to the proposed drop inlet along the south curb of Street 3C. Additionally, the water surface elevation of 2788.895 feet (from CStrunk at WSPG Station 1417) was referenced as the starting HGL for the proposed WSPG models included in this study. All HGLs and flow velocities meet storm drain criteria set forth in Section 2.3 of this study.

North Stub to DI in South Half of 3C:

This lateral line utilizes a 10-ft Type CM2 drop inlet in the south half of 3C to intercept the peak and nuisance flows on the southern half of the roadway. Flow on the southern half of 3C drains east (29.5 cfs – half of the total street flow). A 10-ft Type CM2 drop inlet has been proposed which will intercept approximately 12 cfs. The flow which bypasses this inlet

will drain east in 3C to a low point, where the flow will be added into the system via a drop inlet in sump as described above.

A proposed 18-inch RCP routes drop inlet flows to a junction where a lateral inserts 12 cfs. These flows exit the junction in a 24-inch RCP. Flows then reach the junction with the main line for the south stub where an additional 44 cfs is added to the system. The flow exits the junction in a 36-inch RCP which ties into the trunk Conquistador Storm Drain. Manholes has been proposed in the road to make the connection between the two (2) proposed and one (1) existing storm drains and two (2) proposed and one (1) proposed storm drain. .

A WSPG model has been prepared to analyze the hydraulics of the proposed storm drain. The models extend from connection into the existing Conquistador trunk storm drain to the proposed drop inlet along the south curb of Street 3C. Additionally, the water surface elevation of 2788.895 feet (from CStrunk at WSPG Station 1417) was referenced as the starting HGL for the proposed WSPG models included in this study. All HGLs and flow velocities meet storm drain criteria set forth in Section 2.3 of this study.

North Stub to DI in North Half of 3C:

This lateral line utilizes a 10-ft Type CM2 drop inlet in the north half of 3C to intercept the peak and nuisance flows on the northern half of the roadway. Flow on the northern half of 3C drains east (29.5 cfs – half of the total street flow). A 10-ft Type CM2 drop inlet has been proposed which will intercept approximately 12 cfs. The flow which bypasses this inlet will drain east in 3C to a low point, where the flow will be added into the system via a drop inlet in sump as described above.

A proposed 18-inch RCP routes drop inlet flows to a junction where a lateral inserts 12 cfs. These flows exit the junction in a 24-inch RCP. Flows then reach the junction with the main line for the south stub where an additional 44 cfs is added to the system. The flow exits the junction in a 36-inch RCP which ties into the trunk Conquistador Storm Drain. Manholes has been proposed in the road to make the connection between the two (2) proposed and one (1) existing storm drains and two (2) proposed and one (1) proposed storm drain. .

A WSPG model has been prepared to analyze the hydraulics of the proposed storm drain. The models extend from connection into the existing Conquistador trunk storm drain to the proposed drop inlet along the south curb of Street 3C. Additionally, the water surface elevation of 2788.895 feet (from CStrunk at WSPG Station 1417) was referenced as the starting HGL for the proposed WSPG models included in this study. All HGLs and flow velocities meet storm drain criteria set forth in Section 2.3 of this study.

Drainage Easement:

A drainage easement is proposed at the eastern terminus of 3I Court. The easement is utilized to convey flow from the south half of 3I from Subbasin B2 east to 3J Court. Flows are conveyed east between common lot CE-O and 122. The easement is 30-ft wide and contains a valley gutter for nuisance flows.

Refer to Table 9 for a summary of the hydraulic section characteristics. Refer to Exhibit E in Appendix A for the section location and Appendix F for hydraulic computations.

Table 9: Drainage Easement Hydraulic Characteristics				
Section	Flow (cfs)	Width (ft)	Type of Analysis	Depth
Facility 3A	5	30	Normal Depth	0.16
			Weir	0.22

For Facility 3A, the flow depth is against the easement walls. Therefore, three (3) courses of solid grouting are proposed along the easement walls on both sides. Note that the finish floor elevations of the adjacent lot (122) is approximately 6-inches above the upstream water surface elevation in the easement, but since the wall is solid grouted three courses, the lot is considered flood protected. Refer to Appendix F for the finish floor computations

5 ULTIMATE DRAINAGE CONDITION

The ultimate condition considers that Skye Canyon is entirely developed, inclusive of the future residential areas bound by the Phase 1 Infrastructure improvements.

As a result of this study establishing that Parcel 1.3 drainage patterns are in accordance with the Phase 1 Infrastructure Study, the ultimate condition produced by the referenced study remains valid for use by this study. It is anticipated that future offsite development will be in conformance with the Phase 1 Infrastructure drainage patterns, or else be required to provide technical analysis to validate otherwise. Therefore, a specific Parcel 1.3 ultimate condition drainage analysis is not necessary.

6 PROPOSED FINISHED FLOORS

The proposed finished floor elevations satisfy local City of Las Vegas policy 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 F.

Additionally, an emergency overflow path is provided at the low point in the site to allow for storm flows to exit into Conquistador Street in the case that the onsite drop inlets become clogged or considered inefficient. After inspection of weir computations included in Appendix F, the adjacent affected lots have been determined to be above the overflow water surface elevation at the exit points; therefore, considered adequately flood protected.

In the case that the interim storm drain inlet at the west terminus of Racel becomes clogged, an overflow depth in Racel Street ranging from 1.23-ft at maximum slope to 1.77-ft at minimum slope may occur. As a result, as a condition of the Phase 1 Infrastructure Study, the adjacent homes have been flood protected by means of solid grouting the perimeter wall above the overflow depth for additional flood protection.

7 CONCLUSIONS & RECOMMENDATIONS

1. The proposed improvements are not located within a FEMA designated SFHA.
2. The project is adjacent to existing regional alignment CNKC0050 and proposes flow contribution to the regional facility in conformance with the Phase 1 Infrastructure Study that proposes to construct the storm drain.
3. The proposed drainage patterns are in conformance with the Phase 1 Infrastructure Study. It is anticipated that the Phase 1 Infrastructure improvements are in place and functioning prior to start of Parcel 1.3 development.
4. Proposed street flow and storm drain facilities satisfy local criteria.
5. Proposed finished floors are adequately flood protected meeting criteria against design flows and potential overflow conditions.
6. 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, 1990.
3. *Soil Survey of Las Vegas Valley Area, Nevada*. U.S. Department of Agriculture, Soil Conservation Service, July 1985.
4. *Technical Drainage Study for Skye Canyon – Phase 1 Infrastructure*; Slater Hanifan Group, 2014.
5. *Master Drainage Study for Kyle Canyon*; Slater Hanifan Group, 2012.

APPENDIX A

Drainage Exhibits

Exhibit A – Location Map

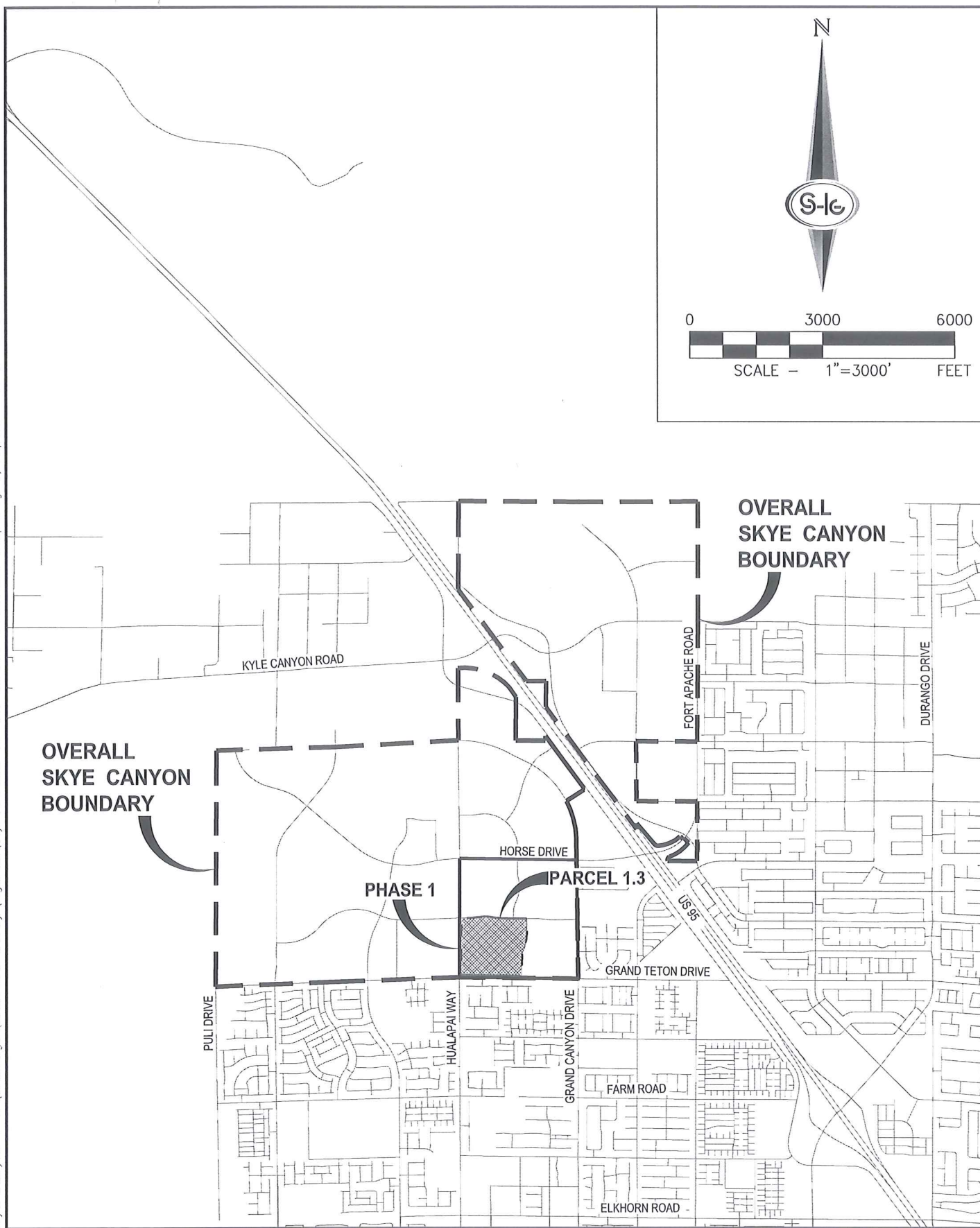
Exhibit B – FEMA FIRM Panel

Exhibit C – 2013 CCRFCD MPU Facilities

Exhibit D – Soils Map

Exhibit E – Developed Condition Drainage Map

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NINETY-FIVE MANAGEMENT, LLC.

SKYE CANYON - PARCEL 1.3
LOCATION MAP

DATE: JUNE 2014

DRAFTER: BC

DESIGNER: BC

CHECKED: SMJ

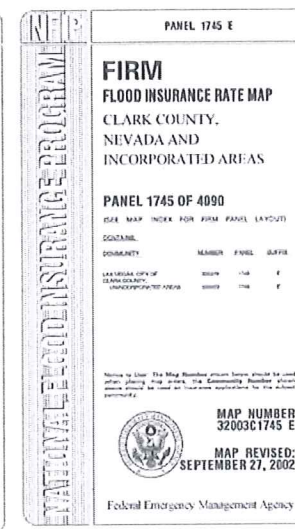
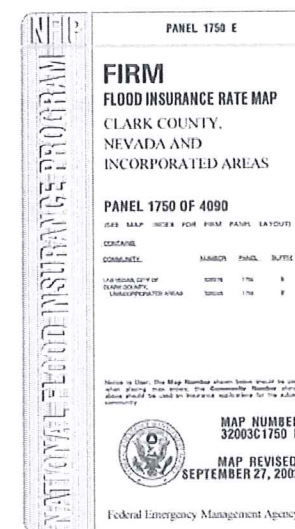
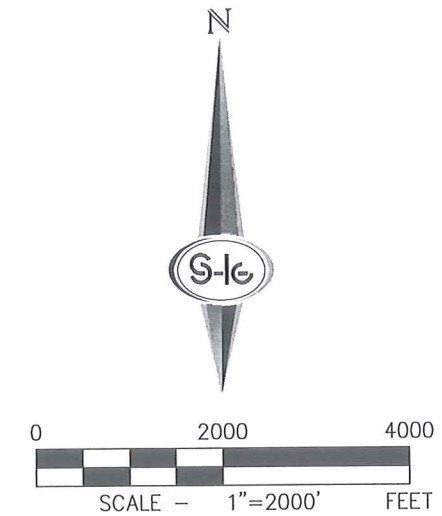
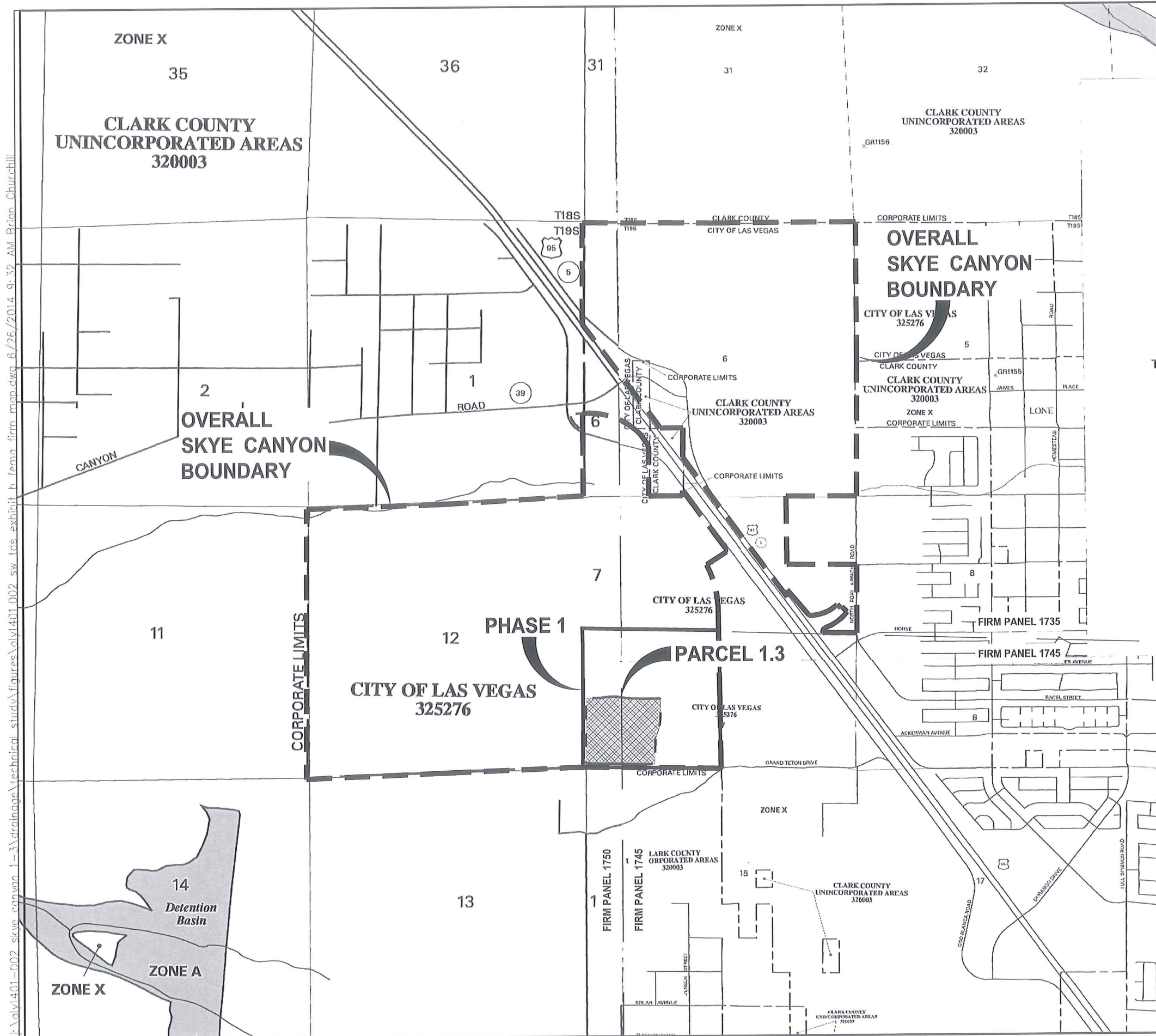
PROJECT NO.

OLY1401.002

EXHIBIT A

SHEET 1 OF 1

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NO.	DESCRIPTION	DATE	BY	APP. DATE

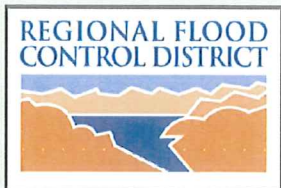
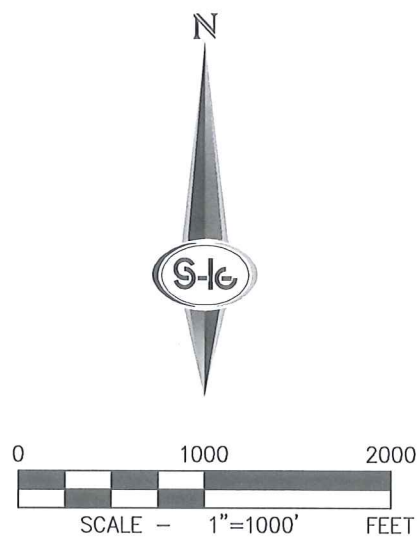
NINETY-FIVE MANAGEMENT, LLC.
SKYE CANYON - PARCEL 1.3
FEMA FIRM MAP

DATE: JUNE 2014
DRAFTER: BC
DESIGNER: BC
CHECKED: SMJ
PROJECT NO. OLY1401.002
EXHIBIT B
SHEET 1 OF 1

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OVERALL
SKYE
CANYON
BOUNDARY

ID / River Mile	Status	Facility Description	Length (ft.)	Flow (cfs)	HEC-1 Node	HEC-1 Model	Tributary Area (sq.mi.)	Channel Slope (%) **
CNGT 0000	E	CENTENNIAL PKWY CHANNEL WEST / GRAND TETON BRANCH	2376	600	CNW71-E	WEST3	0.47	2.58
0043	P0	10' X 5' RCB	3980	600	CNW71-E	WEST3	0.47	3.00
0118	E	6' X 5' RCAP	5472	363	KYLEDET*	KYLEDB	57.73	3.72
CNKC 0000	E	CENTENNIAL PKWY CHANNEL WEST / KYLE CANYON BRANCH	377	999	CNW72-C	WEST3	0.71	4.58
0007	E	12' X 4' RCB	874	999	CNW72-C	WEST3	0.71	3.28
0024	E	10' X 5' RCB	1385	999	CNW72-C	WEST3	0.71	2.40
0050	P0	84" RCP	2610	854	CNW72-C	WEST3	0.71	3.60



2013
LAS VEGAS VALLEY
FLOOD CONTROL
MASTER PLAN UPDATE

FIGURE F- 13
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 | Category B |
|------------|------------|
| Channel | Channel |
| Stormdrain | Stormdrain |

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NO.	DESCRIPTION	DATE	BY	APP.	DATE

NINETY-FIVE MANAGEMENT, LLC.

SKYE CANYON - PARCEL 1.3

CCRFD 2013 MPU FACILITIES MAP

DATE: JUNE 2014

DRAFTER: BC

DESIGNER: BC

CHECKED: SMJ

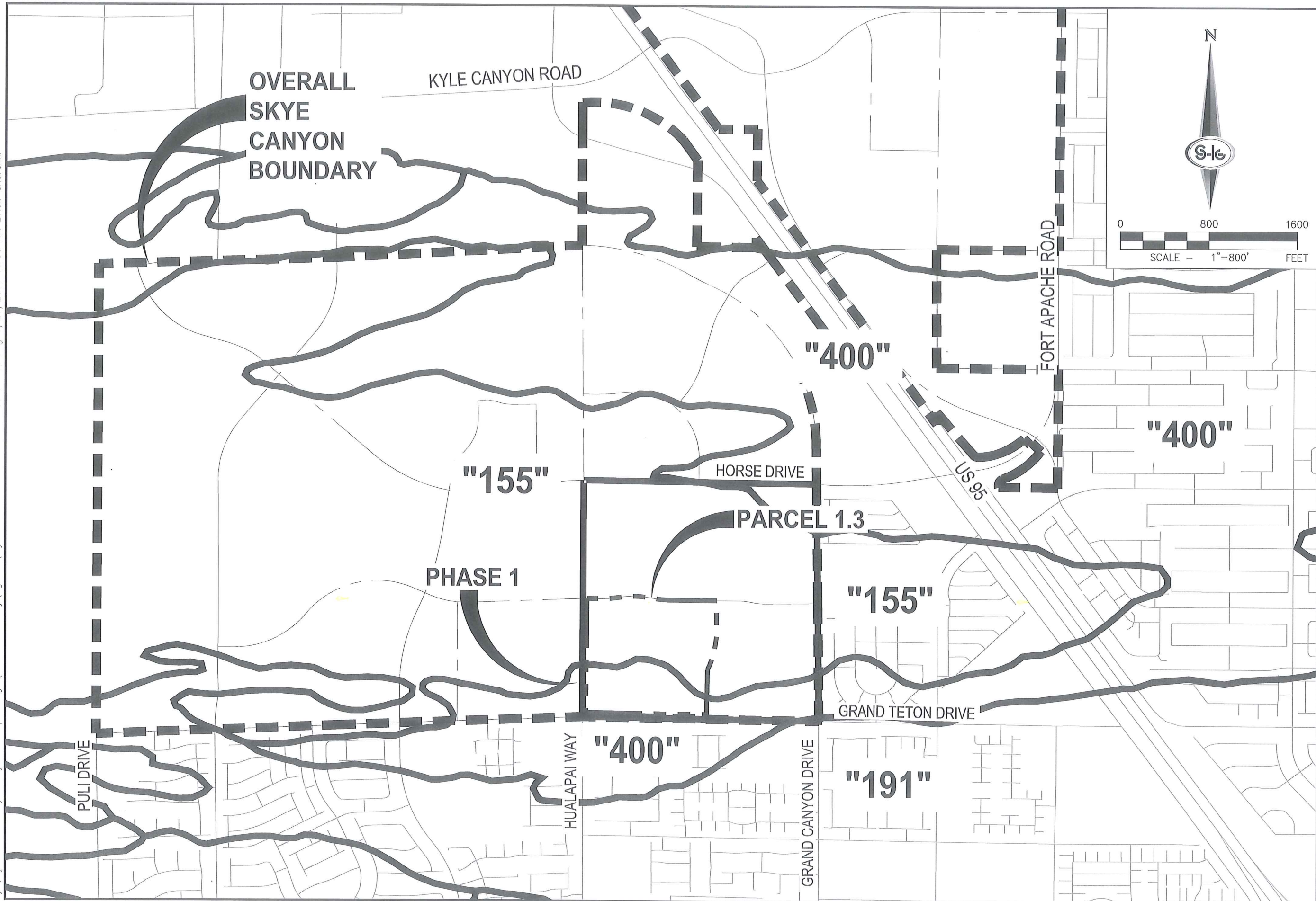
PROJECT NO.

OLY1401.002

EXHIBIT C

SHEET 1 OF 1

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NO.	DESCRIPTION	DATE	BY	APP.	DATE

NINETY-FIVE MANAGEMENT, LLC.
SKYE CANYON - PARCEL 1.3
SOILS MAP

DATE: JUNE 2014
DRAFTER: BC
DESIGNER: BC
CHECKED: SMJ
PROJECT NO.
OLY1401.002

APPENDIX B

Hydrologic Data

Precipitation

Rainfall and Precipitation Computation

Project Name: Skye Canyon Parcel 1.3

Date: 05/28/14

File Name: OLY1401-002 SW TDS Precipitation

By: BMC

Data:

Project is located in: Township: 19 S. Range: 60 E. Section: 7

Reference:

APN Map

Site is NOT located in the McCarran Airport Rainfall Area

Figure 513*

Rainfall Depth-Duration-Frequency 10-Year, 6-Hour: 1.30 inches

Figure 503*

Rainfall Depth-Duration-Frequency 100-Year, 6-Hour: 2.05 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): 37.3 = 0.0583 square miles

Table 502*

DARF = 1.00

Calculations:

$P_{10} = 1.61$ 10-Year Precipitation (in)

$P_{100} = 2.93$ 100-Year Precipitation (in)

$P_{10}/P_{100} = 0.55$ HEC-1 Multiple Ratio Value

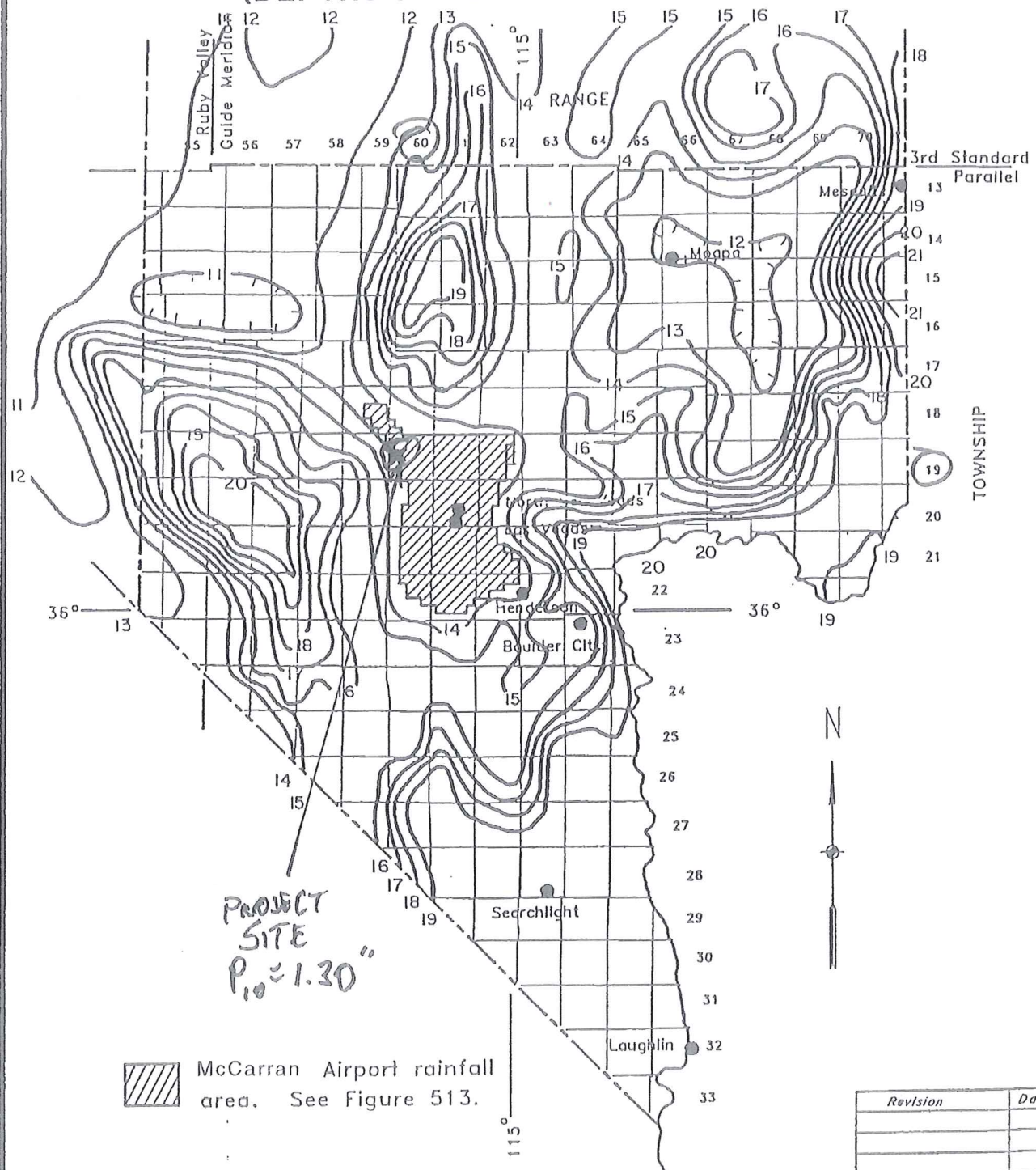
Equations:

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

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

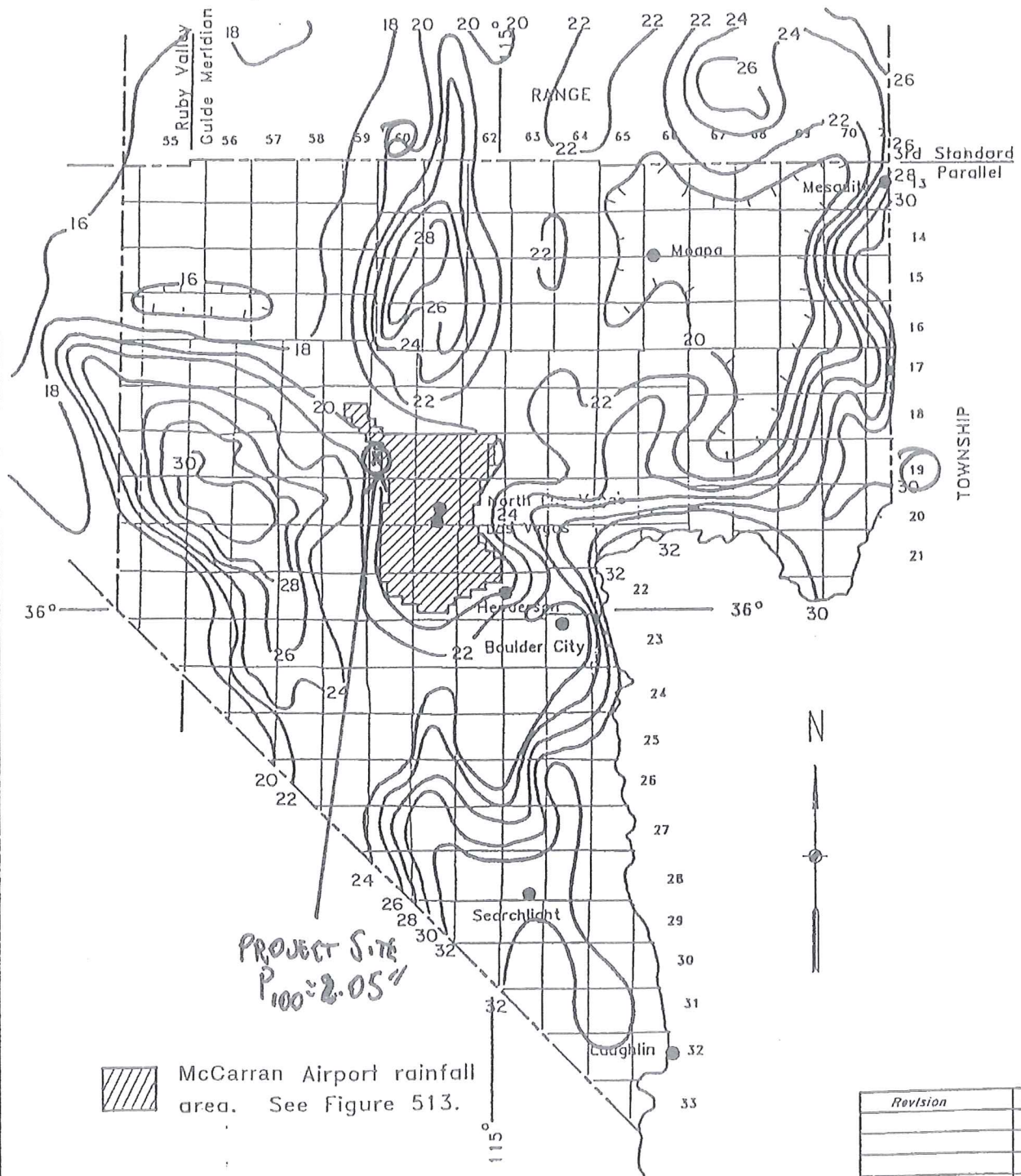
HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL

RAINFALL DEPTH-DURATION-FREQUENCY 10-YEAR, 6-HOUR (DEPTHS IN TENTHS OF INCHES)



HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL

RAINFALL DEPTH-DURATION-FREQUENCY 100-YEAR, 6-HOUR (DEPTHS IN TENTHS OF INCHES)



HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL

PRECIPITATION ADJUSTMENT RATIOS

<u>Recurrence Interval</u>	<u>Ratio to NOAA Atlas 2</u>
2-year	1.00
5-year	1.16
10-year	1.24
25-year	1.33
50-year	1.39
100-year	1.43

- NOTE:
1. Multiply the values obtained from the NOAA Atlas 2 by the above ratios to obtain the adjusted precipitation values.
 2. NOAA Atlas 2 values for use with TR-55 shall not be adjusted by the above ratios.
 3. Tables 505 and 506 require no adjustments.

<i>Revision</i>	<i>Date</i>

**WRC
ENGINEERING**

REFERENCE:
USACE, Los Angeles District, 1988

TABLE 501

HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL

SIX HOUR DEPTH-AREA REDUCTION FACTORS

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

- NOTES: 1. A graphical representation of these factors is presented in Figure 514.
2. Consult with the local entity and/or the CCRFCD for guidance in using the Depth-Area Reduction Factors for drainage areas greater than 200 square miles.

<i>Revision</i>	<i>Date</i>

HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL

SIX-HOUR STORM DISTRIBUTIONS

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

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

Revision	Date

REFERENCE:

TABLE 503

Curve Number

Soil & Curve Number Computation

Project Name: SKYE CANYON Parcel 1.3

Date: 6/11/2014

File Name: OLY1401-001 TDS CN Calc.xlsx

By: BMC

Data:

Soil Type & Description		A	B	C	D
155	Cave gravelly fine sandy loam, 4 to 15 percent slopes	5%	5%	0%	90%
191	Dalian very cobbly fine sandy loam, 2 to 8 percent slopes	5%	85%	0%	10%
400	Tencee very gravelly fine sandy loam, 2 to 8 percent slopes	0%	10%	0%	90%

Reference:

Exhibit D
SCS Soil Data

Land Use	A	B	C	D
Residential (<6,000 sf)*	89	92	94	95
Residential (6,000 sf)	80	87	90	92

* Utilizes Commercial CN per Table 602A from CCRFCD Manual

BASIN ID	SOIL TYPE	SUBAREA PERCENT	LAND USE	HYDROLOGIC SOIL GROUP				LAND USE CN				SUBAREA ACRES	CALCULATED CN
				A	B	C	D	A	B	C	D		
ON1-D	155	7.0%	Residential (<6,000 sf)	5%	5%	0%	90%	89	92	94	95	2.6	6.6
	155	56.0%	Residential (6,000 sf)	5%	5%	0%	90%	80	87	90	92	20.9	51.1
	400	1.1%	Residential (6,000 sf)	0%	10%	0%	90%	80	87	90	92	0.4	1.0
	400	35.9%	Residential (<6,000 sf)	0%	10%	0%	90%	89	92	94	95	13.4	34.0
TOTAL PERCENT		100.0%						TOTAL AREA				37.3	92.7



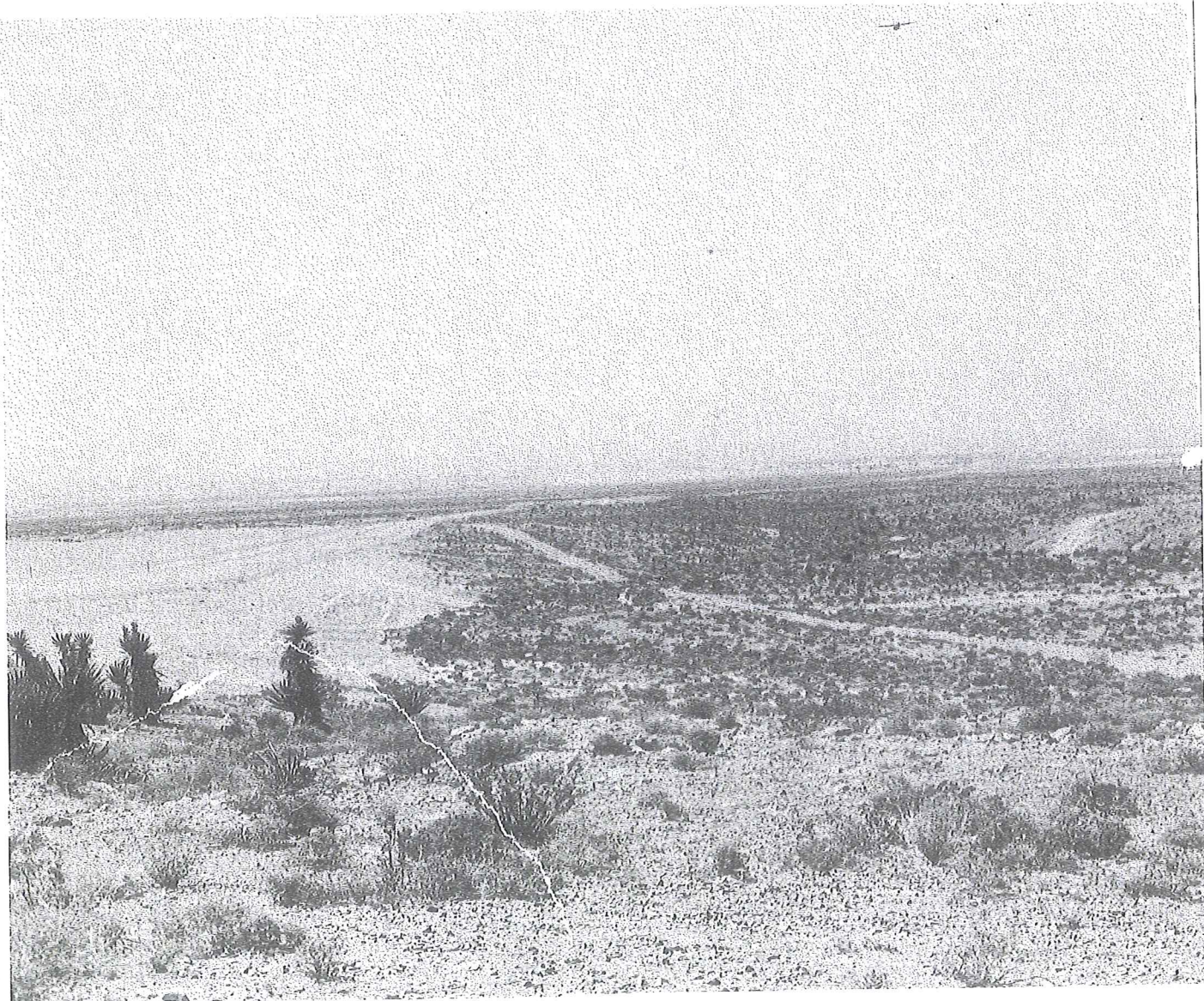
United States
Department of
Agriculture

Soil
Conservation
Service

In cooperation with
United States Department
of the Interior, Bureau
of Land Management, and
University of Nevada
Agricultural Experiment
Station

Soil Survey of Las Vegas Valley Area Nevada

Part of Clark County



This unit is limited for roads because of the depth to the indurated hardpan. Roads should be designed to minimize cuts.

This map unit is in capability subclass VII_s, nonirrigated, and in horticultural group 6.

152—Cave gravelly fine sandy loam, 0 to 4 percent slopes. This shallow, well drained soil is on erosional fan remnants. It formed in alluvium derived from various kinds of rock.

Typically, about 80 percent of the surface is covered with a desert pavement of pebbles and cobbles. The surface layer is pale brown gravelly fine sandy loam about 12 inches thick. The next layer to a depth of 36 inches is an indurated, lime-cemented hardpan. The underlying material to a depth of 60 inches or more is light brown very gravelly sandy loam. Depth to the hardpan ranges from 4 to 20 inches.

Included in this unit are about 5 percent Arizo soils, flooded, in channels, 5 percent Canutio soils on inset fans, and 5 percent Grapevine soils on side slopes of erosional fan remnants. Included areas make up about 15 percent of the total acreage. The percentage varies from one area to another.

Permeability of the Cave soil is moderate above the hardpan. Available water capacity is very low. Effective rooting depth is 4 to 20 inches. Runoff is slow, and the hazard of water erosion is slight. The hazard of soil blowing is high if the surface is disturbed.

This unit is used mainly for urban development. It is also used as habitat for desert wildlife and for recreation.

This unit is poorly suited to urban development. The main limitation is the shallow depth to the hardpan. Excavation for building sites is limited by the hardpan, and heavy equipment is needed. Special design of septic tank absorption fields is needed.

Roads should be designed to minimize cuts because of the limited depth to the hardpan.

It is difficult to establish plants in areas where the pan is exposed. Mulching and fertilizing cut areas help to establish plants. Lawn grasses, shrubs, and trees that are not sensitive to lime-induced chlorosis are well suited to use in landscaping. Annual applications of iron chelates reduce the effects of chlorosis.

Intermittent streams form the drainageways in this unit. These drainageways are subject to rare or occasional periods of high-velocity flooding. Care should be taken during urbanization to accommodate the runoff from the drainageways. If drains become plugged during a major flood, accelerated erosion and damage to roads, buildings, and other structures can occur.

This map unit is in capability subclass VII_s, nonirrigated, and in horticultural group 6.

155—Cave gravelly fine sandy loam, 4 to 15 percent slopes. This shallow, well drained soil is on

erosional fan remnants. It formed in alluvium derived from various kinds of rock.

Typically, about 70 percent of the surface is covered with a desert pavement of rock fragments and pan fragments. The surface layer is light brown gravelly fine sandy loam about 5 inches thick. The underlying material to a depth of 15 inches is light brown gravelly fine sandy loam. The next layer to a depth of 60 inches or more is an indurated, lime-cemented hardpan. Depth to the hardpan ranges from 4 to 20 inches.

Included in this unit are about 5 percent Arizo soils, flooded, in channels and 5 percent Caliza soils on side slopes of erosional fan remnants. Included areas make up about 10 percent of the total acreage. The percentage varies from one area to another.

Permeability of the Cave soil is moderate above the hardpan. Available water capacity is very low. Effective rooting depth is 4 to 20 inches. Runoff is moderate, and the hazard of water erosion is slight. The hazard of soil blowing is high if the surface is disturbed.

This unit is used as habitat for desert wildlife and for recreation.

This unit is limited for roads because of the depth to the indurated hardpan. Roads should be designed to minimize cuts. Cutting and filling can be reduced by building roads in the less sloping areas.

This map unit is in capability subclass VII_s, nonirrigated and in horticultural group 6.

160—Destazo cobbly fine sandy loam, 0 to 2 percent slopes. This very deep, well drained soil is on relict alluvial flats. It formed in alluvium derived dominantly from limestone and dolomite.

Typically, about 60 percent of the surface is covered with a desert pavement of pebbles and cobbles. The surface layer is pink cobbly fine sandy loam about 11 inches thick. The upper 29 inches of the underlying material is light brown very gravelly sandy clay loam, and the lower part to a depth of 60 inches or more is pinkish white gravelly sandy loam containing some crystalline gypsum.

Included in this unit are about 5 percent Bracken very cobbly fine sandy loam, 2 to 8 percent slopes, on side slopes of slightly higher remnants of relict alluvial flats and 10 percent Las Vegas soils on summits of slightly higher remnants of alluvial flats. Included areas make up about 15 percent of the total acreage.

Permeability of this Destazo soil is moderately slow. Available water capacity is moderate. Effective rooting depth is 60 inches or more. Runoff is slow, and the hazard of water erosion is slight. The hazard of soil blowing is moderate.

This unit is used mainly as habitat for desert wildlife and for recreation. It is also used for urban development.

This unit is well suited to the construction of dwellings.

The main limitation for septic tank absorption fields is restricted permeability. The operation of septic tank

Because of the content of gypsum and other salts in the soil, salt-tolerant plants should be selected for lawns and landscaping. Because of the underlying hardpan, deep cuts should be avoided on this soil. Lawn grasses, shrubs, and trees that are not sensitive to lime-induced chlorosis are well suited to use in landscaping. Annual applications of iron chelates reduce the effects of chlorosis.

This map unit is in capability subclasses IIIs, irrigated, and VIIs, nonirrigated. It is in horticultural group 6.

390—Spring clay loam. This very deep, moderately well drained soil is on alluvial flats. It formed in gypsiferous lacustrine sediment. Slope is 0 to 2 percent.

Typically, the surface layer is pale brown clay loam about 5 inches thick. The underlying material to a depth of 60 inches or more is stratified, light brown to pink silt loam to silty clay, averaging silty clay loam, and contains many gypsum crystals.

Included in this unit are about 10 percent Land soils on alluvial flats and 5 percent Las Vegas soils on relict alluvial flats. Included areas make up about 15 percent of the total acreage.

Permeability of the Spring soil is slow. Available water capacity is high. Effective rooting depth is 60 inches or more. Runoff is slow, and the hazard of water erosion is slight. The hazard of soil blowing is high. This soil is subject to rare periods of flooding during prolonged, high-intensity storms. Channeling and deposition are common along streambanks. This soil is strongly affected by salts to a depth of 5 inches, and it is moderately affected below this depth.

This unit is used mainly for urban development. It is also used as habitat for desert wildlife and for recreation.

The main limitation for construction of dwellings is the hazard of flooding. Dikes and channels that have outlets for floodwater can be used to protect buildings from flooding. Gypsum in the soil can induce electrochemical action that corrodes concrete. This limitation can be overcome by using cement that is resistant to sulfate corrosion.

The main limitation for septic tank absorption fields is restricted permeability. Special design of septic tank absorption fields is needed. Using long absorption lines and backfilling the trench with sandy material help to compensate for the restricted permeability.

The Spring soil is limited for roads because of limited ability to support a load. Roads and streets should be designed to compensate for the instability of the soil.

The main limitation for lawns and landscaping is the excess soluble salts in the soil. Intensive management is required to reduce the salinity and maintain soil productivity. Excess salts in the soil can be flushed out by using heavy periodic applications of water. Because of the content of gypsum and other salts in the soil, salt-tolerant plants should be selected.

This map unit is in capability subclasses VI_s, irrigated, and VII_s, nonirrigated. It is in horticultural group 4.

400—Tencoe very gravelly fine sandy loam, 2 to 8 percent slopes. This shallow, well drained soil is on erosional fan remnants. It formed in alluvium derived dominantly from limestone and dolomite.

Typically, 75 percent of the surface is covered with a well developed desert pavement of pebbles. There is a dark desert varnish on the exposed surfaces of the rock fragments. The surface layer is light brown very gravelly fine sandy loam about 5 inches thick. The next layer is light brown very gravelly fine sandy loam and very gravelly sandy loam and is weakly cemented with lime to a depth of about 15 inches. An indurated, lime-cemented hardpan is at a depth of about 15 inches. Depth to the hardpan ranges from 7 to 20 inches.

Included in this unit are small areas of Dalian soils on side slopes of fan remnants and on inset fans. Included areas make up about 10 percent of the total acreage. The percentage varies from one area to another.

Permeability of the Tencoe soil is moderate above the hardpan. Available water capacity is very low. Effective rooting depth is 7 to 20 inches. Runoff is medium, and the hazard of water erosion is slight. The hazard of soil blowing is moderate if the surface is disturbed.

This unit is used as habitat for desert wildlife and for recreation.

This unit is limited for roads because of the depth to the indurated hardpan. Roads should be designed to minimize cuts. Heavy equipment is needed for excavation.

This map unit is in capability subclass VII_s, nonirrigated, and in horticultural group 6.

415—Aztec very gravelly sandy loam, 2 to 8 percent slopes. This very deep, well drained soil is on erosional fan remnants. It formed in alluvium derived from various kinds of rock.

Typically, 80 percent of the surface is covered with pebbles. The surface layer is light yellowish brown very gravelly sandy loam about 2 inches thick. The underlying material to a depth of 63 inches is stratified, light yellowish brown, light brown, and light reddish brown very gravelly sandy loam to extremely gravelly loamy coarse sand with weak, continuous gypsum cementation in some layers.

Included in this unit are about 5 percent Bracken soils on pediment remnants, 5 percent Rock outcrop on isolated ridges, and 5 percent Caliza soils on erosional fan remnants. Included areas make up about 15 percent of the total acreage. The percentage varies from one area to another.

Permeability of the Aztec soil is moderately slow. Available water capacity is low. Effective rooting depth is 60 inches or more. Runoff is medium, and the hazard of water erosion is slight. The hazard of soil blowing is high.

TABLE 15.--SOIL AND WATER FEATURES

["Flooding" and "water table" and terms such as "rare" and "occasional" are explained in the text. The symbol < means less than; > means more than. Absence of an entry indicates that the feature is not a concern]

Soil name and map symbol	Hydro-logic group	Flooding		High water table		Bedrock		Cemented pan		Risk of corrosion	
		Frequency	Months	Depth	Months	Depth	Thick-ness	Depth	Hard-ness	Uncoated steel	Concrete
				<u>Ft</u>		<u>In</u>		<u>In</u>			
105*: McCullough-----	B	Rare-----	---	>6.0	---	>60	---	---	---	High-----	High.
Jean-----	A	Rare-----	---	>6.0	---	>60	---	---	---	High-----	Low.
Bluepoint-----	A	None-----	---	>6.0	---	>60	---	---	---	High-----	Low.
107----- Arizo	A	Rare-----	---	>6.0	---	>60	---	---	---	High-----	Low.
112----- Arizo	A	Occasional	Mar-Sep	>6.0	---	>60	---	---	---	High-----	Low.
113----- Arizo	A	Rare-----	---	>6.0	---	>60	---	---	---	High-----	High.
117----- Arizo	A	None-----	---	>6.0	---	>60	---	---	---	High-----	Low.
120----- Bluepoint	A	Rare-----	---	4.0-6.0	Jun-Sep	>60	---	---	---	High-----	Moderate.
127, 128, 129----- Bluepoint	A	None-----	---	>6.0	---	>60	---	---	---	High-----	Low.
130*: Bracken-----	B	None-----	---	>6.0	---	40-60	Soft	---	---	High-----	High.
Destazo-----	B	None-----	---	>6.0	---	>60	---	---	---	High-----	High.
132----- Bracken	B	None-----	---	>6.0	---	40-60	Soft	---	---	High-----	High.
133*: Bracken-----	B	None-----	---	>6.0	---	40-60	Soft	---	---	High-----	High.
Rock outcrop.											
134----- Bracken	B	None-----	---	>6.0	---	40-60	Soft	---	---	High-----	High.
140----- Casaga	C	None-----	---	>6.0	---	>60	---	---	---	High-----	High.
150----- Cave	D	None-----	---	>6.0	---	>60	---	4-20	Thick	High-----	Low.
151----- Cave	D	None-----	---	>6.0	---	>60	---	10-20	Thick	High-----	Low.
152, 155----- Cave	D	None-----	---	>6.0	---	>60	---	4-20	Thick	High-----	Low.
160----- Destazo	B	None-----	---	>6.0	---	>60	---	---	---	High-----	High.
181*: Galiza-----	B	None-----	---	>6.0	---	>60	---	---	---	High-----	Low.
Pittman-----	C	None-----	---	>6.0	---	>60	---	20-30	Thick	High-----	Low.

See footnote at end of table.

TABLE 15.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydro-logic group	Flooding		High water table		Bedrock		Cemented pan		Risk of corrosion	
		Frequency	Months	Depth	Months	Depth	Thick-ness	Depth	Hard-ness	Uncoated steel	Concrete
				<u>Ft</u>		<u>In</u>		<u>In</u>			
270----- Land	B	Rare-----	-----	3.5-6.0	Mar-Sep	>60	-----	-----	-----	High-----	High.
278----- Land	D	Rare-----	-----	1.5-3.0	Jan-Dec	>60	-----	-----	-----	High-----	High.
282----- Land	C	Rare-----	-----	3.0-3.5	Jan-Dec	>60	-----	-----	-----	High-----	High.
300, 301----- Las Vegas	D	Rare-----	-----	>6.0	-----	>60	-----	3-14	Thick	High-----	High.
302#: Las Vegas-----	D	Rare-----	-----	>6.0	-----	>60	-----	3-14	Thick	High-----	High.
McCarran-----	B	Rare-----	-----	>6.0	-----	>60	-----	-----	-----	High-----	High.
Grapevine-----	B	Rare-----	-----	>6.0	-----	>60	-----	-----	-----	High-----	High.
305#: Las Vegas-----	D	Rare-----	-----	>6.0	-----	>60	-----	3-14	Thick	High-----	High.
Destazo-----	B	Rare-----	-----	>6.0	-----	>60	-----	-----	-----	High-----	High.
307#: Las Vegas-----	D	Rare-----	-----	>6.0	-----	>60	-----	3-14	Thick	High-----	High.
Skyhaven-----	C	Rare-----	-----	>6.0	-----	>60	-----	24-40	Thick	High-----	High.
325, 326----- McCarran	B	Rare-----	-----	>6.0	-----	>60	-----	-----	-----	High-----	High.
341----- Paradise	C	Rare-----	-----	3.0-5.0	Dec-Mar	>60	-----	-----	-----	High-----	Low.
360#: Rock outcrop.											
St. Thomas-----	D	None-----	-----	>6.0	-----	4-20	Hard	-----	-----	High-----	Low.
380----- Skyhaven	C	Rare-----	-----	>6.0	-----	>60	-----	24-40	Thick	High-----	High.
390----- Spring	C	Rare-----	-----	>6.0	-----	>60	-----	-----	-----	High-----	High.
400----- Tencee	D	None-----	-----	>6.0	-----	>60	-----	7-20	Thick	High-----	Low.
415----- Aztec	B	None-----	-----	>6.0	-----	>60	-----	-----	-----	High-----	High.
417#: Aztec-----	B	None-----	-----	>6.0	-----	>60	-----	-----	-----	High-----	High.
Rock outcrop.											
418#: Aztec-----	B	None-----	-----	>6.0	-----	>60	-----	-----	-----	High-----	High.
Nickel-----	B	None-----	-----	>6.0	-----	40-60	Hard	-----	-----	High-----	Low.
Knob Hill-----	B	None-----	-----	>6.0	-----	>60	-----	-----	-----	High-----	Low.

See footnote at end of table.

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.):					
Poor condition (grass cover < 50%)		68	79	86	89
Fair condition (grass cover 50% to 75%)		49	69	79	84
Good condition (grass cover > 75%)		39	61	74	80
Impervious areas:					
Paved parking lots, roofs, driveways, etc. (excluding right-of-way)		98	98	98	98
Streets and roads:					
Paved; curbs and storm sewers (excluding right-of-way)		98	98	98	98
Paved; open ditches (including right-of-way)		83	89	92	93
Gravel (including right-of-way)		76	85	89	91
Dirt (including right-of-way)		72	82	87	89
Western desert urban areas:					
Natural desert landscaping (pervious areas only) ⁴ ...		63	77	85	88
Artificial desert landscaping (impervious weed barrier, desert shrub with 1- to 2-inch sand or gravel mulch and basin borders)		96	96	96	96
Urban districts:					
Commercial and business	85	89	92	94	95
Industrial	72	81	88	91	93
Residential districts by average lot size:					

See Table 602A

Developing urban areas

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

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

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

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

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

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

Revision	Date

HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL

RUNOFF CURVE NUMBERS (SEMIARID RANGELANDS¹)

Cover description		Curve numbers for hydrologic soil group—			
Cover type	Hydrologic condition ²	A ³	B	C	D
Herbaceous—mixture of grass, weeds, and low-growing brush, with brush the minor element.	Poor		80	87	93
	Fair		71	81	89
	Good		62	74	85
Oak-aspen—mountain brush mixture of oak brush, aspen, mountain mahogany, bitter brush, maple, and other brush.	Poor		66	74	79
	Fair		48	57	63
	Good		30	41	48
Pinyon-juniper—pinyon, juniper, or both; grass understory.	Poor		75	85	89
	Fair		58	73	80
	Good		41	61	71
Sagebrush with grass understory.	Poor		67	80	85
	Fair		51	63	70
	Good		36	47	55
Desert shrub—major plants include saltbush, greasewood, creosotebush, blackbrush, bursage, palo verde, mesquite, and cactus.	Poor	63	77	85	88
	Fair	55	72	81	86
	Good	49	68	79	84

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

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

Fair: 30 to 70% ground cover.

Good: >70% ground cover.

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

Revision	Date

**WRC
ENGINEERING**

REFERENCE:

SCS TR-55, USDA, June 1986.

**TABLE 602
4 of 4**

HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL

RUNOFF CURVE NUMBERS - 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

Lag Time - Standard Form 4 Computations



Project Name: **SKYE CANYON Parcel 1.3**
 Description: **Hydrologic Data**
 File Name: **OLY1401-001 TDS SF4.xls**
 By: **BMC**
 Date: **6/11/2014**

Description:

File Name:

Bv:

Date:

SKYF CANYON Parcel 1.3

Hydrologic Data

OLY1401-001 TDS SF4.xls

BMC

6/11/2014

SUB-BASIN DATA							INITIAL / OVERLAND TIME (Ti)			TRAVEL TIME (Tt)					Tc		Tc Check		Tiag
DESIG:	DEV./EX. (D or E)	CN	K	AREA Ac	AREA Mi^2	INITIAL LENGTH Feet	SLOPE %	Ti Min	TRAVEL	SLOPE	VELOCITY	V2	Tt	Tc Calc.	Tc Length Feet	Tc Check	Tiag Hours		
									LENGTH Feet	%	FPS	FPS	Min					[9]	
ON1-D	D	92.7	0.834	37.3	0.0583	110	1.4	4.53		2.3	3.05	4.62	8.11	12.63	2100	21.667	0.126		
[1]	K = 0.0132 (CN) - 0.39						[5]	For Existing Conditions: V2 = 29.4 * (S/100)^0.5						[9]	Tc = (L/180) + 10				
[2]	A = Area/640						[5]	For Developed Conditions: V2 = 30.6 * (S/100)^0.5						[10]	Tiag = (0.6*Tc)/60				
[3]	Ti = (1.8 (1.1-K) L^0.5)/S^0.33						[6]	Tt = L/(60*V)						[11]	Min Tiag = 0.05				
[4]	For Existing Conditions: V1 = 14.8 * (S/100)^0.5						[7]	Tc = Ti + Tt						Note: For Travel Time Calcs: V1 applies to first 500 feet and V2 applies to remaining distance.					
	For Developed Conditions: V1 = 20.2 * (S/100)^0.5						[8]	Total L = Initial L + Travel L											
REFERENCE :																			
STANDARD FORM 4																			

APPENDIX C

Developed Condition HEC-1 Analysis

DEV.OUT

```

*****
* FLOOD HYDROGRAPH PACKAGE (HEC-1) *
* JUN 1998 *
* VERSION 4.1 *
* RUN DATE 11JUN14 TIME 09:35:14 *
*****

```

```

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

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

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

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE. THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION NEW OPTIONS: DAMBREAK OUTFLOW 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 1.3
4 ID TECHNICAL DRAINAGE STUDY
5 ID DEVELOPED DRAINAGE CONDITION
6 ID
7 ID RETURN PERIOD ----- 100 & 10-YEAR
8 ID DISTRIBUTION ----- 6-HOUR SDN3
9 ID PROJECT NO. ----- OLY1401.002
10 ID FILENAME ----- DEV.H1
11 ID DATE ----- 06/10/14
12 ID MODELED BY ----- BC
13 ID
14 ID PRECIPITATION STORM EVENT RATIOS
15 ID STORM EVENT RATIO
16 ID 100-YR 1.00
17 ID 10-YR 0.55
18 ID
19 IT 5 0 0 300
20 IO 5 0 0
21 IN 5 0 0
22 JR PREC 1.00 0.55
*
22 KK ON1-D
23 KM DEVELOPED ONSITE BASIN
24 BA .0583
25 PB 2.93
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 92.7
35 UD 0.126
*
36 ZZ

```

1

SCHEMATIC DIAGRAM OF STREAM NETWORK

```

INPUT (V) ROUTING (--->) DIVERSION OR PUMP FLOW
LINE NO. (.) CONNECTOR (<---) RETURN OF DIVERTED OR PUMPED FLOW
22 ON1-D

```

(***) RUNOFF ALSO COMPUTED AT THIS LOCATION

```

*****
* FLOOD HYDROGRAPH PACKAGE (HEC-1) *
* JUN 1998 *
* VERSION 4.1 *
* RUN DATE 11JUN14 TIME 09:35:14 *
*****

```

```

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

```

```

SLATER HANIFAN GROUP
SKYE CANYON PARCEL 1.3
TECHNICAL DRAINAGE STUDY
DEVELOPED DRAINAGE CONDITION

```

DEV.OUT

RETURN PERIOD ----- 100 & 10-YEAR
DISTRIBUTION ----- 6-HOUR SDN3
PROJECT NO. ----- OLY1401.002
FILENAME ----- DEV.H1
DATE ----- 06/10/14
MODELED BY ----- BC

PRECIPITATION STORM EVENT RATIOS
STORM EVENT RATIO
100-YR 1.00
10-YR 0.55

19 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 .55

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	.55
HYDROGRAPH AT					
+	ON1-D	.06	1 FLOW	103.	48.
			TIME	3.58	3.58

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

APPENDIX D

Surface Flow Hydraulic Computations

Street Flows

Section A-1 (100-Year) - Basin ON1-D(A) **Worksheet for Irregular Channel**

Project Description	
Worksheet	Section A-1 (100-Year) - Basin ON1-D(A)
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data	
Channel Slope	2.14 %
Discharge	59.00 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	0.015
Water Surface Elevation	0.54 ft
Elevation Range	0.00 to 0.48
Flow Area	11.1 ft ²
Wetted Perimeter	49.36 ft
Top Width	49.00 ft
Actual Depth	0.54 ft
Critical Elevation	0.67 ft
Critical Slope	0.47 %
Velocity	5.32 ft/s
Velocity Head	0.44 ft
Specific Energy	0.98 ft
Froude Number	1.97
Flow Type	Supercritical

Calculation Messages:
Water elevation exceeds lowest end station by 0.58441432e-1 ft.

Roughness Segments		
Start Station	End Station	Mannings Coefficient
0+00.0	0+07.5	0.013
0+07.5	0+41.5	0.016
0+41.5	0+49.0	0.013

Natural Channel Points	
Station (ft)	Elevation (ft)
0+00.0	0.48
0+05.0	0.38
0+05.4	0.38
0+06.5	0.00
0+07.5	0.08
0+07.5	0.13
0+24.5	0.47
0+41.5	0.13
0+41.5	0.08

Section A-1 (100-Year) - Basin ON1-D(A)
Worksheet for Irregular Channel

Natural Channel Points	
Station (ft)	Elevation (ft)
0+42.5	0.00
0+43.6	0.38
0+44.0	0.38
0+49.0	0.48

Notes:

Q = ON1-D(A)

Section B-1 (100-Year) - Basin ON1-D(B1+B2)

Worksheet for Irregular Channel

Project Description	
Worksheet	Section B-1 (100-Year) - Basin ON1-D(B1+B2)
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data	
Channel Slope	1.50 %
Discharge	44.00 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	0.015
Water Surface Elevation	0.52 ft
Elevation Range	0.00 to 0.48
Flow Area	10.3 ft ²
Wetted Perimeter	49.33 ft
Top Width	49.00 ft
Actual Depth	0.52 ft
Critical Elevation	0.60 ft
Critical Slope	0.51 %
Velocity	4.26 ft/s
Velocity Head	0.28 ft
Specific Energy	0.80 ft
Froude Number	1.63
Flow Type	Supercritical

Calculation Messages:

Water elevation exceeds lowest end station by 0.43269658e-1 ft.

Roughness Segments		
Start Station	End Station	Mannings Coefficient
0+00.0	0+07.5	0.013
0+07.5	0+41.5	0.016
0+41.5	0+49.0	0.013

Natural Channel Points	
Station (ft)	Elevation (ft)
0+00.0	0.48
0+05.0	0.38
0+05.4	0.38
0+06.5	0.00
0+07.5	0.08
0+07.5	0.13
0+24.5	0.47
0+41.5	0.13
0+41.5	0.08

Section B-1 (100-Year) - Basin ON1-D(B1+B2)
Worksheet for Irregular Channel

Natural Channel Points	
Station (ft)	Elevation (ft)
0+42.5	0.00
0+43.6	0.38
0+44.0	0.38
0+49.0	0.48

Section B-1 (100-Year) - Basin ON1-D(B1+B2)

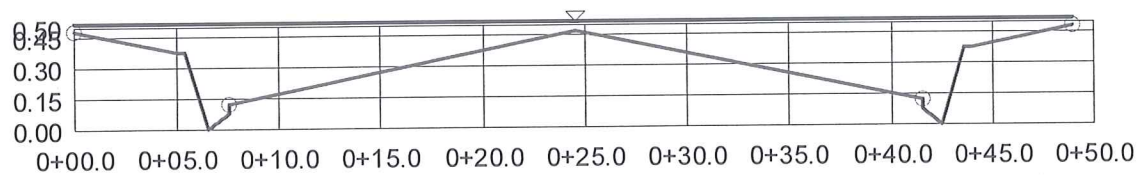
Cross Section for Irregular Channel

Project Description

Worksheet	Section B-1 (100-Year) - Basin ON1-D(B1+B2)
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

Section Data

Mannings Coefficient	0.015
Channel Slope	1.50 %
Water Surface Elevation	0.52 ft
Elevation Range	0.00 to 0.48
Discharge	44.00 cfs



V:10.0
H:1
NTS

E-1 Section Worksheet for Irregular Channel

Project Description	
Worksheet	Section E-1 (Site Entry)
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data	
Channel Slope	0.77 %
Discharge	22.00 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	0.015
Water Surface Elevation	2.23 ft
Elevation Range	1.73 to 2.94
Flow Area	7.6 ft ²
Wetted Perimeter	38.90 ft
Top Width	37.92 ft
Actual Depth	0.50 ft
Critical Elevation	2.25 ft
Critical Slope	0.58 %
Velocity	2.90 ft/s
Velocity Head	0.13 ft
Specific Energy	2.36 ft
Froude Number	1.14
Flow Type	Supercritical

Calculation Messages:
Flow is divided.

Roughness Segments		
Start Station	End Station	Mannings Coefficient
0+00.0	0+02.0	0.013
0+02.0	0+25.0	0.016
0+25.0	0+33.0	0.013
0+33.0	0+56.0	0.016
0+56.0	0+58.0	0.013

Natural Channel Points	
Station (ft)	Elevation (ft)
0+00.0	2.23
0+00.5	2.21
0+00.5	1.73
0+02.0	1.86
0+25.0	2.36
0+25.0	2.86
0+29.0	2.94

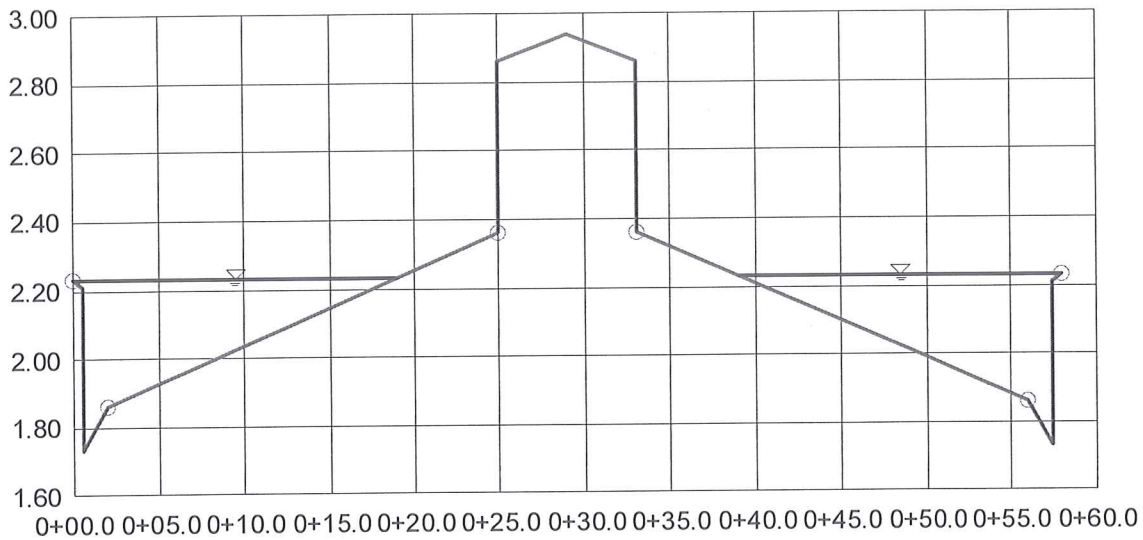
E-1 Section
Worksheet for Irregular Channel

Natural Channel Points	
Station (ft)	Elevation (ft)
0+33.0	2.86
0+33.0	2.36
0+56.0	1.86
0+57.5	1.73
0+57.5	2.21
0+58.0	2.23

E-1 Section Cross Section for Irregular Channel

Project Description	
Worksheet	Section E-1 (Site Entry)
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

Section Data	
Mannings Coefficient	0.015
Channel Slope	0.77 %
Water Surface Elevation	2.23 ft
Elevation Range	1.73 to 2.94
Discharge	22.00 cfs



V:20.0
H:1
NTS

SC1 South Conquistador Street Section

Worksheet for Irregular Channel

Project Description	
Worksheet	SC1 South Conquistador Street Section
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data	
Channel Slope	1.92 %
Discharge	14.00 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	0.014
Water Surface Elevation	0.40 ft
Elevation Range	0.00 to 0.56
Flow Area	3.5 ft ²
Wetted Perimeter	26.44 ft
Top Width	25.56 ft
Actual Depth	0.40 ft
Critical Elevation	0.48 ft
Critical Slope	0.50 %
Velocity	3.96 ft/s
Velocity Head	0.24 ft
Specific Energy	0.64 ft
Froude Number	1.88
Flow Type	Supercritical

Calculation Messages:
Flow is divided.

Roughness Segments		
Start Station	End Station	Mannings Coefficient
0+00.00	0+02.00	0.013
0+02.00	0+41.00	0.016
0+41.00	0+43.00	0.013

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

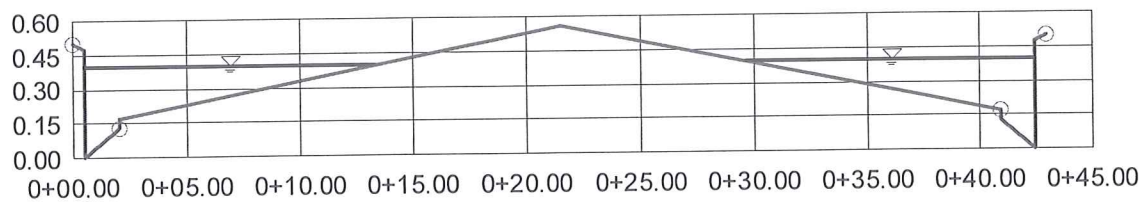
SC1 South Conquistador Street Section Worksheet for Irregular Channel

Natural Channel Points	
Station (ft)	Elevation (ft)
0+42.50	0.48
0+43.00	0.50

SC1 South Conquistador Street Section Cross Section for Irregular Channel

Project Description	
Worksheet	SC1 South Conquistador Street Section
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

Section Data	
Mannings Coefficient	0.014
Channel Slope	1.92 %
Water Surface Elevation	0.40 ft
Elevation Range	0.00 to 0.56
Discharge	14.00 cfs



V:10.0
H:1
NTS

SC2 Conquistador @ DI near Park Worksheet for Irregular Channel

Project Description	
Worksheet	SC2 Conquistador Street Section @ Park DI
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data	
Channel Slope	1.92 %
Discharge	6.00 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	0.014
Water Surface Elevation	0.32 ft
Elevation Range	0.00 to 0.56
Flow Area	1.9 ft ²
Wetted Perimeter	18.64 ft
Top Width	17.91 ft
Actual Depth	0.32 ft
Critical Elevation	0.37 ft
Critical Slope	0.59 %
Velocity	3.20 ft/s
Velocity Head	0.16 ft
Specific Energy	0.48 ft
Froude Number	1.74
Flow Type	Supercritical

Calculation Messages:
Flow is divided.

Roughness Segments		
Start Station	End Station	Mannings Coefficient
0+00.00	0+02.00	0.013
0+02.00	0+41.00	0.016
0+41.00	0+43.00	0.013

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

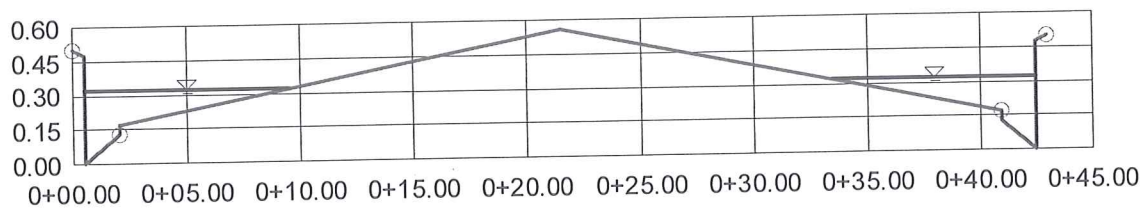
SC2 Conquistador @ DI near Park Worksheet for Irregular Channel

Natural Channel Points	
Station (ft)	Elevation (ft)
0+42.50	0.48
0+43.00	0.50

SC2 Conquistador @ DI near Park Cross Section for Irregular Channel

Project Description	
Worksheet	SC2 Conquistador Street Section @ Park DI
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

Section Data	
Mannings Coefficient	0.014
Channel Slope	1.92 %
Water Surface Elevation	0.32 ft
Elevation Range	0.00 to 0.56
Discharge	6.00 cfs



V:10.0
H:1
NTS

R2 Racel Half Street Section Worksheet for Irregular Channel

Project Description	
Worksheet	R2 Racel Half Street Section
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data	
Channel Slope	4.90 %
Discharge	5.00 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	0.015
Water Surface Elevation	0.33 ft
Elevation Range	0.00 to 0.56
Flow Area	1.1 ft ²
Wetted Perimeter	9.95 ft
Top Width	9.57 ft
Actual Depth	0.33 ft ←
Critical Elevation	0.43 ft
Critical Slope	0.68 %
Velocity	4.76 ft/s
Velocity Head	0.35 ft
Specific Energy	0.68 ft
Froude Number	2.53
Flow Type	Supercritical

Roughness Segments		
Start Station	End Station	Mannings Coefficient
0+21.50	0+41.00	0.016
0+41.00	0+43.00	0.013

Natural Channel Points	
Station (ft)	Elevation (ft)
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

* PER Exhibit I
of Infrastructure
Study Reference

RACEL @ R1

8.5 CFS

- X DROP INLET
+ 4 cfs 1.3 "Future"
Allocation

9 CFS

∴ DROP INLETS
INTERCEPT 3.5 CFS

8.5 CFS RACEL

- 3.5 CFS DROP INLET

+ 0 CFS SITE DISCHARGE
TO RACEL

5 CFS
Q₁₀₀

@ ENTRY to 1.3
OFF RACEL

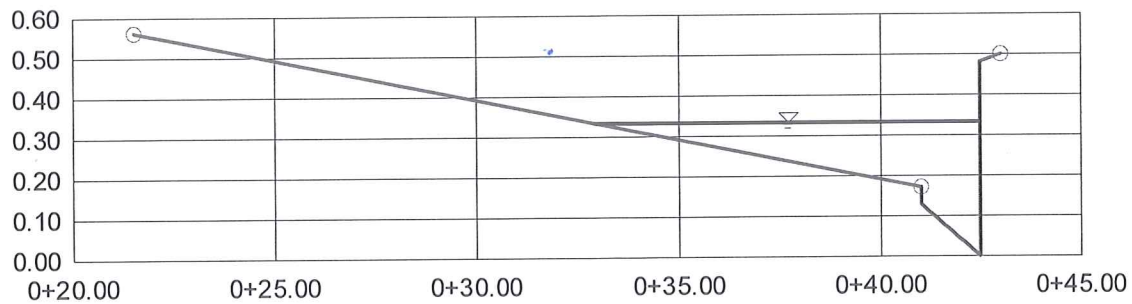
R2 Racel Half Street Section Cross Section for Irregular Channel

Project Description

Worksheet	R2 Racel Half Street Section
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

Section Data

Mannings Coefficient	0.015
Channel Slope	4.90 %
Water Surface Elevation	0.33 ft
Elevation Range	0.00 to 0.56
Discharge	5.00 cfs



V:10.0
H:1
NTS

Section A-1 (100-Year) - Basin ON1-D(A)

Worksheet for Irregular Channel

Project Description	
Worksheet	Section A-1 (100-Year) - Basin ON1-D(A)
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data	
Channel Slope	2.14 %
Discharge	59.00 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	0.015
Water Surface Elevation	0.54 ft
Elevation Range	0.00 to 0.48
Flow Area	11.1 ft ²
Wetted Perimeter	49.36 ft
Top Width	49.00 ft
Actual Depth	0.54 ft
Critical Elevation	0.67 ft
Critical Slope	0.47 %
Velocity	5.32 ft/s
Velocity Head	0.44 ft
Specific Energy	0.98 ft
Froude Number	1.97
Flow Type	Supercritical

Calculation Messages:

Water elevation exceeds lowest end station by 0.58441432e-1 ft.

Roughness Segments		
Start Station	End Station	Mannings Coefficient
0+00.0	0+07.5	0.013
0+07.5	0+41.5	0.016
0+41.5	0+49.0	0.013

Natural Channel Points	
Station (ft)	Elevation (ft)
0+00.0	0.48
0+05.0	0.38
0+05.4	0.38
0+06.5	0.00
0+07.5	0.08
0+07.5	0.13
0+24.5	0.47
0+41.5	0.13
0+41.5	0.08

Section A-1 (100-Year) - Basin ON1-D(A)
Worksheet for Irregular Channel

Natural Channel Points	
Station (ft)	Elevation (ft)
0+42.5	0.00
0+43.6	0.38
0+44.0	0.38
0+49.0	0.48

Notes:

Q = ON1-D(A)

Section B-1 (100-Year) - Basin ON1-D(B1+B2)

Worksheet for Irregular Channel

Project Description	
Worksheet	Section B-1 (100-Year) - Basin ON1-D(B1+B2)
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data	
Channel Slope	1.50 %
Discharge	44.00 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	0.015
Water Surface Elevation	0.52 ft
Elevation Range	0.00 to 0.48
Flow Area	10.3 ft ²
Wetted Perimeter	49.33 ft
Top Width	49.00 ft
Actual Depth	0.52 ft
Critical Elevation	0.60 ft
Critical Slope	0.51 %
Velocity	4.26 ft/s
Velocity Head	0.28 ft
Specific Energy	0.80 ft
Froude Number	1.63
Flow Type	Supercritical

Calculation Messages:

Water elevation exceeds lowest end station by 0.43269658e-1 ft.

Roughness Segments		
Start Station	End Station	Mannings Coefficient
0+00.0	0+07.5	0.013
0+07.5	0+41.5	0.016
0+41.5	0+49.0	0.013

Natural Channel Points	
Station (ft)	Elevation (ft)
0+00.0	0.48
0+05.0	0.38
0+05.4	0.38
0+06.5	0.00
0+07.5	0.08
0+07.5	0.13
0+24.5	0.47
0+41.5	0.13
0+41.5	0.08

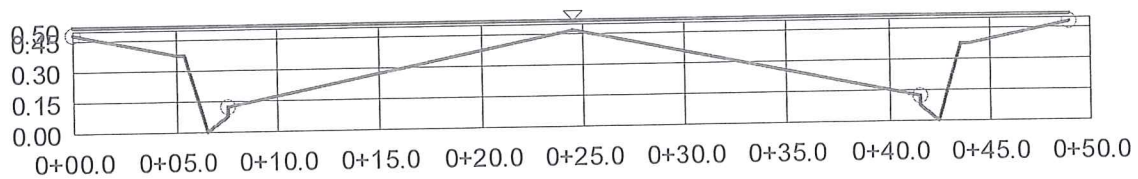
Section B-1 (100-Year) - Basin ON1-D(B1+B2)
Worksheet for Irregular Channel

Natural Channel Points	
Station (ft)	Elevation (ft)
0+42.5	0.00
0+43.6	0.38
0+44.0	0.38
0+49.0	0.48

Section B-1 (100-Year) - Basin ON1-D(B1+B2) **Cross Section for Irregular Channel**

Project Description	
Worksheet	Section B-1 (100-Year) - Basin ON1-D(B1+B2)
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

Section Data	
Mannings Coefficient	0.015
Channel Slope	1.50 %
Water Surface Elevation	0.52 ft
Elevation Range	0.00 to 0.48
Discharge	44.00 cfs



V:10.0
H:1
NTS

E-1 Section Worksheet for Irregular Channel

Project Description	
Worksheet	Section E-1 (Site Entry)
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data	
Channel Slope	0.77 %
Discharge	22.00 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	0.015
Water Surface Elevation	2.23 ft
Elevation Range	1.73 to 2.94
Flow Area	7.6 ft ²
Wetted Perimeter	38.90 ft
Top Width	37.92 ft
Actual Depth	0.50 ft
Critical Elevation	2.25 ft
Critical Slope	0.58 %
Velocity	2.90 ft/s
Velocity Head	0.13 ft
Specific Energy	2.36 ft
Froude Number	1.14
Flow Type	Supercritical

Calculation Messages:
Flow is divided.

Roughness Segments		
Start Station	End Station	Mannings Coefficient
0+00.0	0+02.0	0.013
0+02.0	0+25.0	0.016
0+25.0	0+33.0	0.013
0+33.0	0+56.0	0.016
0+56.0	0+58.0	0.013

Natural Channel Points	
Station (ft)	Elevation (ft)
0+00.0	2.23
0+00.5	2.21
0+00.5	1.73
0+02.0	1.86
0+25.0	2.36
0+25.0	2.86
0+29.0	2.94

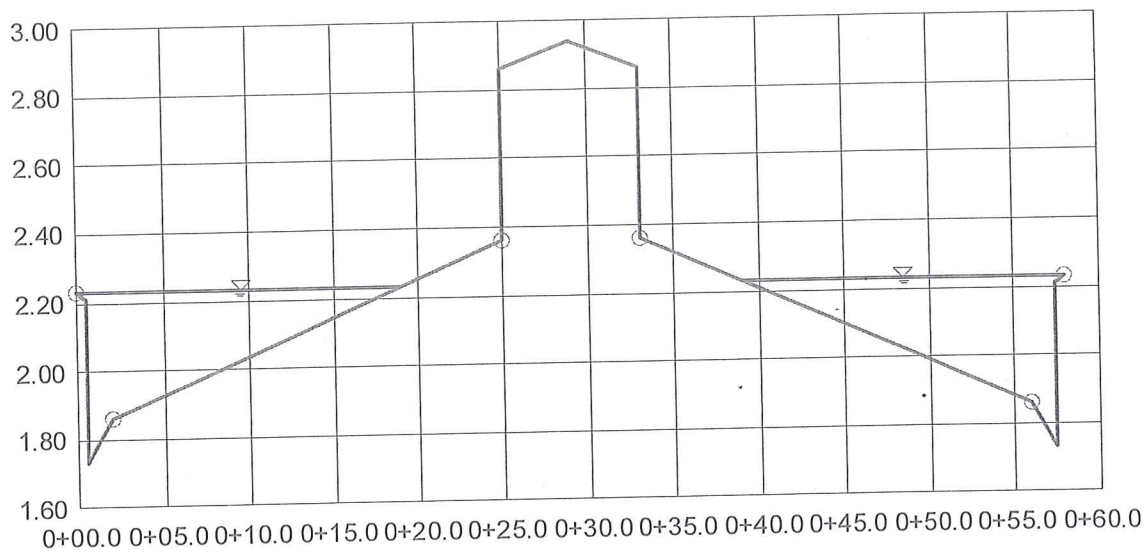
E-1 Section
Worksheet for Irregular Channel

Natural Channel Points	
Station (ft)	Elevation (ft)
0+33.0	2.86
0+33.0	2.36
0+56.0	1.86
0+57.5	1.73
0+57.5	2.21
0+58.0	2.23

E-1 Section Cross Section for Irregular Channel

Project Description	
Worksheet	Section E-1 (Site Entry)
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

Section Data	
Mannings Coefficient	0.015
Channel Slope	0.77 %
Water Surface Elevation	2.23 ft
Elevation Range	1.73 to 2.94
Discharge	22.00 cfs



V:20.0
H:1
NTS

SC1 South Conquistador Street Section

Worksheet for Irregular Channel

Project Description	
Worksheet	SC1 South Conquistador Street Section
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data	
Channel Slope	1.92 %
Discharge	14.00 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	0.014
Water Surface Elevation	0.40 ft
Elevation Range	0.00 to 0.56
Flow Area	3.5 ft ²
Wetted Perimeter	26.44 ft
Top Width	25.56 ft
Actual Depth	0.40 ft
Critical Elevation	0.48 ft
Critical Slope	0.50 %
Velocity	3.96 ft/s
Velocity Head	0.24 ft
Specific Energy	0.64 ft
Froude Number	1.88
Flow Type	Supercritical

Calculation Messages:
Flow is divided.

Roughness Segments		
Start Station	End Station	Mannings Coefficient
0+00.00	0+02.00	0.013
0+02.00	0+41.00	0.016
0+41.00	0+43.00	0.013

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

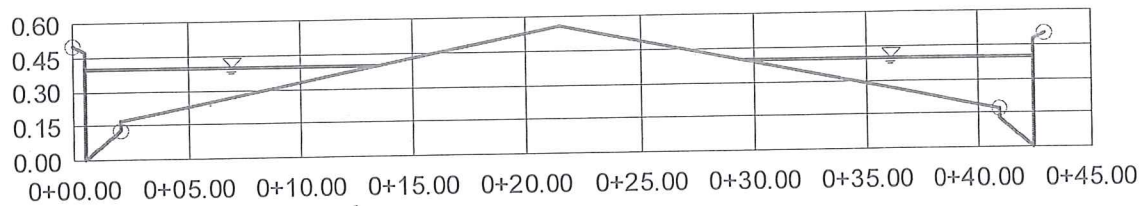
SC1 South Conquistador Street Section Worksheet for Irregular Channel

Natural Channel Points	
Station (ft)	Elevation (ft)
0+42.50	0.48
0+43.00	0.50

SC1 South Conquistador Street Section **Cross Section for Irregular Channel**

Project Description	
Worksheet	SC1 South Conquistador Street Section
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

Section Data	
Mannings Coefficient	0.014
Channel Slope	1.92 %
Water Surface Elevation	0.40 ft
Elevation Range	0.00 to 0.56
Discharge	14.00 cfs



V:10.0
H:1
NTS

SC2 Conquistador @ DI near Park Worksheet for Irregular Channel

Project Description

Worksheet	SC2 Conquistador Street Section @ Park DI
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data

Channel Slope	1.92 %
Discharge	6.00 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	0.014
Water Surface Elevation	0.32 ft
Elevation Range	0.00 to 0.56
Flow Area	1.9 ft ²
Wetted Perimeter	18.64 ft
Top Width	17.91 ft
Actual Depth	0.32 ft
Critical Elevation	0.37 ft
Critical Slope	0.59 %
Velocity	3.20 ft/s
Velocity Head	0.16 ft
Specific Energy	0.48 ft
Froude Number	1.74
Flow Type	Supercritical

Calculation Messages:
Flow is divided.

Roughness Segments

Start Station	End Station	Mannings Coefficient
0+00.00	0+02.00	0.013
0+02.00	0+41.00	0.016
0+41.00	0+43.00	0.013

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

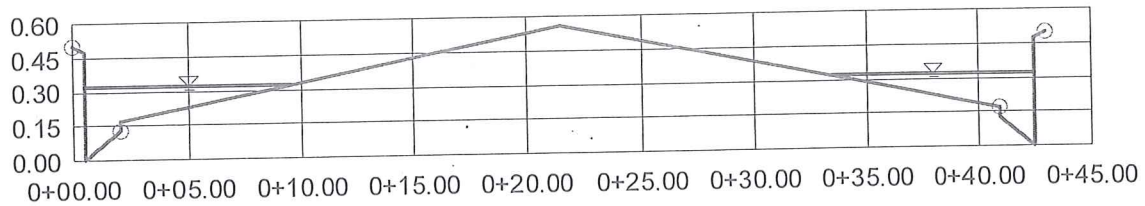
SC2 Conquistador @ DI near Park
Worksheet for Irregular Channel

Natural Channel Points	
Station (ft)	Elevation (ft)
0+42.50	0.48
0+43.00	0.50

SC2 Conquistador @ DI near Park **Cross Section for Irregular Channel**

Project Description	
Worksheet	SC2 Conquistador Street Section @ Park DI
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

Section Data	
Mannings Coefficient	0.014
Channel Slope	1.92 %
Water Surface Elevation	0.32 ft
Elevation Range	0.00 to 0.56
Discharge	6.00 cfs



V:10.0
H:1
NTS

R2 Racel Half Street Section Worksheet for Irregular Channel

* PER Exhibit I
of Infrastructure
Study Reference

Project Description	
Worksheet	R2 Racel Half Street Section
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data	
Channel Slope	4.90 %
Discharge	5.00 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	0.015
Water Surface Elevation	0.33 ft
Elevation Range	0.00 to 0.56
Flow Area	1.1 ft ²
Wetted Perimeter	9.95 ft
Top Width	9.57 ft
Actual Depth	0.33 ft ←
Critical Elevation	0.43 ft
Critical Slope	0.68 %
Velocity	4.76 ft/s
Velocity Head	0.35 ft
Specific Energy	0.68 ft
Froude Number	2.53
Flow Type	Supercritical

Roughness Segments		
Start Station	End Station	Mannings Coefficient
0+21.50	0+41.00	0.016
0+41.00	0+43.00	0.013

Natural Channel Points	
Station (ft)	Elevation (ft)
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

RACEL @ R1

8.5 CFS

- X DROP INLET
+ 4 CFS 1.3 "Future"
Allotment

9 CFS

∴ DROP INLETS
INTERCEPT 3.5 CFS

8.5 CFS RACEL

- 3.5 CFS DROP INLET

+ 0 CFS SITE DISCHARGE
TO RACEL

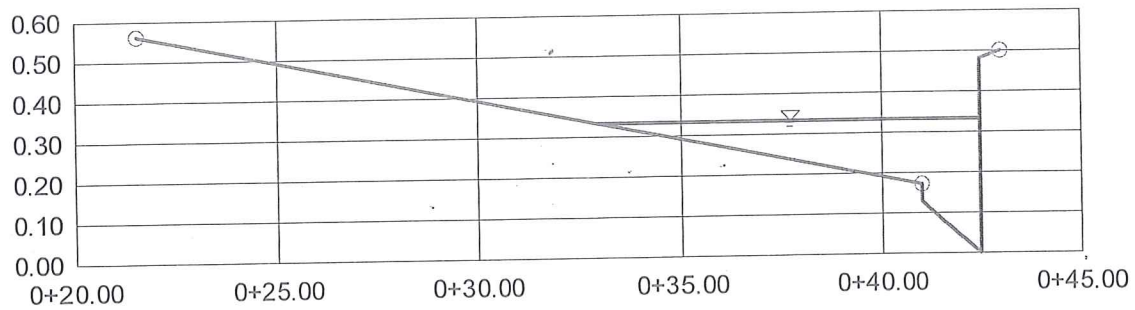
Q₁₀₀ 5 CFS

@ ENTRY to 1.3
OFF RACEL

R2 Racel Half Street Section Cross Section for Irregular Channel

Project Description	
Worksheet	R2 Racel Half Street Section
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

Section Data	
Mannings Coefficient	0.015
Channel Slope	4.90 %
Water Surface Elevation	0.33 ft
Elevation Range	0.00 to 0.56
Discharge	5.00 cfs



V:10.0
H:1
NTS

Drop Inlets

Project:	Skye Canyon Parcel 1.3	
Title:	Type CM2 Drop Inlet (Continuous Grade)	
Subtitle:	12.5-ft Drop Inlet near B-1	
By:	BC	
Date:	6/11/2014	
Input:	Variable:	Input:
Street Flow (cfs)	Q	22.0
Longitudinal Slope (ft/ft)	S _o	0.0150
Manning's Coefficient	n	0.016
Street Flow Velocity (fps)	V	4.26
Street Flow Depth (ft)	D	0.52
Street Cross Slope (ft/ft)	S _x	0.02
Grate Width (ft)	W	1.5
Grate Depression (in)	D _g	2.0
Length of Grate (ft)	L _g	10.0
Length of Curb Opening (ft)	L _c	12.50
Clogging Factor - Grate (%)	CF _g	50%
Clogging Factor - Curb (%)	CF _c	50%
Effective Grate Length (ft)	L _{ge}	5.0
Effective Curb Opening Length (ft)	L _{ce}	6.25
Output (Grate):	Equation:	Output (Grate):
¹ R _f - Frontal Flow Factor	1-0.09*(V-V _x) if V>V _x ; else Frontal Flow Factor=1	1.00
² V _o - Splash Over Velocity (fps)	V _x =p+q*L _g -r*L _{ge} ² +sy*L _{ge} ³ ; where p=0.30,q=4.85,r=1.31,sy=0.15 (for Vane Grate)	10.55
¹ E - Grate Flow Ratio	Frontal Flow/Side Flow	0.21
² Q _w - Frontal Flow (cfs)	Q _w = Q[1-(1-(W/T)) ^{2.67}]	4.64
¹ Q _s - Side Flow (cfs)	Q _s = Q-Q _w	17.4
T - Side Flow Spread (ft)	(D-D _g)/S _x	17.67
¹ R _s - Side Flow Factor	1/(1+(0.15*V ^{1.8})/(S _x *L _{ge} ^{2.3}))	0.28
¹ Q _{gi} - Intercepted Flow (cfs)	(R _f *E+R _s *(1-E))*Q	9.6
Output (Curb):	Equation:	Output (Curb):
¹ S _e - Equivalent Cross Slope (ft/ft)	S _x +S _g *E	0.043
Q _{sx} - Remaining Flow After Grate Interception (cfs)	Q-Q _{gi}	12.419
S _g - Gutter Cross Slope (ft/ft)	D _g /W	0.111
¹ L _t - Effective Interception Length (ft)	0.60*Q _{sx} ^{0.42} *S _o ^{0.30} *(1/n*S _e) ^{0.6}	38.49
¹ Q _{ci} - Intercepted Flow (cfs)	(1-(1-L _{ce} /L _t) ^{1.8})*Q _{sx} or Q _{sx} if L _t is less than L _{ce}	3.4
Output (Combination):		Output (Combination):
Total Intercepted Flow (cfs)	Intercepted (Grate) + Intercepted (Curb)	13.0
¹ Formula referenced from the CCRFCD Manual		
² Formula referenced from FHWA Urban Drainage Design Manual (HEC-22)		

Project:	Skye Canyon Parcel 1.3	
Title:	Type CM2 Drop Inlet (Continuous Grade)	
Subtitle:	2: 5-ft Drop Inlets @ E-1	
By:	BC	
Date:	6/11/2014	
Input:	Variable:	Input:
Street Flow (cfs)	Q	11.0
Longitudinal Slope (ft/ft)	S _o	0.0077
Manning's Coefficient	n	0.016
Street Flow Velocity (fps)	V	2.90
Street Flow Depth (ft)	D	0.50
Street Cross Slope (ft/ft)	S _x	0.02
Grate Width (ft)	W	1.5
Grate Depression (in)	D _g	2.0
Length of Grate (ft)	L _g	2.5
Length of Curb Opening (ft)	L _c	5.00
Clogging Factor - Grate (%)	CF _g	50%
Clogging Factor - Curb (%)	CF _c	50%
Effective Grate Length (ft)	L _{ge}	1.3
Effective Curb Opening Length (ft)	L _{ce}	2.50
Output (Grate):	Equation:	Output (Grate):
¹ R _f - Frontal Flow Factor	1-0.09*(V-V _x) if V>V _x ; else Frontal Flow Factor=1	1.00
² V _o - Splash Over Velocity (fps)	V _x =p+q*L _g *r*L _{ge} ² +sy*L _{ge} ³ ; where p=0.30,q=4.85,r=1.31,sy=0.15 (for Vane Grate)	4.61
¹ E - Grate Flow Ratio	Frontal Flow/Side Flow	0.22
² Q _w - Frontal Flow (cfs)	Q _w = Q[1-(1-(W/T)) ^{2.67}]	2.45
¹ Q _s - Side Flow (cfs)	Q _s = Q-Q _w	8.551320869
T - Side Flow Spread (ft)	(D-D _g)/S _x	16.67
¹ R _s - Side Flow Factor	1/(1+(0.15*V ^{1.8})/(S _x *L _{ge} ^{2.3}))	0.03
¹ Q _{gi} - Intercepted Flow (cfs)	(R _f *E+R _s *(1-E))*Q	2.7
Output (Curb):	Equation:	Output (Curb):
¹ S _e - Equivalent Cross Slope (ft/ft)	S _x +S _g *E	0.045
Q _{sx} - Remaining Flow After Grate Interception (cfs)	Q-Q _{gi}	8.280
S _g - Gutter Cross Slope (ft/ft)	D _g /W	0.111
¹ L _t - Effective Interception Length (ft)	0.60*Q _{sx} ^{0.42} *S _o ^{0.30} *(1/n*S _e) ^{0.6}	26.11
¹ Q _{ci} - Intercepted Flow (cfs)	(1-(1-L _{ce} /L _t) ^{1.8})*Q _{sx} or Q _{sx} if L _t is less than L _{ce}	1.4
Output (Combination):		Output (Combination):
Total Intercepted Flow (cfs)	Intercepted (Grate) + Intercepted (Curb)	4.1
¹ Formula referenced from the CCRFCD Manual		
² Formula referenced from FHWA Urban Drainage Design Manual (HEC-22)		

Project:	Skye Canyon Parcel 1.3	
Title:	Type CM2 Drop Inlet (Continuous Grade)	
Subtitle:	2: 10-ft Drop Inlet @ A-1	
By:	BC	
Date:	6/11/2014	
Input:	Variable:	Input:
Street Flow (cfs)	Q	29.5
Longitudinal Slope (ft/ft)	S_o	0.0214
Manning's Coefficient	n	0.016
Street Flow Velocity (fps)	V	5.32
Street Flow Depth (ft)	D	0.54
Street Cross Slope (ft/ft)	S_x	0.02
Grate Width (ft)	W	1.5
Grate Depression (in)	D_g	2.0
Length of Grate (ft)	L_g	7.5
Length of Curb Opening (ft)	L_c	10.00
Clogging Factor - Grate (%)	CF_g	50%
Clogging Factor - Curb (%)	CF_c	50%
Effective Grate Length (ft)	L_{ge}	3.8
Effective Curb Opening Length (ft)	L_{ce}	5.00
Output (Grate):	Equation:	Output (Grate):
¹ R_f - Frontal Flow Factor	$1-0.09*(V-V_x)$ if $V>V_x$; else Frontal Flow Factor=1	1.00
² V_o - Splash Over Velocity (fps)	$V_x=p+q*L_g-r*L_{ge}^2+sy*L_{ge}^3$; where $p=0.30, q=4.85, r=1.31, sy=0.15$ (for Vane Grate)	7.98
¹ E - Grate Flow Ratio	Frontal Flow/Side Flow	0.20
² Q_w - Frontal Flow (cfs)	$Q_w = Q[1-(1-(W/T))^{2.67}]$	5.91
¹ Q_s - Side Flow (cfs)	$Q_s = Q - Q_w$	23.6
T - Side Flow Spread (ft)	$(D-D_g)/S_x$	18.67
¹ R_s - Side Flow Factor	$1/(1+(0.15*V^{1.8})/(S_x*L_{ge}^{2.3}))$	0.12
¹ Q_{gi} - Intercepted Flow (cfs)	$(R_f*E+R_s*(1-E))*Q$	8.8
Output (Curb):	Equation:	Output (Curb):
¹ S_e - Equivalent Cross Slope (ft/ft)	S_x+S_g*E	0.042
Q_{sx} - Remaining Flow After Grate Interception (cfs)	$Q-Q_{gi}$	20.735
S_g - Gutter Cross Slope (ft/ft)	D_g/W	0.111
¹ L_t - Effective Interception Length (ft)	$0.60*Q_{sx}^{0.42}*S_o^{0.30}*(1/n*S_e)^{0.6}$	53.98
¹ Q_{ci} - Intercepted Flow (cfs)	$(1-(1-L_{ce}/L_t)^{1.8})*Q_{sx}$ or Q_{sx} if L_t is less than L_{ce}	3.3
Output (Combination):		Output (Combination):
Total Intercepted Flow (cfs)	Intercepted (Grate) + Intercepted (Curb)	12.1
¹ Formula referenced from the CCRFCD Manual		
² Formula referenced from FHWA Urban Drainage Design Manual (HEC-22)		

Project:	Skye Canyon Parcel 1.3	
Title:	Type CM2 Drop Inlet (SUMP)	
Subtitle:	20-ft Drop Inlet @ End of Street 3C	
By:	BC	
Date:	6/11/2014	
Input:	Variable:	Input:
Depth at Inlet (ft)	D	0.83
Grate Width (ft)	W	1.50
Length of Grate (ft)	L_g	17.50
Length of Curb Opening (ft)	L_c	20.00
Height of Curb Opening (ft)	H	0.500
Weir Coef. - Curb Opening	W_c	2.3
Weir Coef. - Grate	W_g	3.0
Orifice Coef.	O_c	0.67
Grate Coef.	G_c	0.60
Clogging Factor - Grate (%)	CF_g	50
Clogging Factor - Curb (%)	CF_c	50
Output (Grate):	Equation:	Output (Grate):
Effective Weir Length (ft)	$2*W+L_g$	20.50
Adjusted Effective Weir Length (ft)	$2*(1-CF_g/100)*W+(1-CF_g/100)*L_g$	10.25
Grate Open Area (sf)	$W*L_g$	26.25
Adjusted Grate Open Area (sf)	Grate Open Area * $G_c*(1-CF_g/100)$	7.88
Controlling Flow Type (weir/orifice)	If $D < 1.792*(Adj. \text{ Grate Open Area}/Adj. \text{ Eff. Length})$ use weir, else orifice	weir
Intercepted Flow (cfs)	weir: $W_g*(Adj. \text{ Eff. Weir Length})*D^{1.5}$	23.4
	orifice: $O_c*(Adj. \text{ Grate Open Area})*(64.4*D)^{0.5}$	
Output (Curb):	Equation:	Output (Curb):
Effective Weir Length (ft)	$L+1.8*W$	22.70
Adjusted Effective Weir Length (ft)	$L+1.8(1-CF_c/100)*W$	21.41
Curb Open Area (sf)	$L*H$	10.00
Adjusted Curb Open Area (sf)	Curb Open Area * $(1-CF_c/100)$	5.00
Controlling Flow Type (weir/orifice)	If $D < H$, weir, else orifice	orifice
Intercepted Flow (cfs)	weir: $W_c*(Adj. \text{ Eff. Weir Length})*D^{1.5}$	24.48
	orifice: $O_c*(Adj. \text{ Curb Open Area})*(64.4*(D-H/2))^{0.5}$	
Output (Combination):		Output (Combination):
Total Intercepted Flow (cfs)	Intercepted (Grate) + Intercepted (Curb)	47.9
	Actual Flow Intercepted:	44.0

Project:	Skye Canyon Parcel 1.3	
Title:	Type CM2 Drop Inlet (Continuous Grade)	
Subtitle:	2: Ex. 10-ft Drop Inlet: Conquistador @ Section SC2	
By:	BC	
Date:	6/11/2014	
Input:	Variable:	Input:
Street Flow (cfs)	Q	3.0
Longitudinal Slope (ft/ft)	S _o	0.0192
Manning's Coefficient	n	0.016
Street Flow Velocity (fps)	V	3.20
Street Flow Depth (ft)	D	0.32
Street Cross Slope (ft/ft)	S _x	0.02
Grate Width (ft)	W	1.5
Grate Depression (in)	D _g	2.0
Length of Grate (ft)	L _g	7.5
Length of Curb Opening (ft)	L _c	10.00
Clogging Factor - Grate (%)	CF _g	50%
Clogging Factor - Curb (%)	CF _c	50%
Effective Grate Length (ft)	L _{ge}	3.8
Effective Curb Opening Length (ft)	L _{ce}	5.00
Output (Grate):	Equation:	Output (Grate):
¹ R _f - Frontal Flow Factor	1-0.09*(V-V _x) if V>V _x ; else Frontal Flow Factor=1	1.00
² V _o - Splash Over Velocity (fps)	V _x =p+q*L _g -r*L _{ge} ² +sy*L _{ge} ³ ; where p=0.30,q=4.85,r=1.31,sy=0.15 (for Vane Grate)	7.98
¹ E - Grate Flow Ratio	Frontal Flow/Side Flow	0.44
² Q _w - Frontal Flow (cfs)	Q _w = Q[1-(1-(W/T)) ^{2.67}]	1.32
¹ Q _s - Side Flow (cfs)	Q _s = Q-Q _w	1.7
T - Side Flow Spread (ft)	(D-D _g)/S _x	7.67
¹ R _s - Side Flow Factor	1/(1+(0.15*V ^{1.8})/(S _x *L _{ge} ^{2.3}))	0.26
¹ Q _{gi} - Intercepted Flow (cfs)	(R _f *E+R _s *(1-E))*Q	1.8
Output (Curb):	Equation:	Output (Curb):
¹ S _e - Equivalent Cross Slope (ft/ft)	S _x +S _g *E	0.069
Q _{sx} - Remaining Flow After Grate Interception (cfs)	Q-Q _{gi}	1.249
S _g - Gutter Cross Slope (ft/ft)	D _g /W	0.111
¹ L _t - Effective Interception Length (ft)	0.60*Q _{sx} ^{0.42} *S _o ^{0.30} *(1/n*S _e) ^{0.6}	11.97
¹ Q _{ci} - Intercepted Flow (cfs)	(1-(1-L _{ce} /L _t) ^{1.8})*Q _{sx} or Q _{sx} if L _t is less than L _{ce}	0.8
Output (Combination):		Output (Combination):
Total Intercepted Flow (cfs)	Intercepted (Grate) + Intercepted (Curb)	2.5
¹ Formula referenced from the CCRFCD Manual		
² Formula referenced from FHWA Urban Drainage Design Manual (HEC-22)		

APPENDIX E

Storm Drain WSPG Analyses

Conquistador Storm Drain (CSTrunk)

CSTrunk

01
T1 SKYE CANYON PARCEL 1.3
T2 BY OLYMPIA COMPANIES
T3 CONQUISTADOR (SOUTH) - TRUNK STORM DRAIN REVISED FOR FLOW CHANGES
SO 1000.002771.79 42 2773.8
R 1057.502772.60 42 .013 45. 1
JX 1057.502773.10 36 18 18.013 2.5 2.52774.602774.60 45.00 45.00
R 1354.002778.75 36 .013 5. 1
R 1417.002779.97 36 .013 5. 1
JX 1417.002779.97 36 30 .013 68.0 2780.47 70.00
R 1571.002782.90 36 .013 5. 1
R 1679.002784.97 36 .013 5. 1
JX 1679.002784.97 36 24 24.013 6.0 6.02785.972785.97 45.00 45.00
R 1750.002786.32 36 .013 60. 1
R 1844.002789.14 36 .013
SH 1844.002789.14 36
CD 18 4 1.5
CD 24 4 2.
CD 30 4 2.5
CD 36 4 3.
CD 42 4 3.5
CD 48 4 4.
□

CSTrunk

0
Q
□□

21.

CSTRUNK

DATE: 6/26/2014
TIME: 13:32

PAGE 1

F0515P
WATER SURFACE PROFILE - CHANNEL DEFINITION LISTING

CARD CODE	SECT NO	CHN TYPE	NO OF PIERS	AVE PIER WIDTH	HEIGHT 1 DIAMETER	BASE WIDTH	ZL	ZR	INV	Y(1)	Y(2)	Y(3)	Y(4)	Y(5)	Y(6)	Y(7)	Y(8)	Y(9)	Y(10)
CD	18	4			1.50														
CD	24	4			2.00														
CD	30	4			2.50														
CD	36	4			3.00														
CD	42	4			3.50														
CD	48	4			4.00														

PAGE NO 3

F 0 5 1 5 P

WATER SURFACE PROFILE - TITLE CARD LISTING

HEADING LINE NO 1 IS -

SKYE CANYON PARCEL 1.3

HEADING LINE NO 2 IS -

BY OLYMPIA COMPANIES

HEADING LINE NO 3 IS -

CONQUISTADOR (SOUTH) - TRUNK STORM DRAIN REVISED FOR FLOW CHANGES
F 0 5 1 5 P

PAGE NO 2

WATER SURFACE PROFILE - ELEMENT CARD LISTING

ELEMENT NO	1 IS A SYSTEM OUTLET U/S DATA	STATION	INVERT	SECT	W S ELEV
		1000.00	2771.79	42	2773.80
ELEMENT NO	2 IS A REACH U/S DATA	STATION	INVERT	SECT	
		1057.50	2772.60	42	
ELEMENT NO	3 IS A JUNCTION U/S DATA	STATION	INVERT	SECT	
		1057.50	2773.10	36	
ELEMENT NO	4 IS A REACH U/S DATA	STATION	INVERT	SECT	
		1354.00	2778.75	36	
ELEMENT NO	5 IS A REACH U/S DATA	STATION	INVERT	SECT	
		1417.00	2779.97	36	
ELEMENT NO	6 IS A JUNCTION U/S DATA	STATION	INVERT	SECT	
		1417.00	2779.97	36	

Page 1

CSTRUNK

THE ABOVE ELEMENT CONTAINED AN INVERT ELEV WHICH WAS NOT GREATER THAN THE PREVIOUS INVERT ELEV -WARNING
 THE ABOVE ELEMENT CONTAINED AN INVERT ELEV WHICH WAS NOT GREATER THAN THE PREVIOUS INVERT ELEV -WARNING

ELEMENT NO	7 IS A REACH U/S DATA	* STATION 1571.00	* INVERT 2782.90	* SECT. 36	N 0.013	RADIUS 0.00	ANGLE 0.00	ANG PT 5.00	MAN H 1
ELEMENT NO	8 IS A REACH U/S DATA	* STATION 1679.00	* INVERT 2784.97	* SECT 36	N 0.013	RADIUS 0.00	ANGLE 0.00	ANG PT 5.00	MAN H 1

ELEMENT NO	9 IS A JUNCTION U/S DATA	* STATION 1679.00	* INVERT 2784.97	* SECT 36	N 0.013	RADIUS 0.00	ANGLE 0.00	ANG PT 5.00	MAN H 1
ELEMENT NO	9 IS A JUNCTION U/S DATA	* STATION 1679.00	* INVERT 2784.97	* SECT 36	N 0.013	RADIUS 0.00	ANGLE 0.00	ANG PT 5.00	MAN H 1

THE ABOVE ELEMENT CONTAINED AN INVERT ELEV WHICH WAS NOT GREATER THAN THE PREVIOUS INVERT ELEV -WARNING
 THE ABOVE ELEMENT CONTAINED AN INVERT ELEV WHICH WAS NOT GREATER THAN THE PREVIOUS INVERT ELEV -WARNING
 F 0 5 1 5 P

PAGE NO 3

WATER SURFACE PROFILE - ELEMENT CARD LISTING

ELEMENT NO	10 IS A REACH U/S DATA	* STATION 1750.00	* INVERT 2786.32	* SECT 36	N 0.013	RADIUS 0.00	ANGLE 0.00	ANG PT 60.00	MAN H 1
ELEMENT NO	11 IS A REACH U/S DATA	* STATION 1844.00	* INVERT 2789.14	* SECT 36	N 0.013	RADIUS 0.00	ANGLE 0.00	ANG PT 0.00	MAN H 0

ELEMENT NO	12 IS A SYSTEM HEADWORKS U/S DATA	* STATION 1844.00	* INVERT 2789.14 <th>* SECT 36</th> <th>N 0.013</th> <th>RADIUS 0.00</th> <th>ANGLE 0.00</th> <th>ANG PT 0.00</th> <th>MAN H 0</th>	* SECT 36	N 0.013	RADIUS 0.00	ANGLE 0.00	ANG PT 0.00	MAN H 0
ELEMENT NO	12 IS A SYSTEM HEADWORKS U/S DATA	* STATION 1844.00	* INVERT 2789.14	* SECT 36	N 0.013	RADIUS 0.00 <td>ANGLE 0.00</td> <td>ANG PT 0.00</td> <td>MAN H 0</td>	ANGLE 0.00	ANG PT 0.00	MAN H 0

W S ELEV
0.00

NO EDIT ERRORS ENCOUNTERED-COMPUTATION IS NOW BEGINNING
 ** WARNING NO. 2 ** - WATER SURFACE ELEVATION GIVEN IS LESS THAN OR EQUALS INVERT ELEVATION IN HDWKDS, W.S.ELEV = INV + DC 0
 LICENSEE: SLATER HANIFAN GROUP F0515P

PAGE 1

WATER SURFACE PROFILE LISTING

SKYE CANYON PARCEL 1.3
 BY OLYMPIA COMPANIES
 CONQUISTADOR (SOUTH) - TRUNK STORM DRAIN REVISED FOR FLOW CHANGES

STATION	INVERT ELEV	DEPTH OF FLOW	W.S. ELEV	Q	VEL	VEL HEAD	ENERGY GRD.EL.	SUPER ELEV	CRITICAL DEPTH	HGT/ DIA	BASE/ ID NO.	ZL PIER	NO AVBPR
1000.00	2771.79	2.348	2774.138	106.0	15.45	3.704	2777.842	0.00	3.132	3.50	0.00	0.00	0 0.00
0.09	0.01409					.017750	0.00					0.00	
1000.09	2771.79	2.348	2774.139	106.0	15.45	3.705	2777.844	0.00	3.132	3.50	0.00	0.00	0 0.00
57.41	0.01409					.018865	1.08					0.00	
1057.50	2772.60	2.252	2774.852	106.0	16.20	4.075	2778.927	0.00	3.132	3.50	0.00	0.00	0 0.00
JUNCT STR	0.00000					.020037	0.00					0.00	

Page 2

1057.50	2773.10	2.899	2775.999	101.0	14.44	3.237	2779.236	0.00	2.899	3.00	0.00	0.00	0.00
14.97	0.01906					.021337	0.32			3.000	0.00		
1072.47	2773.39	3.000	2776.385	101.0	14.29	3.170	2779.555	0.00	2.899	3.00	0.00	0.00	
281.53	0.01906					.022753	6.41			3.000	0.00		
1354.00	2778.75	4.241	2782.991	101.0	14.29	3.170	2786.161	0.00	2.899	3.00	0.00	0.00	
63.00	0.01937					.022930	1.44			3.000	0.00		
1417.00	2779.97	4.677	2784.647	101.0	14.29	3.170	2787.817	0.00	2.899	3.00	0.00	0.00	
JUNCT STR 0.00000													
1417.00	2779.97	8.925	2788.895	33.0	4.67	0.338	2789.233	0.00	1.865	3.00	0.00	0.00	
154.00	0.01903					.002448	0.38			1.241	0.00		
1571.00	2782.90	6.394	2789.294	33.0	4.67	0.338	2789.632	0.00	1.865	3.00	0.00	0.00	
108.00	0.01917					.002448	0.26			1.240	0.00		
1679.00	2784.97	4.611	2789.581	33.0	4.67	0.338	2789.919	0.00	1.865	3.00	0.00	0.00	
JUNCT STR 0.00000													
1679.00	2784.97	4.943	2789.913	21.0	2.97	0.137	2790.050	0.00	1.472	3.00	0.00	0.00	
71.00	0.01901					.000991	0.07			0.973	0.00		

LICENSEE: SLATER HANIFAN GROUP

SKYE CANYON PARCEL 1.3
BY OLYMPIA COMPANIES
CONQUISTADOR (SOUTH) - TRUNK STORM DRAIN REVISED FOR FLOW CHANGES

WATER SURFACE PROFILE LISTING

STATION	INVERT ELEV	DEPTH OF FLOW	W.S. ELEV	Q	VEL	VEL HEAD	ENERGY GRD. EL.	SUPER ELEV	CRITICAL DEPTH	HGT/ DIA	BASE/ ID NO.	ZL NO PIER	AVBPR
L/ELEM ***** SO ***** SF AVE HF ***** NORM DEPTH ***** ZR *****													
1750.00	2786.32	3.697	2790.017	21.0	2.97	0.137	2790.154	0.00	1.472	3.00	0.00	0.00	0.00
24.04	0.03000					.000983	0.02			0.865	0.00		
1774.04	2787.04	3.000	2790.041	21.0	2.97	0.137	2790.178	0.00	1.472	3.00	0.00	0.00	0.00
9.08	0.03000					.000922	0.01			0.865	0.00		
1783.12	2787.31	2.721	2790.035	21.0	3.12	0.151	2790.186	0.00	1.472	3.00	0.00	0.00	0.00
5.02	0.03000					.000898	0.00			0.865	0.00		
1788.14	2787.46	2.560	2790.024	21.0	3.27	0.166	2790.190	0.00	1.472	3.00	0.00	0.00	0.00

[illegible]

South Stub Tie-In

South Stub Tie in to DI in 3G

Entry

0

T1 SKYE CANYON - PHASE 1.3

T2 BY OLYMPIA COMPANIES

T3 CONQUISTADOR (SOUTH) - SOUTH STUB TIE IN TO DI IN 3G

SO	1000.002786.32	36			2790.017				
R	1093.952789.14	36		.013				60.00	1
JX	1093.952790.64	18	18	18.013	4.0	4.02790.642790.64	45.00	90.00	
R	1203.622792.17	18		.013				45.00	1
SH	1203.622792.17	18							
CD	18	4						1.5	
CD	24	4						2.	
CD	30	4						2.5	
CD	36	4						3.	
CD	42	4						3.5	
CD	48	4						4.	

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Q
□□

13.

Entry

DATE: 6/26/2014
TIME: 14:24

ENTRY

F0515P
WATER SURFACE PROFILE - CHANNEL DEFINITION LISTING

PAGE 1

CARD NO	SECT NO	CHN TYPE	NO OF PIERS	AVE PIER WIDTH	HEIGHT 1 DIAMETER	BASE WIDTH	ZL	ZR	INV	Y(1)	Y(2)	Y(3)	Y(4)	Y(5)	Y(6)	Y(7)	Y(8)	Y(9)	Y(10)
CD	18	4			1.50														
CD	24	4			2.00														
CD	30	4			2.50														
CD	36	4			3.00														
CD	42	4			3.50														
CD	48	4			4.00														

F 0 5 1 5 P

PAGE NO 3

WATER SURFACE PROFILE - TITLE CARD LISTING

HEADING LINE NO 1 IS -

SKYE CANYON - PHASE 1.3

HEADING LINE NO 2 IS -

BY OLYMPIA COMPANIES

HEADING LINE NO 3 IS -

CONQUISTADOR (SOUTH) - SOUTH STUB TIE IN TO DI IN 3G
F 0 5 1 5 P

PAGE NO 2

WATER SURFACE PROFILE - ELEMENT CARD LISTING

ELEMENT NO	1 IS A SYSTEM OUTLET U/S DATA	STATION	INVERT	SECT	W S ELEV
		1000.00	2786.32	36	2790.01
ELEMENT NO	2 IS A REACH U/S DATA	STATION	INVERT	SECT	RADIUS
		1093.95	2789.14	36	0.00
ELEMENT NO	3 IS A JUNCTION U/S DATA	STATION	INVERT	SECT	ANGLE
		1093.95	2790.64	18	0.00
ELEMENT NO	4 IS A REACH U/S DATA	STATION	INVERT	SECT	ANGLE
		1203.62	2792.17	18	0.00
ELEMENT NO	5 IS A SYSTEM HEADWORKS U/S DATA	STATION	INVERT	SECT	ANGLE
		1203.62	2792.17	18	0.00

NO EDIT ERRORS ENCOUNTERED-COMPUTATION IS NOW BEGINNING
** WARNING NO. 2 ** - WATER SURFACE ELEVATION GIVEN IS LESS THAN OR EQUALS INVERT ELEVATION IN HDWKDS, W.S.ELEV = INV + DC 0
LICENSEE: SLATER HANIFAN GROUP F0515P WATER SURFACE PROFILE LISTING

SKYE CANYON - PHASE 1.3
BY OLYMPIA COMPANIES
CONQUISTADOR (SOUTH) - SOUTH STUB TIE IN TO DI IN 3G

[illegible]

NOTES

1. GLOSSARY
- | | | | |
|---|---|----------|-------------------|
| I | = | INVERT | ELEVATION |
| C | = | CRITICAL | DEPTH |
| W | = | WATER | SURFACE ELEVATION |
| H | = | HEIGHT | OF CHANNEL |
| E | = | ENERGY | GRADE LINE |
| X | = | CURVES | CROSSING OVER |
| B | = | BRIDGE | ENTRANCE OR EXIT |
| Y | = | WALL | ENTRANCE OR EXIT |
2. STATIONS FOR POINTS A A JUN

South Stub Tie in to DI North in Entry

Entry_N

0
T1 SKYE CANYON - PHASE 1.3
T2 BY OLYMPIA COMPANIES
T3 CONQUISTADOR (SOUTH) - SOUTH STUB TO ENTRY DI NORTH
SO 1000.002786.32 36 2790.017
R 1093.952789.14 36 .013 60.00 1
JX 1093.952790.64 18 18 18.013 13.0 4.02790.642790.64 45.00 45.00
R 1135.432794.44 18 .013 90.00 1
SH 1135.432794.44 18
CD 18 4 1.5
CD 24 4 2.
CD 30 4 2.5
CD 36 4 3.
CD 42 4 3.5
CD 48 4 4.
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Q
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4.

Entry_N

DATE: 6/26/2014
TIME: 14:24

ENTRY_N

F0515P
WATER SURFACE PROFILE - CHANNEL DEFINITION LISTING

PAGE 1

CARD CODE	SECT NO	CHN TYPE	NO OF PIERS	AVE WIDTH	PIER DIAMETER	HEIGHT 1 WIDTH	ZL	ZR	INV DROP	Y(1)	Y(2)	Y(3)	Y(4)	Y(5)	Y(6)	Y(7)	Y(8)	Y(9)	Y(10)
CD	18	4				1.50													
CD	24	4				2.00													
CD	30	4				2.50													
CD	36	4				3.00													
CD	42	4				3.50													
CD	48	4				4.00													

F 0 5 1 5 P

PAGE NO 3

WATER SURFACE PROFILE - TITLE CARD LISTING

HEADING LINE NO 1 IS -

SKYE CANYON - PHASE 1.3

HEADING LINE NO 2 IS -

BY OLYMPIA COMPANIES

HEADING LINE NO 3 IS -

CONQUISTADOR (SOUTH) - SOUTH STUB TO ENTRY DI NORTH
F 0 5 1 5 P

PAGE NO 2

WATER SURFACE PROFILE - ELEMENT CARD LISTING

ELEMENT NO	1	IS A SYSTEM OUTLET	STATION	INVERT	SECT																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											</
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NO EDIT ERRORS ENCOUNTERED-COMPUTATION IS NOW BEGINNING
** WARNING NO. 2 ** - WATER SURFACE ELEVATION GIVEN IS LESS THAN OR EQUALS INVERT ELEVATION IN HDWKDS, W.S.ELEV = INV + DC 0
LICENSEE: SLATER HANIFAN GROUP F0515P WATER SURFACE PROFILE LISTING

SKYE CANYON - PHASE 1.3
BY OLYMPIA COMPANIES
CONQUISTADOR (SOUTH) - SOUTH STUB TO ENTRY DI NORTH

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

1000.00	2786.32	3.690	2790.010	21.0	2.97	0.137	2790.147	0.00	1.472		3.00	0.00	0.00	0	0.00
24.77	0.03002					.000983	0.02			0.864			0.00		
1024.77	2787.06	3.000	2790.063	21.0	2.97	0.137	2790.200	0.00	1.472		3.00	0.00	0.00	0	0.00
9.08	0.03002					.000922	0.01			0.864			0.00		
1033.85	2787.34	2.721	2790.057	21.0	3.12	0.151	2790.208	0.00	1.472		3.00	0.00	0.00	0	0.00
5.01	0.03002					.000898	0.00			0.864			0.00		
1038.86	2787.49	2.560	2790.046	21.0	3.27	0.166	2790.212	0.00	1.472		3.00	0.00	0.00	0	0.00
4.01	0.03002					.000972	0.00			0.864			0.00		
1042.87	2787.61	2.427	2790.034	21.0	3.43	0.182	2790.216	0.00	1.472		3.00	0.00	0.00	0	0.00
3.41	0.03002					.001069	0.00			0.864			0.00		
1046.28	2787.71	2.310	2790.019	21.0	3.59	0.201	2790.220	0.00	1.472		3.00	0.00	0.00	0	0.00
2.72	0.03002					.001187	0.00			0.864			0.00		
1049.00	2787.79	2.205	2789.996	21.0	3.77	0.221	2790.217	0.00	1.472		3.00	0.00	0.00	0	0.00
HYDRAULIC JUMP															
1049.00	2787.79	0.940	2788.731	21.0	11.09	1.909	2790.640	0.00	1.472		3.00	0.00	0.00	0	0.00
6.31	0.03002					.021410	0.14			0.864			0.00		
1055.31	2787.98	0.950	2788.930	21.0	10.93	1.854	2790.784	0.00	1.472		3.00	0.00	0.00	0	0.00
13.09	0.03002					.019668	0.26			0.864			0.00		
1068.40	2788.37	0.983	2789.356	21.0	10.42	1.685	2791.041	0.00	1.472		3.00	0.00	0.00	0	0.00
9.24	0.03002					.017228	0.16			0.864			0.00		
1077.64	2788.65	1.018	2789.668	21.0	9.93	1.531	2791.199	0.00	1.472		3.00	0.00	0.00	0	0.00
6.92	0.03002					.015096	0.10			0.864			0.00		

SKYE CANYON - PHASE 1.3
BY OLYMPIA COMPANIES
CONQUISTADOR (SOUTH) - SOUTH STUB TO ENTRY DI NORTH

SKYE CANYON - PHASE 1.3

SKILL CENTER - PHASE 1
BY OLYMPIA COMPANIES
CONQUISTADOR (SOUTH) - SOUTH STUB TO ENTRY DI NORTH

L/ELEM	SO	SF AVE	HF	NORM DEPTH	ZR
*	*	*	*	*	*

ENTRY_N	1.392	2791.304	0.00	1.472	3.00	0.00	0.00	0.00
1084.56	2788.86	1.054	2789.912	21.0	9.47	1.392	2791.304	0.00
5.27	0.03002					.013233	0.07	
1089.83	2789.02	1.092	2790.108	21.0	9.03	1.266	2791.374	0.00
4.12	0.03002					.011605	0.05	
1093.95	2789.14	1.131	2790.271	21.0	8.61	1.150	2791.421	0.00
JUNCT STR	0.00000					.046740	0.00	
1093.95	2790.64	0.369	2791.009	4.0	11.87	2.188	2793.197	0.00
10.16	0.09161					.078709	0.80	
1104.11	2791.57	0.377	2791.948	4.0	11.46	2.040	2793.988	0.00
8.00	0.09161					.070097	0.56	
1112.11	2792.30	0.390	2792.694	4.0	10.93	1.855	2794.549	0.00
5.10	0.09161					.061346	0.31	
1117.21	2792.77	0.404	2793.175	4.0	10.42	1.685	2794.860	0.00
3.66	0.09161					.053700	0.20	
1120.87	2793.11	0.418	2793.524	4.0	9.93	1.530	2795.054	0.00
2.78	0.09161					.047009	0.13	
1123.65	2793.36	0.433	2793.794	4.0	9.46	1.389	2795.183	0.00
2.21	0.09161					.041160	0.09	
1125.86	2793.56	0.448	2794.012	4.0	9.03	1.266	2795.278	0.00
1.80	0.09161					.036012	0.06	
1127.66	2793.73	0.463	2794.191	4.0	8.60	1.149	2795.340	0.00
1.46	0.09161					.031532	0.05	

LICENSEE: SLATER HANIFAN GROUP

WATER SURFACE PROFILE LISTING

SKYE CANYON - PHASE 1.3
BY OLYMPIA COMPANIES
CONQUISTADOR (SOUTH) - SOUTH STUB TO ENTRY DI NORTH

STATION	INVERT ELEV	DEPTH OF FLOW	W.S. ELEV	Q	VEL	VEL HEAD	ENERGY GRD.EL.	SUPER ELEV	CRITICAL DEPTH	HGT/DIA	BASE/ID NO.	ZL	NO PIER	AVBPR
1129.12	2793.86	0.480	2794.342	4.0	8.20	1.043	2795.385	0.00	0.766	1.50	0.00	0.00	0	0.00
1.22	0.09161					.027636	0.03							
1130.34	2793.97	0.497	2794.470	4.0	7.83	0.951	2795.421	0.00	0.766	1.50	0.00	0.00	0	0.00

NORM DEPTH

ZR

STATION	INVERT ELEV	DEPTH OF FLOW	W.S. ELEV	Q	VEL	VEL HEAD	ENERGY GRD. EL.	SUPER ELEV	CRITICAL DEPTH	NORM DEPTH	HGT/DIA	BASE/ID NO.	ZL	NO PIER	AVBPR	
1.02	0.09161															
1131.36	2794.07	0.514	2794.581	4.0	7.46	0.865	2795.446	0.00	0.766	0.360	1.50	0.00	0.00	0	0.00	
0.86	0.09161						0.02			0.360						
1132.22	2794.15	0.532	2794.678	4.0	7.10	0.784	2795.462	0.00	0.766	0.360	1.50	0.00	0.00	0	0.00	
0.72	0.09161						0.01			0.360						
1132.94	2794.21	0.551	2794.763	4.0	6.78	0.714	2795.477	0.00	0.766	0.360	1.50	0.00	0.00	0	0.00	
0.60	0.09161						0.01			0.360						
1133.54	2794.27	0.571	2794.837	4.0	6.46	0.648	2795.485	0.00	0.766	0.360	1.50	0.00	0.00	0	0.00	
0.49	0.09161						0.01			0.360						
1134.03	2794.31	0.592	2794.903	4.0	6.16	0.590	2795.493	0.00	0.766	0.360	1.50	0.00	0.00	0	0.00	
0.40	0.09161						0.01			0.360						
1134.43	2794.35	0.614	2794.962	4.0	5.87	0.536	2795.498	0.00	0.766	0.360	1.50	0.00	0.00	0	0.00	
0.33	0.09161						0.00			0.360						
1134.76	2794.38	0.636	2795.014	4.0	5.60	0.487	2795.501	0.00	0.766	0.360	1.50	0.00	0.00	0	0.00	
0.26	0.09161						0.00			0.360						
1135.02	2794.40	0.659	2795.061	4.0	5.34	0.443	2795.504	0.00	0.766	0.360	1.50	0.00	0.00	0	0.00	
0.18	0.09161						0.00			0.360						
1135.20	2794.42	0.684	2795.103	4.0	5.10	0.403	2795.506	0.00	0.766	0.360	1.50	0.00	0.00	0	0.00	
0.13	0.09161						0.00			0.360						

LICENSEE: SLATER HANIFAN GROUP

SKYE CANYON - PHASE 1.3
BY OLYMPIA COMPANIES
CONQUISTADOR (SOUTH) - SOUTH STUB TO ENTRY DI NORTH

WATER SURFACE PROFILE LISTING

PAGE 4

L/ELEM	SO	STATION	INVERT ELEV	DEPTH OF FLOW	W.S. ELEV	Q	VEL	VEL HEAD	ENERGY GRD. EL.	SUPER ELEV	CRITICAL DEPTH	NORM DEPTH	HGT/DIA	BASE/ID NO.	ZL	NO PIER	AVBPR
1135.33	2794.43	0.710	2795.141	4.0	4.85	0.366	2795.507	0.00	0.766	0.360	1.50	0.00	0.00	0	0.00		
0.08	0.09161						0.00										
1135.41	2794.44	0.736	2795.175	4.0	4.63	0.333	2795.508	0.00	0.766	0.360	1.50	0.00	0.00	0	0.00		
0.02	0.09161						0.00										
1135.43	2794.44	0.766	2795.206	4.0	4.41	0.301	2795.507	0.00	0.766	0.360	1.50	0.00	0.00	0	0.00		

SKYE CANYON - PHASE 1.3
BY OLYMPIA COMPANIES

ENTRY N

Page 5

South Stub Tie in to DI South in Entry

Entry_S

0

T1 SKYE CANYON - PHASE 1.3

T2 BY OLYMPIA COMPANIES

T3 CONQUISTADOR (SOUTH) - SOUTH STUB TO ENTRY DI SOUTH

SO 1000.002786.32 36 2790.017

R 1093.952789.14 36 .013 60.00 1

JX 1093.952790.64 18 18 18.013 4.0 13.02790.642790.64 90.00 45.00

R 1115.682794.54 18 .013 45.00 1

SH 1115.682794.54 18

CD 18 4 1.5

CD 24 4 2.

CD 30 4 2.5

CD 36 4 3.

CD 42 4 3.5

CD 48 4 4.

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Entry_S

0
Q
00

4.

ENTRY_S

DATE: 6/26/2014
TIME: 14:25

F0515P
WATER SURFACE PROFILE - CHANNEL DEFINITION LISTING

CARD CODE	SECT NO	CHN TYPE	NO OF PIERS	AVE WIDTH	PIER WIDTH	HEIGHT 1 DIAMETER	BASE WIDTH	ZL	ZR	INV DROP	Y(1)	Y(2)	Y(3)	Y(4)	Y(5)	Y(6)	Y(7)	Y(8)	Y(9)	Y(10)	PAGE
CD	18	4				1.50															1
CD	24	4				2.00															
CD	30	4				2.50															
CD	36	4				3.00															
CD	42	4				3.50															
CD	48	4				4.00															

F 0 5 1 5 P

PAGE NO 3

WATER SURFACE PROFILE - TITLE CARD LISTING

HEADING LINE NO 1 IS -

SKYE CANYON - PHASE 1.3

HEADING LINE NO 2 IS -

BY OLYMPIA COMPANIES

HEADING LINE NO 3 IS -

CONQUISTADOR (SOUTH) - SOUTH STUB TO ENTRY DI SOUTH
F 0 5 1 5 P

PAGE NO 2

WATER SURFACE PROFILE - ELEMENT CARD LISTING

ELEMENT NO	1 IS A SYSTEM OUTLET U/S DATA	STATION	INVERT	SECT	W S ELEV
		1000.00	2786.32	36	2790.01
ELEMENT NO	2 IS A REACH U/S DATA	STATION	INVERT	SECT	
		1093.95	2789.14	36	
ELEMENT NO	3 IS A JUNCTION U/S DATA	STATION	INVERT	SECT	
		1093.95	2790.64	18	
ELEMENT NO	4 IS A REACH U/S DATA	STATION	INVERT	SECT	
		1115.68	2794.54	18	
ELEMENT NO	5 IS A SYSTEM HEADWORKS U/S DATA	STATION	INVERT	SECT	
		1115.68	2794.54	18	

NO EDIT ERRORS ENCOUNTERED-COMPUTATION IS NOW BEGINNING
** WARNING NO. 2 ** - WATER SURFACE ELEVATION GIVEN IS LESS THAN OR EQUALS INVERT ELEVATION IN HDWKDS, W.S.ELEV = INV + DC 0
LICENSEE: SLATER HANIFAN GROUP

F0515P
WATER SURFACE PROFILE LISTING
Page 1

PAGE 1

SKYE CANYON - PHASE 1.3
BY OLYMPIA COMPANIES
CONQUISTADOR (SOUTH) - S

SKYE CANYON - PHASE 1.3
BY OLYMPIA COMPANIES
CONQUISTADOR (SOUTH) - SOUTH STUB TO ENTRY DI SOUTH

STATION	INVERT ELEV	DEPTH OF FLOW	W.S. ELEV	Q	VEL	VEL HEAD	ENERGY GRD.ELEV.	SUPER ELEV	CRITICAL DEPTH	NORM DEPTH	HGT/ DIA	BASE/ ID NO.	ZL	NO PIER	AVBPR													
L/ELEM	SO	*****													ZR	*****												
1000.00	2786.32	3.690	2790.010	21.0	2.97	0.137	2790.147	0.00	1.472		3.00	0.00	0.00	0	0.00													
24.77	0.03002					.000983	0.02			0.864			0.00															
1024.77	2787.06	3.000	2790.063	21.0	2.97	0.137	2790.200	0.00	1.472		3.00	0.00	0.00	0	0.00													
9.08	0.03002					.000922	0.01			0.864			0.00															
1033.85	2787.34	2.721	2790.057	21.0	3.12	0.151	2790.208	0.00	1.472		3.00	0.00	0.00	0	0.00													
5.01	0.03002					.000898	0.00			0.864			0.00															
1038.86	2787.49	2.560	2790.046	21.0	3.27	0.166	2790.212	0.00	1.472		3.00	0.00	0.00	0	0.00													
4.01	0.03002					.000972	0.00			0.864			0.00															
1042.87	2787.61	2.427	2790.034	21.0	3.43	0.182	2790.216	0.00	1.472		3.00	0.00	0.00	0	0.00													
3.41	0.03002					.001069	0.00			0.864			0.00															
1046.28	2787.71	2.310	2790.019	21.0	3.59	0.201	2790.220	0.00	1.472		3.00	0.00	0.00	0	0.00													
2.95	0.03002					.001187	0.00			0.864			0.00															
1049.23	2787.80	2.205	2790.003	21.0	3.77	0.221	2790.224	0.00	1.472		3.00	0.00	0.00	0	0.00													
1.04	0.03002					.001271	0.00			0.864			0.00															
1050.27	2787.83	2.176	2790.005	21.0	3.82	0.227	2790.232	0.00	1.472		3.00	0.00	0.00	0	0.00													
HYDRAULIC JUMP																												
1050.27	2787.83	0.958	2788.787	21.0	10.80	1.812	2790.599	0.00	1.472		3.00	0.00	0.00	0	0.00													
9.95	0.03002					.019040	0.19			0.864			0.00															
1060.22	2788.13	0.992	2789.119	21.0	10.29	1.644	2790.763	0.00	1.472		3.00	0.00	0.00	0	0.00													
8.56	0.03002					.016659	0.14			0.864			0.00															
1068.78	2788.39	1.027	2789.412	21.0	9.81	1.495	2790.907	0.00	1.472		3.00	0.00	0.00	0	0.00													
6.42	0.03002					.014600	0.09			0.864			0.00															
															PAGE	2												

F0515P
WATER SURFACE PROFILE LISTING

SKYE CANYON - PHASE 1.3
BY OLYMPIA COMPANIES

CONQUISTADOR (SOUTH) - SOUTH STUB TO ENTRY DI SOUTH

ENTRY_S

STATION	INVERT ELEV	DEPTH OF FLOW	W.S. ELEV	Q	VEL	VEL HEAD	SF AVE	HF GRD.EL.	SUPER ELEV	CRITICAL DEPTH	NORM DEPTH	HGT/ DIA	BASE/ ID NO.	ZL	NO PIER	AVBPR
L/ELEM	SO															
1075.20	2788.58	1.064	2789.641	21.0	9.35	1.359	2791.000	0.06	0.00	1.472	0.864	3.00	0.00	0.00	0	0.00
4.97	0.03002					.012800										
1080.17	2788.73	1.102	2789.828	21.0	8.92	1.235	2791.063	0.04	0.00	1.472	0.864	3.00	0.00	0.00	0	0.00
3.90	0.03002					.011222										
1084.07	2788.84	1.141	2789.984	21.0	8.51	1.123	2791.107	0.03	0.00	1.472	0.864	3.00	0.00	0.00	0	0.00
3.02	0.03002					.009841										
1087.09	2788.93	1.182	2790.116	21.0	8.11	1.021	2791.137	0.02	0.00	1.472	0.864	3.00	0.00	0.00	0	0.00
2.33	0.03002					.008635										
1089.42	2789.00	1.225	2790.229	21.0	7.73	0.928	2791.157	0.01	0.00	1.472	0.864	3.00	0.00	0.00	0	0.00
1.76	0.03002					.007581										
1091.18	2789.06	1.270	2790.327	21.0	7.37	0.844	2791.171	0.01	0.00	1.472	0.864	3.00	0.00	0.00	0	0.00
1.27	0.03002					.006659										
1092.45	2789.09	1.317	2790.412	21.0	7.03	0.767	2791.179	0.01	0.00	1.472	0.864	3.00	0.00	0.00	0	0.00
0.86	0.03002					.005852										
1093.31	2789.12	1.366	2790.487	21.0	6.70	0.697	2791.184	0.00	0.00	1.472	0.864	3.00	0.00	0.00	0	0.00
0.49	0.03002					.005145										
1093.80	2789.14	1.417	2790.553	21.0	6.39	0.634	2791.187	0.00	0.00	1.472	0.864	3.00	0.00	0.00	0	0.00
0.15	0.03002					.004521										
1093.95	2789.14	1.472	2790.612	21.0	6.09	0.575	2791.187	0.00	0.00	1.472	0.864	3.00	0.00	0.00	0	0.00
JUNCT STR	0.00000															
1093.95	2790.64	0.330	2790.970	4.0	13.89	2.995	2793.965	0.00	0.00	0.766	0.300	1.50	0.00	0.00	0	0.00
0.01	0.17947					.128333										
LICENSEE:	SLATER HANIFAN GROUP					F0515P										

WATER SURFACE PROFILE LISTING

SKYE CANYON - PHASE 1.3
BY OLYMPIA COMPANIES
CONQUISTADOR (SOUTH) - SOUTH STUB TO ENTRY DI SOUTH

STATION	INVERT ELEV	DEPTH OF FLOW	W.S. ELEV	Q	VEL	VEL HEAD	ENTRY_S ENERGY GRD.EL.	SUPER ELEV	CRITICAL DEPTH	NORM DEPTH	HGT/ DIA	BASE/ ID NO.	ZL	NO PIER	AVBPR
L/ELEM	SO					SF AVE	HF						ZR		
1093.96	2790.64	0.330	2790.971	4.0	13.84	2.975	2793.946	0.00	0.766		1.50	0.00	0.00	0	0.00
4.37	0.17947					.120004	0.52			0.300			0.00		
1098.33	2791.43	0.341	2791.767	4.0	13.20	2.706	2794.473	0.00	0.766		1.50	0.00	0.00	0	0.00
3.14	0.17947					.104913	0.33			0.300			0.00		
1101.47	2791.99	0.353	2792.343	4.0	12.58	2.457	2794.800	0.00	0.766		1.50	0.00	0.00	0	0.00
2.42	0.17947					.091756	0.22			0.300			0.00		
1103.89	2792.42	0.365	2792.789	4.0	12.01	2.241	2795.030	0.00	0.766		1.50	0.00	0.00	0	0.00
1.93	0.17947					.080190	0.15			0.300			0.00		
1105.82	2792.77	0.377	2793.147	4.0	11.46	2.040	2795.187	0.00	0.766		1.50	0.00	0.00	0	0.00
1.57	0.17947					.070097	0.11			0.300			0.00		
1107.39	2793.05	0.390	2793.443	4.0	10.93	1.855	2795.298	0.00	0.766		1.50	0.00	0.00	0	0.00
1.31	0.17947					.061346	0.08			0.300			0.00		
1108.70	2793.29	0.404	2793.691	4.0	10.42	1.685	2795.376	0.00	0.766		1.50	0.00	0.00	0	0.00
1.10	0.17947					.053700	0.06			0.300			0.00		
1109.80	2793.49	0.418	2793.903	4.0	9.93	1.530	2795.433	0.00	0.766		1.50	0.00	0.00	0	0.00
0.94	0.17947					.047009	0.04			0.300			0.00		
1110.74	2793.65	0.433	2794.086	4.0	9.46	1.389	2795.475	0.00	0.766		1.50	0.00	0.00	0	0.00
0.80	0.17947					.041160	0.03			0.300			0.00		
1111.54	2793.80	0.448	2794.246	4.0	9.03	1.266	2795.512	0.00	0.766		1.50	0.00	0.00	0	0.00
0.70	0.17947					.036012	0.03			0.300			0.00		
1112.24	2793.92	0.463	2794.386	4.0	8.60	1.149	2795.535	0.00	0.766		1.50	0.00	0.00	0	0.00
0.59	0.17947					.031532	0.02			0.300			0.00		

LICENSEE: SLATER HANIFAN GROUP

WATER SURFACE PROFILE LISTING

SKYE CANYON - PHASE 1.3
BY OLYMPIA COMPANIES
CONQUITADOR (SOUTH) - SOUTH STUB TO ENTRY DI SOUTH

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

L/ELEM	SO	*****	*****	*****	SF AVE	HF	*****	NORM DEPTH	*****	ZR	*****
*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****
1112.83	2794.03	0.480	2794.509	4.0	8.20	1.043	2795.552	0.00	0.766	1.50	0.00 0 0.00
0.52	0.17947					.027636	0.01		0.300		0.00
1113.35	2794.12	0.497	2794.618	4.0	7.83	0.951	2795.569	0.00	0.766	1.50	0.00 0 0.00
0.44	0.17947					.024203	0.01		0.300		0.00
1113.79	2794.20	0.514	2794.715	4.0	7.46	0.865	2795.580	0.00	0.766	1.50	0.00 0 0.00
0.39	0.17947					.021195	0.01		0.300		0.00
1114.18	2794.27	0.532	2794.802	4.0	7.10	0.784	2795.586	0.00	0.766	1.50	0.00 0 0.00
0.32	0.17947					.018576	0.01		0.300		0.00
1114.50	2794.33	0.551	2794.879	4.0	6.78	0.714	2795.593	0.00	0.766	1.50	0.00 0 0.00
0.28	0.17947					.016290	0.00		0.300		0.00
1114.78	2794.38	0.571	2794.949	4.0	6.46	0.648	2795.597	0.00	0.766	1.50	0.00 0 0.00
0.23	0.17947					.014295	0.00		0.300		0.00
1115.01	2794.42	0.592	2795.011	4.0	6.16	0.590	2795.601	0.00	0.766	1.50	0.00 0 0.00
0.18	0.17947					.012552	0.00		0.300		0.00
1115.19	2794.45	0.614	2795.067	4.0	5.87	0.536	2795.603	0.00	0.766	1.50	0.00 0 0.00
0.16	0.17947					.011019	0.00		0.300		0.00
1115.35	2794.48	0.636	2795.117	4.0	5.60	0.487	2795.604	0.00	0.766	1.50	0.00 0 0.00
0.13	0.17947					.009673	0.00		0.300		0.00
1115.48	2794.50	0.659	2795.163	4.0	5.34	0.443	2795.606	0.00	0.766	1.50	0.00 0 0.00
0.09	0.17947					.008500	0.00		0.300		0.00
1115.57	2794.52	0.684	2795.204	4.0	5.10	0.403	2795.607	0.00	0.766	1.50	0.00 0 0.00
0.06	0.17947					.007477	0.00		0.300		0.00
						F0515P					PAGE 5

LICENSEE: SLATER HANIFAN GROUP

SKYE CANYON - PHASE 1.3

BY OLYMPIA COMPANIES

CONQUISTADOR (SOUTH) - SOUTH STUB TO ENTRY DI SOUTH

WATER SURFACE PROFILE LISTING

NO AVBPR
PIERBASE/
ID NO.HGT/
DIACRITICAL
DEPTHSUPER
ELEVENERGY
GRD. EL.VEL
HEAD

VEL

Q

W.S.
ELEVDEPTH
OF FLOWINVERT
ELEV

STATION

NORM DEPTH

SF AVE

HF

Page 5

ZL

ZR

ENTRY_S

SKYE CANYON - PHASE 1.3
BY OLYMPIA COMPANIES
CONQUISTADOR (SOUTH) - SOUTH STUB TO ENTRY DI SOUTH

Page 6

[illegible]

	2786.32	2787.29	2788.26	2789.24	2790.21	ENTRY_S 2791.18	2792.15	2793.12	2794.10	2795.07	2796.04

N O T E S

1. GLOSSARY

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

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

North Stub Tie-In

North Stub to Sump DI

STUBSUMP

0

T1 SKYE CANYON - PHASE 1.3

T2 BY OLYMPIA COMPANIES

T3 CONQUISTADOR (SOUTH) - NORTH STUB TO SUMP DI

SO 1000.002779.97 36 2788.895

R 1082.682780.80 36 .013 1

JX 1082.682781.30 30 24 .013 24.0 2781.80 22.50

R 1105.682787.93 30 .013 75.0 1

SH 1105.682787.93 30

CD 18 4 1.5

CD 24 4 2.

CD 30 4 2.5

CD 36 4 3.

CD 42 4 3.5

CD 48 4 4.

□

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Q
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44.

STUBSUMP

DATE: 6/26/2014
TIME: 13:56

STUBSUMP

PAGE 1

F0515P
WATER SURFACE PROFILE - CHANNEL DEFINITION LISTING

CARD CODE	SECT NO	CHN TYPE	NO OF PIERS	AVE WIDTH	PIER WIDTH	HEIGHT 1 DIAMETER	BASE WIDTH	ZL	ZR	INV DROP	Y(1)	Y(2)	Y(3)	Y(4)	Y(5)	Y(6)	Y(7)	Y(8)	Y(9)	Y(10)
CD	18	4				1.50														
CD	24	4				2.00														
CD	30	4				2.50														
CD	36	4				3.00														
CD	42	4				3.50														
CD	48	4				4.00														

PAGE NO 3

F 0 5 1 5 P

WATER SURFACE PROFILE - TITLE CARD LISTING

HEADING LINE NO 1 IS -

SKYE CANYON - PHASE 1.3

HEADING LINE NO 2 IS -

BY OLYMPIA COMPANIES

HEADING LINE NO 3 IS -

CONQUISTADOR (SOUTH) - NORTH STUB TO SUMP DI
F 0 5 1 5 P

PAGE NO 2

WATER SURFACE PROFILE - ELEMENT CARD LISTING

ELEMENT NO	1 IS A SYSTEM OUTLET U/S DATA	STATION	INVERT	SECT	INVERT	SECT	W S ELEV	RADIUS	ANGLE	ANG PT	MAN H
		1000.00	2779.97	36			2788.89	0.00	0.00	0.00	1
ELEMENT NO	2 IS A REACH U/S DATA	STATION	INVERT	SECT							
		1082.68	2780.80	36				0.00	0.00	0.00	1
ELEMENT NO	3 IS A JUNCTION U/S DATA	STATION	INVERT	SECT	LAT-1	LAT-2					
		1082.68	2781.30	30	24	0	0.013	0.00	22.50	0.00	
ELEMENT NO	4 IS A REACH U/S DATA	STATION	INVERT	SECT							
		1105.68	2787.93	30				0.00	0.00	75.00	1
ELEMENT NO	5 IS A SYSTEM HEADWORKS U/S DATA	STATION	INVERT	SECT							
		1105.68	2787.93	30				0.00	0.00	0.00	

NO EDIT ERRORS ENCOUNTERED-COMPUTATION IS NOW BEGINNING
** WARNING NO. 2 ** - WATER SURFACE ELEVATION GIVEN IS LESS THAN OR EQUALS INVERT ELEVATION IN HDWKDS, W.S.ELEV = INV + DC 0
LICENSEE: SLATER HANIFAN GROUP F0515P WATER SURFACE PROFILE LISTING

STUBSUMP

SKYE CANYON - PHASE 1.3
BY OLYMPIA COMPANIES
CONQUISTADOR (SOUTH) - NORTH STUB TO SUMP DI

STATION	INVERT ELEV	DEPTH OF FLOW	W.S. ELEV	Q	VEL	VEL HEAD	ENERGY GRD.EL.	SUPER ELEV	CRITICAL DEPTH	HGT/ DIA	BASE/ ID NO.	ZL	NO PIER	AVBPR
L/ELEM	SO					SF AVE	HF		NORM DEPTH			ZR		
1000.00	2779.97	8.920	2788.890	68.0	9.62	1.437	2790.327	0.00	2.630	3.00	0.00	0.00	0	0.00
82.68	0.01004					.010394	0.86		2.510			0.00		
1082.68	2780.80	9.021	2789.821	68.0	9.62	1.437	2791.258	0.00	2.630	3.00	0.00	0.00	0	0.00
JUNCT STR	0.00000					.010951	0.00					0.00		
1082.68	2781.30	8.990	2790.290	44.0	8.96	1.247	2791.537	0.00	2.208	2.50	0.00	0.00	0	0.00
23.00	0.28826					.011507	0.26		0.760			0.00		
1105.68	2787.93	2.996	2790.926	44.0	8.96	1.247	2792.173	0.00	2.208	2.50	0.00	0.00	0	0.00

SKYE CANYON - PHASE 1.3
BY OLYMPIA COMPANIES
CONQUISTADOR (SOUTH) - NORTH STUB TO SUMP DI

	I	C	H				W	E		R
1000.00	.	.	.	.	.	.	.	.	.	.
1002.16	.	.	.	.	.	.	.	.	.	.
1004.31	.	.	.	.	.	.	.	.	.	.
1006.47	.	.	.	.	.	.	.	.	.	.
1008.63	.	.	.	.	.	.	.	.	.	.
1010.78	.	.	.	.	.	.	.	.	.	.
1012.94	.	.	.	.	.	.	.	.	.	.
1015.10	.	.	.	.	.	.	.	.	.	.
1017.25	.	.	.	.	.	.	.	.	.	.
1019.41	.	.	.	.	.	.	.	.	.	.
1021.57	.	.	.	.	.	.	.	.	.	.
1023.72	.	.	.	.	.	.	.	.	.	.
1025.88	.	.	.	.	.	.	.	.	.	.
1028.04	.	.	.	.	.	.	.	.	.	.
1030.19	.	.	.	.	.	.	.	.	.	.
1032.35	.	.	.	.	.	.	.	.	.	.
1034.51	.	.	.	.	.	.	.	.	.	.
1036.66	.	.	.	.	.	.	.	.	.	.
1038.82	.	.	.	.	.	.	.	.	.	.
1040.98	.	.	.	.	.	.	.	.	.	.
1043.13	.	.	.	.	.	.	.	.	.	.
1045.29	.	.	.	.	.	.	.	.	.	.
1047.45	.	.	.	.	.	.	.	.	.	.
1049.60	.	.	.	.	.	.	.	.	.	.
1051.76	.	.	.	.	.	.	.	.	.	.
1053.92	.	.	.	.	.	.	.	.	.	.
1056.08	.	.	.	.	.	.	.	.	.	.

[illegible]

1. GLOSSARY

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

2. STATIONS FOR POINTS A A JUN

North Stub to DI in South Half of 3C

					STUB_DI	
0						
T1	SKYE CANYON - PHASE 1.3					
T2	BY OLYMPIA COMPANIES					
T3	CONQUISTADOR (SOUTH) - NORTH STUB TO SOUTH DI IN 3C					
SO	1000.002779.97 36			2788.895		
R	1082.682780.80 36	.013				1
JX	1082.682781.80 24 24	.013	44.0	2781.80	90.00	
R	1287.612788.28 24	.013			10.00	1
JX	1287.612788.78 18 18	.013	12.0	2788.78	10.00	
R	1329.492794.31 18	.013			45.00	
SH	1329.492794.31 18					
CD	18 4		1.5			
CD	24 4		2.			
CD	30 4		2.5			
CD	36 4		3.			
CD	42 4		3.5			
CD	48 4		4.			
□						

0
Q
□□

12.

STUB_DI

DATE: 6/26/2014
TIME: 13:46

STUB_DI

PAGE 1

F0515P
WATER SURFACE PROFILE - CHANNEL DEFINITION LISTING

CARD CODE	SECT NO	CHN TYPE	NO OF PIERS	AVE PIER WIDTH	HEIGHT 1 DIAMETER	BASE WIDTH	ZL	ZR	INV DROP	Y(1)	Y(2)	Y(3)	Y(4)	Y(5)	Y(6)	Y(7)	Y(8)	Y(9)	Y(10)
CD	18	4			1.50														
CD	24	4			2.00														
CD	30	4			2.50														
CD	36	4			3.00														
CD	42	4			3.50														
CD	48	4			4.00														

PAGE NO 3

F 0 5 1 5 P

WATER SURFACE PROFILE - TITLE CARD LISTING

HEADING LINE NO 1 IS -

SKYE CANYON - PHASE 1.3

HEADING LINE NO 2 IS -

BY OLYMPIA COMPANIES

HEADING LINE NO 3 IS -

CONQUISTADOR (SOUTH) - NORTH STUB TO SOUTH DI IN 3C
F 0 5 1 5 P

PAGE NO 2

WATER SURFACE PROFILE - ELEMENT CARD LISTING

ELEMENT NO	1 IS A SYSTEM OUTLET U/S DATA	STATION	INVERT	SECT	INVERT	SECT	W S ELEV
		1000.00	2779.97	36			2788.89
ELEMENT NO	2 IS A REACH U/S DATA	STATION	INVERT	SECT	N	0.013	
		1082.68	2780.80	36			
ELEMENT NO	3 IS A JUNCTION U/S DATA	STATION	INVERT	SECT	LAT-1	LAT-2	
		1082.68	2781.80	24	24	0	
					Q3	Q4	
					44.0	0.0	
					*	*	
					PHI 3	PHI 4	
					90.00	0.00	
ELEMENT NO	4 IS A REACH U/S DATA	STATION	INVERT	SECT	N	0.013	
		1287.61	2788.28	24			
ELEMENT NO	5 IS A JUNCTION U/S DATA	STATION	INVERT	SECT	LAT-1	LAT-2	
		1287.61	2788.78	18	18	0	
					Q3	Q4	
					12.0	0.0	
					*	*	
					PHI 3	PHI 4	
					10.00	0.00	
ELEMENT NO	6 IS A REACH U/S DATA	STATION	INVERT	SECT	N	0.013	
		1329.49	2794.31	18			
					RADIUS	ANGLE	
					0.00	45.00	
					MAN PT	MAN H	
					0.00	0.00	

Page 1

[illegible]

1. GLOSSARY

- GLOSSARY
- I = INVERT ELEVATION
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Page 3

North Stub to DI in North Half of 3C

STUB_DIN

0

T1 SKYE CANYON - PHASE 1.3

T2 BY OLYMPIA COMPANIES

T3 CONQUISTADOR (SOUTH) - NORTH STUB AT DI NORTH IN 3C

SO	1000.002779.97	36			2788.895		
R	1082.682780.80	36	.013				1
JX	1082.682781.80	24	.013	44.0	2781.80	90.00	
R	1287.612788.28	24	.013			10.00	1
JX	1287.612788.78	18	.013	12.0	2788.78	10.00	
R	1310.962795.00	18	.013			45.00	

SH 1310.962795.00 18

CD 18 4 1.5

CD 24 4 2.

CD 30 4 2.5

CD 36 4 3.

CD 42 4 3.5

CD 48 4 4.

□

0
Q
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12.

STUB_DIN

STUB_DIN

DATE: 6/26/2014
TIME: 13:50

F0515P
WATER SURFACE PROFILE - CHANNEL DEFINITION LISTING

PAGE 1

CARD CODE	SECT NO	CHN TYPE	NO OF PIERS	AVE PIER WIDTH	HEIGHT 1 DIAMETER	BASE WIDTH	ZL	ZR	INV DROP	Y(1)	Y(2)	Y(3)	Y(4)	Y(5)	Y(6)	Y(7)	Y(8)	Y(9)	Y(10)
CD	18	4			1.50														
CD	24	4			2.00														
CD	30	4			2.50														
CD	36	4			3.00														
CD	42	4			3.50														
CD	48	4			4.00														

PAGE NO 3

F 0 5 1 5 P

WATER SURFACE PROFILE - TITLE CARD LISTING

HEADING LINE NO 1 IS -

SKYE CANYON - PHASE 1.3

HEADING LINE NO 2 IS -

BY OLYMPIA COMPANIES

HEADING LINE NO 3 IS -

CONQUISTADOR (SOUTH) - NORTH STUB AT DI NORTH
F 0 5 1 5 P

PAGE NO 2

WATER SURFACE PROFILE - ELEMENT CARD LISTING

ELEMENT NO	1 IS A SYSTEM OUTLET U/S DATA	STATION	INVERT	SECT	INVERT	SECT	W S ELEV
		1000.00	2779.97	36			2788.89
ELEMENT NO	2 IS A REACH U/S DATA	STATION	INVERT	SECT			
		1082.68	2780.80	36			
ELEMENT NO	3 IS A JUNCTION U/S DATA	STATION	INVERT	SECT	LAT-1	LAT-2	
		1082.68	2781.80	24	24	0	
ELEMENT NO	4 IS A REACH U/S DATA	STATION	INVERT	SECT			
		1287.61	2788.28	24			
ELEMENT NO	5 IS A JUNCTION U/S DATA	STATION	INVERT	SECT	LAT-1	LAT-2	
		1287.61	2788.78	18	18	0	
ELEMENT NO	6 IS A REACH U/S DATA	STATION	INVERT	SECT			
		1310.96	2795.00	18			
ELEMENT NO	7 IS A SYSTEM HEADWORKS U/S DATA	STATION	INVERT	SECT			
		1310.96	2795.00	18			

STATION	INVERT ELEV	DEPTH OF FLOW	W.S. ELEV	Q	VEL	VEL HEAD	ENERGY GRD.EL.	SUPER ELEV	CRITICAL DEPTH	HGT/DIA	BASE/ID NO.	ZL PIER	NO AVBPR
L/ELEM	SO												
*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****
1000.00	2779.97	8.920	2788.890	68.0	9.62	1.437	2790.327	0.00	2.630	3.00	0.00	0.00	0 0.00
82.68	0.01004					.010394	0.86						0.00
1082.68	2780.80	9.021	2789.821	68.0	9.62	1.437	2791.258	0.00	2.630	3.00	0.00	0.00	0 0.00
JUNCT STR	0.00000					.010825	0.00						0.00
1082.68	2781.80	10.885	2792.685	24.0	7.64	0.906	2793.591	0.00	1.735	2.00	0.00	0.00	0 0.00
204.93	0.03162					.011255	2.31						0.00
1287.61	2788.28	6.818	2795.098	24.0	7.64	0.906	2796.004	0.00	1.735	2.00	0.00	0.00	0 0.00
JUNCT STR	0.00000					.012153	0.00						0.00
1287.61	2788.78	6.591	2795.371	12.0	6.79	0.716	2796.087	0.00	1.314	1.50	0.00	0.00	0 0.00
17.11	0.26638					.013050	0.22						0.00
1304.72	2793.34	2.340	2795.678	12.0	6.79	0.716	2796.394	0.00	1.314	1.50	0.00	0.00	0 0.00
HYDRAULIC JUMP													
1304.72	2793.34	0.749	2794.087	12.0	13.61	2.874	2796.961	0.00	1.314	1.50	0.00	0.00	0 0.00
0.98	0.26638					.049270	0.05						0.00
1305.70	2793.60	0.778	2794.376	12.0	12.96	2.608	2796.984	0.00	1.314	1.50	0.00	0.00	0 0.00
0.93	0.26638					.043372	0.04						0.00
1306.63	2793.85	0.808	2794.654	12.0	12.36	2.372	2797.026	0.00	1.314	1.50	0.00	0.00	0 0.00
0.80	0.26638					.038262	0.03						0.00
1307.43	2794.06	0.840	2794.900	12.0	11.79	2.158	2797.058	0.00	1.314	1.50	0.00	0.00	0 0.00
0.70	0.26638					.033785	0.02						0.00
1308.13	2794.25	0.873	2795.120	12.0	11.24	1.960	2797.080	0.00	1.314	1.50	0.00	0.00	0 0.00
0.61	0.26638					.029858	0.02						0.00
LICENSEE: SLATER HANIFAN GROUP						F0515P							PAGE 2

STATION	CONQUISTADOR (SOUTH) - NORTH					STUB_DIN AT DI NORTH					CRITICAL DEPTH	HGT/DIA	BASE/ ID NO.	ZL	NO PIER	AVBPR
	INVERT ELEV	DEPTH OF FLOW	W.S. ELEV	Q	VEL	VEL HEAD	SF AVE	HF	ENERGY GRD.EL.	SUPER ELEV						
L/ELEM	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	NORM DEPTH	*****	*****	*****	*****	*****
1308.74	2794.41	0.908	2795.316	12.0	10.71	1.783	2797.099	0.00	1.314	1.50	0.00	0.00	0	0.00		
0.51	0.26638					.026436	0.01				0.480					
1309.25	2794.55	0.946	2795.492	12.0	10.21	1.620	2797.112	0.00	1.314	1.50	0.00	0.00	0	0.00		
0.45	0.26638					.023453	0.01				0.480					
1309.70	2794.66	0.986	2795.649	12.0	9.74	1.473	2797.122	0.00	1.314	1.50	0.00	0.00	0	0.00		
0.37	0.26638					.020846	0.01				0.480					
1310.07	2794.76	1.029	2795.791	12.0	9.29	1.340	2797.131	0.00	1.314	1.50	0.00	0.00	0	0.00		
0.30	0.26638					.018577	0.01				0.480					
1310.37	2794.84	1.075	2795.918	12.0	8.86	1.218	2797.136	0.00	1.314	1.50	0.00	0.00	0	0.00		
0.25	0.26638					.016601	0.00				0.480					
1310.62	2794.91	1.124	2796.033	12.0	8.44	1.106	2797.139	0.00	1.314	1.50	0.00	0.00	0	0.00		
0.18	0.26638					.014902	0.00				0.480					
1310.80	2794.96	1.179	2796.136	12.0	8.05	1.006	2797.142	0.00	1.314	1.50	0.00	0.00	0	0.00		
0.12	0.26638					.013476	0.00				0.480					
1310.92	2794.99	1.241	2796.229	12.0	7.67	0.914	2797.143	0.00	1.314	1.50	0.00	0.00	0	0.00		
0.04	0.26638					.012317	0.00				0.480					
1310.96	2795.00	1.314	2796.314	12.0	7.31	0.830	2797.144	0.00	1.314	1.50	0.00	0.00	0	0.00		

NOTES

1. GLOSSARY

I = INVERT ELEVATION

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H = HEIGHT OF CHANNEL

E = ENERGY GRADE LINE

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B = BRIDGE ENTRANCE OR EXIT

Y = WALL ENTRANCE OR EXIT

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

APPENDIX F

Finished Floor Analysis

Design Street Flows

SKY CANYON - PARCEL 1.3										
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	A-1	2830.64	2830.26	0.54	2831.34	2831.14	2832.5	OK	OK	
2	A-1	2832.47	2832.09	0.54	2833.17	2832.97	2834.4	OK	OK	
3	A-1	2834.35	2833.97	0.54	2835.05	2834.85	2836.3	OK	OK	
4	A-1	2836.48	2836.10	0.54	2837.18	2836.98	2838.4	OK	OK	
5	A-1	2838.61	2838.23	0.54	2839.31	2839.11	2840.5	OK	OK	
6	A-1	2840.63	2840.25	0.54	2841.33	2841.13	2841.4	OK	OK	
7	A-1	2842.10	2841.72	0.54	2842.80	2842.60	2844.0	OK	OK	
8	A-1	2841.11	2840.73	0.54	2841.81	2841.61	2843.3	OK	OK	
9	A-1	2841.14	2840.76	0.54	2841.84	2841.64	2843.3	OK	OK	
10	A-1	2841.48	2841.10	0.54	2842.18	2841.98	2843.6	OK	OK	
11	A-1	2841.81	2841.43	0.54	2842.51	2842.31	2843.9	OK	OK	
12	A-1	2842.14	2841.76	0.54	2842.84	2842.64	2844.3	OK	OK	
13	A-1	2842.47	2842.09	0.54	2843.17	2842.97	2844.6	OK	OK	
14	A-1	2842.80	2842.42	0.54	2843.50	2843.30	2844.9	OK	OK	
15	A-1	2843.13	2842.75	0.54	2843.83	2843.63	2845.3	OK	OK	
16	A-1	2843.46	2843.08	0.54	2844.16	2843.96	2845.6	OK	OK	
17	A-1	2843.70	2843.32	0.54	2844.40	2844.20	2845.9	OK	OK	
18	A-1	2843.74	2843.36	0.54	2844.44	2844.24	2846.4	OK	OK	
19	A-1	2843.74	2843.36	0.54	2844.44	2844.24	2846.1	OK	OK	
20	A-1	2843.63	2843.25	0.54	2844.33	2844.13	2845.7	OK	OK	
21	A-1	2843.27	2842.89	0.54	2843.97	2843.77	2845.3	OK	OK	
22	A-1	2842.87	2842.49	0.54	2843.57	2843.37	2845.1	OK	OK	
23	A-1	2830.67	2830.29	0.54	2831.37	2831.17	2833.0	OK	OK	
24	A-1	2832.22	2831.84	0.54	2832.92	2832.72	2834.2	OK	OK	
25	A-1	2833.16	2832.78	0.54	2833.86	2833.66	2835.1	OK	OK	
26	A-1	2833.16	2832.78	0.54	2833.86	2833.66	2835.5	OK	OK	
27	A-1	2833.02	2832.64	0.54	2833.72	2833.52	2835.0	OK	OK	
28	A-1	2832.23	2831.85	0.54	2832.93	2832.73	2834.2	OK	OK	
29	A-1	2832.52	2832.14	0.54	2833.22	2833.02	2834.8	OK	OK	
30	A-1	2832.52	2832.14	0.54	2833.22	2833.02	2834.5	OK	OK	
31	A-1	2831.75	2831.37	0.54	2832.45	2832.25	2833.7	OK	OK	
32	A-1	2830.18	2829.80	0.54	2830.88	2830.68	2832.1	OK	OK	
33	A-1	2816.14	2815.76	0.54	2816.84	2816.64	2819.0	OK	OK	
34	A-1	2818.73	2818.35	0.54	2819.43	2819.23	2820.7	OK	OK	
35	A-1	2820.42	2820.04	0.54	2821.12	2820.92	2822.4	OK	OK	
36	A-1	2822.76	2822.38	0.54	2823.46	2823.26	2824.7	OK	OK	
37	A-1	2823.08	2822.70	0.54	2823.78	2823.58	2825.2	OK	OK	
38	A-1	2822.75	2822.37	0.54	2823.45	2823.25	2824.2	OK	OK	
39	A-1	2821.19	2820.81	0.54	2821.89	2821.69	2823.0	OK	OK	
40	A-1	2819.96	2819.58	0.54	2820.66	2820.46	2821.9	OK	OK	
41	A-1	2817.94	2817.56	0.54	2818.64	2818.44	2819.9	OK	OK	
42	A-1	2815.92	2815.54	0.54	2816.62	2816.42	2817.9	OK	OK	
43	A-1	2804.21	2803.83	0.54	2804.91	2804.71	2806.6	OK	OK	
44	A-1	2805.45	2805.07	0.54	2806.15	2805.95	2807.4	OK	OK	
45	A-1	2806.27	2805.89	0.54	2806.97	2806.77	2808.2	OK	OK	
46	A-1	2807.27	2806.89	0.54	2807.97	2807.77	2809.2	OK	OK	
47	A-1	2807.37	2806.99	0.54	2808.07	2807.87	2809.7	OK	OK	
48	A-1	2805.58	2805.20	0.54	2806.28	2806.08	2807.5	OK	OK	
49	A-1	2804.75	2804.37	0.54	2805.45	2805.25	2806.7	OK	OK	
50	A-1	2803.91	2803.53	0.54	2804.61	2804.41	2805.9	OK	OK	
51	A-1	2802.21	2801.83	0.54	2802.91	2802.71	2804.1	OK	OK	
52	A-1	2801.58	2801.20	0.54	2802.28	2802.08	2803.5	OK	OK	
53	A-1	2800.90	2800.52	0.54	2801.60	2801.40	2802.8	OK	OK	
54	A-1	2800.22	2799.84	0.54	2800.92	2800.72	2802.1	OK	OK	
55	A-1	2798.75	2798.37	0.54	2799.45	2799.25	2800.7	OK	OK	
56	A-1	2799.36	2798.98	0.54	2800.06	2799.86	2801.3	OK	OK	
57	A-1	2800.81	2800.43	0.54	2801.51	2801.31	2802.7	OK	OK	
58	A-1	2803.61	2803.23	0.54	2804.31	2804.11	2805.5	OK	OK	
59	A-1	2804.19	2803.81	0.54	2804.89	2804.69	2806.1	OK	OK	
60	A-1	2804.80	2804.42	0.54	2805.50	2805.30	2806.7	OK	OK	
61	A-1	2805.75	2805.37	0.54	2806.45	2806.25	2807.6	OK	OK	
62	A-1	2805.22	2804.84	0.54	2805.92	2805.72	2807.1	OK	OK	
63	A-1	2807.12	2806.74	0.54	2807.82	2807.62	2809.0	OK	OK	

SKY CANYON - PARCEL 1.3 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
64	A-1	2809.66	2809.28	0.54	2810.36	2810.16	2811.6	OK	OK	
65	A-1	2812.47	2812.09	0.54	2813.17	2812.97	2814.4	OK	OK	
66	A-1	2815.29	2814.91	0.54	2815.99	2815.79	2817.2	OK	OK	
67	A-1	2818.10	2817.72	0.54	2818.80	2818.60	2820.0	OK	OK	
68	A-1	2820.91	2820.53	0.54	2821.61	2821.41	2822.8	OK	OK	
69	A-1	2823.97	2823.59	0.54	2824.67	2824.47	2825.9	OK	OK	
70	A-1	2828.47	2828.09	0.54	2829.17	2828.97	2830.4	OK	OK	
71	A-1	2830.92	2830.54	0.54	2831.62	2831.42	2832.8	OK	OK	
72	A-1	2833.63	2833.25	0.54	2834.33	2834.13	2835.5	OK	OK	
73	A-1	2836.44	2836.06	0.54	2837.14	2836.94	2838.3	OK	OK	
74	A-1	2839.26	2838.88	0.54	2839.96	2839.76	2841.2	OK	OK	
75	A-1	2842.09	2841.71	0.54	2842.79	2842.59	2843.0	OK	OK	
76	A-1	2839.39	2839.01	0.54	2840.09	2839.89	2841.3	OK	OK	
77	A-1	2838.39	2838.01	0.54	2839.09	2838.89	2840.3	OK	OK	
78	A-1	2836.53	2836.15	0.54	2837.23	2837.03	2838.4	OK	OK	
79	A-1	2834.66	2834.28	0.54	2835.36	2835.16	2836.6	OK	OK	
80	A-1	2832.70	2832.32	0.54	2833.40	2833.20	2834.6	OK	OK	
81	A-1	2830.44	2830.06	0.54	2831.14	2830.94	2832.3	OK	OK	
82	A-1	2825.80	2825.42	0.54	2826.50	2826.30	2827.7	OK	OK	
83	A-1	2823.15	2822.77	0.54	2823.85	2823.65	2825.1	OK	OK	
84	A-1	2820.74	2820.36	0.54	2821.44	2821.24	2822.6	OK	OK	
85	A-1	2818.40	2818.02	0.54	2819.10	2818.90	2820.3	OK	OK	
86	A-1	2816.05	2815.67	0.54	2816.75	2816.55	2818.0	OK	OK	
87	A-1	2813.70	2813.32	0.54	2814.40	2814.20	2815.6	OK	OK	
88	A-1	2811.32	2810.94	0.54	2812.02	2811.82	2813.2	OK	OK	
89	A-1	2808.90	2808.52	0.54	2809.60	2809.40	2810.8	OK	OK	
90	A-1	2806.77	2806.39	0.54	2807.47	2807.27	2808.6	OK	OK	
91	A-1	2807.73	2807.35	0.54	2808.43	2808.23	2809.6	OK	OK	
92	A-1	2809.92	2809.54	0.54	2810.62	2810.42	2811.8	OK	OK	
93	A-1	2812.33	2811.95	0.54	2813.03	2812.83	2814.2	OK	OK	
94	A-1	2815.03	2814.65	0.54	2815.73	2815.53	2816.9	OK	OK	
95	A-1	2817.74	2817.36	0.54	2818.44	2818.24	2819.6	OK	OK	
96	A-1	2820.46	2820.08	0.54	2821.16	2820.96	2822.4	OK	OK	
97	A-1	2822.97	2822.59	0.54	2823.67	2823.47	2824.9	OK	OK	
98	A-1	2825.13	2824.75	0.54	2825.83	2825.63	2827.0	OK	OK	
99	B-1	2804.76	2804.38	0.52	2805.42	2805.26	2806.7	OK	OK	
100	B-1	2805.73	2805.35	0.52	2806.39	2806.23	2807.6	OK	OK	
101	B-1	2806.46	2806.08	0.52	2807.12	2806.96	2808.4	OK	OK	
102	B-1	2806.85	2806.47	0.52	2807.51	2807.35	2808.8	OK	OK	
103	B-1	2807.23	2806.85	0.52	2807.89	2807.73	2809.1	OK	OK	
104	B-1	2807.61	2807.23	0.52	2808.27	2808.11	2809.5	OK	OK	
105	B-1	2808.06	2807.68	0.52	2808.72	2808.56	2810.0	OK	OK	
106	B-1	2808.73	2808.35	0.52	2809.39	2809.23	2810.6	OK	OK	
107	B-1	2809.37	2808.99	0.52	2810.03	2809.87	2811.3	OK	OK	
108	B-1	2809.76	2809.38	0.52	2810.42	2810.26	2811.7	OK	OK	
109	B-1	2810.15	2809.77	0.52	2810.81	2810.65	2812.1	OK	OK	
110	B-1	2810.47	2810.09	0.52	2811.13	2810.97	2812.3	OK	OK	
111	B-1	2810.49	2810.11	0.52	2811.15	2810.99	2812.4	OK	OK	
112	B-1	2811.55	2811.17	0.52	2812.21	2812.05	2813.5	OK	OK	
113	B-1	2813.11	2812.73	0.52	2813.77	2813.61	2815.0	OK	OK	
114	B-1	2814.55	2814.17	0.52	2815.21	2815.05	2816.5	OK	OK	
115	B-1	2816.07	2815.69	0.52	2816.73	2816.57	2818.0	OK	OK	
116	B-1	2817.59	2817.21	0.52	2818.25	2818.09	2819.5	OK	OK	
117	B-1	2819.11	2818.73	0.52	2819.77	2819.61	2821.0	OK	OK	
118	B-1	2820.63	2820.25	0.52	2821.29	2821.13	2822.5	OK	OK	
119	B-1	2822.16	2821.78	0.52	2822.82	2822.66	2824.1	OK	OK	
120	B-1	2823.68	2823.30	0.52	2824.34	2824.18	2825.6	OK	OK	
121	B-1	2825.27	2824.89	0.52	2825.93	2825.77	2826.6	OK	OK	
122	B-1	2828.32	2827.94	0.52	2828.98	2828.82	2830.6	OK	OK	
123	B-1	2827.62	2827.24	0.52	2828.28	2828.12	2829.5	OK	OK	
124	B-1	2826.33	2825.95	0.52	2826.99	2826.83	2828.2	OK	OK	
125	B-1	2824.72	2824.34	0.52	2825.38	2825.22	2826.6	OK	OK	

SKY CANYON - PARCEL 1.3 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
126	B-1	2823.20	2822.82	0.52	2823.86	2823.70	2825.1	OK	OK	
127	B-1	2821.68	2821.30	0.52	2822.34	2822.18	2823.6	OK	OK	
128	B-1	2820.15	2819.77	0.52	2820.81	2820.65	2822.1	OK	OK	
129	B-1	2818.63	2818.25	0.52	2819.29	2819.13	2820.5	OK	OK	
130	B-1	2817.11	2816.73	0.52	2817.77	2817.61	2819.0	OK	OK	
131	B-1	2815.59	2815.21	0.52	2816.25	2816.09	2817.5	OK	OK	
132	B-1	2814.07	2813.69	0.52	2814.73	2814.57	2816.0	OK	OK	
133	B-1	2812.42	2812.04	0.52	2813.08	2812.92	2814.3	OK	OK	
134	B-1	2811.00	2810.62	0.52	2811.66	2811.50	2812.9	OK	OK	
135	B-1	2807.55	2807.17	0.52	2808.21	2808.05	2809.5	OK	OK	
136	B-1	2808.73	2808.35	0.52	2809.39	2809.23	2810.6	OK	OK	
137	B-1	2810.32	2809.94	0.52	2810.98	2810.82	2812.2	OK	OK	
138	B-1	2811.90	2811.52	0.52	2812.56	2812.40	2813.8	OK	OK	
139	B-1	2813.49	2813.11	0.52	2814.15	2813.99	2815.4	OK	OK	
140	B-1	2815.07	2814.69	0.52	2815.73	2815.57	2817.0	OK	OK	
141	B-1	2816.66	2816.28	0.52	2817.32	2817.16	2818.6	OK	OK	
142	B-1	2818.25	2817.87	0.52	2818.91	2818.75	2820.2	OK	OK	
143	B-1	2819.83	2819.45	0.52	2820.49	2820.33	2821.7	OK	OK	
144	B-1	2821.42	2821.04	0.52	2822.08	2821.92	2823.3	OK	OK	
145	B-1	2822.97	2822.59	0.52	2823.63	2823.47	2824.9	OK	OK	
146	B-1	2824.28	2823.90	0.52	2824.94	2824.78	2826.2	OK	OK	
147	B-1	2826.05	2825.67	0.52	2826.71	2826.55	2827.5	OK	OK	
148	B-1	2830.24	2829.86	0.52	2830.90	2830.74	2832.3	OK	OK	
149	B-1	2830.60	2830.22	0.52	2831.26	2831.10	2832.5	OK	OK	
150	B-1	2830.95	2830.57	0.52	2831.61	2831.45	2832.9	OK	OK	
151	B-1	2831.41	2831.03	0.52	2832.07	2831.91	2833.3	OK	OK	
152	B-1	2832.01	2831.63	0.52	2832.67	2832.51	2833.8	OK	OK	
153	B-1	2830.60	2830.22	0.52	2831.26	2831.10	2832.5	OK	OK	
154	B-1	2831.61	2831.23	0.52	2832.27	2832.11	2833.5	OK	OK	
155	B-1	2832.62	2832.24	0.52	2833.28	2833.12	2834.5	OK	OK	
156	B-1	2833.17	2832.79	0.52	2833.83	2833.67	2835.0	OK	OK	
157	B-1	2833.74	2833.36	0.52	2834.40	2834.24	2835.6	OK	OK	
158	B-1	2834.83	2834.45	0.52	2835.49	2835.33	2836.7	OK	OK	
159	B-1	2836.07	2835.69	0.52	2836.73	2836.57	2838.0	OK	OK	
160	B-1	2837.37	2836.99	0.52	2838.03	2837.87	2839.3	OK	OK	
161	B-1	2838.71	2838.33	0.52	2839.37	2839.21	2840.6	OK	OK	
162	B-1	2840.05	2839.67	0.52	2840.71	2840.55	2842.0	OK	OK	
163	B-1	2841.70	2841.32	0.52	2842.36	2842.20	2843.6	OK	OK	
164	B-1	2843.66	2843.28	0.52	2844.32	2844.16	2844.5	OK	OK	
165	B-1	2846.44	2846.06	0.52	2847.10	2846.94	2847.9	OK	OK	
166	B-1	2844.62	2844.24	0.52	2845.28	2845.12	2846.5	OK	OK	
167	B-1	2843.38	2843.00	0.52	2844.04	2843.88	2845.3	OK	OK	
168	B-1	2842.09	2841.71	0.52	2842.75	2842.59	2844.0	OK	OK	
169	B-1	2840.83	2840.45	0.52	2841.49	2841.33	2842.7	OK	OK	
170	B-1	2839.49	2839.11	0.52	2840.15	2839.99	2841.4	OK	OK	
171	B-1	2838.15	2837.77	0.52	2838.81	2838.65	2840.1	OK	OK	
172	B-1	2836.65	2836.27	0.52	2837.31	2837.15	2838.6	OK	OK	
173	B-1	2835.19	2834.81	0.52	2835.85	2835.69	2837.1	OK	OK	
174	B-1	2833.87	2833.49	0.52	2834.53	2834.37	2835.8	OK	OK	
175	B-1	2832.56	2832.18	0.52	2833.22	2833.06	2834.5	OK	OK	
176	B-1	2833.86	2833.48	0.52	2834.52	2834.36	2835.8	OK	OK	
177	B-1	2835.16	2834.78	0.52	2835.82	2835.66	2837.1	OK	OK	
178	B-1	2836.45	2836.07	0.52	2837.11	2836.95	2838.4	OK	OK	
179	B-1	2837.75	2837.37	0.52	2838.41	2838.25	2839.7	OK	OK	
180	B-1	2839.08	2838.70	0.52	2839.74	2839.58	2841.0	OK	OK	
181	B-1	2840.67	2840.29	0.52	2841.33	2841.17	2842.6	OK	OK	
182	B-1	2841.97	2841.59	0.52	2842.63	2842.47	2843.9	OK	OK	
183	B-1	2843.26	2842.88	0.52	2843.92	2843.76	2845.2	OK	OK	
184	B-1	2845.43	2845.05	0.52	2846.09	2845.93	2846.7	OK	OK	
185	B-1	2845.47	2845.09	0.52	2846.13	2845.97	2847.5	OK	OK	
186	B-1	2844.71	2844.33	0.52	2845.37	2845.21	2846.6	OK	OK	
187	B-1	2842.72	2842.34	0.52	2843.38	2843.22	2844.6	OK	OK	

SKY CANYON - PARCEL 1.3										
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
188	B-1	2840.73	2840.35	0.52	2841.39	2841.23	2842.6	OK	OK	
189	B-1	2839.46	2839.08	0.52	2840.12	2839.96	2841.4	OK	OK	
190	B-1	2838.19	2837.81	0.52	2838.85	2838.69	2840.1	OK	OK	
191	B-1	2836.87	2836.49	0.52	2837.53	2837.37	2838.8	OK	OK	
192	B-1	2835.55	2835.17	0.52	2836.21	2836.05	2837.5	OK	OK	
193	B-1	2834.07	2833.69	0.52	2834.73	2834.57	2836.0	OK	OK	
194	B-1	2832.75	2832.37	0.52	2833.41	2833.25	2834.7	OK	OK	

Where:

1: Top of Curb at High Side of Lot

2: TC-0.38 (For Roll Curb), TC-0.5 (For L Curb)

3: Minimum Allowable Finished Floor Elevation above flowline elevation @ high side of lot = (2 x D₁₀₀) + 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.

Onsite Overflow Condition

Adjacent to Emergency Overflow Paths					
Lot	High TC/FL ¹	Flow Depth ²	Min FF ³	Design FF	Solid Grout
54	2804.84	0.89	2805.73	2807.10	No
55	2806.74	0.89	2807.63	2809.00	No
56	2842.88	0.89	2843.77	2845.20	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.

Emergency Overflow at Stub Worksheet for Generic Weir

Project Description

Worksheet	Weir at ON1-D
Type	Generic Weir
Solve For	Headwater Elevation

Input Data

Discharge	44.00 cfs
Crest Elevation	98.33 ft
Discharge Coefficient	3.00 US
Crest Length	17.50 ft

Results

Headwater Elevation	99.22 ft
Headwater Height Above Crest	0.89 ft
Flow Area	15.6 ft ²
Velocity	2.83 ft/s
Wetted Perimeter	19.28 ft
Top Width	17.50 ft

Drainage Easement Calculations

Adjacent to Drainage Easements						
Lot	High TC/FL ¹	Flow Depth ²	Min FF ³	Design FF	Check	Solid Grout
152	2831.75	0.22	2833.47	2833.80	OK	No
153	2830.60	0.22	2832.32	2832.50	OK	No
154	2831.61	0.22	2833.33	2833.50	OK	No
155	2832.62	0.22	2834.34	2834.50	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.

Facility 3A - Drainage Easement Weir Calc Worksheet for Generic Weir

Project Description	
Worksheet	Facility 3A - Drainage Easement Weir
Type	Generic Weir
Solve For	Headwater Elevation

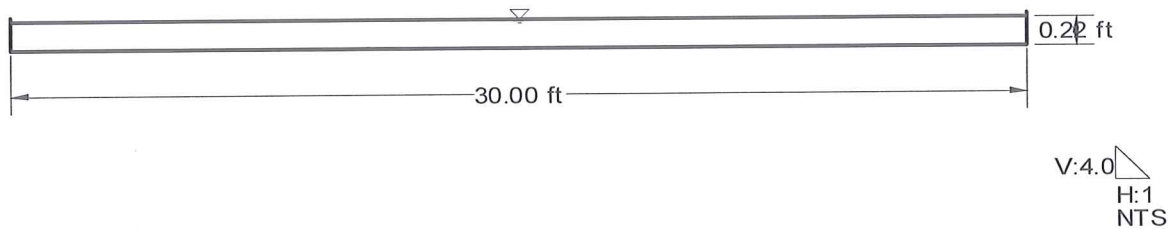
Input Data	
Discharge	9.00 cfs
Crest Elevation	29.26 ft
Discharge Coefficient	3.00 US
Crest Length	30.00 ft

Results	
Headwater Elevation	29.48 ft
Headwater Height Above Crest	0.22 ft
Flow Area	6.5 ft ²
Velocity	1.39 ft/s
Wetted Perimeter	30.43 ft
Top Width	30.00 ft

Facility 3A - Drainage Easement Cross Section for Generic Weir

Project Description	
Worksheet	Facility 3A - Drainage Easement Weir
Type	Generic Weir
Solve For	Headwater Elevation

Section Data	
Discharge	9.00 cfs
Headwater Elevation	29.48 ft
Crest Elevation	29.26 ft
Discharge Coefficient	3.00 US
Crest Length	30.00 ft



Facility 3A - Drainage Easement Calc Worksheet for Irregular Channel

Project Description	
Worksheet	Facility 3A - Drainage Easement Channel
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data	
Channel Slope	2.57 %
Discharge	9.00 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	0.013
Water Surface Elevation	29.57 ft
Elevation Range	29.41 to 32.56
Flow Area	2.5 ft ²
Wetted Perimeter	30.02 ft
Top Width	30.00 ft
Actual Depth	0.16 ft
Critical Elevation	29.63 ft
Critical Slope	0.48 %
Velocity	3.54 ft/s
Velocity Head	0.19 ft
Specific Energy	29.76 ft
Froude Number	2.14
Flow Type	Supercritical

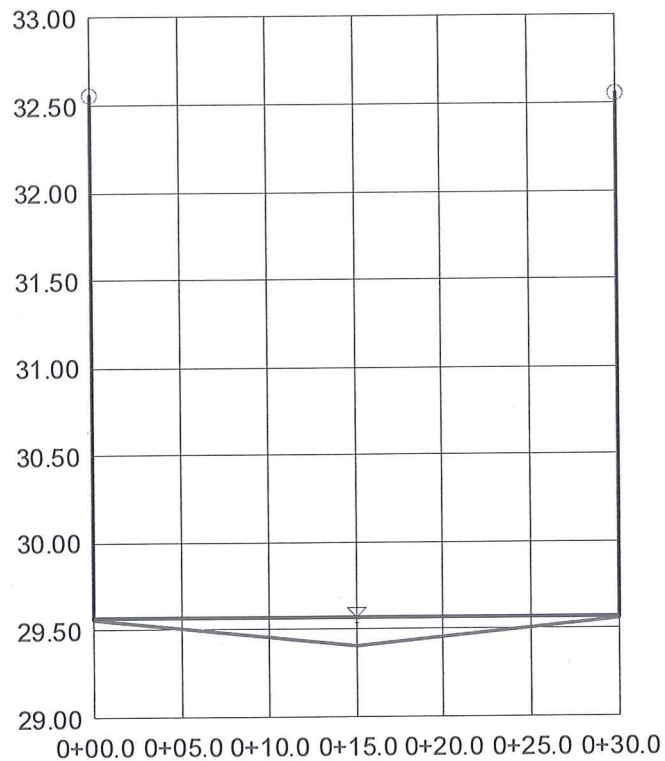
Roughness Segments		
Start Station	End Station	Mannings Coefficient
0+00.0	0+30.0	0.013

Natural Channel Points	
Station (ft)	Elevation (ft)
0+00.0	32.56
0+00.0	29.56
0+15.0	29.41
0+30.0	29.56
0+30.0	32.56

Facility 3A - Drainage Easement Cross Section for Irregular Channel

Project Description	
Worksheet	Facility 3A - Drainage Easement Channel
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

Section Data	
Mannings Coefficient	0.013
Channel Slope	2.57 %
Water Surface Elevation	29.57 ft
Elevation Range	29.41 to 32.56
Discharge	9.00 cfs



V:10.0
H:1
NTS

Racel Overflow Condition

Overflow Section - Racel Street (Min. Slope) **Worksheet for Irregular Channel**

Project Description	
Worksheet	Racel Overflow Street Section (Min. Slope)
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data	
Channel Slope	1.00 %
Discharge	704.00 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	1.77 ft
Elevation Range	0.00 to 0.56
Flow Area	61.2 ft ²
Wetted Perimeter	46.60 ft
Top Width	43.00 ft
Actual Depth	1.77 ft
Critical Elevation	2.37 ft
Critical Slope	0.32 %
Velocity	11.50 ft/s
Velocity Head	2.05 ft
Specific Energy	3.83 ft
Froude Number	1.70
Flow Type	Supercritical

Calculation Messages:

Water elevation exceeds lowest end station by 1.27089931 ft.

Roughness Segments		
Start Station	End Station	Mannings Coefficient
0+00.00	0+02.00	0.013
0+02.00	0+41.00	0.016
0+41.00	0+43.00	0.013

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

RACEL
 - FROM HUALAPAI to
 1.3 Entrance Varies
 from 1.0% to 4.9%

- FROM Entrance at 1.3
 to INTERSECTION WITH
 CONQUISTADOR, SLOPE
 IS 4.9%

Lots 3 to 7 would need
 to be flood protected
 to a flood depth of
 1.27 feet.

2 COURSES SOLID GROUTING
 FOR these lots with walls
 adjacent to RACEL.
 ($8/12 \times 2 = 1.33$ ft)

← -0.5 ft
 (curb)
 1.27 ft

Overflow Section - Racel Street (Min. Slope)
Worksheet for Irregular Channel

Natural Channel Points	
Station (ft)	Elevation (ft)
0+42.50	0.48
0+43.00	0.50

Notes: Q = Developed Condition RA-HU

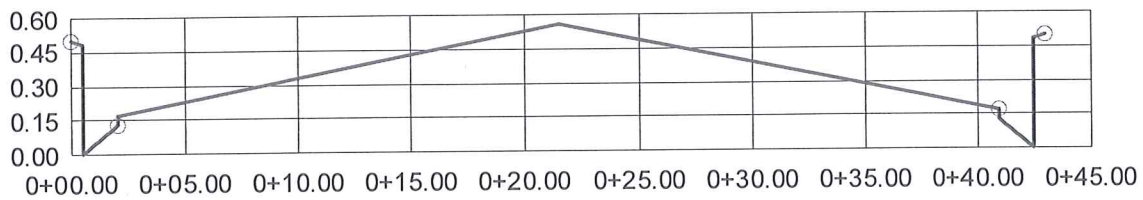
Overflow Section - Racel Street (Min. Slope) **Cross Section for Irregular Channel**

Project Description

Worksheet	Racel Overflow Street Section (Min. Slope)
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

Section Data

Mannings Coefficient	0.016
Channel Slope	1.00 %
Water Surface Elevation	1.77 ft
Elevation Range	0.00 to 0.56
Discharge	704.00 cfs



V:10.0
H:1
NTS

Overflow Section - Racel Street (Max. Slope) **Worksheet for Irregular Channel**

Project Description	
Worksheet	Racel Overflow Street Section (Max. Slope)
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data	
Channel Slope	4.90 %
Discharge	704.00 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	1.23 ft
Elevation Range	0.00 to 0.56
Flow Area	37.8 ft ²
Wetted Perimeter	45.51 ft
Top Width	43.00 ft
Actual Depth	1.23 ft
Critical Elevation	2.37 ft
Critical Slope	0.32 %
Velocity	18.63 ft/s
Velocity Head	5.40 ft
Specific Energy	6.62 ft
Froude Number	3.50
Flow Type	Supercritical

Handwritten:
 -0.5 ft (curb)
 0.73 ft

Handwritten:
 $\frac{8}{12} \times 1 = 0.67$

Handwritten:
 $\therefore 2 \text{ COURSES as well.}$

Handwritten:
 Lots 1 1/2, and
 90 thru 98
 back to RACEL
 at SLOPE
 OF 4.9 %.

Calculation Messages:
 Water elevation exceeds lowest end station by 0.72556818 ft.

Roughness Segments		
Start Station	End Station	Mannings Coefficient
0+00.00	0+02.00	0.013
0+02.00	0+41.00	0.016
0+41.00	0+43.00	0.013

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

Overflow Section - Racel Street (Max. Slope)
Worksheet for Irregular Channel

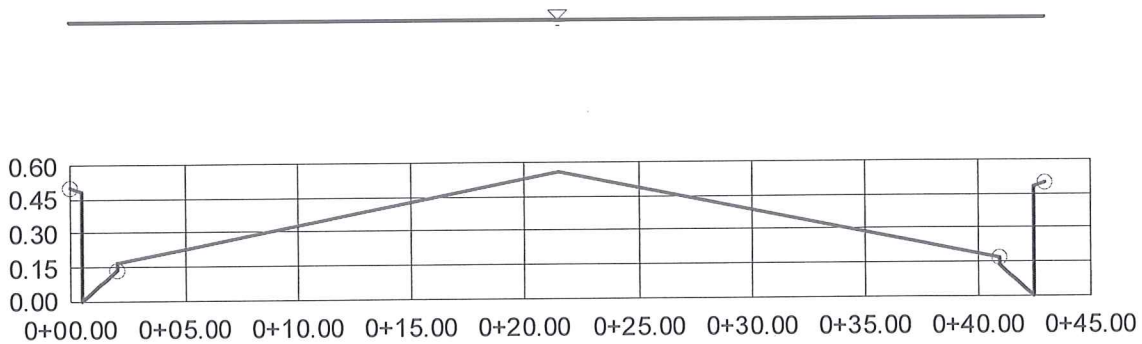
Natural Channel Points	
Station (ft)	Elevation (ft)
0+42.50	0.48
0+43.00	0.50

Notes: Q = Developed Condition RA-HU

Overflow Section - Racel Street (Max. Slope) **Cross Section for Irregular Channel**

Project Description	
Worksheet	Racel Overflow Street Section (Max. Slope)
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	1.23 ft
Elevation Range	0.00 to 0.56
Discharge	704.00 cfs



V:10.0
H:1
NTS

APPENDIX G

Reference Material

Technical Drainage Study for Skye Canyon – Phase 1 Infrastructure, by SHG

CITY OF LAS VEGAS INTER-OFFICE MEMORANDUM		DATE: June 16, 2014
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 1 Infrastructure		COPIES TO: Slater Hanifan Group
Cross Streets:	NEC of Grand Teton Blvd. & Hualapai Way	K A G Development South, LLC / Ninety-Five Management, LLC
File Number:	F:\Depot\DSMemos\DS4661B.doc	Bart Anderson, P.E., DevCo
Parcel Number:	125-07-301-001 & 125-07-301-002; 125-07-401-001 & 125-07-401-002	CCRFCD
Zoning Action:	TMP-53058	
FEMA Flood Zone	YES	NO X
Proposed Storm Drain	YES X	NO

HISTORY	DATE RECEIVED	DATE REVIEWED	COMMENTS	REVIEW FEES	FEES PAID Payment Trn #
1 st Submittal	3/19/2014	4/17/2014	Not Approved	\$400.00	351277: \$400
2 nd Submittal	5/14/2014	6/12/2014	See Comments Below	\$400.00	356797: \$400
TOTAL FEES (LDDRS):				\$800.00	

REMARKS:

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

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

1. This drainage study is acceptable in concept; however, City of Las Vegas will not formally accept the study until the Clark County Regional Flood Control District (CCRFCD) has issued a letter of concurrence. The engineer should contact the CCRFCD to confirm that they have begun their review.
2. The Kyle Canyon Master Drainage Study is proposing to revise the hydrology and facilities identified in the Clark County Regional Flood Control District's (CCRFCD) 2008 Las Vegas Valley Flood Control Master Plan Update. A Master Plan Amendment (MPA) must be submitted to the City of Las Vegas for approval. The City of Las Vegas will coordinate the MPA submittal to CCRFCD for approval. The Master Developer will be responsible for preparing all submittals needed for CCRFCD along with any and all presentations. The MPU must be approved by the City of Las Vegas City Council prior to the final approval of the Master Drainage Study.
3. In an overview perspective for the proposed Phase 1 Infrastructures, Racel Street with its regional storm drain act as the sole perpetuation pathway for offsite flows during a major storm event in the interim condition (reference Sheets GR-01 & GR-02).

In a worst case scenario that the upstream culvert entrance is completely clogged, ie, the 100-year flow will be conveyed on the *Racel Street* surface. Provide a hydraulic calculation for the worst case 100-year water surface in *Racel Street*. The finish floor elevation of future houses in the PODs adjacent to *Racel* shall be above the corresponding water surface or flood wall for protection to that effect. This shall serve as a guideline in the future technical drainage studies for the PODs.

4. All drainage facilities proposed in this *Phase 1 Infrastructure Study* are considered interim facilities and must be maintained by the master developer until the facilities are formally accepted by the *City of Las Vegas*.
5. The proposed improvement plans show drainage facilities of a size that must be reviewed for Maintenance and Access concerns. The engineer must coordinate with *City Streets & Sanitation Department* for their review and approval prior to the subject drainage study approval.
6. 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 *Flood Control* prior to final acceptance of the technical drainage study.
7. The project proposes to build a temporary drainage facility on the west side of *Hualapai Way*. Prior to final plan approval the developer must complete a ***Maintenance and Liability Agreement*** for the interim drainage improvements (off-site berms or channels) 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 constructing the facility and an exhibit that adequately shows the location and limits of the drainage facility to *Flood Control* for approval. Once the drainage study is conditionally approved, the engineer/developer should contact the *City's Land Development Section* (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 offsite berms / channels are no longer necessary and can be removed.

8. **Sheet SD-09:** Review and revise an appeared low point "61.95TC" in *Grand Canyon Drive* at the intersection with *Grand Teton Drive*.
9. Technical drainage studies are required for each of the POD's. The technical drainage studies for the POD's may not be conditional approved until the final approval of the pertinent infrastructure drainage study is obtained.
10. 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.

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/R60E/07
AREA G-07

Interim Condition Exhibit & HEC-1
(Parcel 1.3 Existing Condition)

Interim Condition (100-Yr)

```

1*****
*
* FLOOD HYDROGRAPH PACKAGE (HEC-1)
*   JUN 1998
*   VERSION 4.1
*
* RUN DATE 13MAR14 TIME 11:09:54
*
*****

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INT-100.OUT

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

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

```

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

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.

THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION

NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,

DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL LOSS RATE:GREEN AND AMPT INFILTRATION

KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM

1 HEC-1 INPUT PAGE 1

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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10
*DIAGRAM
1  ID      SLATER HANIFAN GROUP
2  ID      OLYMPIA COMPANIES
3  ID      SKYE CANYON - PHASE 1 INFRASTRUCTURE
4  ID      INTERIM CONDITION (100-YR STORM)
5  ID
6  ID      RETURN PERIOD ----- 100-YEAR
7  ID      DISTRIBUTION ----- 6-HOUR SDN3
8  ID      PROJECT NO. ----- OLY1401.001
9  ID      FILENAME ----- INT-100.H1
10 ID      DATE ----- 03/10/14
11 ID      MODELED BY ----- AJH/SMJ
12 ID
13 ID      SIX HOUR DEPTH-AREA REDUCTION FACTORS
14 ID      DRAINAGE AREA (MIA2)  DARF
15 ID      0.0-0.49              1.00
16 ID      0.5-0.99              0.98
17 ID      1.0-1.99              0.97
18 ID
19 IT      5      0      0      300
20 IO      5      0      0
21 IN      5      0      0
22 JR      PREC  1.00  0.98  0.97
*
23 KK      HUAL
24 KM      OFFSITE STREET BASIN FOR HUALAPAI WAY
25 PB      2.93
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 BA      .0144
35 LS      0      93.2
36 UD      0.136
*
37 KK      OFF20
38 KM      REFERENCED FROM GCW MASTER DRAINAGE STUDY
39 BA      .0656
40 PB      3.01
41 LS      0      86.2
42 UD      0.190
*
43 KK      ROFF20
44 KM      ROUTE OFF20 TO PT2
45 RD      6020  0.034  0.035      0  TRAP  15      1
*

```

1 HEC-1 INPUT PAGE 2

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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10
46 KK      OFF2-E
47 KM      LOCAL OFFSITE BASIN
48 BA      .1355
49 PB      3.00
50 LS      0      86.2
51 UD      0.243
*
52 KK      PT2
53 KM      COMBINES OFF20 AND OFF2-E

```

INT-100.OUT

54	HC	2							
	*								
55	KK	OFF21							
56	KM	REFERENCED FROM GCW MASTER DRAINAGE STUDY							
57	BA	.5280							
58	PB	3.10							
59	LS	0	85.7						
60	UD	0.446							
	*								
61	KK	ROFF21							
62	KM	ROUTE OFF21 TO PT3							
63	RD	5655 0.037 0.035	0	TRAP	0	100			
	*								
64	KK	OFF3-E							
65	KM	LOCAL OFFSITE BASIN							
66	BA	.1581							
67	PB	3.00							
68	LS	0	82.8						
69	UD	0.302							
	*								
70	KK	PT3							
71	KM	COMBINES OFF21 AND OFF3-E							
72	HC	2							
	*								
73	KK	CP0							
74	HC	2							
	*								
75	KK	OFF1-E							
76	KM	LOCAL OFFSITE BASIN							
77	PB	3.00							
78	BA	.0917							
79	LS	0	86.2						
80	UD	0.202							
	*								

1

HEC-1 INPUT

PAGE 3

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

81	KK	RA-HU							
82	KM	COMBINES OFF20, OFF21, OFF1-E, OFF2-E, OFF3-E, HUAL							
83	HC	3							
	*								
84	KK	RRA-HU							
85	KM	ROUTE RA-HU TO CP26							
86	RK	2700 0.040 0.013	0	CIRC	6				
	*								
87	KK	ON2-I							
88	KM	ONSITE BASIN SOUTH OF ON1-I AND NORTH OF RACEL ST							
89	PB	2.93							
90	BA	.0247							
91	LS	0	86.2						
92	UD	0.101							
	*								
93	KK	ON4-I							
94	KM	SOUTHWEST QUAD ONSITE BASIN							
95	PB	2.93							
96	BA	.0611							
97	LS	0	86.4						
98	UD	0.100							
	*								

PROJECT SITE (includes PARK)

99	KK	RAC							
100	KM	STREET BASIN FOR RACEL ST							
101	PB	2.93							
102	BA	.0071							
103	LS	0	92.5						
104	UD	0.097							
	*								
105	KK	CONQ							
106	KM	STREET BASIN FOR CONQUISTADOR ST							
107	PB	2.93							
108	BA	.0035							
109	LS	0	92.5						
110	UD	0.133							
	*								
111	KK	CP1							
112	KM	COMBINES RA-HU, ON2-I, ON4-I, RAC AND CONQ							
113	HC	5							
	*								
114	KK	ON3-I							
115	KM	NORTHEAST QUAD ONSITE BASIN							
116	PB	2.93							
117	BA	.0553							
118	LS	0	86.3						
119	UD	0.127							
	*								

1

HEC-1 INPUT

PAGE 4

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

120	KK	ON5-I							
121	KM	SOUTHEAST QUAD ONSITE BASIN							

Page 2

INT-100.OUT

122	PB	2.93	
123	BA	.0505	
124	LS	0	86.4
125	UD	0.129	
	*		
126	KK	GCD	
127	KM	OFFSITE (HALF) STREET BASIN FOR GRAD CANYON DR	
128	PB	2.93	
129	BA	.0053	
130	LS	0	93.8
131	UD	0.137	
	*		
132	KK	CP26	
133	KM	COMBINES CP1, ON3-I, ON5-I AND GCD	
134	HC	4	
	*		
135	KK	ON1-I	
136	KM	NORTHWEST QUAD ONSITE BASIN, NORTH OF ON2-I	
137	PB	2.93	
138	BA	.0262	
139	LS	0	86.2
140	UD	0.100	
	*		
141	KK	HOR	
142	KM	OFFSITE STREET BASIN FOR HORSE DR	
143	PB	2.93	
144	BA	.0163	
145	LS	0	93.3
146	UD	0.108	
	*		
147	KK	CP2	
148	KM	COMBINES ON1-D AND HOR	
149	HC	2	
	*		
150	KK	OFF18	
151	KM	REFERENCED FROM GCW MASTER DRAINAGE STUDY	
152	BA	.5491	
153	PB	3.05	
154	LS	0	86.3
155	UD	0.445	
	*		

1

HEC-1 INPUT

PAGE 5

LINE	ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10
156	KK ROFF18
157	KM ROUTE OFF18 THRU EX-W5
158	RM 2 0.171 0.15
	*
159	KK EX-W5
160	KM REFERENCED FROM GCW MASTER DRAINAGE STUDY
161	BA .4460
162	PB 2.86
163	LS 0 86.3
164	UD .308
	*
165	KK CP12
166	KM COMBINES OFF18 AND EX-W5
167	HC 2
	*
168	KK CP3
169	KM COMBINES CP2 AND CP12
170	HC 2
	*
171	KK GTD
172	KM OFFSITE (HALF) STREET BASIN FOR GRAD TETON DR
173	PB 2.93
174	BA .0073
175	LS 0 93.9
176	UD 0.105
	*
177	ZZ

1

SCHEMATIC DIAGRAM OF STREAM NETWORK

INPUT LINE	(V) ROUTING	(--->) DIVERSION OR PUMP FLOW
NO.	(.) CONNECTOR	(<---) RETURN OF DIVERTED OR PUMPED FLOW
23	HUAL	
	.	
37	OFF20	
	.	
	V	
43	ROFF20	
	.	
	.	
46	OFF2-E	
	.	
	.	
52	PT2.....	
	.	
	.	
55	OFF21	

61	.	.	V	
	.	.	V	ROFF21
	.	.	.	
64	.	.	.	OFF3-E
	.	.	.	
70	.	.	.	PT3
	.	.	.	
73	.	.	.	CP0
	.	.	.	
75	.	.	.	OFF1-E
	.	.	.	
81	RA-HU	.	.	
	V	.	.	
84	RRA-HU	.	.	
	.	.	.	
87	.	.	.	ON2-I
	.	.	.	
93	.	.	.	ON4-I
	.	.	.	
99	.	.	.	RAC
	.	.	.	
105	.	.	.	CONQ
	.	.	.	
111	CP1	.	.	
	.	.	.	
114	.	.	.	ON3-I
	.	.	.	
120	.	.	.	ON5-I
	.	.	.	
126	.	.	.	GCD
	.	.	.	
132	CP26	.	.	
	.	.	.	
135	.	.	.	ON1-I
	.	.	.	
141	.	.	.	HOR
	.	.	.	
147	.	.	.	CP2
	.	.	.	
150	.	.	.	OFF18
	.	.	.	V
156	.	.	.	ROFF18
	.	.	.	
159	.	.	.	EX-W5
	.	.	.	
165	.	.	.	CP12
	.	.	.	
168	.	.	.	CP3
	.	.	.	
171	.	.	.	STD

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

SIX HOUR DEPTH-AREA REDUCTION FACTORS	
DRAINAGE AREA (MI ²)	DARF
0.0-0.49	1.00

0.5-0.99 0.98 INT-100.OUT
 1.0-1.99 0.97

20 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 .98 .97

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

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

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

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

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

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

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

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

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

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

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

1

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

OPERATION	STATION	AREA	PLAN	RATIOS APPLIED TO PRECIPITATION		
				RATIO 1 1.00	RATIO 2 .98	RATIO 3 .97
HYDROGRAPH AT +	HUAL	.01	1 FLOW TIME	26. 3.58	25. 3.58	25. 3.58
HYDROGRAPH AT +	OFF20	.07	1 FLOW TIME	85. 3.58	82. 3.58	81. 3.58

INT-100.OUT

ROUTED TO	ROFF20	.07	1	FLOW TIME	85. 3.83	83. 3.83	82. 3.83
HYDROGRAPH AT	OFF2-E	.14	1	FLOW TIME	160. 3.67	155. 3.67	153. 3.67
2 COMBINED AT	PT2	.20	1	FLOW TIME	232. 3.75	225. 3.75	222. 3.75
HYDROGRAPH AT	OFF21	.53	1	FLOW TIME	475. 3.92	461. 3.92	454. 3.92
ROUTED TO	ROFF21	.53	1	FLOW TIME	477. 4.08	462. 4.08	455. 4.08
HYDROGRAPH AT	OFF3-E	.16	1	FLOW TIME	146. 3.75	142. 3.75	139. 3.75
2 COMBINED AT	PT3	.69	1	FLOW TIME	557. 4.08	540. 4.08	531. 4.08
2 COMBINED AT	CP0	.89	1	FLOW TIME	676. 4.00	655. 4.00	644. 4.00
HYDROGRAPH AT	OFF1-E	.09	1	FLOW TIME	114. 3.58	111. 3.58	109. 3.58
3 COMBINED AT	RA-HU	.99	1	FLOW TIME	727. 4.00	704. 4.00	693. 4.00
ROUTED TO	RRA-HU	.99	1	FLOW TIME	726. 4.00	703. 4.00	692. 4.00
HYDROGRAPH AT	ON2-I	.02	1	FLOW TIME	36. 3.50	35. 3.50	34. 3.50
HYDROGRAPH AT	ON4-I	.06	1	FLOW TIME	90. 3.50	88. 3.50	86. 3.50
HYDROGRAPH AT	RAC	.01	1	FLOW TIME	13. 3.50	13. 3.50	13. 3.50
HYDROGRAPH AT	CONQ	.00	1	FLOW TIME	6. 3.58	6. 3.58	6. 3.58
5 COMBINED AT	CP1	1.09	1	FLOW TIME	756. 4.00	733. 4.00	721. 4.00
HYDROGRAPH AT	ON3-I	.06	1	FLOW TIME	78. 3.58	76. 3.58	75. 3.58
HYDROGRAPH AT	ON5-I	.05	1	FLOW TIME	72. 3.58	70. 3.58	69. 3.58
HYDROGRAPH AT	GCD	.01	1	FLOW TIME	10. 3.58	9. 3.58	9. 3.58
4 COMBINED AT	CP26	1.20	1	FLOW TIME	794. 4.00	769. 4.00	757. 4.00
HYDROGRAPH AT	ON1-I	.03	1	FLOW TIME	38. 3.50	37. 3.50	37. 3.50
HYDROGRAPH AT	HOR	.02	1	FLOW TIME	30. 3.50	29. 3.50	29. 3.50
2 COMBINED AT	CP2	.04	1	FLOW TIME	68. 3.50	67. 3.50	66. 3.50
HYDROGRAPH AT	OFF18	.55	1	FLOW TIME	495. 3.92	480. 3.92	473. 3.92
ROUTED TO	ROFF18	.55	1	FLOW TIME	473. 4.08	459. 4.08	452. 4.08
HYDROGRAPH AT	EX-W5	.45	1	FLOW TIME	443. 3.75	429. 3.75	423. 3.75
2 COMBINED AT							


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+          CP12      1.00      1  FLOW      792.      INT-100.OUT
+          CP3       1.04      1  FLOW      807.      768.      756.
+          GTD       .01      1  FLOW      14.       13.       13.
+          HYDROGRAPH AT
+          1

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

ISTAQ	ELEMENT	DT	PEAK	TIME TO PEAK	VOLUME	DT	INTERPOLATED TO COMPUTATION INTERVAL PEAK	INTERVAL TIME TO PEAK	VOLUME
		(MIN)	(CFS)	(MIN)	(IN)	(MIN)	(CFS)	(MIN)	(IN)
FOR PLAN = 1	RATIO=	.00							
ROFF20	MANE	5.00	85.42	230.00	1.69	5.00	85.42	230.00	1.69

CONTINUITY SUMMARY (AC-FT) - INFLOW= .5899E+01 EXCESS= .0000E+00 OUTFLOW= .5917E+01 BASIN STORAGE= .6045E-02 PERCENT ERROR= -.4

FOR PLAN = 1	RATIO=	.00							
ROFF20	MANE	5.00	83.10	230.00	1.64	5.00	83.10	230.00	1.64

CONTINUITY SUMMARY (AC-FT) - INFLOW= .5719E+01 EXCESS= .0000E+00 OUTFLOW= .5736E+01 BASIN STORAGE= .5980E-02 PERCENT ERROR= -.4

FOR PLAN = 1	RATIO=	.00							
ROFF20	MANE	5.00	81.93	230.00	1.61	5.00	81.93	230.00	1.61

CONTINUITY SUMMARY (AC-FT) - INFLOW= .5628E+01 EXCESS= .0000E+00 OUTFLOW= .5646E+01 BASIN STORAGE= .5764E-02 PERCENT ERROR= -.4

FOR PLAN = 1	RATIO=	.00							
ROFF21	MANE	5.00	476.60	245.00	1.73	5.00	476.60	245.00	1.73

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4859E+02 EXCESS= .0000E+00 OUTFLOW= .4862E+02 BASIN STORAGE= .5083E-02 PERCENT ERROR= -.1

FOR PLAN = 1	RATIO=	.00							
ROFF21	MANE	5.00	461.93	245.00	1.67	5.00	461.93	245.00	1.67

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4709E+02 EXCESS= .0000E+00 OUTFLOW= .4713E+02 BASIN STORAGE= .5011E-02 PERCENT ERROR= -.1

FOR PLAN = 1	RATIO=	.00							
ROFF21	MANE	5.00	454.60	245.00	1.65	5.00	454.60	245.00	1.65

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4635E+02 EXCESS= .0000E+00 OUTFLOW= .4638E+02 BASIN STORAGE= .4975E-02 PERCENT ERROR= -.1

FOR PLAN = 1	RATIO=	1.00							
RRA-HU	MANE	.43	726.67	240.46	1.67	5.00	726.02	240.00	1.67

CONTINUITY SUMMARY (AC-FT) - INFLOW= .8864E+02 EXCESS= .0000E+00 OUTFLOW= .8864E+02 BASIN STORAGE= .1383E-10 PERCENT ERROR= .0

FOR PLAN = 1	RATIO=	.98							
RRA-HU	MANE	.45	703.76	240.73	1.62	5.00	703.06	240.00	1.62

CONTINUITY SUMMARY (AC-FT) - INFLOW= .8590E+02 EXCESS= .0000E+00 OUTFLOW= .8589E+02 BASIN STORAGE= .1354E-10 PERCENT ERROR= .0

FOR PLAN = 1	RATIO=	.97							
RRA-HU	MANE	.41	692.62	240.66	1.60	5.00	691.63	240.00	1.60

CONTINUITY SUMMARY (AC-FT) - INFLOW= .8453E+02 EXCESS= .0000E+00 OUTFLOW= .8453E+02 BASIN STORAGE= .1380E-10 PERCENT ERROR= .0

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

Interim Condition (10-Yr)

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1*****
*
* FLOOD HYDROGRAPH PACKAGE (HEC-1)
*   JUN 1998
*   VERSION 4.1
*
* RUN DATE 13MAR14 TIME 11:09:40
*
*****
INT-10.OUT
*****
*
* U.S. ARMY CORPS OF ENGINEERS
* HYDROLOGIC ENGINEERING CENTER
* 609 SECOND STREET
* DAVIS, CALIFORNIA 95616
* (916) 756-1104
*
*****

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

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

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.

THE DEFINITION OF -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

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LINE ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10
*DIAGRAM
1 ID SLATER HANIFAN GROUP
2 ID OLYMPIA COMPANIES
3 ID SKYE CANYON - PHASE 1 INFRASTRUCTURE
4 ID INTERIM CONDITION (10-YR STORM)
5 ID
6 ID RETURN PERIOD ----- 10-YEAR
7 ID DISTRIBUTION ----- 6-HOUR SDN3
8 ID PROJECT NO. ----- OLY1401.001
9 ID FILENAME ----- INT-10.H1
10 ID DATE ----- 03/10/14
11 ID MODELED BY ----- AJH/SMJ
12 ID
13 ID SIX HOUR DEPTH-AREA REDUCTION FACTORS
14 ID DRAINAGE AREA (MIA^2) DARF
15 ID 0.0-0.49 1.00
16 ID 0.5-0.99 0.98
17 ID 1.0-1.99 0.97
18 ID
19 IT 5 0 0 300
20 IO 5 0 0
21 IN 5 0 0
22 JR PREC 1.00 0.98 0.97
*
23 KK HUAL
24 KM OFFSITE STREET BASIN FOR HUALAPAI WAY
25 PB 1.61
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 BA .0144
35 LS 0 91.2
36 UD 0.138
*
37 KK OFF20
38 KM REFERENCED FROM GCW MASTER DRAINAGE STUDY
39 BA .0656
40 PB 1.72
41 LS 0 86.2
42 UD 0.190
*
43 KK ROFF20
44 KM ROUTE OFF20 TO PT2
45 RD 6020 0.034 0.035 0 TRAP 15 1
*

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1 HEC-1 INPUT PAGE 2

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LINE ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10
46 KK OFF2-E
47 KM LOCAL OFFSITE BASIN
48 BA .1355
49 PB 1.67
50 LS 0 86.2
51 UD 0.243
*
52 KK PT2
53 KM COMBINES OFF20 AND OFF2-E

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INT-10.OUT

54	HC	2							
	*								
55	KK	OFF21							
56	KM	REFERENCED FROM GCW MASTER DRAINAGE STUDY							
57	BA	.5280							
58	PB	1.77							
59	LS	0	85.7						
60	UD	0.446							
	*								
61	KK	ROFF21							
62	KM	ROUTE OFF21 TO PT3							
63	RD	5655 0.037 0.035	0	TRAP	0	100			
	*								
64	KK	OFF3-E							
65	KM	LOCAL OFFSITE BASIN							
66	BA	.1581							
67	PB	1.67							
68	LS	0	82.8						
69	UD	0.302							
	*								
70	KK	PT3							
71	KM	COMBINES OFF21 AND OFF3-E							
72	HC	2							
	*								
73	KK	CP0							
74	HC	2							
	*								
75	KK	OFF1-E							
76	KM	LOCAL OFFSITE BASIN							
77	PB	1.67							
78	BA	.0917							
79	LS	0	86.2						
80	UD	0.202							
	*								

1

HEC-1 INPUT

PAGE 3

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

81	KK	RA-HU							
82	KM	COMBINES OFF20, OFF21, OFF2-E, OFF3-E, OFF1-E AND HUAL							
83	HC	3							
	*								
84	KK	RRA-HU							
85	KM	ROUTE RA-HU TO CP26							
86	RK	2700 0.040 0.013	0	CIRC	6				
	*								
87	KK	ON2-I							
88	KM	ONSITE BASIN SOUTH OF ON1-I AND NORTH OF RACEL ST							
89	PB	1.61							
90	BA	.0247							
91	LS	0	86.2						
92	UD	0.101							
	*								
93	KK	ON4-I							
94	KM	SOUTHWEST QUAD ONSITE BASIN							
95	PB	1.61							
96	BA	.0611							
97	LS	0	86.4						
98	UD	0.100							
	*								

— PROJECT SITE (INCLUDING PARK) Future

99	KK	RAC							
100	KM	STREET BASIN FOR RACEL ST							
101	PB	1.61							
102	BA	.0071							
103	LS	0	92.5						
104	UD	0.097							
	*								
105	KK	CONQ							
106	KM	STREET BASIN FOR CONQUISTADOR ST							
107	PB	1.61							
108	BA	.0035							
109	LS	0	92.5						
110	UD	0.133							
	*								
111	KK	CP1							
112	KM	COMBINES RA-HU, ON2-I, ON4-I, RAC AND CONQ							
113	HC	5							
	*								
114	KK	ON3-I							
115	KM	NORTHEAST QUAD ONSITE BASIN							
116	PB	1.61							
117	BA	.0553							
118	LS	0	86.3						
119	UD	0.127							
	*								

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HEC-1 INPUT

PAGE 4

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

120	KK	ONS-I							
121	KM	SOUTHEAST QUAD ONSITE BASIN							

INT-10.OUT

122	PB	1.61	
123	BA	.0505	
124	LS	0	86.4
125	UD	0.129	
	*		
126	KK	GCD	
127	KM	OFFSITE (HALF) STREET BASIN FOR GRAD CANYON DR	
128	PB	1.61	
129	BA	.0053	
130	LS	0	93.8
131	UD	0.137	
	*		
132	KK	CP26	
133	KM	COMBINES CP1, ON3-I, ON5-I AND GCD	
134	HC	4	
	*		
135	KK	ON1-I	
136	KM	NORTHWEST QUAD ONSITE BASIN, NORTH OF ON2-I	
137	PB	1.61	
138	BA	.0262	
139	LS	0	86.2
140	UD	0.100	
	*		
141	KK	HOR	
142	KM	OFFSITE STREET BASIN FOR HORSE DR	
143	PB	1.61	
144	BA	.0163	
145	LS	0	93.3
146	UD	0.108	
	*		
147	KK	CP2	
148	KM	COMBINES ON1-D AND HOR	
149	HC	2	
	*		
150	KK	OFF18	
151	KM	REFERENCED FROM GCW MASTER DRAINAGE STUDY	
152	BA	.5491	
153	PB	1.708	
154	LS	0	86.3
155	UD	0.445	
	*		

1

HEC-1 INPUT

PAGE 5

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

156	KK	ROFF18	
157	KM	ROUTE OFF18 THRU EX-W5	
158	RM	2 0.171 0.15	
	*		
159	KK	EX-W5	
160	KM	REFERENCED FROM GCW MASTER DRAINAGE STUDY	
161	BA	.4460	
162	PB	1.606	
163	LS	0	86.3
164	UD	.308	
	*		
165	KK	CP12	
166	KM	COMBINES OFF18 AND EX-W5	
167	HC	2	
	*		
168	KK	CP3	
169	KM	COMBINES CP2 AND CP12	
170	HC	2	
	*		
171	KK	GTD	
172	KM	OFFSITE (HALF) STREET BASIN FOR GRAD TETON DR	
173	PB	1.61	
174	BA	.0073	
175	LS	0	93.9
176	UD	0.105	
	*		
177	ZZ		

1

SCHEMATIC DIAGRAM OF STREAM NETWORK

INPUT	(V) ROUTING	(--->) DIVERSION OR PUMP FLOW
LINE	(.) CONNECTOR	(<---) RETURN OF DIVERTED OR PUMPED FLOW
NO.		
23	HUAL	
	.	
37	.	OFF20
	.	V
	.	V
43	.	ROFF20
	.	.
	.	.
46	.	OFF2-E
	.	.
52	.	PT2.....
	.	.
	.	.
55	.	OFF21

0.5-0.99 0.98 INT-10.OUT
 1.0-1.99 0.97

20 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 .98 .97

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

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

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

1

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

OPERATION	STATION	AREA	PLAN	RATIOS APPLIED TO PRECIPITATION		
				RATIO 1 1.00	RATIO 2 .98	RATIO 3 .97
HYDROGRAPH AT +	HUAL	.01	1 FLOW TIME	11. 3.58	10. 3.58	10. 3.58
HYDROGRAPH AT +	OFF20	.07	1 FLOW TIME	33. 3.67	32. 3.67	31. 3.67
ROUTED TO +	ROFF20	.07	1 FLOW TIME	33. 3.92	34. 3.83	33. 3.83
HYDROGRAPH AT +	OFF2-E	.14	1 FLOW TIME	60. 3.67	57. 3.67	56. 3.67
2 COMBINED AT +	PT2	.20	1 FLOW TIME	83. 3.83	82. 3.83	81. 3.83
HYDROGRAPH AT +	OFF21	.53	1 FLOW TIME	186. 3.92	179. 3.92	176. 3.92
ROUTED TO +	ROFF21	.53	1 FLOW TIME	186. 4.17	179. 4.25	176. 4.25
HYDROGRAPH AT +	OFF3-E	.16	1 FLOW TIME	48. 3.75	46. 3.75	44. 3.75

INT-10.OUT									
+ 2 COMBINED AT	PT3	.69	1	FLOW TIME	210. 4.17	202. 4.17	197. 4.17		
+ 2 COMBINED AT	CP0	.89	1	FLOW TIME	251. 4.17	241. 4.17	236. 4.17		
+ HYDROGRAPH AT	OFF1-E	.09	1	FLOW TIME	43. 3.67	42. 3.67	41. 3.67		
+ 3 COMBINED AT	RA-HU	.99	1	FLOW TIME	267. 4.08	255. 4.08	250. 4.08		
+ ROUTED TO	RRA-HU	.99	1	FLOW TIME	264. 4.17	254. 4.17	249. 4.17		
+ HYDROGRAPH AT	ON2-I	.02	1	FLOW TIME	13. 3.58	13. 3.58	12. 3.58		
+ HYDROGRAPH AT	ON4-I	.06	1	FLOW TIME	33. 3.50	32. 3.50	31. 3.50		
+ HYDROGRAPH AT	RAC	.01	1	FLOW TIME	6. 3.50	6. 3.50	6. 3.50		
+ HYDROGRAPH AT	CONQ	.00	1	FLOW TIME	3. 3.58	3. 3.58	3. 3.58		
+ 5 COMBINED AT	CP1	1.09	1	FLOW TIME	275. 4.08	263. 4.08	257. 4.08		
+ HYDROGRAPH AT	ON3-I	.06	1	FLOW TIME	29. 3.58	28. 3.58	28. 3.58		
+ HYDROGRAPH AT	ON5-I	.05	1	FLOW TIME	27. 3.58	26. 3.58	25. 3.58		
+ HYDROGRAPH AT	GCD	.01	1	FLOW TIME	5. 3.58	4. 3.58	4. 3.58		
+ 4 COMBINED AT	CP26	1.20	1	FLOW TIME	288. 4.08	276. 4.08	270. 4.08		
+ HYDROGRAPH AT	ON1-I	.03	1	FLOW TIME	14. 3.50	13. 3.58	13. 3.58		
+ HYDROGRAPH AT	HOR	.02	1	FLOW TIME	14. 3.50	14. 3.50	13. 3.50		
+ 2 COMBINED AT	CP2	.04	1	FLOW TIME	28. 3.50	27. 3.50	26. 3.50		
+ HYDROGRAPH AT	OFF18	.55	1	FLOW TIME	189. 3.92	182. 3.92	179. 3.92		
+ ROUTED TO	ROFF18	.55	1	FLOW TIME	181. 4.08	174. 4.08	170. 4.08		
+ HYDROGRAPH AT	EX-W5	.45	1	FLOW TIME	165. 3.75	159. 3.75	156. 3.75		
+ 2 COMBINED AT	CP12	1.00	1	FLOW TIME	299. 3.92	287. 3.92	281. 3.92		
+ 2 COMBINED AT	CP3	1.04	1	FLOW TIME	306. 3.92	294. 3.92	288. 3.92		
+ HYDROGRAPH AT	GTD	.01	1	FLOW TIME	7. 3.50	6. 3.50	6. 3.50		

1

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

ISTAQ	ELEMENT	DT	PEAK	TIME TO PEAK	VOLUME	DT	INTERPOLATED TO COMPUTATION INTERVAL		VOLUME
							PEAK	TIME TO PEAK	
		(MIN)	(CFS)	(MIN)	(IN)	(MIN)	(CFS)	(MIN)	(IN)
FOR PLAN = 1	RATIO=	.00							
ROFF20	MANE	4.75	33.68	232.75	.66	5.00	32.57	235.00	.66

INT-10.OUT

CONTINUITY SUMMARY (AC-FT) - INFLOW= .2283E+01 EXCESS= .0000E+00 OUTFLOW= .2297E+01 BASIN STORAGE= .5728E-02 PERCENT ERROR= -.9

FOR PLAN = 1 RATIO= .00
ROFF20 MANE 5.00 33.65 230.00 .63 5.00 33.65 230.00 .63

CONTINUITY SUMMARY (AC-FT) - INFLOW= .2199E+01 EXCESS= .0000E+00 OUTFLOW= .2213E+01 BASIN STORAGE= .6791E-02 PERCENT ERROR= -.9

FOR PLAN = 1 RATIO= .00
ROFF20 MANE 5.00 32.93 230.00 .62 5.00 32.93 230.00 .62

CONTINUITY SUMMARY (AC-FT) - INFLOW= .2156E+01 EXCESS= .0000E+00 OUTFLOW= .2170E+01 BASIN STORAGE= .6751E-02 PERCENT ERROR= -1.0

FOR PLAN = 1 RATIO= .00
ROFF21 MANE 5.00 185.81 250.00 .67 5.00 185.81 250.00 .67

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1871E+02 EXCESS= .0000E+00 OUTFLOW= .1874E+02 BASIN STORAGE= .4220E-02 PERCENT ERROR= -.2

FOR PLAN = 1 RATIO= .00
ROFF21 MANE 5.00 178.88 255.00 .64 5.00 178.88 255.00 .64

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1800E+02 EXCESS= .0000E+00 OUTFLOW= .1803E+02 BASIN STORAGE= .4148E-02 PERCENT ERROR= -.2

FOR PLAN = 1 RATIO= .00
ROFF21 MANE 5.00 175.51 255.00 .63 5.00 175.51 255.00 .63

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1765E+02 EXCESS= .0000E+00 OUTFLOW= .1768E+02 BASIN STORAGE= .4112E-02 PERCENT ERROR= -.2

FOR PLAN = 1 RATIO= 1.00
RRA-HU MANE .50 266.47 246.15 .63 5.00 264.46 250.00 .63

CONTINUITY SUMMARY (AC-FT) - INFLOW= .3314E+02 EXCESS= .0000E+00 OUTFLOW= .3315E+02 BASIN STORAGE= .1468E-10 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .98
RRA-HU MANE .58 255.20 246.28 .60 5.00 254.02 250.00 .60

CONTINUITY SUMMARY (AC-FT) - INFLOW= .3188E+02 EXCESS= .0000E+00 OUTFLOW= .3188E+02 BASIN STORAGE= .1423E-10 PERCENT ERROR= .0

FOR PLAN = 1 RATIO= .97
RRA-HU MANE .50 249.85 246.14 .59 5.00 248.96 250.00 .59

CONTINUITY SUMMARY (AC-FT) - INFLOW= .3126E+02 EXCESS= .0000E+00 OUTFLOW= .3126E+02 BASIN STORAGE= .1403E-10 PERCENT ERROR= .0

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

REFER TO EXHIBIT E FOR REMAINDER DELINEATION OF OFFSITE BASINS



Basin Flow Rate Summary (Interim Condition)			
Basin/Concentration Point ID	Area (ac)	Q ₁₀₀ (cfs)	Q ₁₀ (cfs)
ON1-I	16.8	38	14
ON2-I	15.8	36	13
ON3-I	35.4	78	29
ON4-I	39.1	90	33
ON5-I	32.3	72	27
CONQ	2.2	6	3
RAC	4.6	13	6
HOR	10.4	30	14
GCD	3.4	10	5
GTD	4.7	14	7
HUAL	9.2	26	11
OFF1-E	60.3	114	43
OFF2-E	86.8	160	60
OFF3-E	101.2	146	48
*OFF18	351.4	480	182
*OFF20	42.0	85	33
*OFF21	337.9	462	179
*EX-W5	285.4	443	165

Prorated Flow Summary			
Interim Condition			
Basin	Q ₁₀₀ (cfs)	Area (acres)	Unit Flow (cfs/acre)
ON1-I	38	16.8	2.3
Subbasin	Q ₁₀₀ (cfs)	Area (acres)	Unit Flow (cfs/acre)
ON14-A	22	9.8	2.3
ON14-B	16	7.0	2.3
TOTAL	38	16.8	
Basin	Q ₁₀₀ (cfs)	Area (acres)	Unit Flow (cfs/acre)
ON3-I	78	35.4	2.2
Subbasin	Q ₁₀₀ (cfs)	Area (acres)	Unit Flow (cfs/acre)
ON34-A	5	2.2	2.2
ON34-B	38	17.1	2.2
ON34-C	35	16.1	2.2
TOTAL	78	35.4	
Basin	Q ₁₀₀ (cfs)	Area (acres)	Unit Flow (cfs/acre)
ON4-I	90	39.1	2.3
Subbasin	Q ₁₀₀ (cfs)	Area (acres)	Unit Flow (cfs/acre)
ON44-A	7	3.0	2.3
ON44-B	39	17.1	2.3
ON44-C	44	19.1	2.3
TOTAL	90	39.1	
Basin	Q ₁₀₀ (cfs)	Area (acres)	Unit Flow (cfs/acre)
ON5-I	72	32.3	2.2
Subbasin	Q ₁₀₀ (cfs)	Area (acres)	Unit Flow (cfs/acre)
ON54-A	36	16.3	2.2
ON54-B	36	16.0	2.2
TOTAL	72	32.3	

EXHIBIT G
SHEET 1 OF 1

• SERVES AS EXISTING CONDITIONS

Street Hydraulic Exhibits
(Offsite Flow Impacts to Parcel 1.3)

* Basin ON6-D is Parcel 1.4
 * Basin ON5-D is this project site. 11

- 3) A re-evaluation of the drainage patterns impacting Conquistador, south of Racel, has resulted in a change in design from previously proposed. Previously, it was assumed that the entire flow generated by Basin ON5-D would be routed north in Conquistador and collected by proposed roadway drop inlets. Inspection of existing ground across Basins ON5-D and ON6-D is fairly steep in an easterly direction, upwards of 4.0%, resulting in an infeasible assumption that a hump can be provided at the site entry to Basin ON6-D at an elevation required to direct 107 cfs north in Conquistador.

→ This submittal has modified the design assumption to assume that a minimum 6-inch hump will be provided at the site entry to ON6-D to direct a 100-year flow of 29 cfs that produces a flow depth of 0.50-ft north in Conquistador. Although the impacting flows toward the proposed drop inlets in Conquistador have changed, the bypass flow toward Racel remains the same as previously proposed; therefore, no modifications to downstream hydraulic analyses are necessary. As a result, the following table summarizes the change in drop inlet design from the previous submittal.

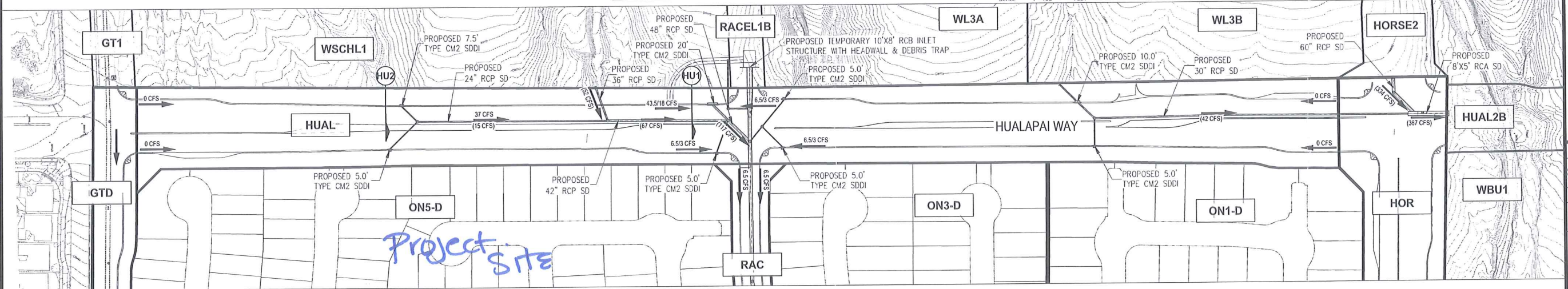
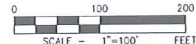
Summary of Conquistador Street Revised Drop Inlet Hydraulic Characteristics							
Previous				Current			
Location	DI Length (ft)	Collected Q_{100} (cfs)	Bypass Q_{100} (cfs)	Location	DI Length (ft)	Collected Q_{100} (cfs)	Bypass Q_{100} (cfs)
SC1	(2) 25.0	79	28	SC1	(2) 15.0	20	9
SC2	(2) 20.0	28	5	SC2	(2) 10.0	8	5

Furthermore, the uncertainty of the grading to Basin ON6-D site entry, has resulted in this study evaluating the proposed Conquistador storm drain to show that the entire flow from ON5-D (107 cfs) is collected by future extension of the provided 36-inch RCP stub. The WSPG hydraulic model, included in Appendix H, shows that entire collection of ON5-D flow prior to reaching Conquistador satisfies storm drain criteria. Therefore, the Q_{100} and HGL shown on the Sheet SD-22 profile is reflective of the analysis utilizing 107 cfs conveyed in the storm drain. Note the flow rates summarized in the above table have been reflected on the Q_{100} and HGL provided on the appropriate lateral profiles.

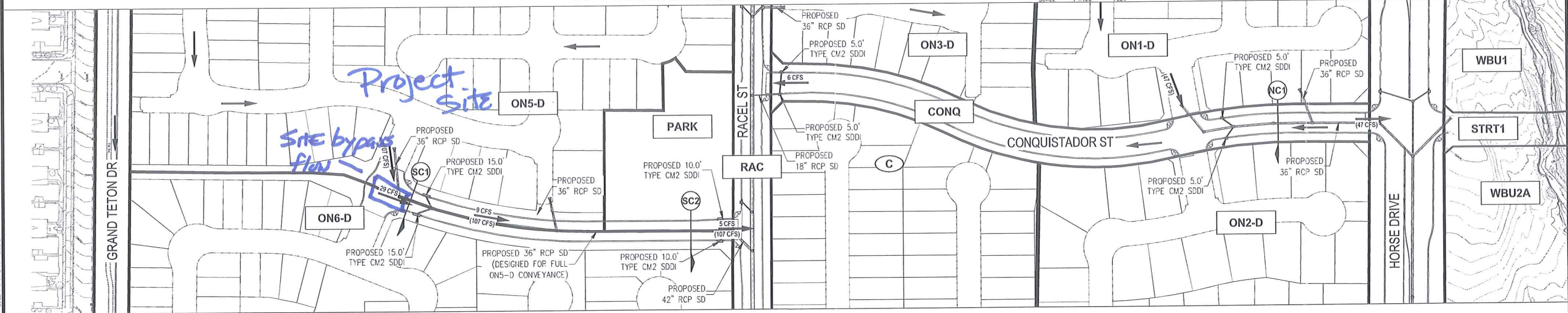
- 4) Due to the addition of several nuisance flow drop inlets requested in the comment letter, the lateral profiles have been updated accordingly to show how they connect into each affected storm drain pipe. Also additional storm drain has been added to the lateral profiles to show the connector pipes between drop inlets proposed in series as requested by the comment letter.

In addition to the quantitative changes to the lateral profiles detailed above, the HGLs for these profiles have also been adjusted where necessary. Previously, several of the HGLs were drawn with negative slope from upstream to downstream end of the pipe reaches. This study has generally shown that the flow in each lateral storm drain does not exceed capacity of the pipe. As a result, the HGLs have been corrected to either show constant elevation over the pipe if the trunk line WSE is above top of pipe or to show HGL at top of lateral pipe at its most upstream end.

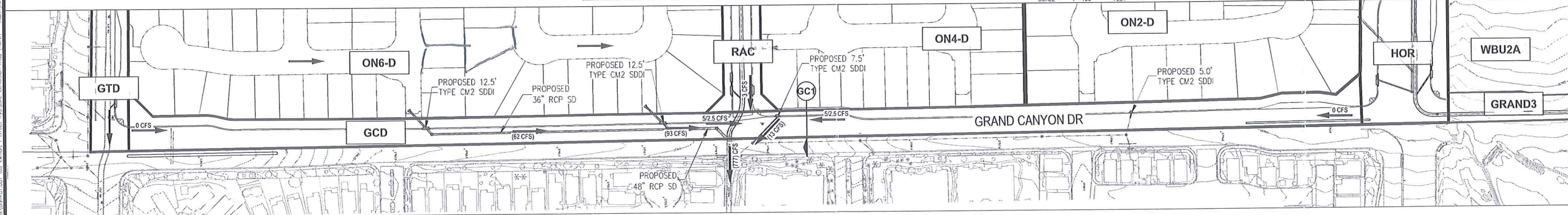
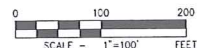
HUALAPAI WAY HYDRAULIC CONDITION



CONQUISTADOR STREET HYDRAULIC CONDITION



GRAND CANYON DRIVE HYDRAULIC CONDITION



Cross Section	Slope (%)	Q ₁₀₀ (cfs)	Depth (ft)	Velocity (fps)	DxV	Dry Lane (ft)
HU1 (100-YR)	0.57	43.5	0.83	3.6	2.9	N/A
HU1 (10-YR)	0.57	18	0.63	2.9	1.8	14.0
HU2 (100-YR)	0.57	52	0.88	3.7	3.3	N/A
HU2 (10-YR)	0.57	24	0.69	3.1	2.1	11.0

*MODELED AS HALF STREET

Cross Section	Slope (%)	Q ₁₀₀ (cfs)	Depth (ft)	Velocity (fps)	DxV
NC1	0.61	6	0.36	2.1	0.8
SC1	1.59	29	0.51	4.1	2.1
SC2	1.59	13	0.40	3.6	1.4

Cross Section	Slope (%)	Q ₁₀₀ (cfs)	Depth (ft)	Velocity (fps)	DxV	Dry Lane (ft)
GC1 (100-YR)	0.50	10	0.54	2.4	1.3	N/A
GC1 (10-YR)	0.50	5	0.44	2.1	0.9	19.5

*MODELED AS HALF STREET

	BASIN BOUNDARY
	BASIN ID
	FLOW DIRECTION
	FLOWMASTER SECTION
	100-YR STREET FLOW
	100-YR STORM FRAIN FLOW



NO.	DESCRIPTION	DATE	BY	APP.	DATE

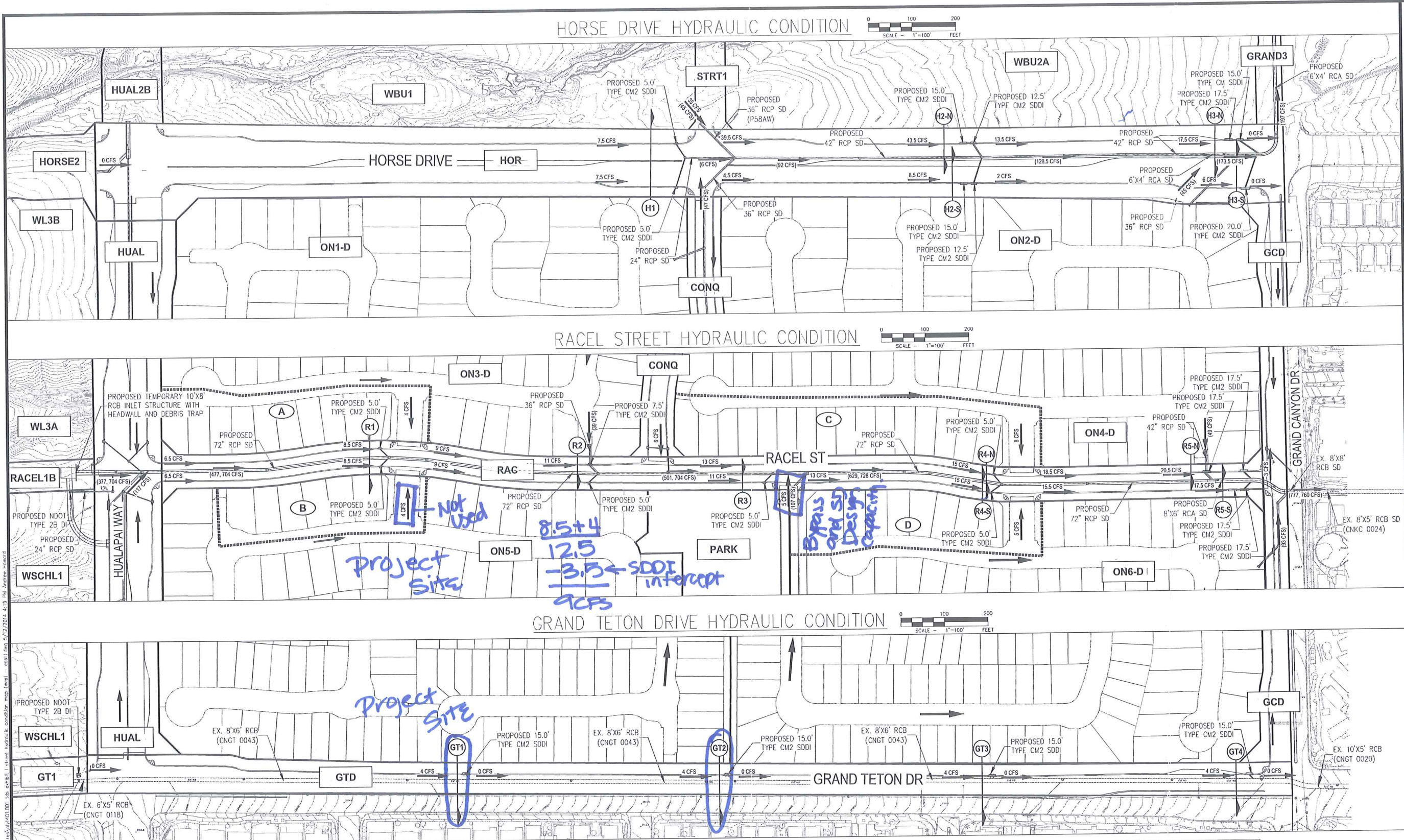
NINETY-FIVE MANAGEMENT, LLC.
SKYE CANYON - PHASE 1 INFRASTRUCTURE STREET HYDRAULIC CONDITION MAP (NORTH/SOUTH STREETS)

DATE: MAY 2014
DRAFTER: AJH
DESIGNER: AJH
CHECKED: SMJ

PROJECT NO. OLY1401.001

REFERENCE

to be revised w/ 1.3 TDS due to flow changes



100-Year Street Flow Summary Horse Drive					
Cross Section	Slope (%)	Q ₁₀₀ (cfs)	Depth (ft)	Velocity (fps)	DxV
H1	3.56	15	0.37	5.2	1.9
*H2-N	4.75	43.5	0.60	8.0	4.8
*H2-S	4.75	8.5	0.37	6.0	2.2
*H3-N	2.26	17.5	0.51	4.9	2.5
*H3-S	2.26	6	0.37	4.1	1.5

*MODELED AS HALF STREET

100-Year Street Flow Summary Racel Street					
Cross Section	Slope (%)	Q ₁₀₀ (cfs)	Depth (ft)	Velocity (fps)	DxV
R1	4.90	17	0.36	6.1	2.2
*R2	4.90	11	0.39	6.3	2.5
*R3	1.53	11	0.47	3.9	1.8
*R4-N	4.90	15	0.43	6.6	2.9
*R4-S	4.90	15	0.43	6.6	2.9
*R5-N	4.90	20.5	0.47	7.0	3.3
*R5-S	4.90	17.5	0.45	6.8	3.1

*MODELED AS HALF STREET

100-Year Street Flow Summary Grand Teton Drive					
Cross Section	Slope (%)	Q ₁₀₀ (cfs)	Depth (ft)	Velocity (fps)	DxV
*GT1	3.60	4	0.33	4.0	1.3
*GT2	3.60	4	0.33	4.0	1.3
*GT3	3.60	4	0.33	4.0	1.3
*GT4	2.30	4	0.35	3.4	1.2

*MODELED AS HALF STREET

LEGEND	
	BASIN BOUNDARY
	BASIN ID
	SUBBASIN BOUNDARY
	SUBBASIN ID
	FLOW DIRECTION
	FLOWMASTER SECTION
XX CFS	100-YR STREET FLOW
(XX CFS)	100-YR STORM DRAIN FLOW*



*RACEL STORM DRAIN FLOW DENOTED AS: (ULTIMATE CONDITION, INTERIM CONDITION CFS)

SLATER HANIFAN GROUP
CONSULTING ENGINEERS & PLANNERS
5740 S. ARVILLE STREET #216, LAS VEGAS, NV 89118
PHONE (702) 284-5300 FAX (702) 284-5390

NO.	DESCRIPTION	DATE	BY	APP.

NINETY-FIVE MANAGEMENT, LLC.
SKYE CANYON - PHASE 1 INFRASTRUCTURE
STREET HYDRAULIC CONDITION MAP
(EASTWEST STREETS)

DATE: MAY 2014
DRAFTER: AJH
DESIGNER: AJH
CHECKED: SMJ
PROJECT NO.
OLY1401.001

EXHIBIT I
SHEET 1 OF 2

REFERENCE

Conquistador Storm Drain Model

(Parcel 1.3 Storm Drain Design)

Revised WSPG Model
"CS-Main.WSP"

CS-MAIN	
WSPG Station	Corresponding Roadway Station
1000	CS (S) 65+00.00
1057.5	CS (S) 64+58.08
1062.5	CS (S) 64+58.08
1354	CS (S) 61+64.15
1451	CS (S) 60+67.72
1571	CS (S) 59+48.29
1679	CS (S) 58+41.08
1750	CS (S) 57+70.13
1844	CS (S) 57+24.54

← Tie-in for North Stub
 ← Tie-in for South Stub
 (Note Station changed on Sheet SD-22 to Sta 6100.99)
 Plan

0 T1 SKYE CANYON INFRASTRUCTURE - PHASE 1
T2 BY OLYMPIA COMPANIES
T3 CONQUISTADOR (SOUTH) - TRUNK STORM DRAIN
SO 1000.002771.79 42
R 1057.502772.60 42
TS 1062.502773.10 36
R 1354.002778.75 36
R 1451.002780.61 36
R 1571.002782.90 36
R 1679.002784.97 36
R 1750.002786.32 36
R 1844.002789.14 36
SH 1844.002789.14 36
CD 18 4
CD 24 4
CD 30 4
CD 36 4
CD 42 4
CD 48 4

2773.8

45. 1
5. 1
5. 1
5. 1
60. 1

CS-Main.WSQ

107.

09

CS-MAIN.OUT

DATE: 4/30/2014
TIME: 9: 8

F0515P
WATER SURFACE PROFILE - CHANNEL DEFINITION LISTING

PAGE 1

CARD CODE	SECT NO	CHN TYPE	NO OF PIERS	AVE WIDTH	HEIGHT 1	BASE DIAMETER	ZL	ZR	INV	Y(1)	Y(2)	Y(3)	Y(4)	Y(5)	Y(6)	Y(7)	Y(8)	Y(9)	Y(10)
CD	18	4			1.50														
CD	24	4			2.00														
CD	30	4			2.50														
CD	36	4			3.00														
CD	42	4			3.50														
CD	48	4			4.00														

9

PAGE NO 3

F 0 5 1 5 P

WATER SURFACE PROFILE - TITLE CARD LISTING

HEADING LINE NO 1 IS -

SKYE CANYON INFRASTRUCTURE - PHASE 1

HEADING LINE NO 2 IS -

BY OLYMPIA COMPANIES

HEADING LINE NO 3 IS -

CONQUISTADOR (SOUTH) - TRUNK STORM DRAIN
F 0 5 1 5 P

9

PAGE NO 2

WATER SURFACE PROFILE - ELEMENT CARD LISTING

W S ELEV
2773.80

ELEMENT NO	1 IS A SYSTEM OUTLET U/S DATA	2 IS A REACH U/S DATA	3 IS A TRANSITION U/S DATA	4 IS A REACH U/S DATA	5 IS A REACH U/S DATA	6 IS A REACH U/S DATA	7 IS A REACH U/S DATA	RADIUS	ANGLE	ANG PT	MAN H
	STATION 1000.00	STATION 1057.50	STATION 1062.50	STATION 1354.00	STATION 1451.00	STATION 1571.00	STATION 1679.00	0.00	0.00	45.00	1
	INVERT 2771.79	INVERT 2772.60	INVERT 2773.10	INVERT 2778.75	INVERT 2780.61	INVERT 2782.90	INVERT 2784.97	0.00	0.00	5.00	1
	SECT 42	SECT 42	SECT 36	SECT 36	SECT 36	SECT 36	SECT 36	0.013	0.013	0.013	1

Page 1

CS-MAIN.OUT

ELEMENT NO	8	IS A REACH	U/S DATA	STATION	INVERT	SECT	RADIUS	ANGLE	ANG PT	MAN H
				1750.00	2786.32	36	0.00	0.00	60.00	1

ELEMENT NO	9	IS A REACH	U/S DATA	STATION	INVERT	SECT	RADIUS	ANGLE	ANG PT	MAN H
				1844.00	2789.14	36	0.00	0.00	0.00	0

ELEMENT NO	10	IS A SYSTEM HEADWORKS	U/S DATA	STATION	INVERT	SECT	W S ELEV
				1844.00	2789.14	36	0.00

NO EDIT ERRORS ENCOUNTERED-COMPUTATION IS NOW BEGINNING
 ** WARNING NO. 2 ** - WATER SURFACE ELEVATION GIVEN IS LESS THAN OR EQUALS INVERT ELEVATION IN HDWKDS, W.S.ELEV = INV + DC $\frac{r}{2}$
 LICENSEE: SLATER HANIFAN GROUP F0515P

WATER SURFACE PROFILE LISTING
 SKYE CANYON INFRASTRUCTURE - PHASE 1
 BY OLYMPIA COMPANIES
 CONQUISTADOR (SOUTH) - TRUNK STORM DRAIN

STATION	INVERT ELEV	DEPTH OF FLOW	W.S. ELEV	Q	VEL	VEL HEAD	ENERGY GRD.EL.	SUPER ELEV	CRITICAL DEPTH	HGT/DIA	BASE/ID NO.	ZL	NO AVBPR PIER
L/ELEM	SO					SF AVE	HF						
1000.00	2771.79	2.264	2774.054	107.0	16.25	4.102	2778.156	0.00	3.142	3.50	0.00	0.00	0 0.00
16.34	0.01409					.020467	0.33					2.585	
1016.34	2772.02	2.232	2774.252	107.0	16.52	4.239	2778.491	0.00	3.142	3.50	0.00	0.00	0 0.00
41.16	0.01409					.022222	0.91					2.585	
1057.50	2772.60	2.143	2774.743	107.0	17.33	4.662	2779.405	0.00	3.142	3.50	0.00	0.00	0 0.00
TRANS STR	0.10000					.023152	0.12					0.00	
1062.50	2773.10	2.919	2776.019	107.0	15.25	3.612	2779.631	0.00	2.919	3.00	0.00	0.00	0 0.00
5.84	0.01938					.024047	0.14					3.000	
1068.34	2773.21	3.000	2776.213	107.0	15.14	3.558	2779.771	0.00	2.919	3.00	0.00	0.00	0 0.00
285.66	0.01938					.025537	7.29					3.000	
1354.00	2778.75	4.989	2783.739	107.0	15.14	3.558	2787.297	0.00	2.919	3.00	0.00	0.00	0 0.00
97.00	0.01918					.025736	2.50					3.000	
1451.00	2780.61	5.862	2786.472	107.0	15.14	3.558	2790.030	0.00	2.919	3.00	0.00	0.00	0 0.00
120.00	0.01908					.025736	3.09					3.000	
1571.00	2782.90	6.897	2789.797	107.0	15.14	3.558	2793.355	0.00	2.919	3.00	0.00	0.00	0 0.00
108.00	0.01917					.025736	2.78					3.000	
1679.00	2784.97	7.843	2792.813	107.0	15.14	3.558	2796.371	0.00	2.919	3.00	0.00	0.00	0 0.00
71.00	0.01901					.025736	1.83					3.000	

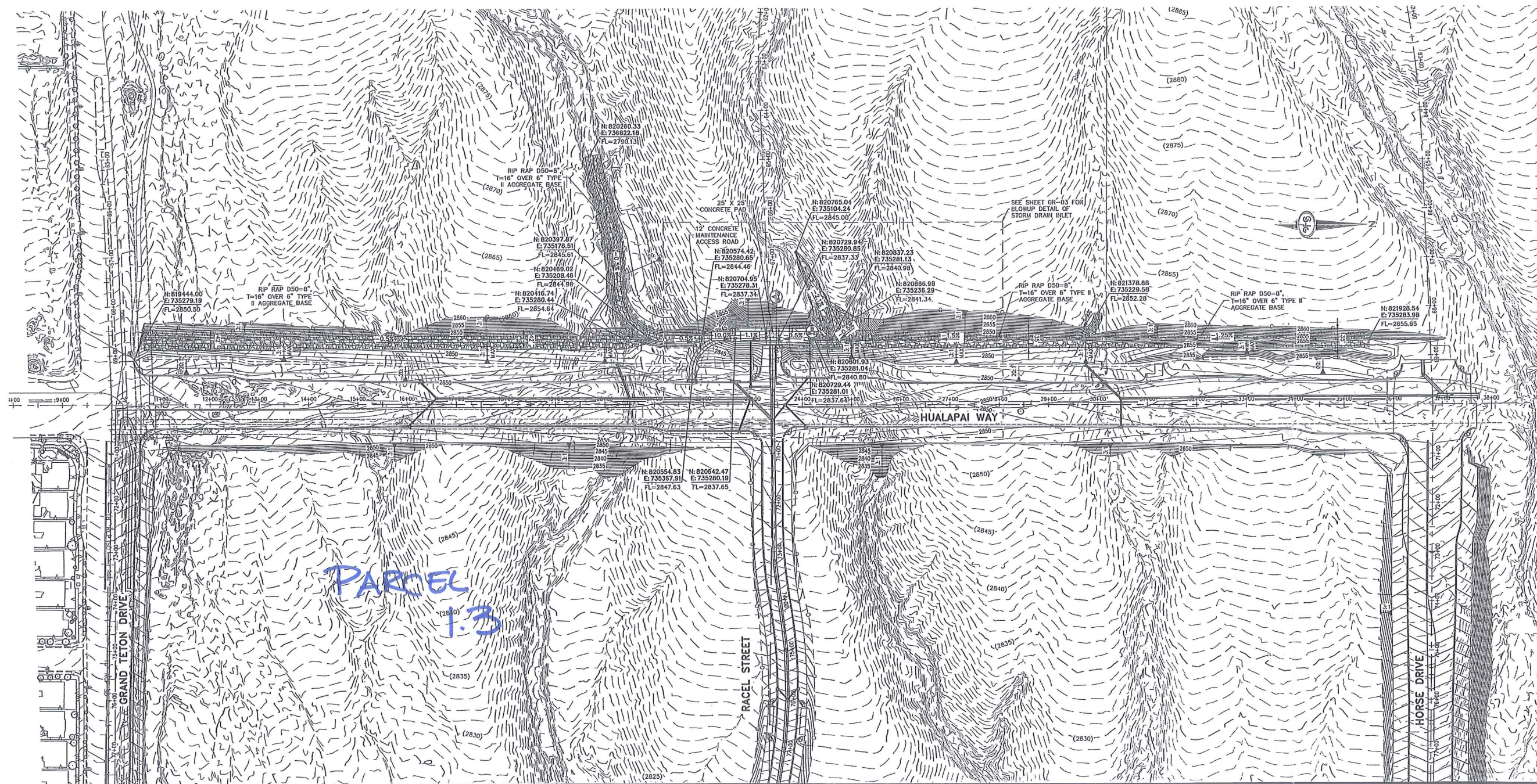
CS-MAIN.OUT

1750.00	2786.32	9.203	2795.523	107.0	15.14	3.558	2799.081	0.00	2.919	3.00	0.00	0.00	0	0.00
94.00	0.03000					.025736	2.42			2.280	0.00			
1844.00	2789.14	8.802	2797.942	107.0	15.14	3.558	2801.500	0.00	2.919	3.00	0.00	0.00	0	0.00

SKYE CANYON INFRASTRUCTURE - PHASE 1
BY OLYMPIA COMPANIES
CONQUISTADOR (SOUTH) - TRUNK STORM DRAIN

1000.00														
1017.22	I													
1034.45	I													
1051.67														
1068.90														
1086.12	I													
1103.35	I													
1120.57	I													
1137.80														
1155.02														
1172.24														
1189.47														
1206.69														
1223.92														
1241.14														
1258.37														
1275.59														
1292.82														
1310.04														
1327.27														
1344.49														
1361.71														
1378.94														
1396.16														
1413.39														
1430.61														
1447.84														
1465.06														
1482.29														
1499.51														
1516.73														
1533.96														
1551.18														
1568.41														
1585.63														
1602.86														
1620.08														
1637.31														
1654.53														
1671.76														
1688.98														
1706.20														
1723.43														
1740.65														
1757.88														
1775.10														
1792.33														
1809.55														

Pertinent Improvement Plan Sheets



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utility lines. It's costly.

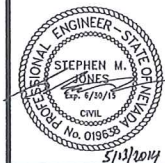
Call
811

OR

1-800-227-2600

NINETY-FIVE MANAGEMENT LLC

GRADING PLAN - 1



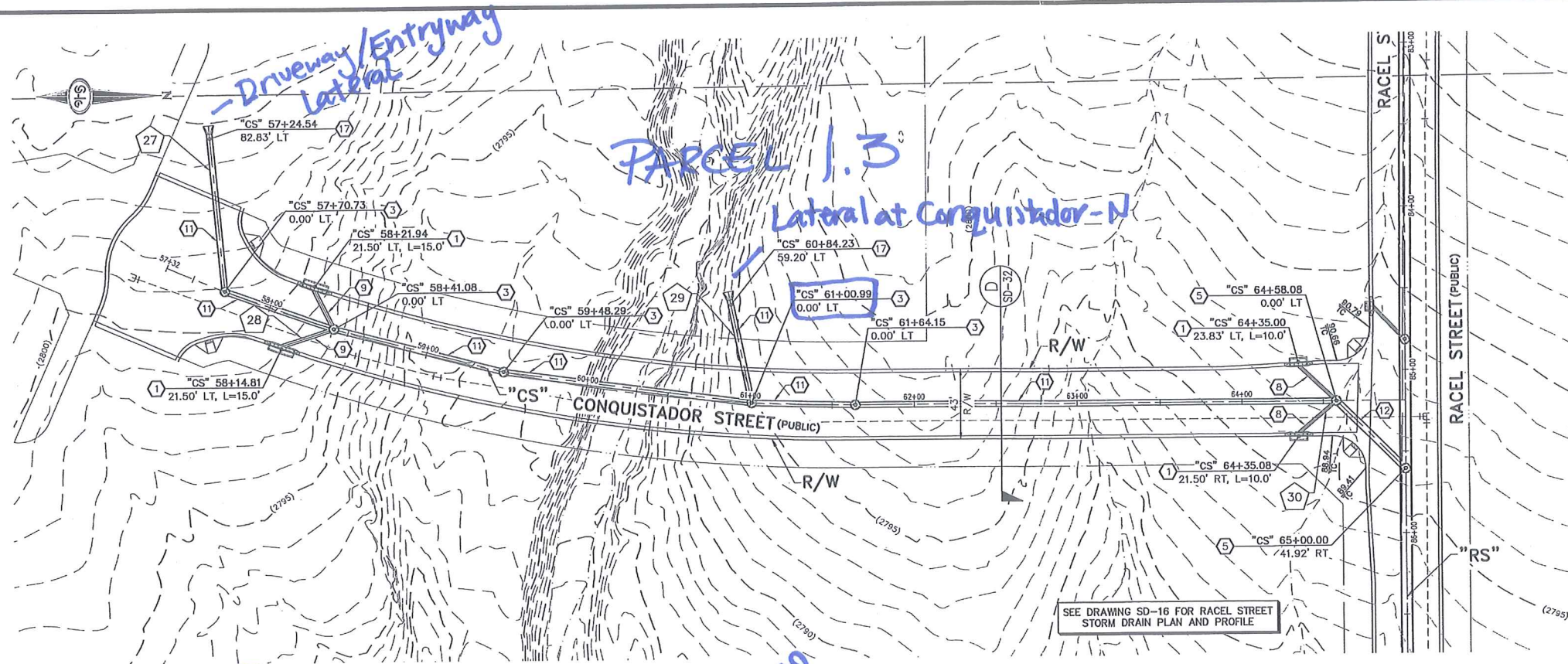
GR-01
SHEET 39 OF 42

Parcel 1.3

This topographic map illustrates the proposed road layout for Parcel 1.3. The map includes the following features:

- Streets:** Grand Teton Drive (left), Racel Street (center), Conquistador Street (top right), and Horse Drive (right).
- Elevations:** Contour lines are shown at 5-foot intervals, with spot elevations ranging from approximately 2740 to 2825 feet.
- Proposed Road Features:**
 - Concrete Slurry 5'x6' Pads:** Located at various points along the proposed road alignment.
 - RIP RAP D50=8" Aggregate Base:** Specified for the road base.
 - Concrete Slurry 5'x6' Pads:** Located at various points along the proposed road alignment.
 - RIP RAP D50=8" Aggregate Base:** Specified for the road base.
- Survey Data:** Numerous stationing points are marked along the proposed road, including:
 - Station 1+00 to 3+00 along Grand Teton Drive.
 - Station 1+00 to 3+00 along Racel Street.
 - Station 1+00 to 3+00 along Conquistador Street.
 - Station 1+00 to 3+00 along Horse Drive.
- Other Features:** A small building footprint is visible near the intersection of Racel Street and Conquistador Street.

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OR
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- ### STORM DRAIN NOTES
- CONSTRUCT TYPE "CM2" DROP INLET (USDCCA STD. DWG. NO. 412.1)
 - CONSTRUCT 60" TYPE I MANHOLE (USDCCA STD. DWG. NO. 403.1)
 - CONSTRUCT 60" TYPE III MANHOLE (USDCCA STD. DWG. NO. 406.1)
 - CONSTRUCT 60" TYPE III MANHOLE WITH TYPE IA RISER (USDCCA STD. DWG. NO. 404.1 AND 406.1)
 - CONSTRUCT NDOT TYPE 4 MANHOLE (NDOT STD. PLAN R-4.3.2)
 - CONSTRUCT RCA ACCESS MANHOLE
 - CONSTRUCT 48" ACCESS MANHOLE
 - INSTALL 18" RCP (USDCCA STD. DWG. NO. 503.2)
 - INSTALL 24" RCP (USDCCA STD. DWG. NO. 503.2)
 - INSTALL 30" RCP (USDCCA STD. DWG. NO. 503.2)
 - INSTALL 36" RCP (USDCCA STD. DWG. NO. 503.2)
 - INSTALL 42" RCP (USDCCA STD. DWG. NO. 503.2)
 - INSTALL 48" RCP (USDCCA STD. DWG. NO. 503.2)
 - INSTALL 60" RCP (USDCCA STD. DWG. NO. 503.2)
 - INSTALL 72" RCP (USDCCA STD. DWG. NO. 503.2) W/ 1" SACRIFICIAL CONCRETE
 - INSTALL 30" RCP END SECTION (NDOT STD. PLAN R-2.3.1)
 - INSTALL 36" RCP END SECTION (NDOT STD. PLAN R-2.3.1)
 - INSTALL 42" RCP END SECTION (NDOT STD. PLAN R-2.3.1)
 - CONSTRUCT 6' X 4' RCA (SEE STRUCTURAL DETAILS BY OTHERS)
 - CONSTRUCT 8' X 5' RCA (SEE STRUCTURAL DETAILS BY OTHERS)
 - CONSTRUCT 8' X 6' RCA (SEE STRUCTURAL DETAILS BY OTHERS) W/ 1" SACRIFICIAL CONCRETE
 - CONSTRUCT 10' X 8' PRECAST RCB (NDOT R-20.1.2) W/ 1" SACRIFICIAL CONCRETE
 - CONSTRUCT NDOT TYPE II HEADWALL (NDOT STD. PLAN B-20.1.5 AND B-20.1.5.1)
 - CONSTRUCT BRICK AND MORTAR PLUG (SEE DETAIL 1, DRAWING SD-34)
 - CONSTRUCT CONCRETE COLLAR (SEE DETAIL 2, DRAWING SD-34)
 - INSTALL NDOT TYPE 2 DROP INLET WITH 3' CONCRETE APRON (NDOT STD. PLAN R-4.2.1)
 - CONSTRUCT JUNCTION STRUCTURE (SEE STRUCTURAL DETAILS BY OTHERS)
 - CONSTRUCT TRANSITION STRUCTURE (SEE STRUCTURAL DETAILS BY OTHERS)
 - CONSTRUCT NDOT TYPE 2B DROP INLET (NDOT STD. PLAN R-4.2.2)
 - CONSTRUCT CONCRETE CROSS GUTTER (USDCCA STD. DWG. NO. 228)
 - CONSTRUCT TYPE "C" DROP INLET (USDCCA STD. DWG. NO. 413)

- ### NOTES
- ALL RCP SHALL BE CLASS III UNLESS OTHERWISE SHOWN.
 - ALL PIPE LENGTHS ARE MEASURED ALONG PIPE CENTERLINE TO CENTER OF MANHOLE OR INSIDE EDGE OF DI OR RCB/RCA.
 - ALL DROP INLETS SHALL INCLUDE STORM WATER MANAGEMENT STAMP AND DETAIL PER USDCCA STD. DWG. NO. 421.
 - SEE STRUCTURAL PLANS FOR ADDITIONAL STRUCTURAL DETAILS AND CONNECTIONS.
 - ALL PIPES ARE PUBLICLY MAINTAINED.

LEGEND

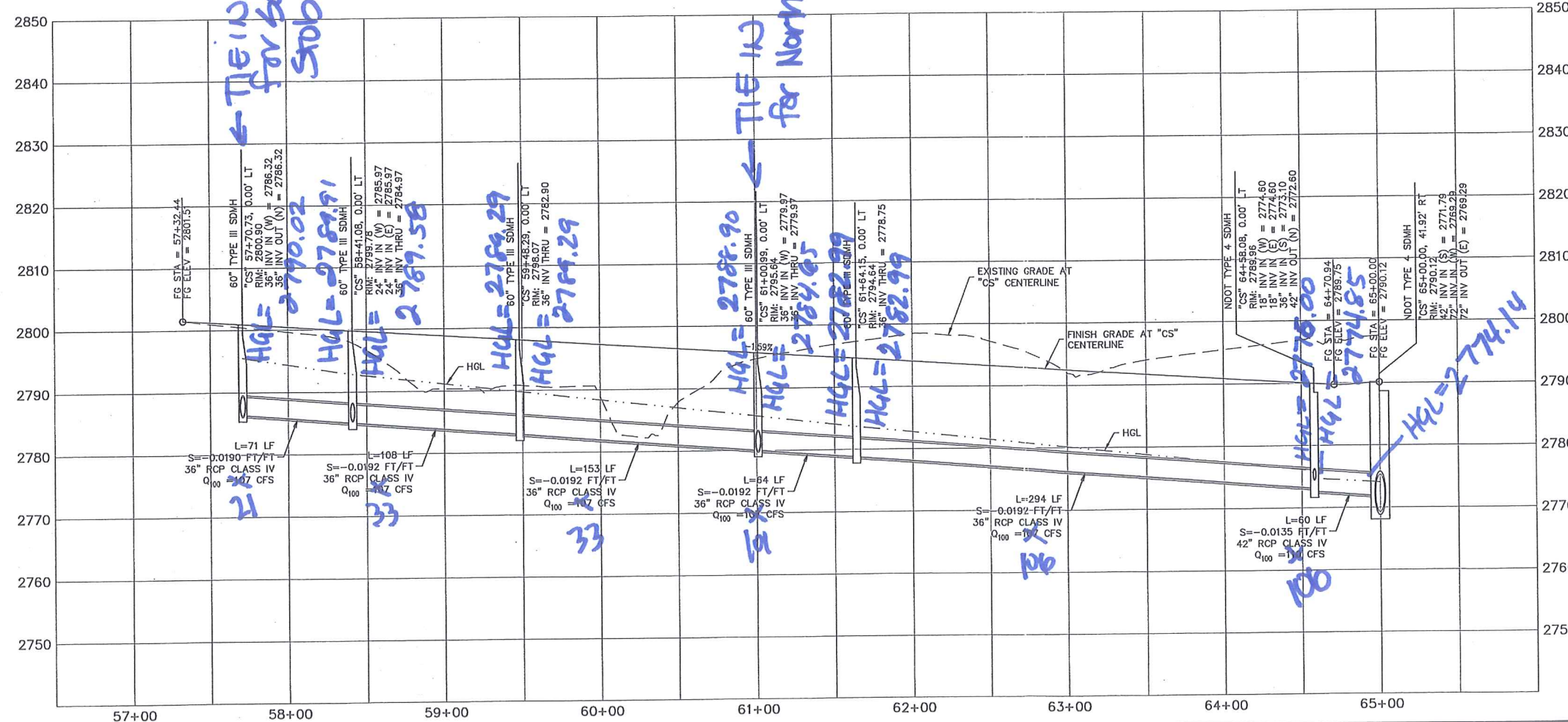
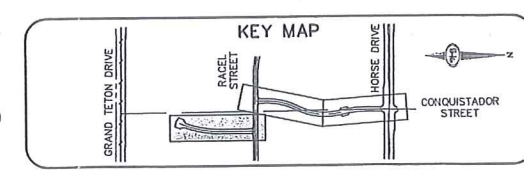
1 STORM DRAIN LATERAL # (SEE SHEETS SD-25 THRU SD-31)

FLOOD ZONE

I CERTIFY THAT THIS GRADING PLAN IS IN CONFORMANCE WITH THE APPROVED TECHNICAL DRAINAGE STUDY (SD-65) ON FILE AT THE CITY OF LAS VEGAS FOR THE SUBJECT PROJECT.

STEPHEN JONES, P.E. 016638 DATE

THE PROJECT SITE IS LOCATED WITHIN A FEMA DESIGNATED ZONE "X" (OUTSIDE THE 500-YEAR FLOOD PLAIN) ON THE FLOOD INSURANCE RATE MAP (FIRM) PANELS: 32003C1735E, 32003C1745E, 32003C1750E, ALL DATED SEPTEMBER 27, 2002.



SLATER HANFAN 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 PHASE 1

CONQUISTADOR STREET STORM DRAIN PLAN AND PROFILE

"CS" 57+00.00 TO "CS" 65+00.00

REFERENCE

DATE: 5/13/14

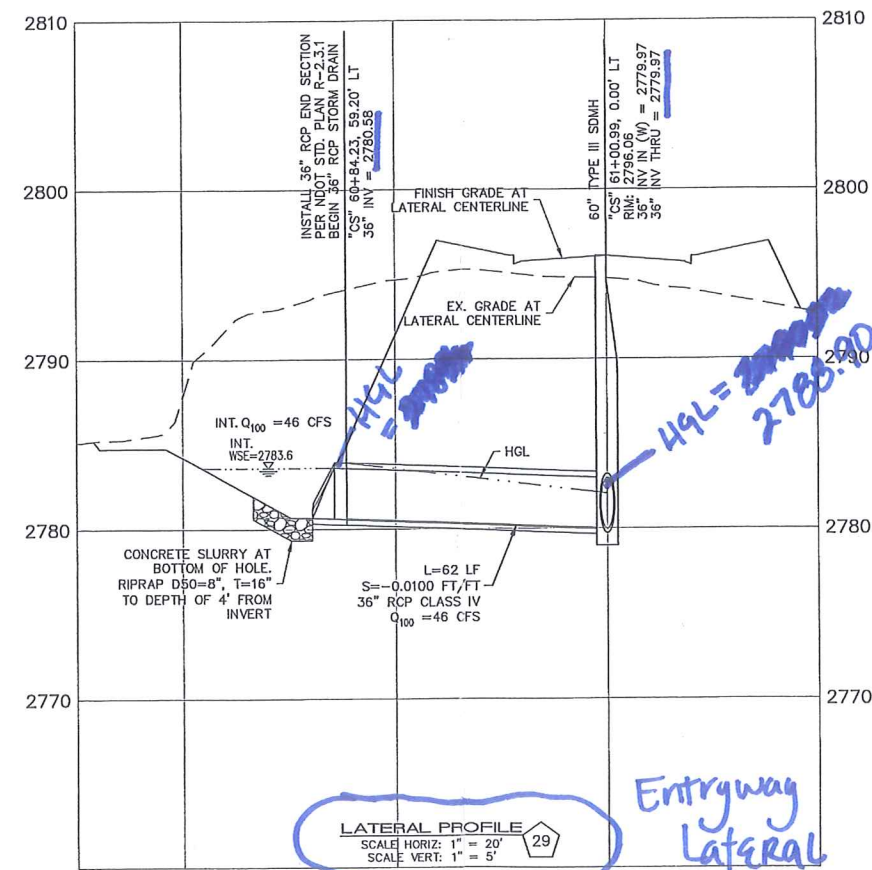
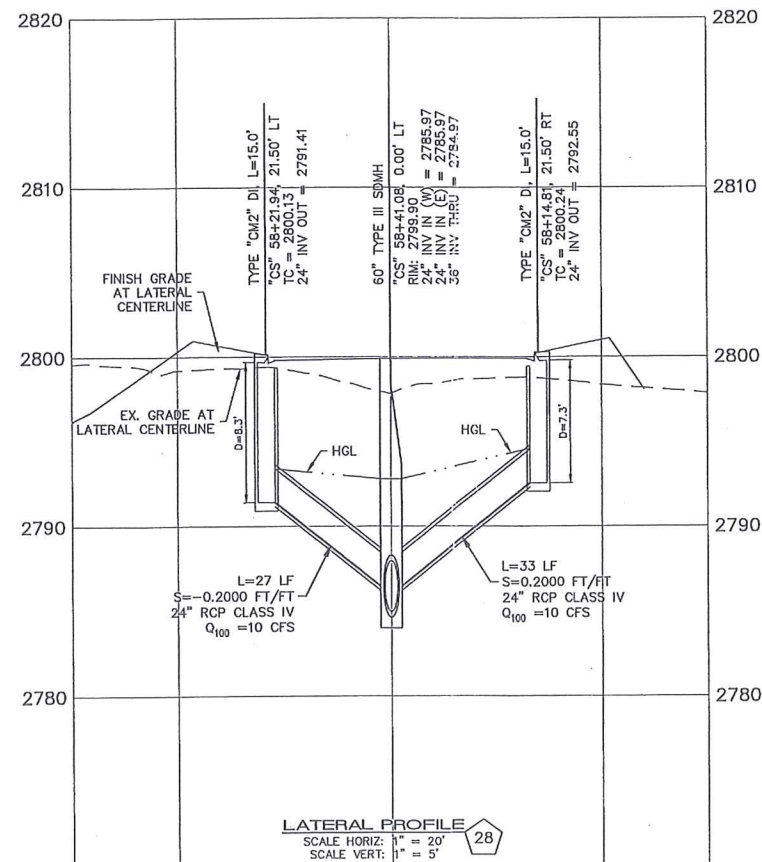
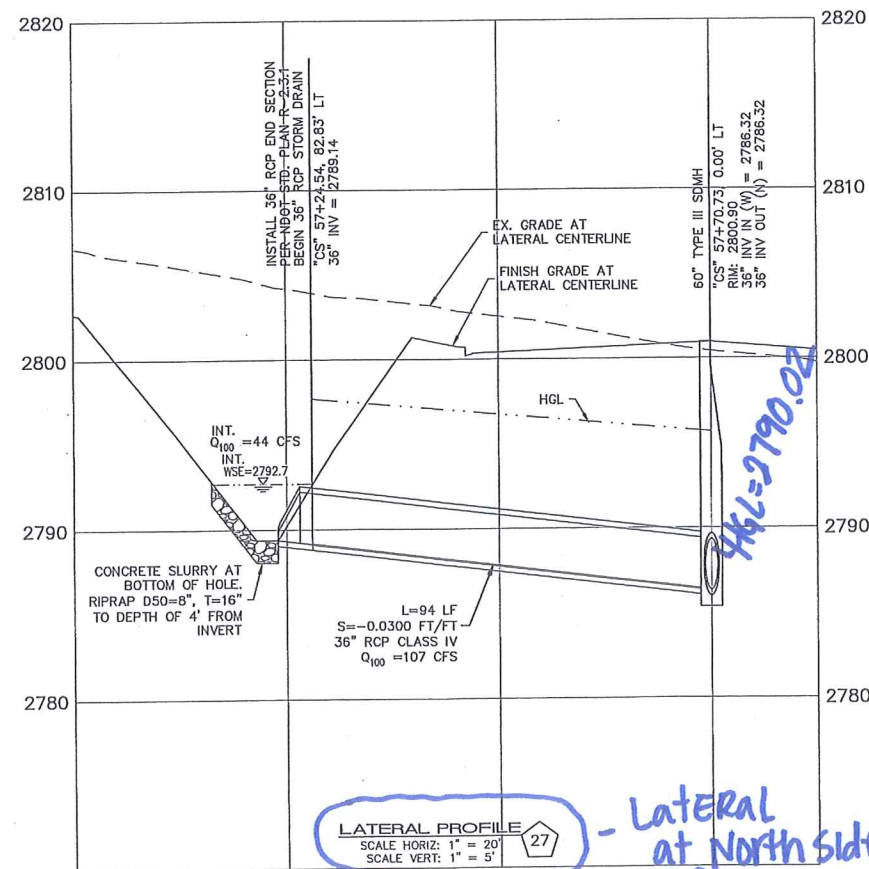
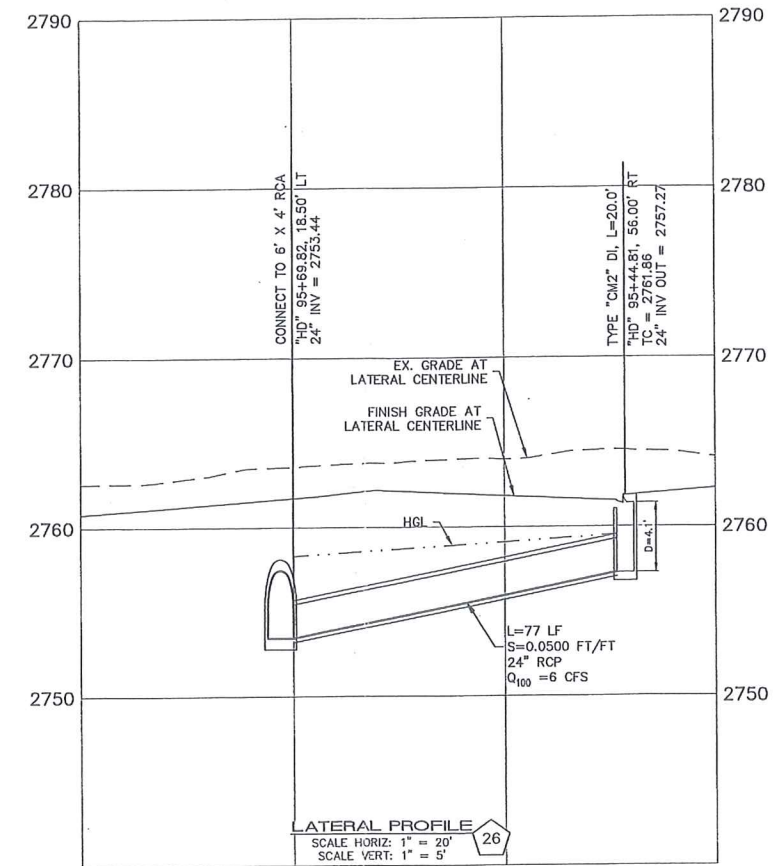
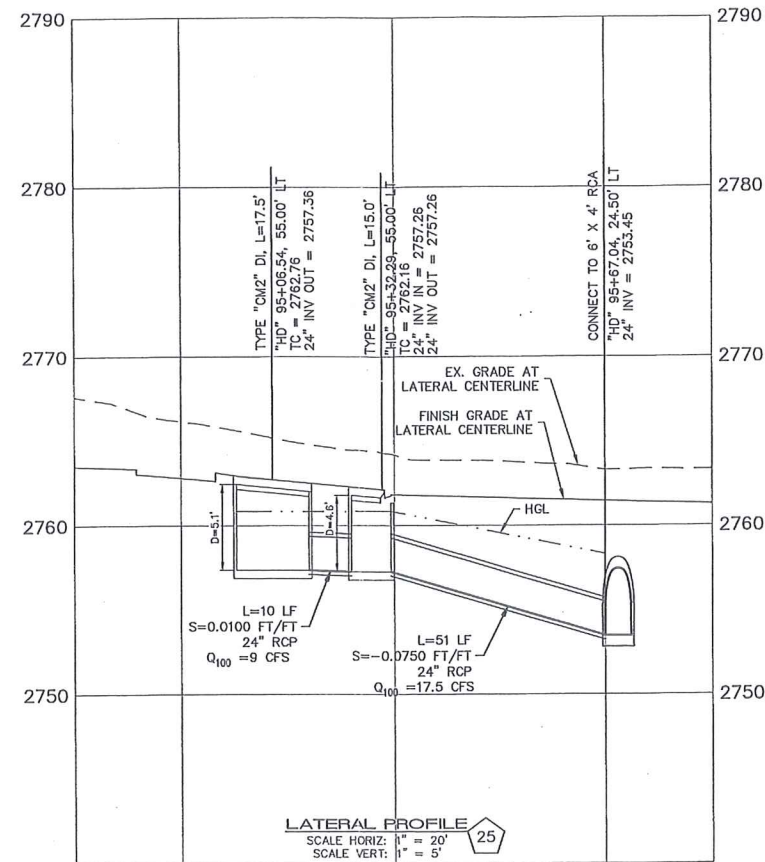
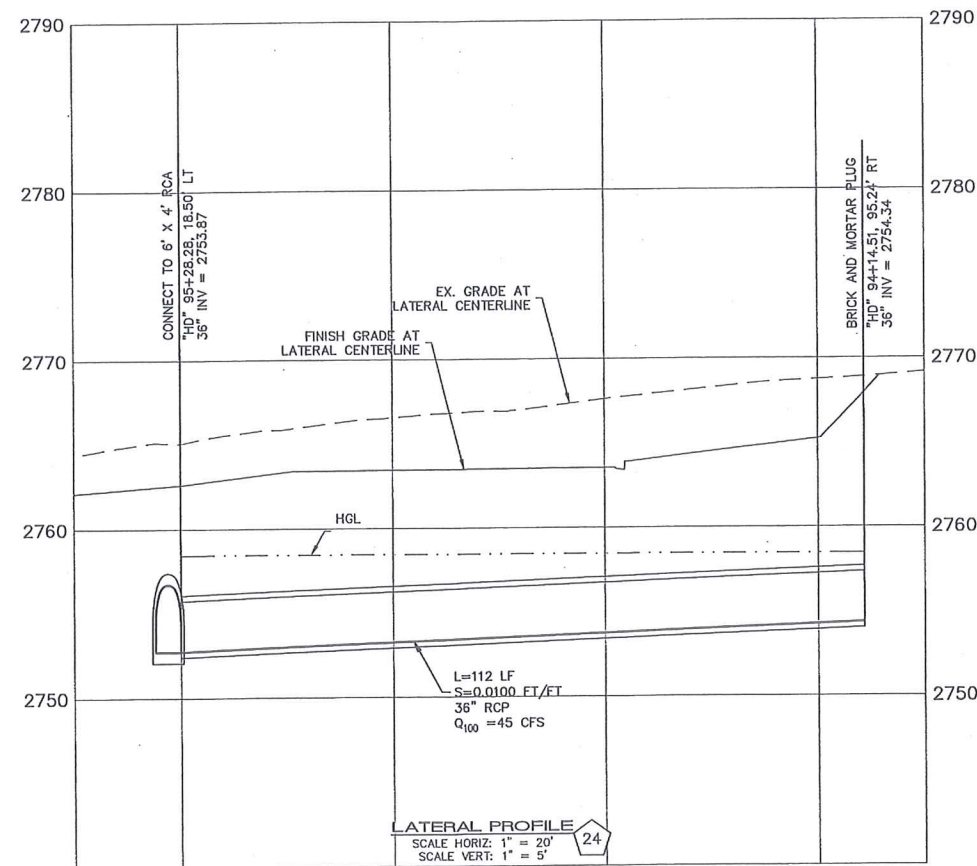
DRAFTER: DAM

DESIGNER: DAM

CHECKED: JJS

PROJECT NO. OLY1401-001

SD-22
SHEET 25 OF 42



- Lateral at North side of Conquistador.

Entryway
Lateral

APPENDIX H

Correspondence with City of Las Vegas

2/5/2014 Kick-off Meeting Summary Notes

Justification Letter for Skye Canyon Phase 1 & Phasing Exhibit (submitted separately to CLV)

MEETING NOTES

Project Number: OLY1401.001

Project Name: Skye Canyon

Meeting Date: 2/5/2014

Meeting Location: CLV Public Works – Turquoise Room

Meeting Topic: Phase 1 Drainage Kickoff

Attendees:	Company Name:	Contact Info (phone)
Oh Sang Kwon	CLV	702-229-1815
Albert Sung	CLV	702-229-2001
Randy Fultz	CLV	702-229-2176
Marc Bolduc	Olympia Companies	702-210-5840
Steve Jones	SHG	702-284-5300
Jerry Slater	SHG	702-284-5300
Mark Failla	SHG	702-284-5300
Rhonda Miller	SHG	702-284-5300

Meeting Notes:

Item:	Discussion:
1	Land Plan & Phase 1 – The land plan for the property was re-introduced as Skye Canyon (formerly Kyle Canyon). It was noted that it is the same land plan approved by CLV with Carwin Advisors previously. Phase 1 was introduced as the approx. 160 acres bound by Horse Drive, Grand Canyon Drive, Grand Teton Drive and Hualapai Way. SHG identified that previous meetings about a supporting parent tentative map have been performed with CLV.
2	Phase 1 Technical Studies – SHG provided the following list of anticipated technical drainage studies for Phase 1. 1 TDS for Infrastructure addressing full street improvements to Horse and Hualapai, remaining half street improvements to Grand Teton and Grand Canyon, and planned regional facility in Racel Street. 1 TDS for each of the four pods of residential development to follow infrastructure drainage study. CLV inquired if an update to the Master Drainage Study is required for these first items of development, and Olympia and SHG discussed with Flynn and the planning department that it is in conformance with the current land plan and thus Master Drainage Study remains valid.
3	Current Master Drainage Study – SHG discussed that since Phase 1 will be in conformance with established drainage patterns and infrastructure designated by the current Master Drainage Study, the Phase 1 technical drainage studies will reference the current Master Study and no update to the current Master Study is necessary for Phase 1. It was identified that a condition of the Master Drainage Study approval states that any infrastructure or residential pod technical studies will not be approved without final approval of the Master Drainage Study. SHG identified that most conditions were satisfied except for concurrences from BLM and NV Energy. CLV added that the CCRFCD MPU Amendment was not formally approved by City Council so its condition is not met, even if it was approved thru CCRFCD Boards and the CCRFCD current F-maps have been updated for Skye Canyon. SHG identified that these remaining conditions placed on the approval of the Master Drainage Study do not impact development of Phase 1, and CLV concurred. However, to continue with Phase 1 development procedurally utilizing the current Master Drainage Study approval, CLV requested a separate "justification letter" showing why the above identified Phase 1 technical studies can be approved based off the current Master Drainage Study. The "justification letter" shall include identification of why the unsatisfied conditions do not impact upcoming Phase 1 technical studies, detail how efforts were previously and are being actively made to satisfy the remaining conditions, identify when a Master Drainage Study Update is necessary, and conceptually identify future development/phasing plan to satisfy the master development agreement including commitment to construct planned detention basin(s) in the subsequent phase. SHG and Olympia concurred that this justification letter will be provided in support of moving forward with Phase 1 prior to the necessity of an updated Master Study. SHG and Olympia agreed to actively pursue meeting the unsatisfied conditions of approval on the Master Drainage Study.

Prepared By: Steve Jones, SHG

Please notify the preparer if you have any questions, concerns or additions to these minutes within 2 days. After 2 days the content of this document will be considered accurate and accepted as the final recordation.

Item:	Discussion:
	All parties acknowledged that a Master Drainage Study Update will be necessary at some point in the future beyond Phase 1; however, large unknowns such as the alignment of Sheep Mountain Parkway prohibit updating the Master Drainage Study at this time.
4	Phase 1 Design Items – The following items were discussed: • Grand Teton Regional Storm Drain: It was acknowledged that the Phase 1 development will be adjacent to the current CIP project installing the regional facility in Grand Teton from Hualapai to Tee Pee. The CIP project is a CMAR with GC Wallace performing the design and Meadow Valley performing the installation, with an estimated construction start of March 2014 and programmed for 7 month completion for a construction cost of \$6.5 Million. It was identified by CLV that since this storm drain facility was a part of the master development agreement for the property, Olympia will likely be responsible for a cost share of the facility; however, financial commitments to the regional storm drain will be worked on between Olympia and CLV in the future. For design purposes, the Phase 1 infrastructure plans will show the regional storm drain as existing and will be responsible for installing drop inlet connections as necessary. • Infrastructure Roadways: It was identified that without the planned detention basin in place upstream for development of Phase 1, the infrastructure drainage will be required to not exceed downstream allowable flows, provide an overflow path at the low point which will need to be designed as Racel Street at its intersection with Hualapai, design any interim flood protection facilities so as to not adversely impact downstream properties, and show all technical drainage requirements are satisfied.
5	Progress Meeting – SHG identified that due to our discussions performed in this meeting, a progress design meeting would be beneficial to address CLV concerns regarding the drainage impacts of this Phase 1 development. CLV agreed and when adequate design information is completed, this design meeting will be scheduled between SHG and CLV prior to submittal of the Infrastructure TDS.

Prepared By: Steve Jones, SHG

Please notify the preparer if you have any questions, concerns or additions to these minutes within 2 days. After 2 days the content of this document will be considered accurate and accepted as the final recordation.



CONSULTING ENGINEERS & PLANNERS
OLY1401.001

March 10, 2014
Revised: May 5, 2014

Oh Sang Kwon, P.E.
City of Las Vegas Department of Public Works – Flood Control Section
333 N. Rancho Drive
Las Vegas, Nevada 89106

Subject: Justification Letter for Skye Canyon (formerly Kyle Canyon) Phase 1

Dear Mr. Kwon:

Olympia Companies has contracted with Slater Hanifan Group (SHG) to process technical drainage studies for the first phase of development within the Skye Canyon property, formerly known as Kyle Canyon. Proposed Phase 1 improvements are to be supported by the *Master Drainage Study for Kyle Canyon* (DS4420).

Per the CLV issued approval letter for the *Master Drainage Study*, note the following conditions relevant to proceeding with technical drainage studies within Skye Canyon:

- *"The technical drainage studies for the infrastructure improvements may be submitted with conditional approval of this Master Drainage Study. However, final approval of the Master Drainage Study must be obtained prior to conditional approval of the infrastructure drainage studies."*
- *"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."*

Per a February 5, 2014 meeting with City of Las Vegas Public Works staff, it was agreed that this letter is intended to serve as justification that the current state of conditional approval for the *Master Drainage Study* is acceptable for utilization in processing the applicable Phase 1 technical drainage studies in response to the above conditions.

The following conditions identified in the approval of the *Master Drainage Study* have not been satisfied to receive final approval:

- Las Vegas City Council approval of the *Kyle Canyon Amendment to the 2008 Las Vegas Valley Master Plan Update*,
- NV Energy approval of any proposed drainage facilities within their access easements,
- BLM approval for flows discharging onto BLM property.

The following actions have been taken to receive the outstanding approvals to satisfy City requirements on the conditionally approved *Master Drainage Study*:

- The *Kyle Canyon Amendment to the 2008 Las Vegas Valley Master Plan Update* had been reviewed and accepted by the CCRFCD Board of Directors on June 13, 2013. Additionally, the proposed regional facilities presented in the Master Plan Amendment are shown on the recently issued 2013 CCRFCD MPU Facilities figures. Note that the

Amendment had been scheduled to be heard at City Council on September 18, 2013 but withdrawn due to the knowledge of changing ownership on the property.

- A meeting was held with NV Energy engineering and transmissions staff discussing the project concept, specifically regarding use of the Puli corridor for the planned detention basins and Moccasin corridor for the interim outfall berm/levee. NV Energy requested exhibit(s) identifying detailed information such as laydown areas around their power poles, etc. in order to provide approval/concurrence at the *Master Drainage Study* level. SHG determined that the requested exhibit is difficult to prepare prior to the technical design being performed. Pursuit of obtaining NV Power approval/concurrence was suspended due to level of detail requested and because of change of ownership.
- A NEPA presentation of the *Master Drainage Study* and its impacts to the BLM property was performed on September 19, 2012. No official feedback or response was received by BLM, and pursuit of approval had been suspended due to change of ownership.

SHG and Olympia have agreed to actively pursue the unsatisfied conditions of approval; however, it has been agreed by CLV in the 2/5/2014 meeting that this justification letter serves to allow processing of the Phase 1 technical drainage studies and improvement plans without final CLV approval of the *Master Drainage Study*.

The proposed **Phase 1** improvements are located in the southeast corner of the portion of the property west of US-95, and include the following:

- Roadway improvements to Horse Drive, Grand Canyon Drive, Grand Teton Drive, Hualapai Way and Racel Street. The associated drainage infrastructure identified in the *Master Drainage Study* is also to be included.
- 4 separate residential development pods within the bounds of the above roadways.
- Community recreation center at southwest corner of intersection of Horse Drive and Hualapai Way.

The unsatisfied conditions of the Master Drainage Study are considered irrelevant to progressing with Phase 1 improvements as supported by the following justifications:

- It is acknowledged that the drainage facility in Racel Street is considered a CCRFCD regional alignment. However, its proposed regional facility is presented on the recently issued 2013 CCRFCD MPU Facilities figures. Additionally, the 2008 CCRFCD MPU also identifies the drainage facility in Racel Street prior to processing of the Kyle Canyon Master Plan Amendment.
- Phase 1 does not encroach into existing NV Energy access easements; therefore NV Energy approval is considered unnecessary.
- Phase 1 does not discharge onto BLM property; therefore, BLM approval is considered unnecessary.
- Phase 1 drainage patterns are in conformance with the Master Drainage Study.

Per the 2/5/14 coordination meeting with CLV, it was requested that a phasing plan be prepared in support of this justification letter identifying the future sequencing of development within the Skye Canyon property after Phase 1. An exhibit, included herewithin, has been prepared identifying the phasing anticipated in the following order:

Master Drainage Study Update

- It is acknowledged that the alignment of Sheep Mountain Parkway and current land plan may both be altered in the future. As a result, a Master Drainage Study Update will be necessary when a significant change occurs to the property's development plan. A Master Drainage Study Update is currently anticipated after development of Phase 1 to ensure that development within the master plan is adequately planned and flood protected.

Detention Basin

- A "shadow of protection" for each detention basin's contributing watershed has been delineated on the included phasing exhibit. If the developer wishes to proceed with development in a "shadow" area without the required detention basin, it will be required to demonstrate that downstream property is not adversely impacted by the affected development.
- It is acknowledged that a "shadow" area inundates the subject Phase 1 area. However, pending technical drainage studies will show that storm runoff produced by the development of Phase 1 does not exceed the pertinent allowable flows on downstream property established by the *Master Drainage Study*. Therefore, it is currently anticipated that design and installation of a detention basin will follow in a subsequent phase after Phase 1.
- Future phasing of the property after Phase 1 and evaluating the necessity of a detention basin will be performed by evaluating areas determined to be within a "shadow" area or not.

Future Phase(s)

- Due to uncertainty in development strategy, locations of next portion of property to develop beyond Phase 1 are uncertain. Therefore, the remainder of the property has been identified as a future phase(s). However, it is acknowledged that a condition of future development may require a Master Drainage Study Update and/or installation of a detention basin.

In conclusion, this letter provides justification to support technical design and development of Phase 1 in accordance with the current approved *Master Drainage Study* despite certain unsatisfied conditions as identified. Upon CLV acceptance of this justification letter, CLV will support processing of Phase 1 technical studies and design plans under the current conditional approval of the *Master Drainage Study*. In the case that the *Master Drainage Study* does not receive the necessary approval from BLM, NV Energy and the associated CCRFCD MPU Amendment to result in final approval of the *Master Drainage Study*, the master developer will perform improvements as necessary to show no post-development storm flow impacts beyond what occurs during the existing condition to BLM, NV Energy jurisdictions and affected CCRFCD MPU Amendment facilities. If you have any questions or require additional information, please do not hesitate to contact us at 284-5300.

Respectfully Submitted,
SLATER HANIFAN GROUP

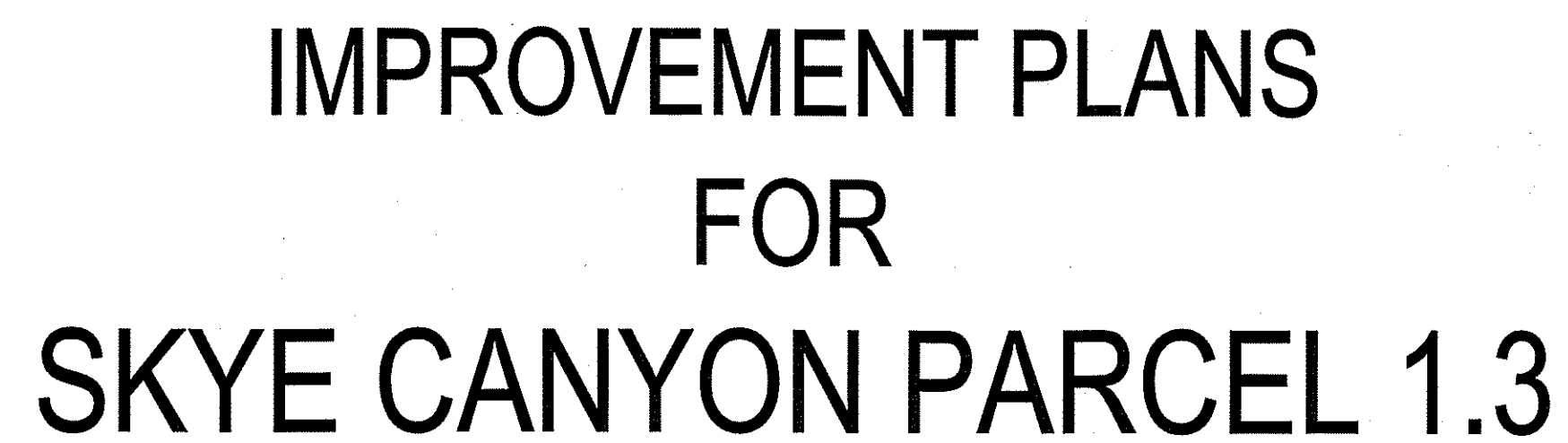


Steve Jones, P.E.
Project Manager - Flood Control Division

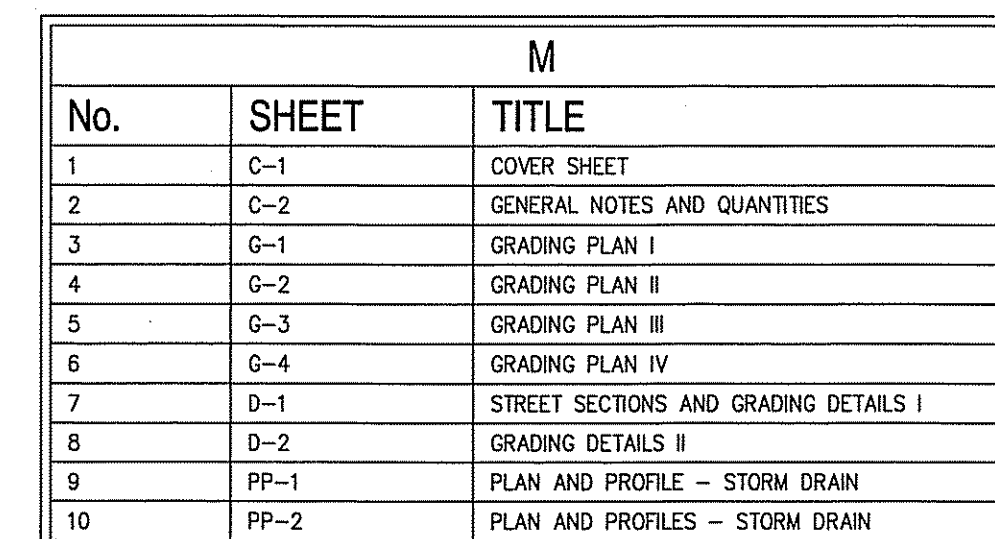
cc: Marc Bolduc – Olympia Companies
Jerry Slater – SHG
Mark Failla – SHG
Rhonda Miller – SHG

APPENDIX I

Grading Plan, Storm Drain Profile and Detail Sheets



LYING WITHIN THE NORTHWEST QUARTER (NW 1/4) OF THE SOUTHWEST QUARTER (SW 1/4) OF SECTION 7,
TOWNSHIP 19 SOUTH, RANGE 60 EAST M.D.M., CLARK COUNTY, NEVADA



LEGAL DESCRIPTION
BEING A PORTION OF THE NORTHWEST QUARTER (NW 1/4) OF THE
SOUTHWEST QUARTER (SW 1/4) OF SECTION 7, TOWNSHIP 19
SOUTH, RANGE 60 EAST M.D.M., CLARK COUNTY, NEVADA.

BASIS OF BEARING
NORTH 89°11'30" WEST, BEING THE BEARING OF THE SOUTH
LINE OF THE SOUTHWEST QUARTER (SW ¼) OF SECTION 7,
TOWNSHIP 19 SOUTH, RANGE 60 EAST, M.D.M., AS PER FILE
151, PAGE 14 OF SURVEYS, ON FILE IN THE COUNTY
RECORDER'S OFFICE.

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 DATUM
PER THE CLARK COUNTY VERTICAL CONTROL LAST REVISED 2003

PROJECT INFORMATION

ACREAGE (GROSS):	= 45.08 AC
ACREAGE (NET):	= 40.90 AC
ACREAGE (NET-NET):	= 38.42 AC
DENSITY (LOTS/NET ACRE):	= 5.14 DU/NET AC
EXISTING ZONING:	= T-D
TOTAL NO. OF RESIDENTIAL LOTS	= 209
TOTAL NO. OF COMMON ELEMENTS *	= 19
MINIMUM LOT SIZE	= 3,722 SF±
MAXIMUM LOT SIZE	= 11,940 SF±
PROPOSED OPEN SPACE	= 124,717 SF±

* NOTE: THE MASTER DEVELOPER IS RESPONSIBLE FOR COMMON LOTS ORDERED ALPHABETICALLY A THRU F. ALL SUBSEQUENT ALPHABETICALLY ORDERED COMMON LOTS ARE THE RESPONSIBILITY OF THE BUILDER AND/OR THEIR RESPECTIVE SUB-ASSOCIATION.

EARTHWORK SUMMARY (UNADJUSTED)		
CUT	0.00	CY.
FILL	0.00	CY.
NET	0.00	CY.

CITY ENGINEER-DAVID BOWERS PE, PTOE #16736 DATE

APPROVAL OF THESE PLANS BY THE CITY ENGINEER IS LIMITED TO THOSE IMPROVEMENTS CONSTRUCTED IN THE DEDICATED OF 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 _____

CHRIS KNIGHT, DIRECTOR
BUILDING AND SAFETY

DATE

THIS PLAN MEETS THE APPLICABLE STANDARDS OF THE PLANNING
DEPARTMENT.

CENTRAL TELEPHONE CO. DBA CENTURYLINK
DATE _____

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

APPROVED FOR CONSTRUCTION

LAS VEGAS VALLEY WATER DISTRICT ENGINEERING SERVICES MANAGER
PROJECT NO. ----- DATE: -----
SHEETS: 1, 2, 9, 13 THRU 22, & 35 THRU 37

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

COX COMMUNICATIONS LAS VEGAS, INC. DATE



**AVOID HITTING
UNDERGROUND TRAFFIC
SIGNAL SYSTEMS AND
STREET LIGHT SYSTEM
CONDUITS. IT'S COSTLY.**

**before you
do UnderGround**
1-702-455-7511
CLARK COUNTY TRAFFIC OPERATIONS
AND
1-702-432-5300
LAS VEGAS AREA
COMPUTERIZED TRAFFIC SYSTEM

Call before you Dig
Avoid cutting underground
utility lines. It's costly.

Call
811

OR
1-800-227-2600
AND
CLARK COUNTY TRAFFIC OPERATIONS
1-702-455-7544

SLATER
HANFAN
SL-1 GROUP
CONSULTING ENGINEERS & PLANNERS
5740 S. ARVILLE STREET #216, LAS VEGAS, NV 89118
PHONE (702) 284-5300
FAX (702) 284-5399

[illegible]

CITY OF LAS VEGAS, NEVADA
NINETY-FIVE MANAGEMENT LLC
SKYE CANYON PARCEL 1.3
COVER SHEET

T12S S7 R60E	
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DATE: 6/24/14

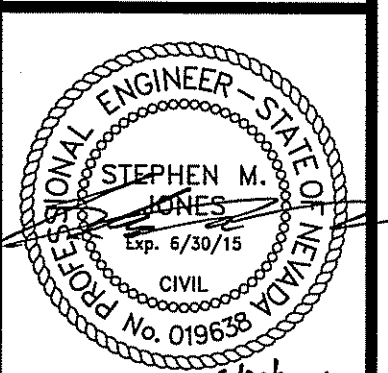
DRAFTER: JTC

DESIGNER: MAK

CHECKED: CAL

PROJECT NO.

OLY1401-002



C-1
SHEET 1 OF 10

2.1 CITY OF LAS VEGAS GENERAL NOTES

1. ALL CONSTRUCTION AND MATERIALS SHALL BE IN ACCORDANCE WITH THE "UNIFORM STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION OFF-SITE IMPROVEMENTS, CLARK COUNTY AREA, NEVADA", LATEST 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 WHICH ARE 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 ONLY FOR THE CONVENIENCE OF THE CONTRACTOR. EXISTING UTILITY SERVICE LATERALS MAY NOT BE SHOWN ON THE PLANS. THE CONTRACTOR SHALL, AT HIS OWN EXPENSE, LOCATE ALL UNDERGROUND AND OVERHEAD INTERFERENCES WHICH MAY AFFECT HIS OPERATION DURING CONSTRUCTION AND SHALL TAKE ALL NECESSARY PRECAUTIONS TO AVOID DAMAGE TO SAME. THE CONTRACTOR SHALL USE EXTREME CAUTION WHEN WORKING NEAR OVERHEAD UTILITIES SO AS TO SAFELY PROTECT ALL PERSONNEL AND EQUIPMENT, AND SHALL BE RESPONSIBLE FOR ALL COST AND LIABILITY IN CONNECTION THEREWITH.
3. THE CONTRACTOR SHALL TAKE ALL PRECAUTIONARY MEASURES NECESSARY TO PROTECT EXISTING UTILITY LINES, STRUCTURES AND STREET IMPROVEMENTS WHICH ARE TO REMAIN IN PLACE, FROM DAMAGE, AND ALL SUCH IMPROVEMENTS OR STRUCTURES DAMAGED BY THE CONTRACTOR'S OPERATIONS SHALL BE REPAIRED OR REPLACED SATISFACTORILY TO THE CITY ENGINEER AND OWNING UTILITY COMPANY AT THE EXPENSE OF THE CONTRACTOR.
4. ALL CONSTRUCTION SHALL BE AS SHOWN ON THESE PLANS, ANY REVISIONS SHALL HAVE THE PRIOR WRITTEN APPROVAL OF THE CITY ENGINEER.
5. TYPE V CEMENT SHALL BE USED IN ALL OFF-SITE CONCRETE WORK. CONCRETE TO BE 3000 P.S.I. MINIMUM @ 28 DAYS. MIX DESIGNS TO BE APPROVED BY THE CITY, PRIOR TO THE USE ON THE PROJECT.
6. PERMITS ARE REQUIRED FOR ANY WORK IN THE PUBLIC RIGHT-OF-WAY. THE CONTRACTOR SHALL SECURE ALL PERMITS AND INSPECTIONS REQUIRED FOR THIS CONSTRUCTION.
7. EXPANSION JOINTS REQUIRED, MAXIMUM EVERY 300' IN EXTRUDED-TYPE CURB.
8. AC PAVEMENT TO BE ONE-HALF INCH (1/2") ABOVE LIP OF ALL GUTTERS AFTER COMPLETION, EXCEPT AT SIDEWALK RAMPS AND CROSS GROUERS.
9. CURB AND GUTTER FOUNDED TO BE UNACCEPTABLE TO THE CITY OF LAS VEGAS SHALL BE REMOVED AND REPLACED PER STANDARD DRAWING 216.
10. SIDEWALK RAMPS SHALL BE CONSTRUCTED IN EACH QUADRANT OF AN INTERSECTION PER STANDARD DRAWING 235. EXACT LOCATION OF RAMPS MAY BE ADJUSTED IN THE FIELD BY A CITY INSPECTOR.
11. CONTRACTOR SHALL PROVIDE ALL NECESSARY HORIZONTAL AND VERTICAL TRANSITIONS BETWEEN NEW CONSTRUCTION AND EXISTING SURFACES TO PROVIDE FOR PROPER DRAINAGE AND FOR INGRESS AND EGRESS TO NEW CONSTRUCTION. THE EXTENT OF THE TRANSITIONS TO BE SHOWN ON PLANS.
12. ALL GRADING WORK SHALL CONFORM TO THE SOILS REPORT AS PREPARED BY XXXX, REPORT XXXXXX, XXXXXXXX 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 PERMANENT SURVEY MONUMENTS. ANY MONUMENTS DISTURBED SHALL BE REPLACED AND ADJUSTED PER AVAILABLE RECORDS IN ACCORDANCE WITH N.E.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 APRONS, FLOWLINES, AND CROSS GROUERS UNLESS WRITTEN APPROVAL IS GRANTED BY THE UTILITY COMPANY AND THE CITY ENGINEER. ALL ABOVE GROUND UTILITY APPURTENANCES SHALL CONFORM TO THE REQUIREMENTS OF 1912.040.
16. WALL NOTES:
17. ALL WALLS, NEW OR EXISTING, ARE ONLY SHOWN ON CIVIL PLANS FOR THE PURPOSE OF REVIEWING GRADING RELATIONSHIPS; FLOOD CONTROL AND SIGHT DISTANCE AT INTERSECTIONS, NEW WALLS REQUIRE A SEPARATE PERMIT AND INSPECTION BY THE BUILDING DEPARTMENT.
18. ASPHALT MIX DESIGN MUST BE SUBMITTED AND APPROVED BY THE CITY ENGINEER PRIOR TO THE PLACEMENT OF ASPHALT WITHIN CITY RIGHT OF WAY.
19. CONTRACTOR SHALL ADJUST ALL NEW EXISTING LINES, VALVE BOXES, MANHOLE RIMS, AND SEWER CLEAN OUTS, ETC. TO FINISH GRADE AS APPLICABLE WHETHER OR NOT THEY ARE SHOWN ON THE PLANS.
20. MATERIALS, HANDLING AND PLACEMENT OF PORTLAND CEMENT CONCRETE SHALL BE IN ACCORDANCE WITH APPLICABLE SECTIONS OF MDOT OR THE CLARK COUNTY AREA SPECIFICATIONS (AS APPLICABLE) AND THE PLANS AND DETAILS SHOWN HEREON.
21. WHEN INSTALLING UNDERGROUND FACILITIES THAT REQUIRE UNDERGROUND LOCATING DEVICES SUCH AS MARKER BALLS, LOCATING RIBBON, ETC. THE CONTRACTOR SHALL PROVIDE WRITTEN DOCUMENTATION TO OFFSITE INSPECTION AND TESTING CERTIFYING THAT ALL DEVICES HAVE BEEN PLACED AND VERIFIED TO BE IN GOOD WORKING CONDITION PRIOR TO THE CONSTRUCTION OF ANY ROAD BASE.
22. SANITARY SEWER AND STORM DRAIN FINAL LOCATION MAP(S) SHALL BE PROVIDED TO THE OFFSITE INSPECTION AND TESTING SECTION PRIOR TO PROJECT ACCEPTANCE AND BOND RELEASE. THE MAP(S) SHALL INCLUDE THE HORIZONTAL AND VERTICAL (INVERT) LOCATION OF PUBLIC SEWER MANHOLES, STORM DRAIN MANHOLES, STORM DRAIN LATERALS AT THE CONNECTION TO THE STORM DRAIN MAIN AND AT THE CONNECTION TO A DROP INLET, AND THE CONNECTION OF SEWER SERVICE LATERALS TO THE SEWER MAIN AND WHERE THE SEWER SERVICE LATERALS EXITS THE PUBLIC RIGHT-OF-WAY. THE LOCATION SHALL BE DESCRIBED BY STATE PLANE COORDINATES WHICH SHALL BE BASED ON THE "NEVADA COORDINATE SYSTEM OF 1983, EAST ZONE" AS DEFINED BY THE NEVADA REVISED STATUTES CHAPTER 327, AND TIED TO THE CITY OF LAS VEGAS NEVADA CONTROL BENCHMARK NETWORK. COORDINATES MUST BE CERTIFIED BY A NEVADA PROFESSIONAL LAND SURVEYOR TO HAVE POSITIONAL CERTAINITY OF +/- 0.1 METER (+/- 0.3 FEET). A SEPARATE ELECTRONIC COMMA DELIMITED FILE FOR THE SANITARY SEWER AND STORM DRAIN COORDINATES SHALL ALSO ACCOMPANY THE SANITARY SEWER AND STORM DRAIN FINAL LOCATION MAP(S).
23. STORM DRAIN LATERALS REQUIRE THE INSTALLATION OF A MARKER BALL AT THE CONNECTION OF THE STORM DRAIN LATERAL TO THE STORM DRAIN MAIN. THE STORM DRAIN LATERAL EXITS THE PUBLIC RIGHT-OF-WAY OR WHERE THE STORM DRAIN LATERAL CONNECTS TO A DROP INLET, THE MARKER BALL SHALL BE 3M 4" MARKER BALL 1404-XR OR APPROVED EQUIVA.
24. CCTV VIDEO INSPECTION IS REQUIRED FOR ALL SEWER AND STORM DRAINS. THE CCTV VIDEO INSPECTIONS NEED TO BE PERFORMED PER THE DESIGN AND CONSTRUCTION STANDARDS FOR WASTEWATER COLLECTION SYSTEMS LATEST EDITION.
25. A SEPARATE BORING PERMIT IS REQUIRED FOR ALL BORING ACTIVITIES.

2.2 CITY OF LAS VEGAS SEWER NOTES

1. ALL CONSTRUCTION AND MATERIALS SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE DESIGN AND CONSTRUCTION STANDARDS FOR WASTEWATER COLLECTION SYSTEMS AND THE UNIFORM STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION OFF-SITE IMPROVEMENTS, CLARK COUNTY AREA, NEVADA, AS AMENDED. IT WILL BE THE RESPONSIBILITY OF THE CONTRACTOR TO BE AWARE OF THE CONTENTS OF THE ABOVE SPECIFICATIONS.
2. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO PERFORM CONSTRUCTION AS PER PLANS, ANY ADDITIONS, DELETIONS, OR CHANGES SHALL FIRST MEET WITH THE APPROVAL OF THE CITY ENGINEER.
3. GHSEL "S" OR "G" IN CURBS WHERE SEWER OR GAS LATERALS PASS UNDER THE CURB.
4. POLYETHYLENE (PE) 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 COVERS, 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" IS 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 REPLACED TO THE SATISFACTION OF THE CITY ENGINEER PRIOR TO ACCEPTANCE BY THE CITY OF LAS VEGAS.
10. INSTALLATION OF CURVED SEWER REQUIRES THE USE OF C-900 PIPE WHICH ALLOWS FOR PIPE DEFLECTION AT THE JOINTS.

2.3 CITY OF LAS VEGAS TRAFFIC NOTES

1. ALL CONSTRUCTION SIGNING, BARRICADING, AND TRAFFIC DELINEATION SHALL CONFORM TO THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES", LATEST EDITION.
2. THE STREET SIGN CONTRACTOR SHALL OBTAIN STREET NAMES AND BLOCK NUMBERING FROM THE PLANNING DEPARTMENT PRIOR TO CONSTRUCTION.
3. BEFORE ANY WORK IS STARTED IN THE RIGHT-OF-WAY, THE CONTRACTOR SHALL INSTALL ALL ADVANCE WARNING SIGNS FOR THE CONSTRUCTION ZONE. THE CONTRACTOR SHALL INSTALL TEMPORARY STOP SIGNS AT ALL NEW STREET ENCROACHMENTS INTO EXISTING CITY STREETS WHERE WARRANTED IMMEDIATELY AFTER FIRST GRADING WORK IS ACCOMPLISHED, AND SHALL MAINTAIN SAE SIGNS UNTIL PERMANENT SIGNS ARE INSTALLED.
4. WHEN A DESIGNATED "SAFE ROUTE TO SCHOOL" IS ENCROACHED UPON BY A CONSTRUCTION ZONE AND PUBLIC WORKS STOP IDENTITIES 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". THE GUARD SHALL BE PRESENT FOR THE FULL DURATION OF THE TIME THAT CHILDREN ARE LIKELY TO BE PRESENT.
5. IF THE IMPROVEMENTS NECESSITATE THE OBSTRUCTION, TEMPORARY OBSTRUCTION, TEMPORARY REMOVAL OR RELOCATION OF ANY EXISTING TRAFFIC PAVEMENT MARKING, SUCH PAVEMENT MARKING SHALL BE RESTORED OR REPLACED WITH LIKE MATERIALS TO THE SATISFACTION OF THE CITY TRAFFIC ENGINEER.
6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING AND INSTALLING ALL PERMANENT SIGNS SHOWN ON THE PLANS. ALL NEW TRAFFIC SIGNS SHALL BE FABRICATED WITH DIAMOND GRADE VIP CLASS 6 REFLECTIVE SHEETING OR APPROVED EQUAL. ALL NEW TRAFFIC SIGNS, EXCEPT STREET NAME AND SCHOOL SPEED LIMIT SIGNS, SHALL HAVE 3M SERIES 1600 OR APPROVED EQUIVALENT ANTI-GRAFFITI PROTECTIVE OVERLAY FILM. SCHOOL ZONE SIGNS SHALL HAVE 3M SERIES 1150 ANTI-GRAFFITI PROTECTIVE OVERLAY FILM. STREET NAME SIGNS SHALL HAVE 3M SERIES 1150 ANTI-GRAFFITI PROTECTIVE OVERLAY FILM. ALL 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 SINGLE SYSTEM, THE SIGN SHALL BE MOUNTED ON THE STREET LIGHT STANDARD AND THE SIGNPOST SHALL BE ELIMINATED.
8. ALL PERMANENT TRAFFIC CONTROL DEVICES CALLED FOR HEREON SHALL BE IN PLACE AND IN FINAL POSITION PRIOR TO ALLOWING ANY PUBLIC TRAFFIC ONTO THE PORTIONS OF THE ROAD(S) BEING IMPROVED HERE UNDER. REGARDLESS OF THE STATUS OF COMPLETION OF PAVING OR OTHER OFF-SITE IMPROVEMENTS CALLED FOR BY THESE PLANS.
9. STREET SIGNS AND STOP SIGNS SHALL BE INSTALLED PER CITY STANDARD SPECIFICATIONS FOR PLACEMENT OF STREET NAME SIGNS.
10. THE CONTRACTOR SHALL PROVIDE ALL NECESSARY TRAFFIC CONTROL DEVICES AND FLAGGERS TO INSURE THE SAFETY OF THE PUBLIC IN OR AROUND THE WORK AREA. THE CONTRACTOR SHALL HAVE A DERIVED ATSSA TRAFFIC CONTROL TECHNICIAN OR HIGH WORK ZONE SAFETY SPECIALIST SET UP, MAINTAIN AND/OR REMOVE ALL TRAFFIC CONTROL DEVICES IN THE CITY OF LAS VEGAS RIGHT OF WAY.
11. WORK IN PUBLIC STREETS, ONCE BEGUN, SHALL BE EXPEDITED TO COMPLETION SO AS TO PROVIDE MINIMUM INCONVENIENCE TO ADJACENT PROPERTY OWNERS AND TO THE TRAVELING PUBLIC.
12. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING CITIZENS AREA TRANSIT (C.A.T.) IF THE CONSTRUCTION INTERRUPTS OR RELOCATES A BUS STOP OR HAS AN AVERAGE EFFECT ON BUS SERVICE ON THAT STREET TO ARRANGE FOR TEMPORARY RELOCATION OF STOP.
13. GUARDS SHALL BE OBTAINED BY CONTACTING THE METROPOLITAN POLICE DEPARTMENT SPECIAL EVENTS UNIT (PHONE # 828-3442) WHO WILL PROVIDE OFFICERS PROPERLY TRAINED IN TRAFFIC CONTROL. FEES FOR THE USE OF THESE OFFICERS SHALL BE SET BY METRO AND WILL BE PAID BY THE CONTRACTOR. THE CONTRACTOR IS RESPONSIBLE FOR ALL ARRANGEMENTS WITH METRO.
14. ANY WORK WITHIN 300' OF A SIGNALIZED INTERSECTION WILL BE NIGHT WORK, UNLESS OTHERWISE DIRECTED BY THE CITY OF LAS VEGAS TRAFFIC.
15. THE CONTRACTOR SHALL CONTACT THE TRAFFIC ENGINEERING DIVISION (TRANSPORTATION SECTION) THROUGH THE PROJECT'S OFFSITE INSPECTOR PRIOR TO PROVIDING DIRECTION FOR ANY PERMANENT OR TEMPORARY MODIFICATIONS TO THE APPROVED DRAWINGS REGARDING FINAL PAVEMENT TRANSITIONS, MARKINGS, AND SIGNING THAT ARE REQUIRED TO MATCH ADJACENT ROADWAY SEGMENTS. THE RECORDS WILL BE SET BY METRO AND WILL BE APPROVED BY THE TRAFFIC ENGINEERING DIVISION DEPENDING ANY ADJUSTMENTS TO THE FINAL PAVEMENT MARKINGS. ANY SIGNAGE WHICH MAY INCLUDE CHANGING, ADDING OR MODIFYING PAVEMENT MARKINGS AND TRAFFIC CONTROL SIGNS THAT ADEQUATE TRANSITIONS AND LANE TERMINATIONS BETWEEN ADJACENT ROADWAY SEGMENTS ARE CONSTRUCTED.

2.4 CITY OF LAS VEGAS STREETLIGHT NOTES

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 EDITION, AND THE "UNIFORM STANDARD DRAWINGS FOR PUBLIC WORKS CONSTRUCTION OFF-SITE IMPROVEMENTS, CLARK COUNTY AREA, NEVADA", LATEST EDITION, AND ANY ADDED SPECIAL AREA STANDARDS.
2. NO DEVIATION OF STREET LIGHT, PULL BOX, CONDUITS (ETC.) 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 CONDUITS STUB SHALL HAVE AT LEAST ONE GREEN #8 THW WIRE INSTALLED, AS TRACER WIRE, WHEN "EMPTY" CONDUIT IS COMPLETELY INSTALLED FROM PB TO PB. IT SHALL HAVE MINIMUM 2 #4 AND 1 #8 THW WIRE WITH THE ENDS TAPPED OR "SAFE OFF" PRIOR TO FINAL INSPECTION.
5. ANY STRUCTURE SUCH AS BLOCK WALLS, CHAIN LINK FENCES, RETAINING WALLS, ETC., SHALL LEAVE A MINIMUM CLEARANCE IN ACCORDANCE WITH THE USD NO. 320A.
6. AS-BUILT DRAWINGS SHALL BE SUPPLIED TO THE TETO PRIOR TO ANY PRE-FINAL INSPECTION. THE AS-BUILT DRAWING NEEDS TO BE STAMPED AS-BUILT AND SIGNED BY THE PREPARER.
7. SERVICE POINT SHALL BE COORDINATED WITH NV ENERGY COMPANY, AND WHEREVER POSSIBLE, BE LOCATED NEAR THE CENTER OF THE CIRCUIT. SERVICE POINTS SHALL BE SHOWN ON THE 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 UTILITIES INVOLVED, AND NO EXPENSE TO THE CITY OF LAS VEGAS, BEFORE STREETLIGHT BASES ARE INSTALLED.
10. THE CONTRACTOR SHALL FURNISH COMPLETE SERVICE TO TRANSFORMERS AND CONTROL SYSTEMS IF REQUIRED ON PLANS.
11. THE DEVELOPER/OWNER WILL BE REQUIRED TO SUPPLY POWER TO ALL NEW PUBLIC STREET LIGHTS INSTALLED UNDER THIS DESIGN PRIOR TO BOND RELEASE OR PROJECT COMPLETION. THE DEVELOPER/OWNER WILL BE RESPONSIBLE FOR ALL ITEMS ASSOCIATED WITH THE INSTALLATION, CONSTRUCTION, ENERGIZING, MAINTENANCE AND OPERATIONAL COST OF SAID STREET LIGHTS PRIOR TO PROJECT COMPLETION. REFER TO THE PLAN FOR ANY NEW SERVICE REQUIREMENTS.
12. THE TRANSFER OF OWNERSHIP FROM THE DEVELOPER/OWNER TO THE CITY OF LAS VEGAS FOR ALL NEW PUBLIC STREET LIGHTS AND/OR SERVICE IS INSTALLED UNDER THIS PLAN DESIGN WILL BE IN CONJUNCTION WITH THIS PROJECT COMPLETION. COORDINATE ALL MAINTENANCE AND OPERATIONAL TRANSFERS WITH THE CITY OF LAS VEGAS TRAFFIC ENGINEERING DEPARTMENT (TETO) AT (702) 229-6331.

2.5 CITY OF LAS VEGAS GRADING NOTES

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

	HORIZONTAL	VERTICAL COMPACTION	
A. PAVEMENT AREA SUBGRADE	0.1"	0.0" TO -0.1"	SEE SOILS REPORT
B. ENGINEERED FILL	0.5"	+0.1" TO -0.1"	SEE SOILS REPORT
7. ALL CUT AND FILL SLOPES SHALL BE PROTECTED UNTIL EFFECTIVE EROSION CONTROL HAS BEEN ESTABLISHED.
8. THE USE OF POTABLE WATER WITHOUT A SPECIAL PERMIT FOR BUILDING OR CONSTRUCTION PURPOSES INCLUDING CONSOLIDATION OF BACKFILL OR DUST CONTROL, IS PROHIBITED. THE CONTRACTOR SHALL OBTAIN ALL NECESSARY PERMITS FOR CONSTRUCTION WATER.
9. THE CONTRACTOR SHALL MAINTAIN THE STREETS, SIDEWALKS AND ALL OTHER PUBLIC RIGHT-OF-WAY IN A CLEAN, SAFE AND USABLE CONDITION. ALL SPILLS OF SOIL, ROCK OR CONSTRUCTION DEBRIS SHALL BE PROMPTLY REMOVED FROM THE PROPERTY DURING CONSTRUCTION AND UPON COMPLETION OF THE PROJECT. ALL ADJACENT PROPERTY, PRIVATE OR PUBLIC SHALL BE MAINTAINED IN A CLEAN, SAFE AND USABLE CONDITION.
10. IN THE EVENT THAT ANY TEMPORARY CONSTRUCTION ITEM IS REQUIRED THAT IS NOT SHOWN ON THESE DRAWINGS, THE OWNER AGREES TO PROVIDE AND INSTALL SUCH ITEM AT HIS OWN EXPENSE AND AT THE DIRECTION OF THE CITY ENGINEER. TEMPORARY CONSTRUCTION INCLUDES DITCHES, BERMS, ROAD SIGNS AND BARRICADES, ETC.

CITY OF LAS VEGAS FIRE AND RESCUE GENERAL NOTES

1. ALL WORK SHALL BE DONE IN STRICT ACCORDANCE WITH THE LAS VEGAS FIRE AND RESCUE ADOPTED FIRE CODE ORDINANCE # 6124 FOR HYDRANT SPECIFICATIONS AND HYDRANT INSTALLATION SPECIFICATIONS. AUTHORITY: CLARK COUNTY AREA, NEVADA.
- * KEYNEEDY - GUARDIAN MODELS K81A AND K81D
* MUELLER - SUPER CENTURION 250 MODEL A-423
* CLOW - MEDALLION MODEL V-2546LV
* U.S. PIPE - METROFLOW M-03
2. A PERMIT IS REQUIRED FROM LAS VEGAS FIRE AND RESCUE FOR THE INSTALLATION OF ON-SITE WATER LINES AND FIRE HYDRANTS. THE PERMIT AND CONTRACTORS MATERIAL TEST CERTIFICATE FOR UNDERGROUND PIPING FORM SHALL BE OBTAINED FROM THE FIRE PROTECTION ENGINEER BEFORE COMMENCEMENT OF WORK.
3. ON ANY RESIDENTIAL OR COMMERCIAL INSTALLATIONS, FIRE HYDRANTS SHALL BE INSTALLED AND FIRE APPARATUS ACCESS ROADS SHALL BE MAINTAINED BEFORE COMMENCEMENT OF ANY COMBUSTIBLE CONSTRUCTION. ALL FIRE HYDRANTS SHALL BE IN GOOD WORKING ORDER AND SHALL BE CAPABLE OF DELIVERING THE REQUIRED FIRE FLOW. SNFC #6124, SECTION 1412.
4. 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. SNFC #6124 SECTION 507.5.7.3
5. ALL UNDERGROUND INSPECTIONS, PRESSURE AND FLUSH VERIFICATIONS OF ALL FIRE HYDRANTS AND FIRE LINES, SHALL BE CONDUCTED BEFORE COVERING THE LINES. CENTER LOADING IS ACCEPTABLE FOR THE HYDRO TESTS WITH PRIOR FIRE PREVENTION APPROVAL.
6. ALL ON-SITE UNDERGROUND WATER MAINS AND MATERIALS SHALL BE U.L. LISTED, A.W.W.A. APPROVED AND SHALL BE RATED FOR THE APPROPRIATE WORKING PRESSURE. SNFC 507.2.1, NEPA 24.
7. PAINTING OF CURBS, FIRE HYDRANTS, PADS, PROTECTION OF FIRE HYDRANTS FROM PHYSICAL DAMAGE, AND ALL OTHER WORK NECESSARY PER PLANS SHALL BE COMPLETED BEFORE APPROVAL BY LAS VEGAS FIRE AND RESCUE, FIRE PREVENTION DIVISION IF 507; SNFC 507.5.7.
8. PRIVATE HYDRANTS SHALL BE PAINTED RED. SNFC 507.5.7.1
9. PRIOR TO THE FINAL OCCUPANCY, A FIRE FLOW TEST SHALL BE WITNESSED BY LAS VEGAS FIRE AND RESCUE, FIRE PREVENTION DIVISION TO VERIFY AVAILABILITY OF THE REQUIRED FIRE FLOW. IF 507; SNFC 507.1
10. FIRE HYDRANT SPACING SHALL BE AS FOLLOWS: SNFC C102
* RESIDENTIAL - 500 FT UNSPRINKLERED; 600 FT SPRINKLERED.
* COMMERCIAL - 300 FT UNSPRINKLERED; 400 FT SPRINKLERED.
11. WHERE THE WATER MAINS ARE EXTENDED ALONG STREETS OR NEW STREETS ARE INSTALLED WHERE FIRE HYDRANTS ARE NOT NEEDED FOR PROTECTION OF THE STRUCTURES, FIRE HYDRANTS SHALL BE INSTALLED AT A MAXIMUM OF 1000 FT SPACING, TO PROVIDE FOR TRANSPORTATION HAZARDS WHERE STREETS ARE PROVIDED WITH MEDIAN DIVIDERS OR HAVE FOUR (4) OR MORE TRAFFIC LANES AND HAVE A TRAFFIC COUNT OF MORE THAN 30,000 PER DAY. HYDRANTS ARE REQUIRED ON EACH SIDE OF THE STREET SPACED AT 500 FT ON AN ALTERNATING BASIS. SNFC C102.1.
12. NO FIRE HYDRANTS SHALL BE LOCATED WITHIN THE RADIUS OF A CUL-DE-SAC OR WITHIN 20 FT OF THE PERIMETER OF THE RADIUS OF THE CUL-DE-SAC.
13. NO FIRE HYDRANTS SHALL BE LOCATED WITHIN 6 FT OF ANY CURB RETURN, DRIVEWAY, POWER POLE, STREETLIGHT OR ANY OTHER OBSTRUCTION. SNFC C102.12
14. A MAXIMUM DISTANCE FROM A FIRE HYDRANT TO A ONE-TWO FAMILY DWELLING SHALL NOT EXCEED 300 FT, AS MEASURED BY AN APPROVED ROUTE. SNFC 102.4
15. THE MAXIMUM DISTANCE FROM A FIRE HYDRANT TO A FIRE DEPARTMENT CONNECTION (FDC) SHALL NOT EXCEED 100 FT, AS MEASURED BY AN APPROVED ROUTE. SNFC C1 02.7
16. THE MAXIMUM DISTANCE FROM A HYDRANT TO THE END OF A DEAD-END STREET SHALL NOT EXCEED 200 FT. SNFC 102.6
17. TWO (2) SOURCES OF SUPPLY ARE REQUIRED WHENEVER THERE IS 4 OR MORE FIRE HYDRANTS/SPRINKLER HEADS ARE INSTALLED ON A SINGLE SYSTEM. SECTIONAL CONTROL VALVES SHALL BE INSTALLED SO THAT NO MORE THAN 2 FIRE HYDRANTS CAN BE OUT OF SERVICE DUE TO A BREAK IN A WATER MAIN.
18. ALL FIRE APPARATUS ACCESS ROADS SHALL BE PAVED TO PROVIDE ALL-WEATHER DRIVING CAPABILITIES. ACCESS SHALL BE DESIGNED AND MAINTAINED TO SUPPORT THE IMPOSED LOADS OF THE FIRE APPARATUS. SNFC 503.2.3
19. 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 FT PRIOR TO OR AFTER THE GRADE CHANGE. ADJACENT TO THE STRUCTURES GRADIENT SHALL NOT EXCEED 6%. SNFC 503.2.7 / 503.2.8
20. THE TURNING RADIUS OF THE FIRE APPARATUS ACCESS ROADS SHALL BE NO LESS THAN 52 FT OUTSIDE AND 28 FT INSIDE TURNING RADIUS. SNFC 503.2.1
21. VERTICAL CLEARANCE OF ALL FIRE APPARATUS ACCESS ROADS SHALL NOT BE LESS THAN 13 FT 6 INS. SNFC 503.2.1.1 IF 503
22. FIRE DEPARTMENT ACCESS ROADS IN ALL RESIDENTIAL DEVELOPMENTS (EXCEPT APARTMENT BUILDINGS) SHALL HAVE A MINIMUM UNOBSTRUCTED WIDTH OF NOT LESS THAN 36 FT FLOW LINE TO FLOW LINE. THIS WIDTH MAY BE REDUCED TO 24 FT IF ALL BUILDINGS FRONTING THE STREET ARE SPRINKLERED FOR MAIN SIDES. THESE WIDTHS MAY BE REDUCED TO 24 FT IF SPRINKLERED. SNFC 503.2.1.1
23. A FIRE APPARATUS ACCESS ROAD SHALL BE REQUIRED WHEN ANY PORTION OF AN EXTERIOR WALL OF THE FIRST STORY IS LOCATED MORE THAN 150 FT FROM A FIRE DEPARTMENT VEHICLE ACCESS. THIS DISTANCE COULD BE INCREASED TO 250 FT IF THE BUILDING IS SPRINKLERED. IF 503.1.1 SNFC 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 500 FT, AND FOR ALL COMMERCIAL, INDUSTRIAL, AND MULTI-FAMILY RESIDENTIAL DEVELOPMENTS. SNFC 503.1.2
26. ALL DEAD-END FIRE APPARATUS ROADS AND/OR FIRE LINES, PUBLIC OR PRIVATE, IN EXCESS OF 150 FT IN LENGTH SHALL BE PROVIDED WITH AN APPROVED TURN AROUND HAVING A MINIMUM DIAMETER OF 81 FT. SNFC 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 ALONG THE DESIGNATED FIRE LANES. SIGNS TO BE PLACED ON BOTH SIDES OF AN ACCESS ROADWAY IF NEEDED TO PREVENT PARKING ON EITHER SIDE. SIGNS TO BE INSTALLED NO HIGHER THAN 10 FT OR LESS THAN 6 FT FROM THE ROADWAY LEVEL. THE CURB ALONG OR ON THE PAVEMENT OR CEMENT (IF NO CURB IS PROVIDED) SHALL BE PAINTED WITH A RED WEATHER RESISTANT PAINT IN ADDITION TO THE SIGNS. SNFC 503.3
28. ELECTRICALLY CONTROLLED ACCESS GATES SHALL BE PROVIDED WITH AN APPROVED EMERGENCY VEHICLE DETECTOR/RECEIVER SYSTEM. SAID SYSTEM SHALL BE INSTALLED IN ACCORDANCE WITH THE CITY OF LAS VEGAS GUIDELINES FOR AUTOMATIC EMERGENCY VEHICLE ACCESS GATES. IF 1 SNFC 503.6
29. ALL FIRE APPARATUS ACCESS ROADS SHALL BE MARKED BY PLACING APPROVED SIGNS AT THE START OF THE DESIGNATED FIRE LANE. ONE SIGN AT THE END OF THE FIRE LANE AND WITH SIGNS AT INTERVALS 100 FEET ALONG ALL DESIGNATED FIRE LANES. SIGNS TO BE PLACED ON BOTH SIDES OF AN ACCESS ROADWAY IF NEEDED TO PREVENT PARKING ON EITHER SIDE. SIGNS TO BE INSTALLED NO HIGHER THAN 10 FEET OR LESS THAN 6 FEET FROM ROADWAY LEVEL. THE CURB ALONG OR ON THE PAVEMENT OR CEMENT IF CURB IS NOT PROVIDED SHALL BE PAINTED WITH RED WEATHER RESISTANT PAINT IN ADDITION TO THE SIGNS. SNFC 503.3
30. ELECTRICALLY CONTROLLED ACCESS GATES SHALL BE PROVIDED WITH AN APPROVED EMERGENCY VEHICLE DETECTOR/RECEIVER SYSTEM. SAID SYSTEM SHALL BE INSTALLED IN ACCORDANCE WITH THE CITY OF LAS VEGAS GUIDELINES FOR AUTOMATIC EMERGENCY VEHICLE ACCESS GATES.

LAS VEGAS VALLEY WATER DISTRICT (LVWD) STANDARD NOTES

LVWD PROJECT #122352

1. NO WORK SHALL BEGUN UNTIL THE WATER PLANS HAVE BEEN APPROVED FOR CONSTRUCTION BY THE LVWD. FOLLOWING WATER PLAN APPROVAL, NOTICE SHALL BE GIVEN TO THE LVWD COMMUNICATION SUPPORT CENTER (259-7171) TWO (2) WORKING DAYS PRIOR TO THE START OF CONSTRUCTION. FOR FUTURE INSPECTIONS, NOTICE MUST BE GIVEN BY 2:00 P.M. THE BUSINESS DAY PRIOR TO THE REQUESTED LVWD INSPECTION. WHEN REQUESTING INSPECTIONS, PLEASE REFER TO THE PROJECT # IDENTIFIED ABOVE.
2. ALL WORK SHALL CONFORM TO LVWD 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.
14. A SINGLE PIPE MATERIAL SHALL BE USED THROUGHOUT THE PROJECT UNLESS OTHERWISE APPROVED BY THE LVWD.
5. ALL SERVICE LATERALS TWO (2) INCHES IN DIAMETER AND SMALLER SHALL BE TYPE K COPPER TUBING WITH LVWD APPROVED SERVICE SADDLES.
6. ALL WATER METER BOXES SHALL BE LOCATED OUTSIDE OF DRIVEWAY AREAS.
7. ALL VALVES SHALL BE LOCATED OUTSIDE OF DRIVEWAYS, VALLEY AND CURB GUTTERS.
8. 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 LVWD DISTRIBUTION SYSTEM.
10. THE CONTRACTOR MUST OBTAIN ALL METERS TWO (2) INCHES AND SMALLER FROM LVWD CENTRAL STORES. TELEPHONE 258-3152 OR 258-3802, TWO (2) WORKING DAYS PRIOR TO METER PICKUP.
11. ANY INTERRUPTION OF SERVICE MUST BE PERFORMED IN ACCORDANCE WITH UDACS SECTION 3.14.01, AND APPROVED BY THE LVWD INSPECTION DIVISION PRIOR TO SHUTDOWN. PROPER WRITTEN NOTIFICATION MUST BE GIVEN TO ALL AFFECTED CUSTOMERS.
12. ALL WATER FACILITY CONSTRUCTION MATERIALS USED MUST BE AS LISTED ON THE LVWD PRE-APPROVED MATERIALS AND MANUFACTURER'S LISTING FOR NEW FACILITIES. LATEST REVISION, OR SPECIFICALLY APPROVED ON THESE PLANS.
13. TELEPHONE "CALL BEFORE YOU DIG" AT "811" OR 1-800-227-2600.
14. THE INSTALLATION OF LAS VEGAS VALLEY WATER DISTRICT (LVWD) MUNICIPAL WATER FACILITIES WITHIN ALL STREETS IS ASSUMED TO BE IN COMPLIANCE WITH THE UNIFORM STANDARDS, INCLUDING THE PLACEMENT OF ASPHALT PAVING STREET SURFACES. ANY REPAIR WORK DONE BY THE LVWD TO THE MUNICIPAL WATER FACILITIES WILL INCLUDE THE PLACEMENT OF AN APPROPRIATE SIZED ASPHALT TO REPAIR PATCH ON THE STREET SURFACE.
- ANY DECORATIVE PAVING SURFACE WITHIN THE STREET IS THE RESPONSIBILITY OF THE OWNER'S ASSOCIATION, OR THE INDIVIDUAL PROPERTY OWNERS IF NO OWNER'S ASSOCIATION IS IN EXISTENCE, OR THE AGENCY HAVING JURISDICTION. DECORATIVE SURFACE MATERIALS PLACED WITHIN THE TEN FOOT EASEMENT ADJACENT TO A PUBLIC OR PRIVATE STREET, IF DISTURBED BY THE LVWD DURING THE REPAIR OR OPERATION OF ITS FACILITIES WILL BE REPLACED BY LVWD WITH AN APPROPRIATELY COLORED CONCRETE PATCH. THE LVWD WILL NOT ATTEMPT TO MATCH COLOR OR FINISH OF ANY ADJACENT MATERIALS.

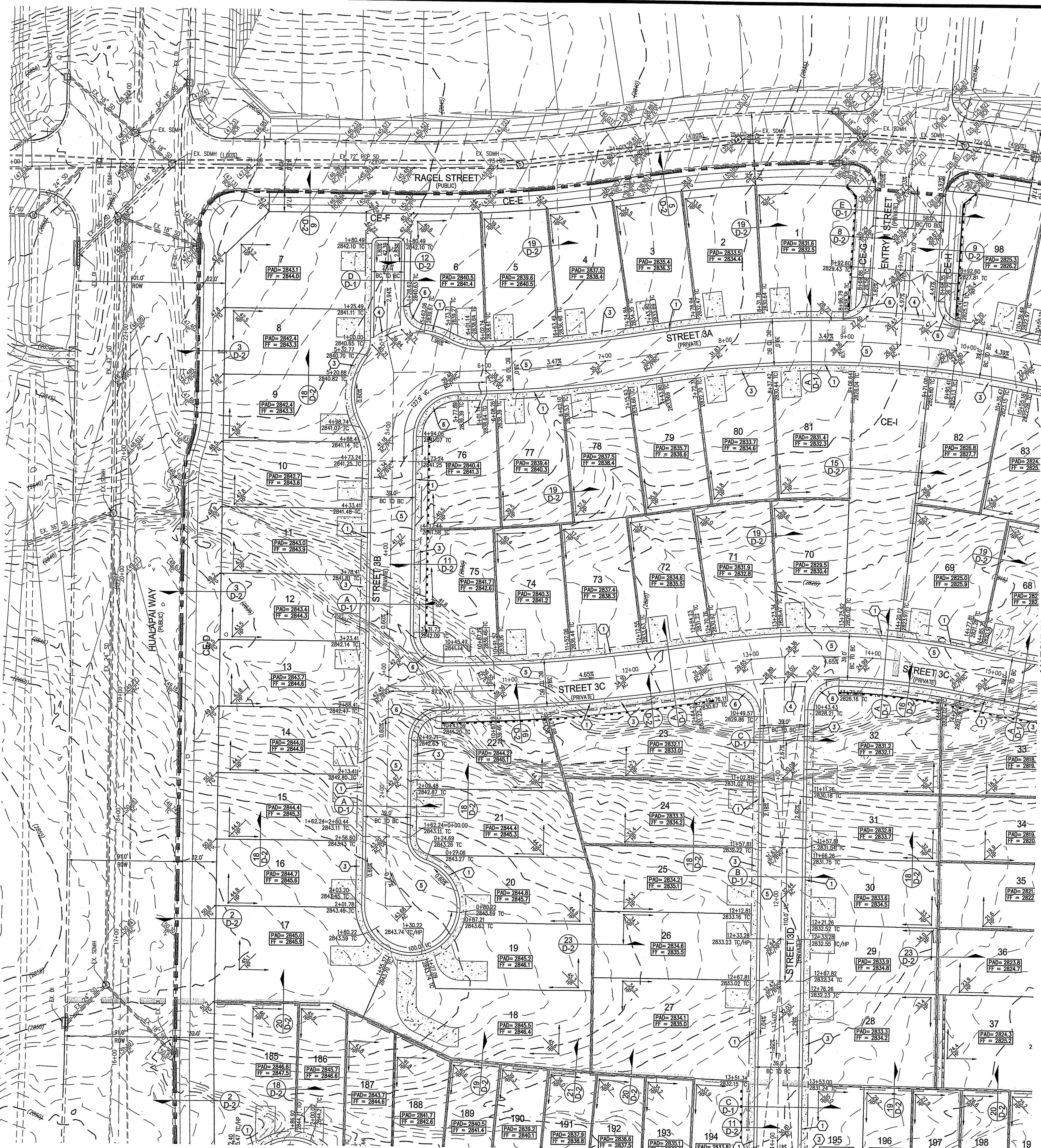
ABBREVIATIONS

AC	ASPHALTIC CONCRETE OR ACRE	NTS	NOT TO SCALE
AGG	AGGREGATE BASE	NUE	NONEXCLUSIVE UTILITY EASEMENT
APN	ASSESSORS PARCEL NUMBER	NEVADA	NEVADA ENERGY
APPROX OR ~	APPROXIMATE	OC	ON CENTER
AVE	AVENUE	OD	OUTSIDE DIAMETER OR OVERALL DIMENSION
Ø	AT	OFF OR OF	OFF SET
BOR	BEGINNING OF CURB RETURN	ORIG	ORIGINAL
BHW	BOTTOM OF HEADWALL	PAE	PUBLIC OR PEDESTRIAN ACCESS EASEMENT
BLDG	BUILDING	PB	PULL BOX
BLVD	BOULEVARD	PC	POINT OF CURVE
BM	BENCHMARK	PCD	POINT OF COMPOUND CURVE
BVC	BEGIN VERTICAL CURVE	PDE	PUBLIC DRAINAGE EASEMENT
CB	CURB AND BACKSLOPE VALVE	PE OR PL	PROPERTY LINE
CC	CLARK COUNTY	POB	POINT OF BEGINNING
CAUSED	CLARK COUNTY AREA UNIFORM STANDARD DRAWINGS	POC	POINT OF CURVATURE
CORFCD	CLARK COUNTY REGIONAL FLOOD DISTRICT	POE	POINT OF ENDING
COMMON	COMMON ELEMENT	PRC	POINT OF REVERSE CURVATURE
CL/C/A/C	CENTERLINE	PRELIM	PRELIMINARY
CLR	CLEAR OR CLEARANCE	PROP	PROPOSED
CLSM	CONTROLLED LOW STRENGTH MATERIAL	PRV	PRESSURE REDUCING VALVE
CMLC&C	CEMENT MORTAR LINED AND COATED	PUE	PUBLIC UTILITY EASEMENT
CMU	CONCRETE MASONRY UNIT	PVC	POLYVINYL CHLORIDE
CONC	CONCRETE	PVI	POINT OF VERTICAL INTERSECTION
COY OR CU Y	CUBIC YARD	R	RADIUS
DCWS	DESIGN AND CONSTRUCTION FOR WASTEWATER COLLECTION SYSTEMS	RCA	REINFORCED CONCRETE ARCH
DET	DETAIL	RCB	REINFORCED CONCRETE BOX
DIA	DUCTILE IRON OR DRAIN INLET	RCP	REINFORCED CONCRETE PIPE
DIA Ø	DIAMETER	RD	ROAD
DOE	DUCTILE IRON PIPE	ROW	ROW
DR	DRIVE	ROW ESMT	ROWWAY EASEMENT
DWG(S)	DRAWING	SLOPE	SLOPE
EA	EACH	RT OR R	RIGHT
EG	EXISTING GROUND	R/W, ROW	RIGHT OF WAY
EL	ELEVATION	SCH	SCHEDULE
EMT	EASEMENT	SD	STORM DRAIN
EP	EDGE OR PAVEMENT	SDMH	STORM DRAIN MANHOLE
EX OR EXIST	EXISTING	SE	SQUARE FEET
FC	FACE OF CURB	SHT	SHEET
FINISH	FINISHED FLOOR	SLC	STREET LIGHT AND TRAFFIC CONTROL ESMT
FL	FINISHED GRADE	SNWA	SOUTHERN NEVADA WATER AUTHORITY
FL	FLOWLINE	SPECS	SPECIFICATIONS
FT	FEET OR FOOT	ST	STREET
FUT	FUTURE	SSMH	SANITARY SEWER MANHOLE
GRD	GRADE OR GROUND	STA	STATION
GB	GRADE BREAK OR GRADE CHANGE	STD	STANDARD
GV	GATE VALVE	STL	STEEL OR STREET LIGHT
HDPE	HIGH DENSITY POLYETHYLENE	SW	SIDEWALK
HOA	HOME OWNERS ASSOCIATION	SWG	SOUTHWEST GAS
HOV	HIGHWAY	SNE OR SS	SANITARY SEWER
HP	HIGH POINT	SY	SEWER YARD
HWL	HIGH WATER LEVEL	TAN	TANGENT
HWL OR HW	HYDRAULIC OR HYDRANT	TC	TOP OF CURB
HYD	HYDRAULIC OR HYDRANT	TOF	TOP OF FLOOR OR TOP OF FOOTING
IN	INSIDE DIAMETER	TOF OF GRADE	TOP OF GRADE
INV	INVERT	THRU	THROUGH
INV	INVERT ELEVATION	TOP OF HEADWALL	TOP OF HEADWALL
IR	IRON PIPE	TP	TOP OF PIPE
IRRG	IRRIGATION	TW	TOP OF WALL
LEFT OR LT	LEFT	TRW	TOP OF RETAINING WALL
LF	LINEAR FEET	UDACS	UNIFORM DESIGN AND CONSTRUCTION STANDARDS
LP	LOW POINT	VC	VERTICAL CURVE
LP	LANDSCAPE	VERT	VERTICAL
MAX	MAXIMUM	VG	VALLEY GUTTER
MECH	MECHANICAL	WI	WROUGHT IRON
MN	MANHOLE	WL	WATER LINE
MISC	MISCELLANEOUS	WPZ	WATER PRESSURE ZONE
MUE	MUNICIPAL UTILITY EASEMENT	WT	WEIGHT
NDOT	NEVADA DEPARTMENT OF TRANSPORTATION	WTR	WATER LINE

STORMWATER RUNOFF MANAGEMENT

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

1. THE OWNER, SITE DEVELOPER, CONTRACTOR AND/OR THEIR AUTHORIZED AGENTS SHALL EACH DAY REMOVE ALL SEDIMENT MUD, CONSTRUCTION DEBRIS, OR OTHER POTENTIAL POLLUTANTS THAT MAY HAVE BEEN DISCHARGED TO, OR ACCUMULATE IN, THE PUBLIC RIGHTS OF WAY OF CLARK COUNTY AS A RESULT OF CONSTRUCTION ACTIVITIES ASSOCIATED WITH THIS SITE DEVELOPMENT



GRADING NOTES

1. INSTALL 30" ROLL CURB PER CCAUSD NO. 217.51 OVER 6" TYPE II AGGREGATE BASE
2. INSTALL 1" TYPE C CURB AND GUTTER PER CCAUSD #216
3. INSTALL 6" WIDE CONCRETE SIDEWALK (4" THICK OVER 5" TYPE II AGGREGATE BASE) PER CCAUSD #234
4. INSTALL 8" CROSS GUTTER PER DETAIL ON SHEET D-1
5. INSTALL 2" ASPHALT PAVEMENT OVER 4" TYPE II AGGREGATE BASE
6. CONSTRUCT SIDEWALK RAMP USING ARMOR TILE TRUNCATED DOWNS OR EQUIVALENT CCAUSD NO. 235, CASE 1 & 235.1
7. CONSTRUCT 10' TRANSITION FROM 1" CURB TO MOD. ROLL CURB PER DETAIL ON SHEET D-1
8. INSTALL 6" WIDE CONCRETE SIDEWALK (4" THICK OVER 5" TYPE II AGGREGATE BASE) PER CCAUSD #234
9. INSTALL 8" WIDE CONCRETE SIDEWALK (4" THICK OVER 5" TYPE II AGGREGATE BASE) PER CCAUSD #234
10. INSTALL TYPE III STORM DRAIN MANHOLE PER CCAUSD #406
11. INSTALL CLASS III RCP (PRIVATE) PIPE SIZE PER PLAN
12. INSTALL 5.0' MOD. TYPE "CM2" DROP INLET PER CCAUSD #412.1 AND #421
13. INSTALL 10.0' MOD. TYPE "CM2" DROP INLET PER CCAUSD #412.1 AND #421
14. INSTALL 12.5' MOD. TYPE "CM2" DROP INLET PER CCAUSD #412.1 AND #421
15. INSTALL 20.0' MOD. TYPE "CM2" DROP INLET PER CCAUSD #412.1 AND #421
16. INSTALL 22.5' MOD. TYPE "CM2" DROP INLET PER CCAUSD #412.1 AND #421
17. INSTALL CLASS IV RCP (PRIVATE) PIPE SIZE PER PLAN

STORMWATER RUNOFF MANAGEMENT

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

1. THE OWNER, SITE DEVELOPER, CONTRACTOR AND/OR THEIR AUTHORIZED AGENTS SHALL EACH DAY REMOVE ALL SEDIMENT AND CONSTRUCTION DEBRIS OR OTHER POTENTIAL POLLUTANTS THAT MAY HAVE BEEN DISCHARGED TO, OR ACCUMULATE IN, THE PUBLIC RIGHTS OF WAYS 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 THE CITY OF LAS VEGAS AND 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. EXCEPTIONS MAY APPLY, REFER TO NEVADA STORMWATER GENERAL PERMIT FOR CONSTRUCTION ACTIVITY NVR100000, 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 ANY ACTUAL RAIN EVENT OF 0.5 INCHES OR MORE. THE CONTRACTOR OR HIS AGENT SHALL UPDATE OR MODIFY THE STORMWATER POLLUTION PREVENTION PLAN AS NECESSARY. SOME EXCEPTIONS TO WEEKLY INSPECTIONS MAY APPLY, SUCH AS SUSPENSION OF LAND DISTURBANCE ACTIVITIES. REFER TO NEVADA STORMWATER GENERAL PERMIT FOR CONSTRUCTION ACTIVITY NVR100000, 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, IF EARLIER, SEDIMENT MUST BE REMOVED WHEN BMP DESIGN CAPACITY HAS BEEN REDUCED BY 50 PERCENT OR MORE.

FLOOD ZONE

THE PROJECT SITE IS LOCATED WITHIN A FEMA DESIGNATED ZONE X (UNSHADED) AS DEPICTED ON FLOOD INSURANCE RATE MAP (FIRM) PANEL 32003C2535F, DATED NOVEMBER 15, 2011. A ZONE X (UNSHADED) IS DESCRIBED AS AN AREA DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOOD.

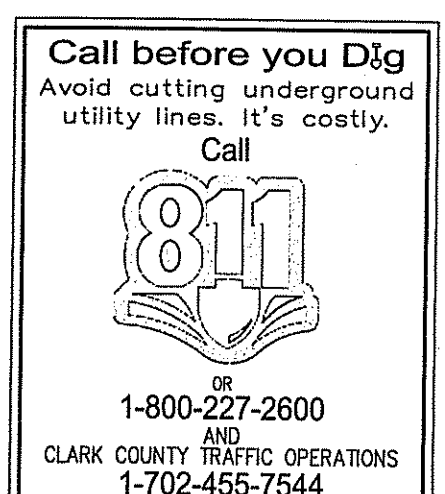
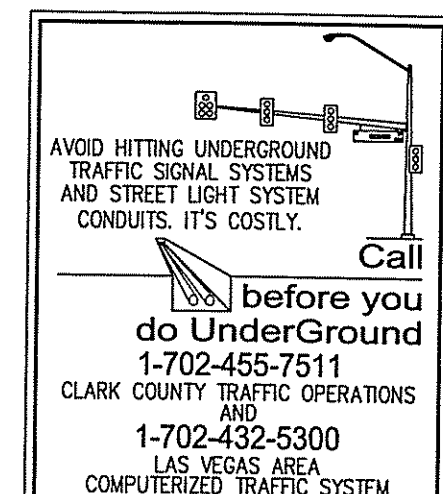
FLOOD CERTIFICATION

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

STEPHEN M. JONES, P.E. 019536 DATE _____

DISCLAIMER NOTE

EXISTING UTILITY LOCATIONS SHOWN HEREON ARE APPROXIMATE ONLY. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE EXCEPT 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.



LEGAL DESCRIPTION

BEING A PORTION OF THE NORTHWEST QUARTER (NW 1/4) OF THE SOUTHWEST QUARTER (SW 1/4) OF SECTION 7, TOWNSHIP 19 SOUTH, RANGE 60 EAST, M.D.M., AS PER FILE 151, PAGE 14 OF SURVEYS, ON FILE IN THE COUNTY RECORDER'S OFFICE.

BASIS OF BEARING

NORTH 89°11'30" WEST, BEING THE BEARING OF THE SOUTH LINE OF THE SOUTHWEST QUARTER (SW 1/4) OF SECTION 7, TOWNSHIP 19 SOUTH, RANGE 60 EAST, M.D.M., AS PER FILE 151, PAGE 14 OF SURVEYS, ON FILE IN THE COUNTY RECORDER'S OFFICE.

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 DATUM
PER THE CLARK COUNTY VERTICAL CONTROL LAST REVISED 2003

GENERAL NOTES

1. SEE PLAN AND PROFILE SHEETS FOR CENTERLINE AND BACK OF CURB CURVE DATA.
2. FINAL GRADES ADJACENT TO STRUCTURES SHALL BE IN CONFORMANCE WITH IBC 2006, SECTION 2304.11.2.2.
3. THE CONTRACTOR SHALL VERIFY ALL CONDITIONS AND DIMENSIONS AND REPORT ALL DISCREPANCIES TO THE ENGINEER.
4. ALL IMPROVEMENTS TO BE PROTECTED FROM EROSION BY SWPPP.
5. MAXIMUM/MINIMUM SLOPES AND MINIMUM STREET SECTIONS NOT TO EXCEED THAT SHOWN ON GEOTECH REPORT.
6. SEE DETAIL SHEETS FOR STREET SECTIONS AND DETAILS.
7. ALL PUBLIC AND PRIVATE DRAINAGE IMPROVEMENTS TO BE BUILT AND MAINTAINED BY THE HOA.
8. CONSTRUCTION OF BLOCK WALLS REQUIRES A SEPARATE BUILDING PERMIT AND APPROVAL.
9. EXISTING UTILITY LOCATIONS SHOWN HEREON ARE APPROXIMATE ONLY. CONTRACTOR TO VERIFY LOCATION AND ELEVATION OF EXISTING UTILITY STRUCTURES AND FACILITIES AND NOTIFY ENGINEER OF ANY DISCREPANCIES PRIOR TO CONSTRUCTION. ENGINEER/OWNER SHALL BE NOTIFIED OF PRIOR DAMAGE TO EXISTING FACILITIES PRIOR TO CONSTRUCTION. CONTRACTOR SHALL BE RESPONSIBLE FOR REPAIR/REPLACING FACILITIES IF ENGINEER/OWNER IS NOT NOTIFIED OF EXISTING DAMAGE PRIOR TO CONSTRUCTION COMMENCING.
10. 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.
11. ALL ELEVATIONS SHOWN, WITH EXCEPTION TO PAD, FINISHED FLOOR, AND CONTOUR ELEVATIONS, ARE THE VALUE SHOWN PLUS 3300'.

PERIMETER SIDEWALKS

PERIMETER SIDEWALK DISPLAYED FOR CONCEPTUAL PURPOSES ONLY. MASTER DEVELOPER TO PROVIDE DESIGN AND CONNECTIONS FOR ONSITE PEDESTRIAN ACCESS.

DRAINAGE EASEMENT NOTE

ALL DRAINAGE EASEMENTS AND COMMON LOTS ARE PUBLIC DRAINAGE EASEMENTS PRIVATELY MAINTAINED BY THE HOA.

PRIVATE STREETS NOTE

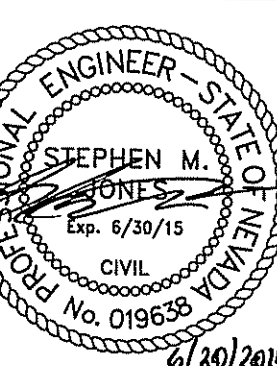
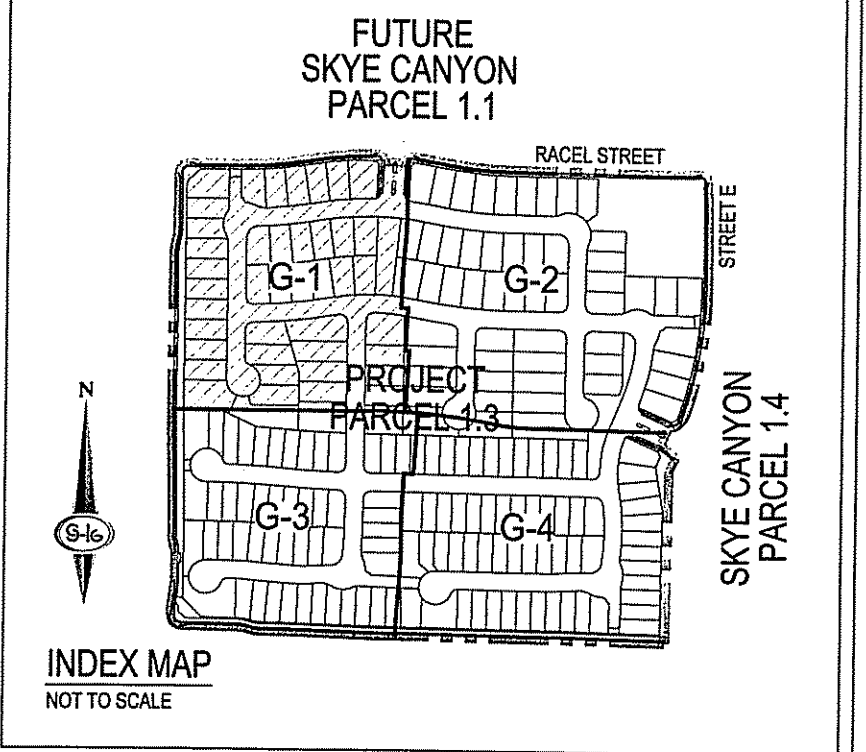
ALL PRIVATE STREETS ARE P.U., PUBLIC SEWER EASEMENTS AND PUBLIC DRAINAGE EASEMENTS TO BE PRIVATELY MAINTAINED BY THE HOA.

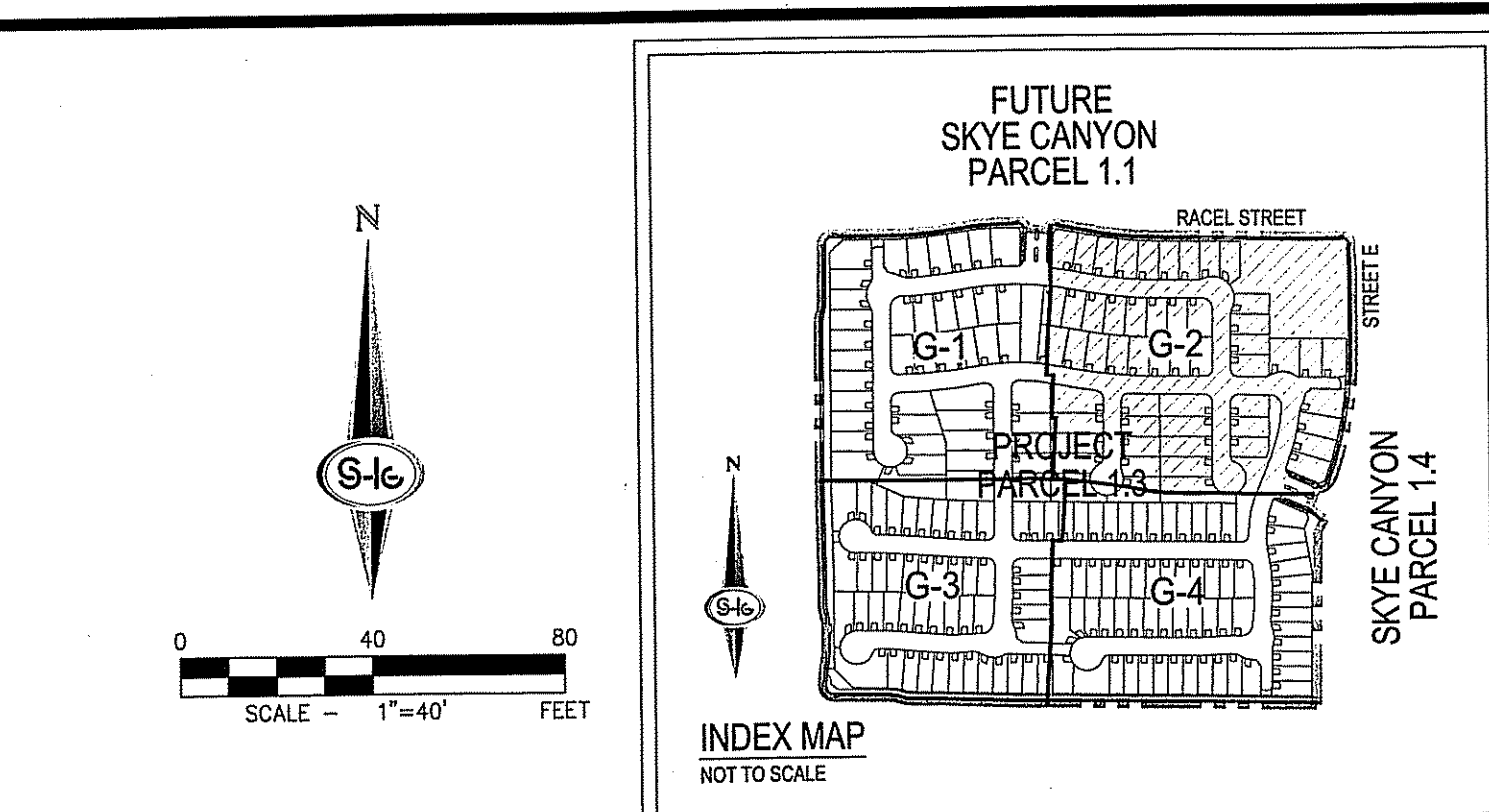
STORM DRAIN NOTE

ALL ONSITE STORM DRAIN AND THE ASSOCIATED FACILITIES ARE PRIVATELY OWNED AND TO BE PRIVATELY MAINTAINED BY THE HOMEOWNERS ASSOCIATION.

WALLS ADJACENT TO COMMON LOTS

SCREEN WALLS ADJACENT TO COMMON LOTS SHALL END NO CLOSER THAN 2' TO BACK OF CURB. RETAINING WALLS SHALL END NO CLOSER THAN 5' TO BACK OF CURB.





- # GRADING NOTES
- (1) INSTALL 30" ROLL CURB PER CCAUSD NO. 217.S1 OVER 6" TYPE 1 AGGREGATE BASE.
 - (2) INSTALL 7" L TYPE CURB AND GUTTER PER CCAUSD #216
 - (3) INSTALL 6" WIDE CONCRETE SIDEWALK (4" THICK OVER 5" TYPE 2 AGGREGATE BASE) PER CCAUSD #234
 - (4) INSTALL 6"-FT CROSS GUTTER PER DETAIL ON SHEET D-1
 - (5) INSTALL 2" ASPHALT PAVEMENT OVER 4" TYPE 1 AGGREGATE BASE
 - (6) CONSTRUCT SIDEWALK RAMP USING ARMOR TILE TRUNCATED DUMPS OR EQUIVALENT CCAUSD NO. 235, CASE 1 & 235.1
 - (7) CONSTRUCT 10' TRANSITION FROM "L" CURB TO MO. ROLL INLET DETAIL PER CCAUSD #216
 - (8) INSTALL 6" WIDE CONCRETE SIDEWALK (4" THICK OVER 5" TYPE 2 AGGREGATE BASE) PER CCAUSD #234
 - (9) INSTALL 6" WIDE CONCRETE SIDEWALK (4" THICK OVER 5" TYPE 2 AGGREGATE BASE) PER CCAUSD #234
 - (10) INSTALL TYPE III STORM DRAIN MANHOLE PER CCAUSD #406
 - (11) INSTALL CLASS III RCP SD (PRIVATE) PIPE SIZE PER PLAN
 - (12) INSTALL 5.0' MOD. TYPE "CM2" DROP INLET PER CCAUSD #121.7 AND #421
 - (13) INSTALL 5.0' MOD. TYPE "CM2" DROP INLET PER CCAUSD #121.7 AND #421
 - (14) INSTALL 12.5' MOD. TYPE "CM2" DROP INLET PER CCAUSD #121.7 AND #421
 - (15) INSTALL 20.0' MOD. TYPE "CM2" DROP INLET PER CCAUSD #121.7 AND #421
 - (16) INSTALL 20.5' MOD. TYPE "CM2" DROP INLET PER CCAUSD #121.7 AND #421
 - (17) INSTALL CLASS IV RCP SD (PRIVATE) PIPE SIZE PER PLAN

LEGAL DESCRIPTION
BEING A PORTION OF THE NORTHWEST QUARTER (NW 1/4) OF
THE SOUTHWEST QUARTER (SW 1/4) OF SECTION 7, TOWNSHIP
19 SOUTH, RANGE 60 EAST M.D.M., CLARK COUNTY, NEVADA.

BASIS OF BEARING

NORTH 89°11'30" WEST, BEING THE BEARING OF THE SOUTH LINE OF THE SOUTHWEST QUARTER (1/4) OF SECTION 7, TOWNSHIP 19 NORTH, RANGE 60 EAST, M.D.M., AS PER FILE 151, PAGE 14 OF SURVEYS, ON FILE IN THE COUNTY RECORDER'S OFFICE.

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 = 2817.6 FEET, 558.81 METERS
N.A.S.D. 88 DATUM
PER THE CLARK COUNTY VERICAL CORRELATION LAST REVISED 2003

- ## GENERAL NOTES
1. SEE PLAN AND PROFILE SHEETS FOR CENTERLINE AND BACK OF CURVE DATA SECTION.
 2. FINAL GRADES ADJACENT TO STRUCTURES SHALL BE IN CONFORMANCE WITH THE ADJACENT SECTION (SECTION 111.2).
 3. THE CONTRACTOR SHALL VERIFY ALL CONDITIONS AND DIMENSIONS AND REPORT ALL DISCREPANCIES TO THE ENGINEER.
 4. ALL IMPROVEMENTS TO BE PROTECTED FROM EROSION BY SWAY.
 5. MAXIMUM/MINIMUM SLOPES AND MINIMUM STREET SECTIONS NOT TO EXCEED THAT SHOWN ON GEOTECH REPORT.
 6. SEE DETAIL SHEETS FOR STREET SECTIONS AND DETAILS.
 7. ALL PUBLIC AND PRIVATE DRAINAGE IMPROVEMENTS TO BE ROUNDED FOR AND INSPECTED.
 8. CONSTRUCTION OF BLOCK WALLS REQUIRES A SEPARATE BUILDING PERMIT AND APPROVAL.
 9. EXISTING UTILITY LOCATIONS SHOWN HEREON ARE FOR INFORMATION ONLY. CONTRACTOR TO VERIFY LOCATION AND ELEVATION OF EXISTING UTILITY STRUCTURES AND MANHOLE AND NOTIFY THE UTILITY OWNERS PRIOR TO CONSTRUCTION. CONTRACTOR TO PROTECT IN PLACE DURING CONSTRUCTION. ENGINEER/OWNER SHALL BE RESPONSIBLE FOR PRIOR DAMAGE TO EXISTING UTILITIES PRIOR TO CONSTRUCTION. CONTRACTOR WILL BE RESPONSIBLE FOR ANY REPAIRS/REPLACEMENTS IF ENGINEER/OWNER IS NOT NOTIFIED OF EXISTING DAMAGE PRIOR TO CONSTRUCTION COMMENCEMENT.
 10. NO STRUCTURE, VEGETATION, OR OBJECTS OF ANY KIND IS PERMITTED OVER THE TOP OF CURB (24" MINUS IN HEIGHT MEASURED FROM THE TOP OF THE ADJACENT CURB IF CURED EXIST) WITHIN THE SIGHT VISIBILITY ZONES.
 11. ALL ELEVATIONS SHOWN, WITH EXCEPTION TO PAD, FINISHED FLOOR, AND CONTIGUOUS ELEVATIONS, ARE THE VALUE SHOWN PLUS 3.300'.

- # STORMWATER RUNOFF MANAGEMENT
- (REQUIRED FOR ALL SITES GREATER THAN 1 ACRE (43,560 SQ.FT.))
1. THE OWNER, SITE DEVELOPER, CONTRACTOR AND/OR THEIR AUTHORIZED AGENTS SHALL EACH DAY REMOVE ALL SEDIMENT AND DEBRIS FROM THE CONSTRUCTION SITE TO PREVENT THAT MAY HAVE BEEN DISCHARGED TO, OR ACCUMULATED THE PUBLIC RIGHTS OF WAYS AS A RESULT OF CONSTRUCTION ACTIVITIES IN ASSOCIATION WITH THE 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 AGENT TO UNDOUBTEDLY PREVENT THE CONSTRUCTION OF THE SUBMITTED PLAN DOES NOT MEET THE PERFORMANCE STANDARDS SPECIFIED IN THE CITY OF NORTH LAS VEGAS AND TULSA 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 OF THE DISTURBED AREAS HAS COMPLETED. THE TEMPORARILY OR PERMANENTLY CEASED. SOME EXCEPTIONS MAY APPLY; REFER TO NEVADA STORMWATER CONTRACTOR PERMIT FOR CONSTRUCTION ACTIVITY NR1000000, SECTION 11A2.
 4. AT A MINIMUM, THE CONTRACTOR OR HIS AGENT SHALL INSPECT AND MAINTAIN DISTURBED AREAS USED FOR STORAGE OF MATERIALS AND EQUIPMENT THAT ARE EXPOSED TO PRECIPITATION, VEHICLE ENTRANCE AND EXIT, AND TO WIND. INSPECTIONS SHALL BE WEEKLY, OR MORE OFTEN, BASED ON ANY ACTUAL RAIN EVENT OF 0.5 INCHES OR MORE. THE CONTRACTOR OR HIS AGENT SHALL UPDATE OR MODIFY THE PREVENTED EROSION PREVENTION PLAN WHEN NECESSARY. SOME EXCEPTIONS TO WEEKLY INSPECTIONS MAY APPLY, SUCH AS SUSPENSION OF LAND DISRUPTION ACTIVITIES, OR THE CONTRACTOR OR HIS AGENT MAY OBTAIN A PERMIT FOR CONSTRUCTION ACTIVITY NR1000000, SECTION 11A2.
 5. ACCUMULATED SEDIMENT IN BMPs SHALL BE REMOVED WITHIN SEVEN DAYS AFTER A STORMWATER RUNOFF EVENT OR PRIOR TO THE NEXT ANTICIPATED STORMWATER RUNOFF EVENT. SEDIMENT REMOVAL SHALL BE REMOVED WHEN BMP DESIGN CAPACITY HAS BEEN REDUCED BY 50 PERCENT OR MORE.

FLOOD ZONE
THE PROJECT SITE IS LOCATED WITHIN A FEMA DESIGNATED ZONE X (UNSHADED) AS DEPICTED ON FLOOD INSURANCE RATE MAP (FIRM) PANEL 32003C2535F, DATED NOVEMBER 16, 2011. A ZONE X (UNSHADED) IS DESCRIBED AS AN AREA DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOOD.

FLOOD CERTIFICATION
I CERTIFY THAT THIS GRADING PLAN IS IN CONFORMANCE WITH THE
APPROVED DRAINAGE STUDY DS _____ ON FILE AT CITY OF LAS
VEGAS FOR THE SUBJECT PROJECT.
STEPHEN M. JONES, P.E. 019638 DATE _____

DISCLAIMER NOTE

EXISTING UTILITY LOCATIONS SHOWN HEREON ARE APPROXIMATE ONLY. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE EXCEPT 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.

PERIMETER SIDEWALKS
PERIMETER SIDEWALK DISPLAYED FOR CONCEPTUAL PURPOSES ONLY. MASTER DEVELOPER TO PROVIDE DESIGN AND CONNECTIONS FOR ONSITE PEDESTRIAN ACCESS

DRAINAGE EASEMENT NOTE
ALL DRAINAGE EASEMENTS AND COMMON LOTS ARE PUBLIC
DRAINAGE EASEMENTS PRIVATELY MAINTAINED BY THE HOA

PRIVATE STREETS NOTE
ALL PRIVATE STREETS ARE P.U., PUBLIC SEWER EASEMENTS AND
PUBLIC DRAINAGE EASEMENTS TO BE PRIVATELY MAINTAINED BY
THE HOA

STORM DRAIN NOTE
ALL ONSITE STORM DRAIN AND THE ASSOCIATED FACILITIES ARE
PRIVATELY OWNED AND TO BE PRIVATELY MAINTAINED BY THE
HOMEOWNERS ASSOCIATION

WALLS ADJACENT TO COMMON LOTS
SCREEN WALLS ADJACENT TO COMMON LOTS SHALL END NO CLOSER THAN 20' TO BACK OF CURB. RETAINING WALLS SHALL END NO CLOSER THAN 5' TO BACK OF CURB.

AVOID HITTING OVERHEAD POWER LINES. IT'S COSTLY.

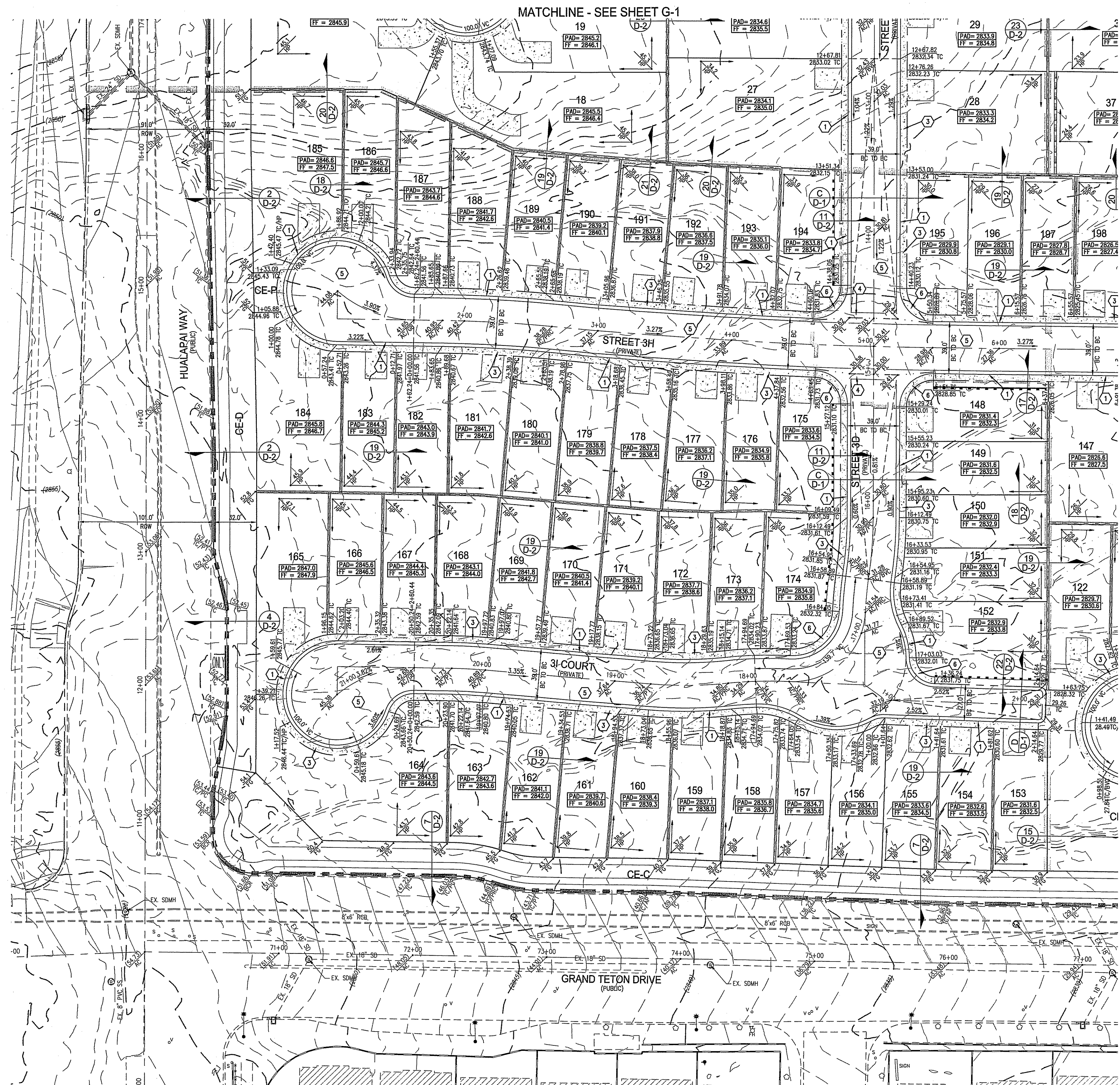
CALL BEFORE YOU DO OVERHEAD

1-702-227-2929

An illustration of a street light pole with two traffic signals. A callout bubble with a pointer is directed towards the text 'before you do UnderGround'.

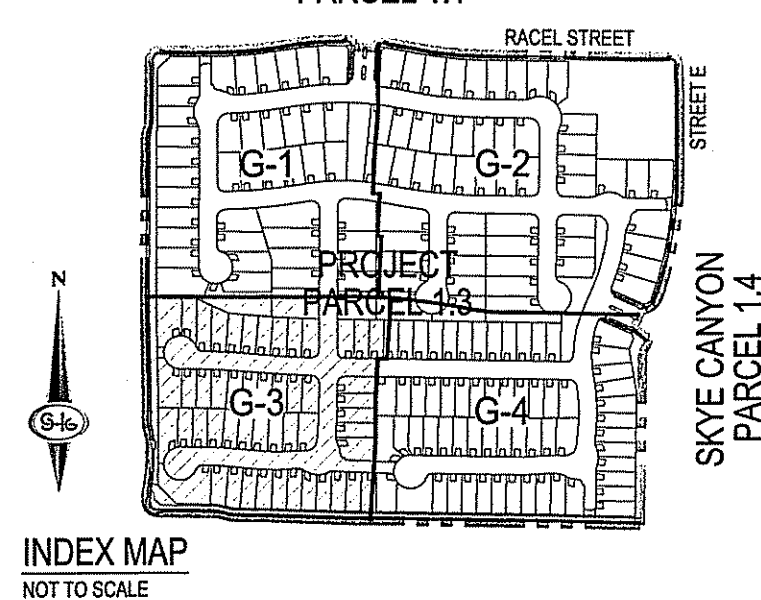
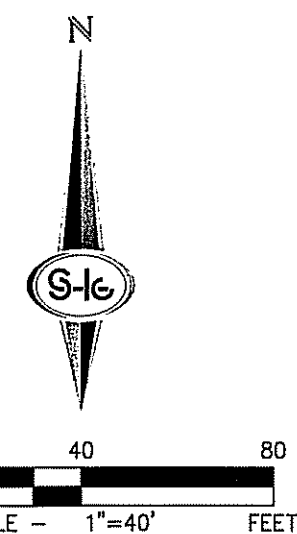
Call before you Dig
Avoid cutting underground
utility lines. It's costly.
Call

OR
1-800-227-2600
AND
CLARK COUNTY TRAFFIC OPERATIONS
1-702-455-7544



MATCHLINE - SEE SHEET G-1

MATCHLINE - SEE SHEET G-4



GRADING NOTES

- (1) INSTALL 30" ROLL CURB PER CCAUSD NO. 2175/ SI OVER 6" TYPE 1 AGGREGATE BASE
- (2) INSTALL 1" L TYPE CURB AND GUTTER PER CCAUSD #216
- (3) INSTALL 5" WIDE CONCRETE SIDEWALK (4" THICK OVER 5" TYPE 1 AGGREGATE BASE)
- (4) INSTALL 2" 8" FL CROSS GUTTER PER DETAIL ON SHEET D-1
- (5) INSTALL 2" ASPHALT PAVEMENT OVER 4" TYPE II AGGREGATE BASE
- (6) CONSTRUCT SIDEWALK RAMP USING ARMOR TILE TRUNCATED CURB OR EQUIVALENT CCAUSD NO. 235, CASE 1 & 235.1
- (7) CONSTRUCT 10' TRANSITION FROM "L" CURB TO MOD. ROLL CURB PER DETAIL ON SHEET D-2
- (8) INSTALL 5" WIDE CONCRETE SIDEWALK (4" THICK OVER 5" TYPE 1 AGGREGATE BASE) PER CCAUSD #234
- (9) INSTALL 8" WIDE CONCRETE SIDEWALK (4" THICK OVER 5" TYPE 1 AGGREGATE BASE) PER CCAUSD #235
- (10) INSTALL TYPE III STORM DRAIN MANHOLE PER CCAUSD #406
- (11) INSTALL CLASS III RCP SD (PRIVATE) PIPE SIZE PER PLAN
- (12) INSTALL 5.0' MOD. TYPE "CM2" DROP INLET PER CCAUSD #412.1 AND #421
- (13) INSTALL 10.0' MOD. TYPE "CM2" DROP INLET PER CCAUSD #412.1 AND #421
- (14) INSTALL 12.5' MOD. TYPE "CM2" DROP INLET PER CCAUSD #412.1 AND #421
- (15) INSTALL 15.0' MOD. TYPE "CM2" DROP INLET PER CCAUSD #412.1 AND #421
- (16) INSTALL 22.5' MOD. TYPE "CM2" DROP INLET PER CCAUSD #412.1 AND #421
- (17) INSTALL CLASS IV RCP SD (PRIVATE) PIPE SIZE PER PLAN

LEGAL DESCRIPTION

BEING A PORTION OF THE NORTHWEST QUARTER (NW 1/4) OF
THE SOUTHWEST QUARTER (SW 1/4) OF SECTION 7, TOWNSHIP
19 SOUTH, RANGE 60 EAST M.D.M., CLARK COUNTY, NEVADA.

BASIS OF BEARING	
1	1.0
2	2.0
3	3.0
4	4.0
5	5.0
6	6.0
7	7.0
8	8.0
9	9.0
10	10.0
11	11.0
12	12.0
13	13.0
14	14.0
15	15.0
16	16.0
17	17.0
18	18.0
19	19.0
20	20.0
21	21.0
22	22.0
23	23.0
24	24.0
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26	26.0
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28	28.0
29	29.0
30	30.0
31	31.0
32	32.0
33	33.0
34	34.0
35	35.0
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37	37.0
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41	41.0
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43	43.0
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86	86.0
87	87.0
88	88.0
89	89.0
90	90.0
91	91.0
92	92.0
93	93.0
94	94.0
95	95.0
96	96.0
97	97.0
98	98.0
99	99.0
100	100.0

NORTH 89°11'30" WEST, BEING THE BEARING OF THE SOUTH
LINE OF THE SOUTHWEST QUARTER (SW ¼) OF SECTION 7,
TOWNSHIP 19 SOUTH, RANGE 60 EAST, M.D.M., AS PER FILE
151, PAGE 14 OF SURVEYS, ON FILE IN THE COUNTY
RECORDER'S OFFICE.

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 DATUM
PER THE CLARK COUNTY VERTICAL CONTROL LAST REVISED 2003

GENERAL NOTES

1. SEE PLAN AND PROFILE SHEETS FOR CENTERLINE AND BACK OF CURB CURVE DATA.
2. FINAL GRADES ADJACENT TO STRUCTURES SHALL BE IN CONFORMANCE WITH BIC 2006, SECTION 2504.17.2.2.
3. THE CONTRACTOR SHALL VERIFY ALL CONDITIONS AND DIMENSIONS AND REPORT ANY DISCREPANCIES TO THE ENGINEER.
4. ALL IMPROVEMENTS TO BE PROTECTED FROM EROSION BY SWEEP.
5. MAXIMUM/MINIMUM SLOPES AND MINIMUM STREET SECTION NOT TO BE EXCEED THAT SHOWN ON GEOTECH REPORT.
6. SEE DETAIL SHEETS FOR STREET SECTIONS AND DETAILS.
7. ALL PUBLIC AND PRIVATE DRAINAGE IMPROVEMENTS TO BE BONDED FOR AND INSPECTED.
8. CONSTRUCTION OF BLOCK WALLS REQUIRES A SEPARATE BUILDING PERMIT AND APPROVAL.
9. EXISTING UTILITY LOCATIONS SHOWN HEREON ARE BASED ON THE ONLY AVAILABLE RECORD INFORMATION AND ELEVATION OF EXISTING UTILITY STRUCTURES AND NOTICES UNDER CONSTRUCTION. CONTRACTOR TO PROTECT ALL UTILITIES DURING CONSTRUCTION. ENGINEER/OWNER SHALL BE RESPONSIBLE FOR VERIFYING UTILITY LOCATIONS PRIOR TO CONSTRUCTION. CONTRACTOR WILL BE RESPONSIBLE FOR ANY DAMAGE TO UTILITIES. CONTRACTOR SHALL BE RESPONSIBLE FOR ANY NOTIFIED OF EXISTING DAMAGE PRIOR TO CONSTRUCTION COMMENCING.
10. NO STRUCTURE, VEGETATION, OR OBJECTS OF ANY KIND PERMITTED WITHIN THEIR RIGHT OF WAY (24 INCHES IN HEIGHT MEASURED FROM THE TOP OF THE ADJACENT CURB IF CURB EXISTS) WITHIN THE SIGHT VISIBILITY ZONES.
11. ALL ELEVATIONS SHOWN, WITH EXCEPTION TO PAD, FINISHED FLOOR, AND CANTOIR ELEVATIONS, ARE THE LEVEL SHOWN PLUS 3.300'.

PERIMETER SIDEWALKS

PERIMETER SIDEWALK DISPLAYED FOR CONCEPTUAL PURPOSES ONLY. MASTER DEVELOPER TO PROVIDE DESIGN AND CONNECTIONS FOR ONSITE PEDESTRIAN ACCESS

DRAINAGE EASEMENT NOTE

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DRAINAGE EASEMENTS PRIVATELY MAINTAINED BY THE HOA

PRIVATE STREETS NOTE

ALL PRIVATE STREETS ARE P.U., PUBLIC SEWER EASEMENTS AND PUBLIC DRAINAGE EASEMENTS TO BE PRIVATELY MAINTAINED BY THE HOA

STORM DRAIN NOTE

ALL ONSITE STORM DRAIN AND THE ASSOCIATED FACILITIES ARE PRIVATELY OWNED AND TO BE PRIVATELY MAINTAINED BY THE HOMEOWNERS ASSOCIATION

WALLS ADJACENT TO COMMON LOTS

SCREEN WALLS ADJACENT TO COMMON LOTS SHALL END NO CLOSER THAN 20' TO BACK OF CURB. RETAINING WALLS SHALL END NO CLOSER THAN 5' TO BACK OF CURB.

FLOOD ZONE

THE PROJECT SITE IS LOCATED WITHIN A FEMA DESIGNATED ZONE X (UNSHADED) AS DEPICTED ON FLOOD INSURANCE RATE MAP (FIRM) PANEL 32003C2555F, DATED NOVEMBER 16, 2011. A ZONE X (UNSHADED) IS DESCRIBED AS AN AREA DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOOD.

FLOOD CERTIFICATION

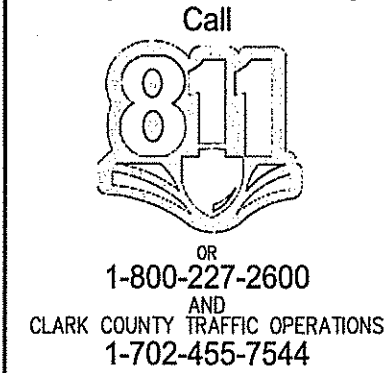
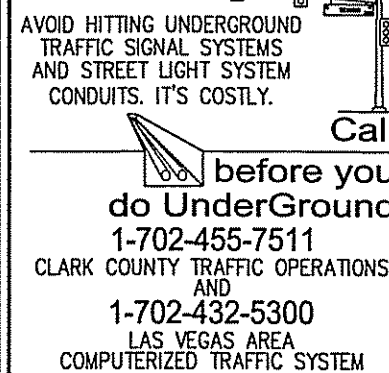
I CERTIFY THAT THIS GRADING PLAN IS IN CONFORMANCE WITH THE
APPROVED DRAINAGE STUDY DS _____ ON FILE AT CITY OF LAS
VEGAS FOR THE SUBJECT PROJECT.

STEPHEN M. JONES, P.E. 019638

DATE _____

DISCLAIMER NOTE

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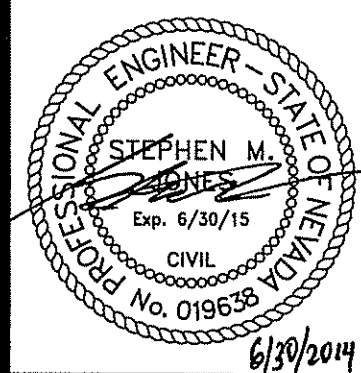
SLATER
HANFAN
GROUP
CONSULTING ENGINEERS & PLANNERS
501 G STREET #216, LAS VEGAS, NV 89118
PHONE (702) 284-5300
FAX (702) 284-5399

[illegible]

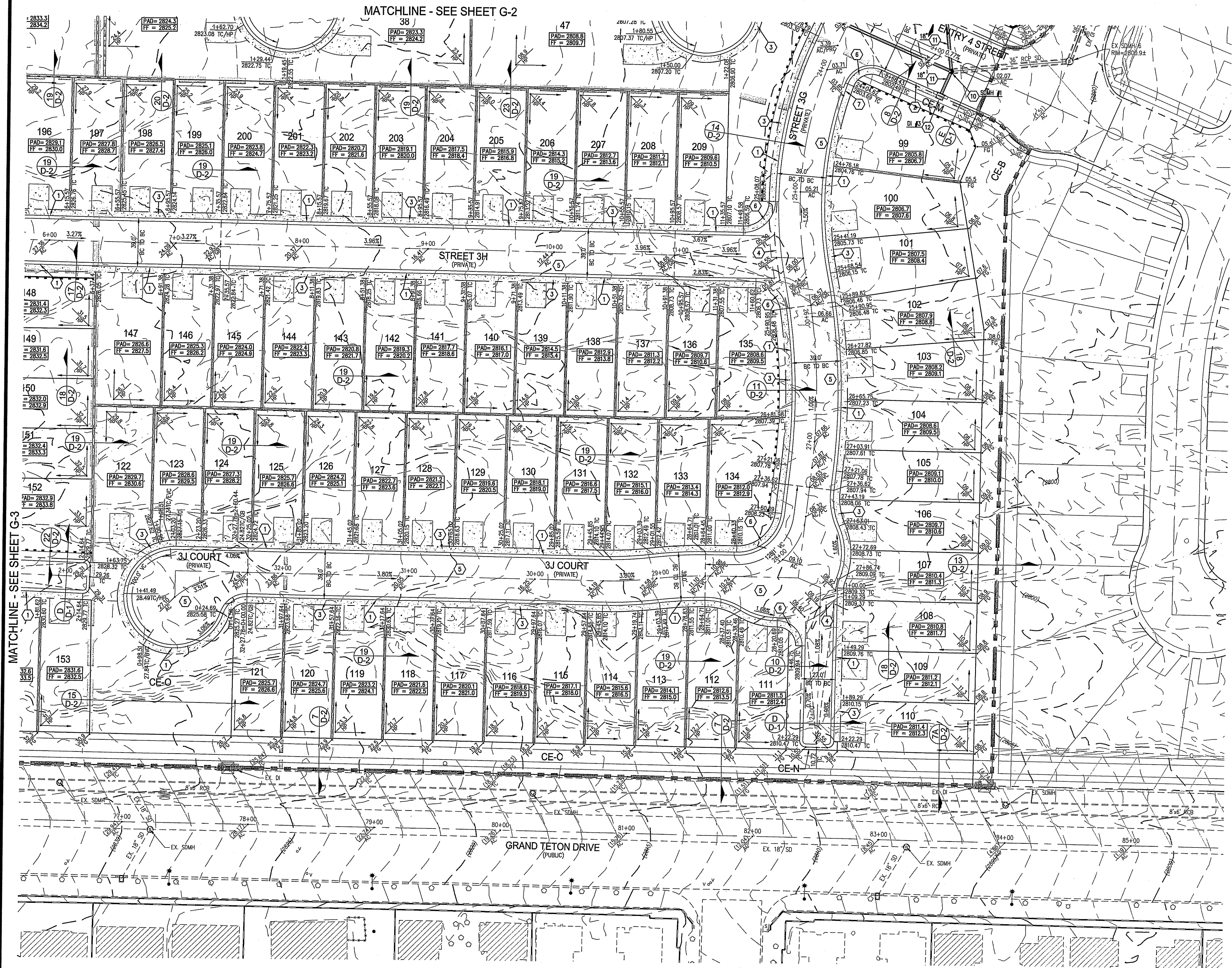
NINETY-FIVE MANAGEMENT LLC
CITY OF LAS VEGAS, NEVADA

SKYE CANYON PARCEL 1.3
GRADING PLAN III

I 12 S \$7 R 60 E	
DATE:	6/24/14
DRAFTER:	JTC
DESIGNER:	MAK
CHECKED:	CAL
PROJECT NO.	OLY1401-002



G-3
SHEET 5 OF 10



GRADING NOTES

1. INSTALL 30" ROLL CURB PER CCAUSD NO. 217.51 OVER 6" TYPE I AGGREGATE BASE
2. INSTALL 1" TYPE I CURB AND GUTTER PER CCAUSD #216
3. INSTALL 5" WIDE CONCRETE SIDEWALK 14" THICK OVER 5" TYPE 2 AGGREGATE BASE PER CCAUSD #234
4. INSTALL 8-FT CROSS GUTTER PER DETAIL ON SHEET D-1
5. INSTALL 2" ASPHALT PAVEMENT OVER 4" TYPE II AGGREGATE BASE
6. CONSTRUCT SIDEWALK RAMP USING ARMOR TIE TRUNCATED DOMES OR EQUIVALENT CCAUSD NO. 235, C&S 1 & 2 S&S 1
7. CONSTRUCT 10' TRANSITION FROM 1" CURB TO MOD. ROLL CURB PER DETAIL ON SHEET D-1
8. INSTALL 5" WIDE CONCRETE SIDEWALK 4" THICK OVER 5" TYPE 2 AGGREGATE BASE PER CCAUSD #234
9. INSTALL 8" WIDE CONCRETE SIDEWALK 4" THICK OVER 5" TYPE 2 AGGREGATE BASE PER CCAUSD #234
10. INSTALL TYPE III STORM DRAIN MANHOLE PER CCAUSD #406
11. INSTALL CLASS III RCP SD (PRIVATE) PIPE SIZE PER PLAN
12. INSTALL 5.0' MOD. TYPE "CM2" DROP INLET PER CCAUSD #412.1 AND #421
13. INSTALL 10.0' MOD. TYPE "CM2" DROP INLET PER CCAUSD #412.1 AND #421
14. INSTALL 12.5' MOD. TYPE "CM2" DROP INLET PER CCAUSD #412.1 AND #421
15. INSTALL 20.0' MOD. TYPE "CM2" DROP INLET PER CCAUSD #412.1 AND #421
16. INSTALL 22.5' MOD. TYPE "CM2" DROP INLET PER CCAUSD #412.1 AND #421
17. INSTALL CLASS IV RCP SD (PRIVATE) PIPE SIZE PER PLAN

STORMWATER RUNOFF MANAGEMENT

- (REQUIRED FOR ALL SITES GREATER THAN 1 ACRE (43,560 SQ. FT.))
1. THE OWNER, SITE DEVELOPER, CONTRACTOR AND/OR THEIR AUTHORIZED AGENTS SHALL EACH DAY REMOVE ALL SEDIMENT AND CONSTRUCTION DEBRIS OR OTHER POTENTIAL POLLUTANTS THAT MAY HAVE BEEN DISCHARGED TO, OR ACCUMULATED IN, THE PUBLIC RIGHTS OF WAY 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 BY 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 THE CITY OF LAS VEGAS AND 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 NEVADA STORMWATER GENERAL PERMIT FOR CONSTRUCTION ACTIVITY NVR100000, 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 ANY ACTUAL RAIN EVENT OF 0.5 INCHES OR MORE. THE CONTRACTOR OR HIS AGENT SHALL UPDATE OR MODIFY THE STORMWATER POLLUTION PREVENTION PLAN AS NECESSARY. SOME EXCEPTIONS TO WEEKLY INSPECTIONS MAY APPLY, SUCH AS SUSPENSION OF LAND DISTURBANCE ACTIVITIES. REFER TO NEVADA STORMWATER GENERAL PERMIT FOR CONSTRUCTION ACTIVITY NVR100000, 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 STORMWATER RUNOFF EVENT. EARLIER. SEDIMENT MUST BE REMOVED WHEN BMP DESIGN CAPACITY HAS BEEN REDUCED BY 50 PERCENT OR MORE.

FLOOD ZONE

THE PROJECT SITE IS LOCATED WITHIN A FEMA DESIGNATED ZONE X (UNSHADED) AS DEPICTED ON FLOOD INSURANCE RATE MAP (FIRM) PANEL 32003C2535F, DATED NOVEMBER 16, 2011. A ZONE X (UNSHADED) IS DESCRIBED AS AN AREA DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOOD.

FLOOD CERTIFICATION

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

STEPHEN M. JONES, P.E. 019538 DATE _____

DISCLAIMER NOTE

EXISTING UTILITY LOCATIONS SHOWN HEREON ARE APPROXIMATE ONLY. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE EXCEPT 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.

LEGAL DESCRIPTION

BEING A PORTION OF THE NORTHWEST QUARTER (NW 1/4) OF THE SOUTHWEST QUARTER (SW 1/4) OF SECTION 7, TOWNSHIP 19 SOUTH, RANGE 60 EAST, M.D.M., AS PER FILE 151, PAGE 14 OF SURVEYS, ON FILE IN THE COUNTY RECORDER'S OFFICE.

BASIS OF BEARING

NORTH 89°11'30" WEST, BEING THE BEARING OF THE SOUTH LINE OF THE SOUTHWEST QUARTER (SW 1/4) OF SECTION 7, TOWNSHIP 19 SOUTH, RANGE 60 EAST, M.D.M., AS PER FILE 151, PAGE 14 OF SURVEYS, ON FILE IN THE COUNTY RECORDER'S OFFICE.

BENCHMARK

USDA BRASS CAP ON AN IRON PIPE, 140' SOUTHWEST OF TELEPHONE POLE #269941, SOUTHWEST CORNER OF THE U.S. 85/KYLE CANYON TURNOFF.

ELEVATION = 2817.62 FEET, 858.813 METERS

N.A.S.D. 88 DATUM

PER THE CLARK COUNTY VERTICAL CONTROL, LAST REVISED 2003

GENERAL NOTES

1. SEE PLAN AND PROFILE SHEETS FOR CENTERLINE AND BACK OF CURB CURVE DATA.
2. FINAL GRADES ADJACENT TO STRUCTURES SHALL BE IN CONFORMANCE WITH IBC 2006, SECTION 2304.11.2.2.
3. THE CONTRACTOR SHALL VERIFY ALL CONDITIONS AND DIMENSIONS AND REPORT ALL DISCREPANCIES TO THE ENGINEER.
4. ALL IMPROVEMENTS TO BE PROTECTED FROM EROSION BY SWPPP.
5. MAXIMUM/MINIMUM SLOPES AND MINIMUM STREET SECTIONS NOT TO EXCEED THAT SHOWN ON GEOTECH REPORT.
6. SEE DETAIL SHEETS FOR STREET SECTIONS AND DETAILS.
7. ALL PUBLIC AND PRIVATE DRAINAGE IMPROVEMENTS TO BE PROVIDED FOR AND INSPECTED.
8. CONSTRUCTION OF BLOCK WALLS REQUIRES A SEPARATE BUILDING PERMIT AND APPROVAL.
9. EXISTING UTILITY LOCATIONS SHOWN HEREON ARE APPROXIMATE ONLY. CONTRACTOR TO VERIFY LOCATION AND ELEVATION OF EXISTING UTILITY STRUCTURES, FACILITIES AND NOTIFY ENGINEER OF ANY DISCREPANCIES PRIOR TO CONSTRUCTION. CONTRACTOR TO PROTECT IN PLACE DURING CONSTRUCTION. ENGINEER/OWNER SHALL BE NOTIFIED PRIOR DAMAGE TO EXISTING FACILITIES PRIOR TO CONSTRUCTION. CONTRACTOR WILL BE RESPONSIBLE FOR REPAIR/REPLACING FACILITIES IF ENGINEER/OWNER IS NOT NOTIFIED OF EXISTING DAMAGE PRIOR TO CONSTRUCTION COMMENCING.
10. 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.
11. ALL ELEVATIONS SHOWN, WITH EXCEPTION TO PAD, FINISHED FLOOR, AND CONTOUR ELEVATIONS, ARE THE VALUE SHOWN PLUS 3300'.

PERIMETER SIDEWALKS

PERIMETER SIDEWALK DISPLAYED FOR CONCEPTUAL PURPOSES ONLY. MASTER DEVELOPER TO PROVIDE DESIGN AND CONNECTIONS FOR ON-SITE PEDESTRIAN ACCESS.

DRAINAGE EASEMENT NOTE

ALL DRAINAGE EASEMENTS AND COMMON LOTS ARE PUBLIC DRAINAGE EASEMENTS PRIVATELY MAINTAINED BY THE HOA.

PRIVATE STREETS NOTE

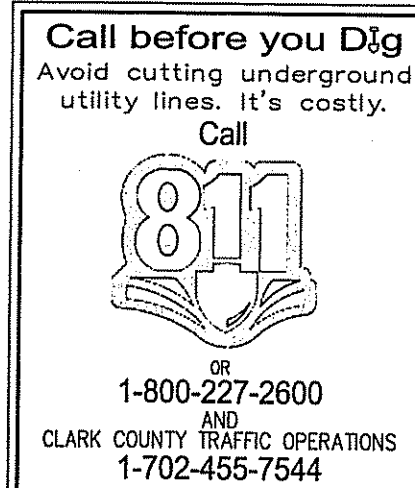
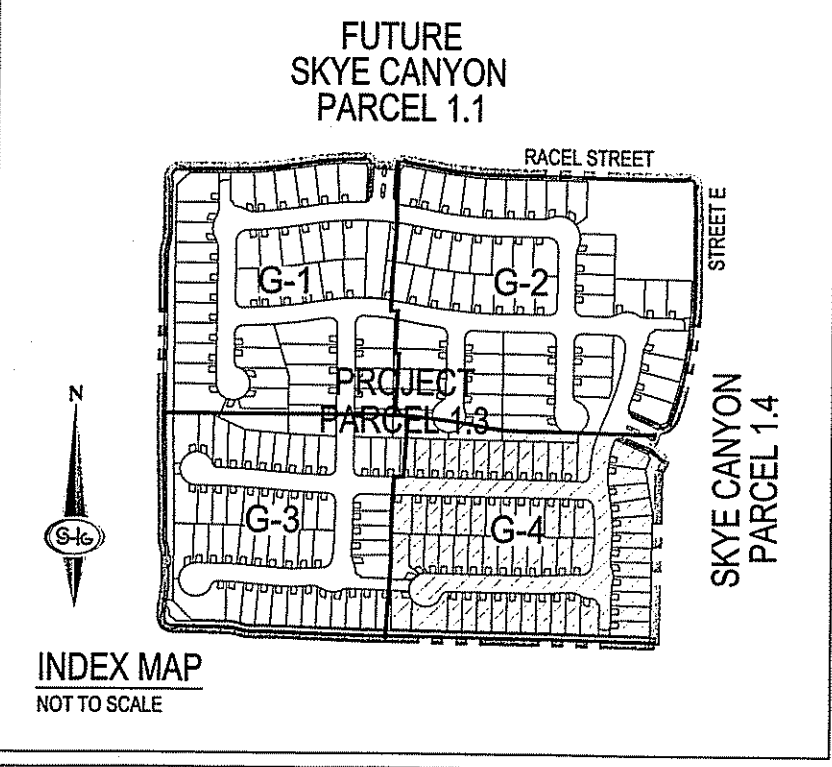
ALL PRIVATE STREETS ARE P.U., PUBLIC SEWER EASEMENTS AND PUBLIC DRAINAGE EASEMENTS TO BE PRIVATELY MAINTAINED BY THE HOA.

STORM DRAIN NOTE

ALL ON-SITE STORM DRAIN AND THE ASSOCIATED FACILITIES ARE PRIVATELY OWNED AND TO BE PRIVATELY MAINTAINED BY THE HOMEOWNERS ASSOCIATION.

WALLS ADJACENT TO COMMON LOTS

SCREEN WALLS ADJACENT TO COMMON LOTS SHALL END NO CLOSER THAN 20' TO BACK OF CURB. RETAINING WALLS SHALL END NO CLOSER THAN 5' TO BACK OF CURB.



SLATER HANFAN 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 1.3

GRADING PLAN IV

DATE: 6/24/14

DRAWN: JTC

DESIGNER: MAK

CHECKED: CAL

PROJECT NO. OLY1401-002

ENGINEER - STATE LICENSED

STEPHEN M. JONES

CIVIL

Exp. 6/16/15

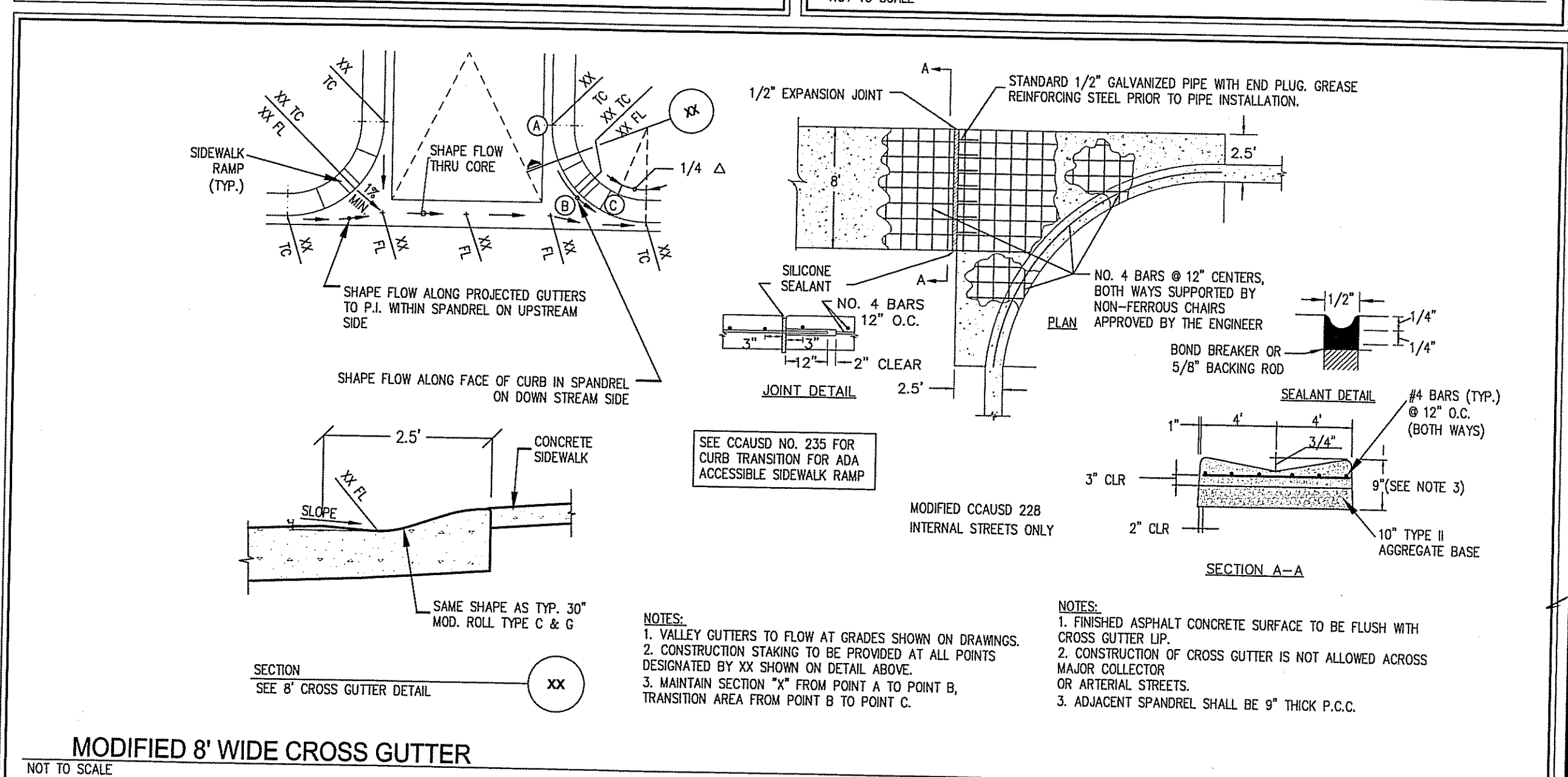
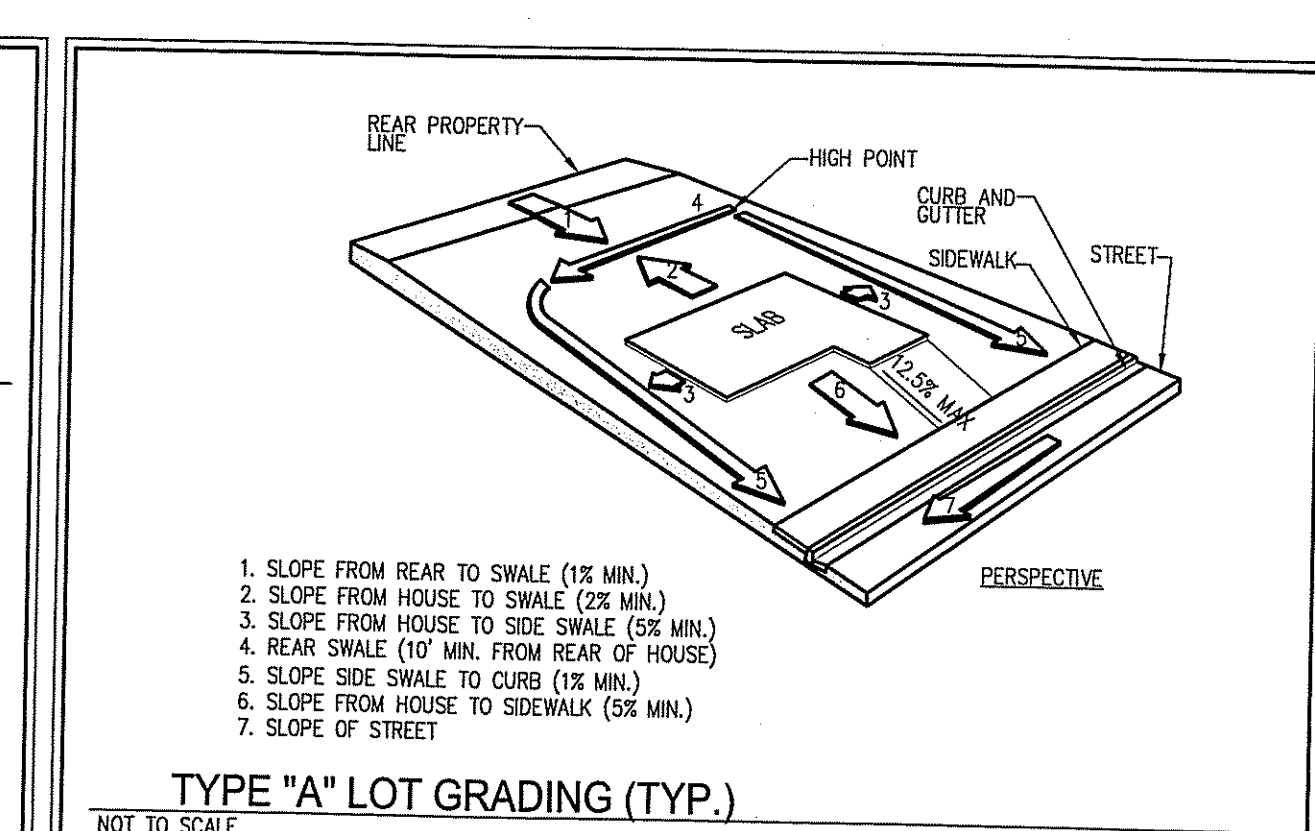
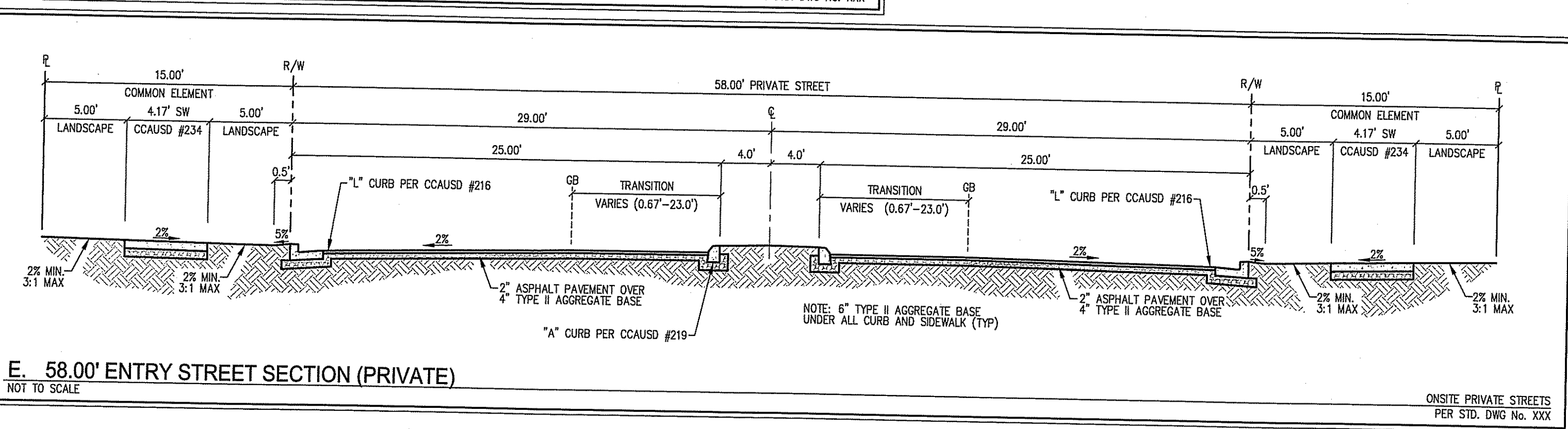
CLARK COUNTY No. 019538

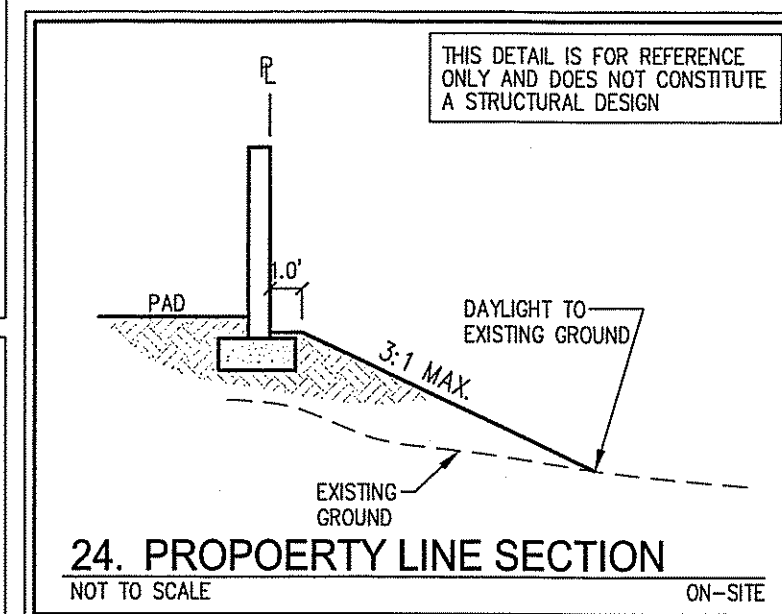
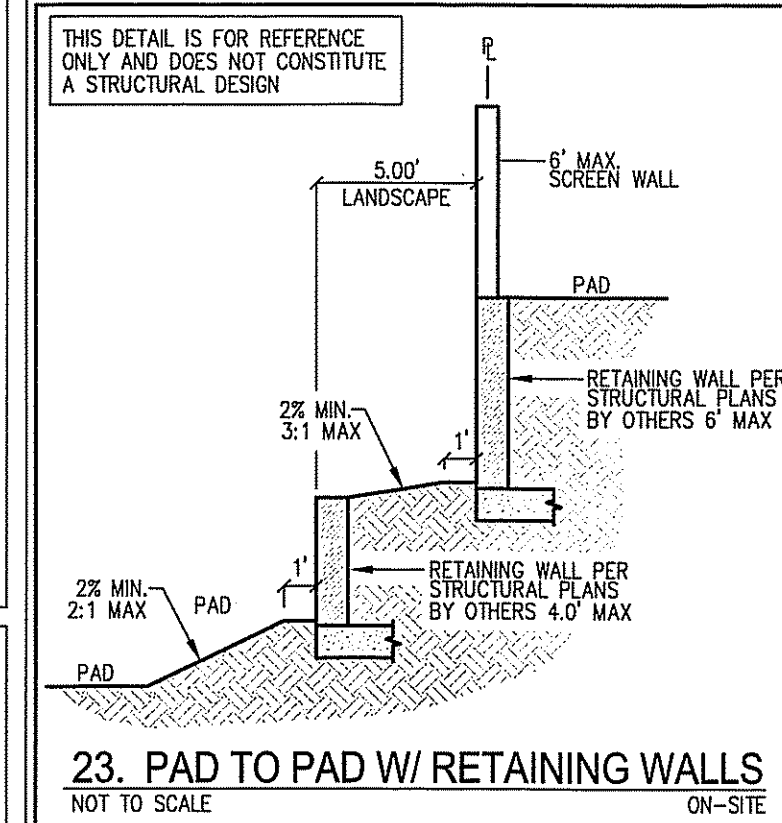
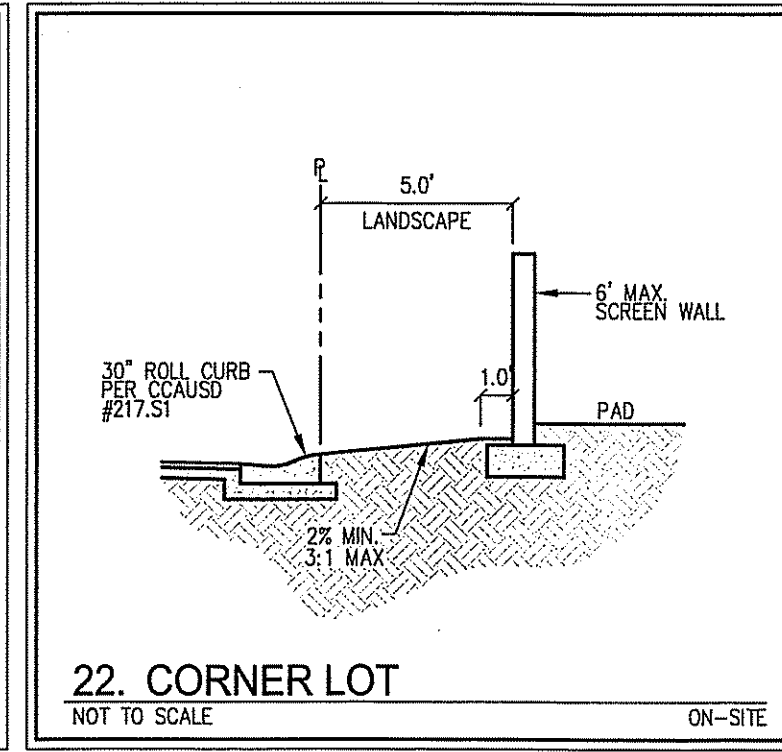
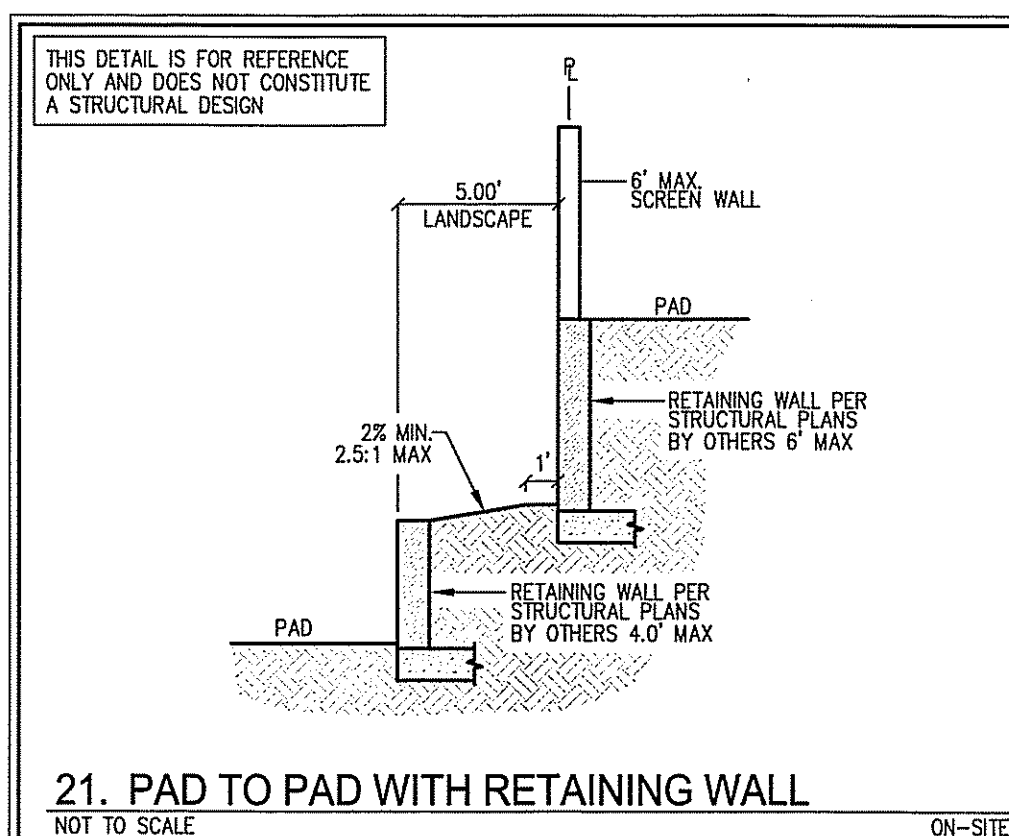
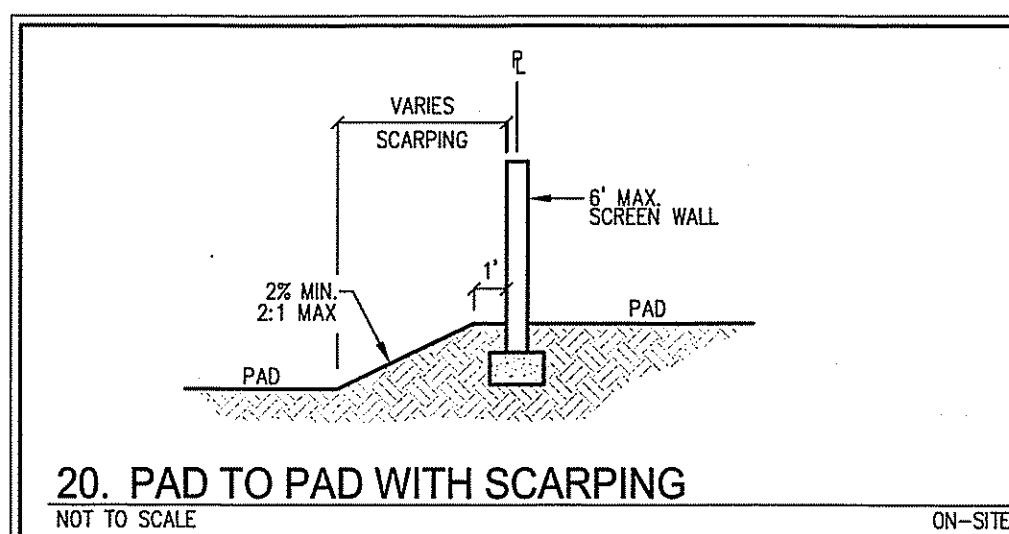
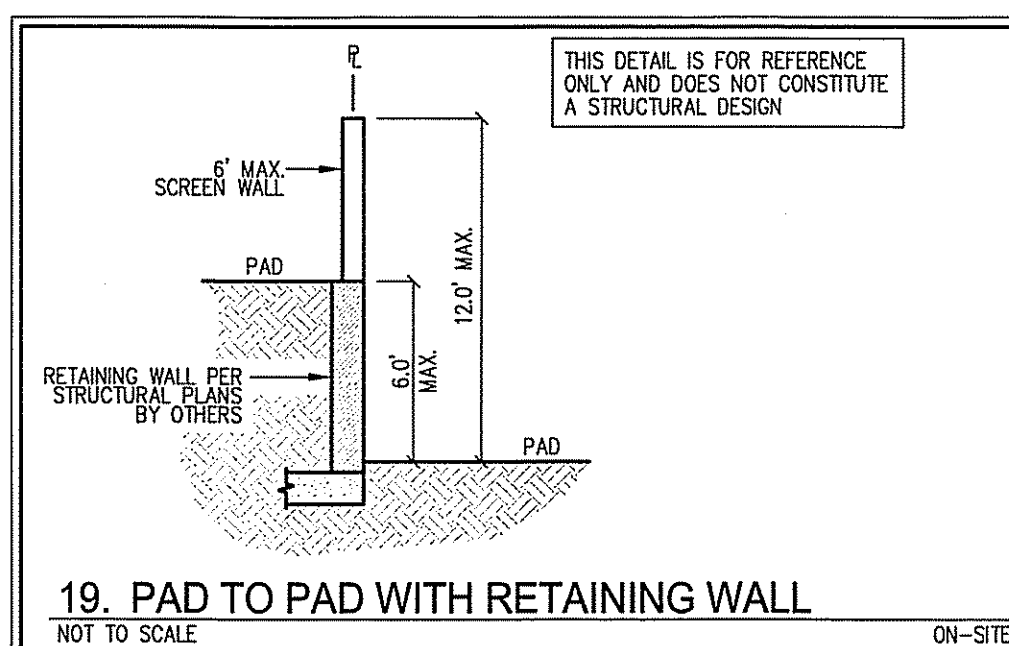
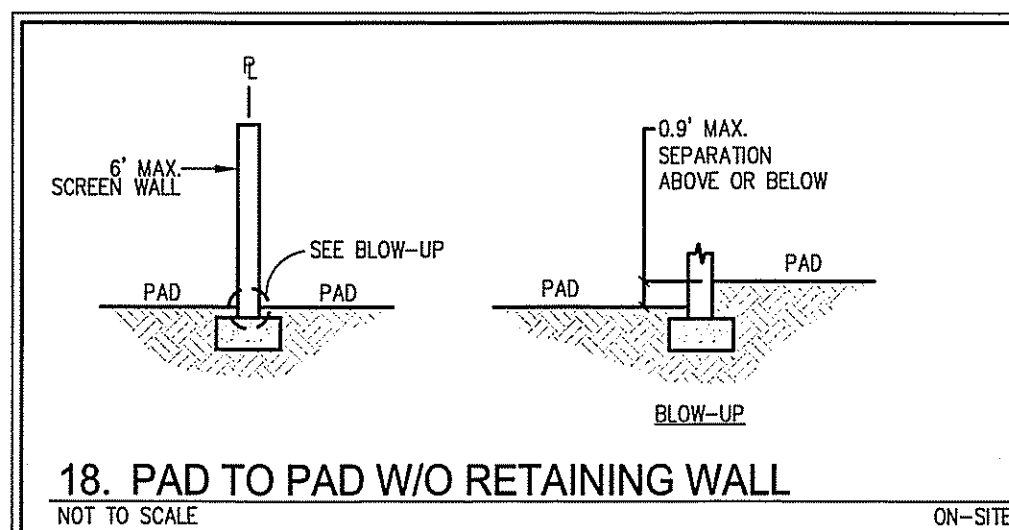
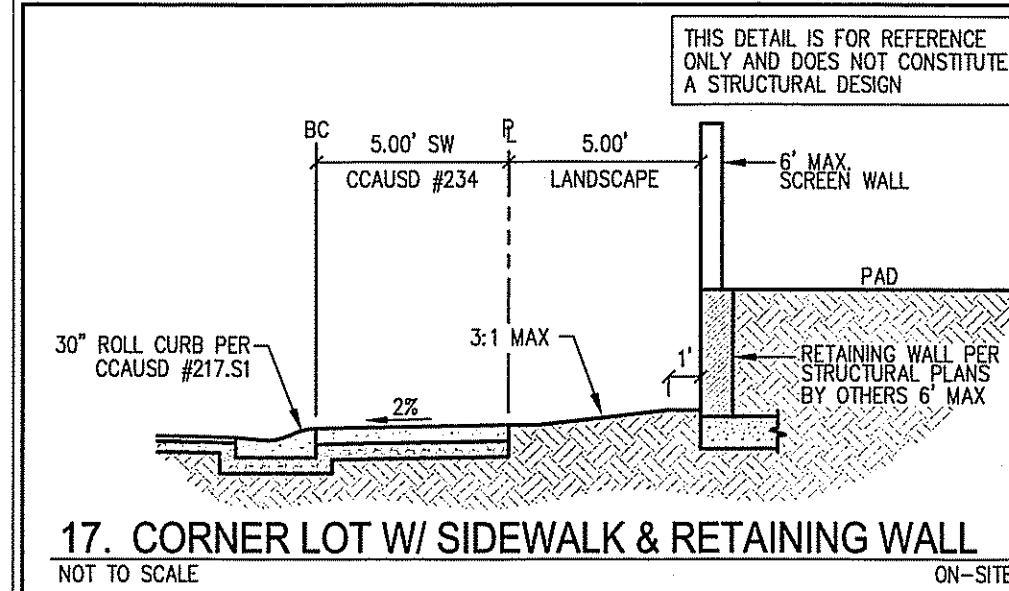
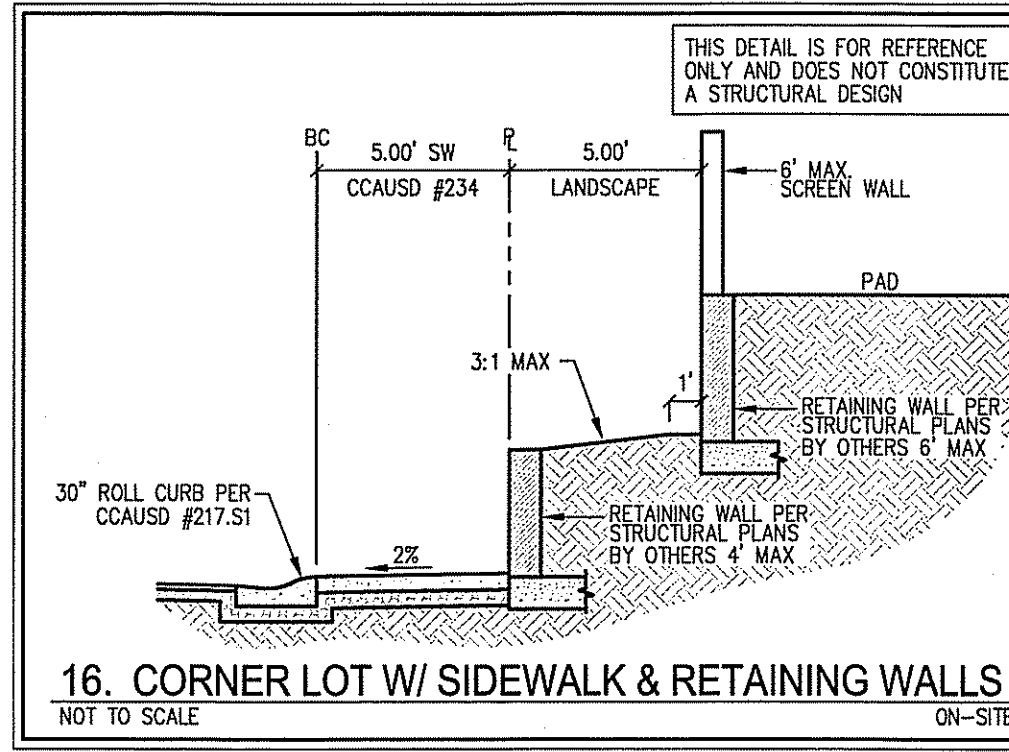
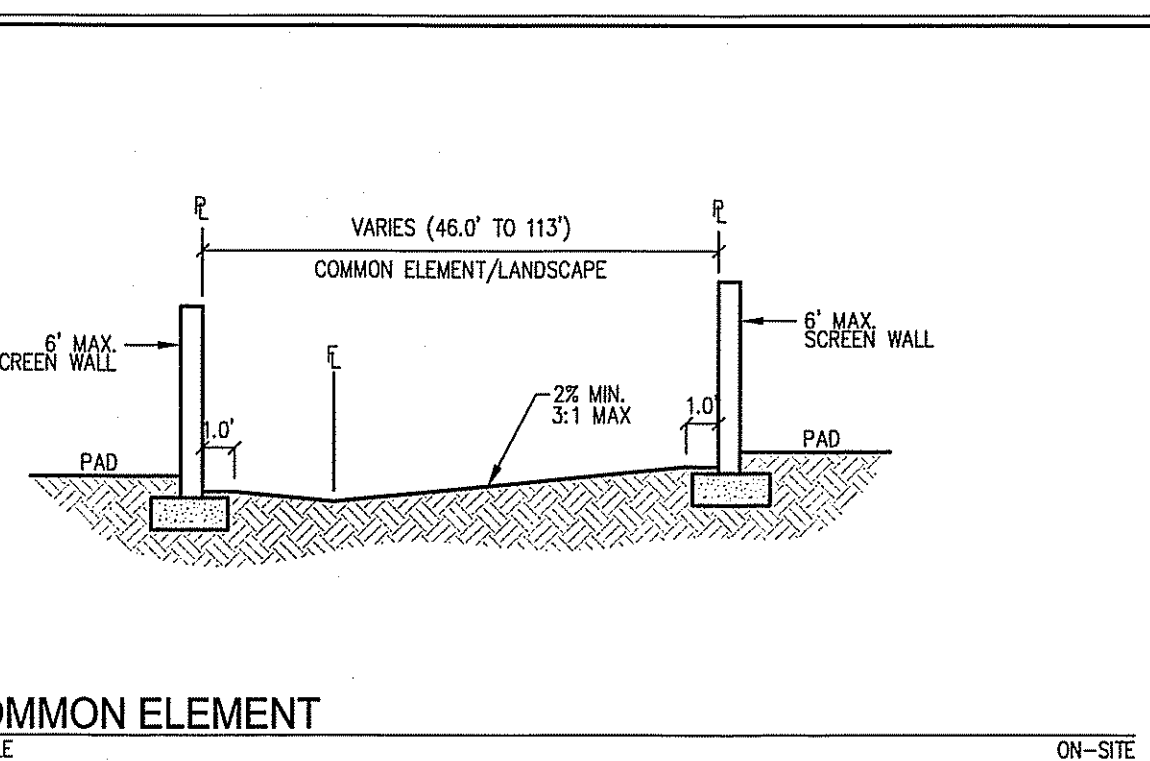
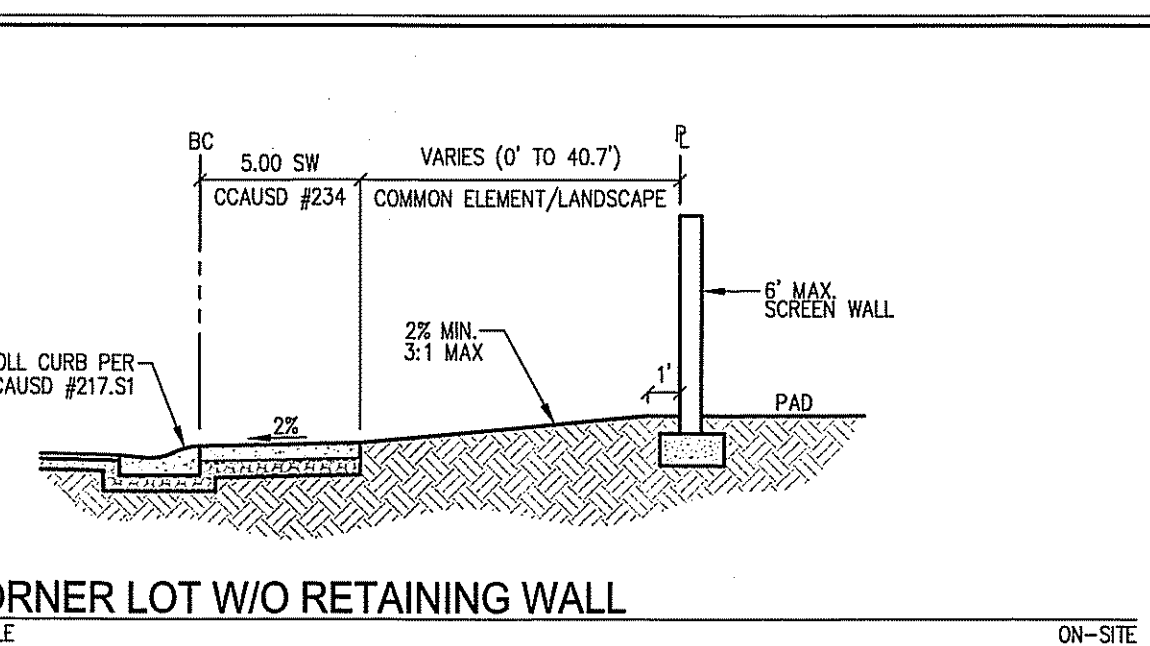
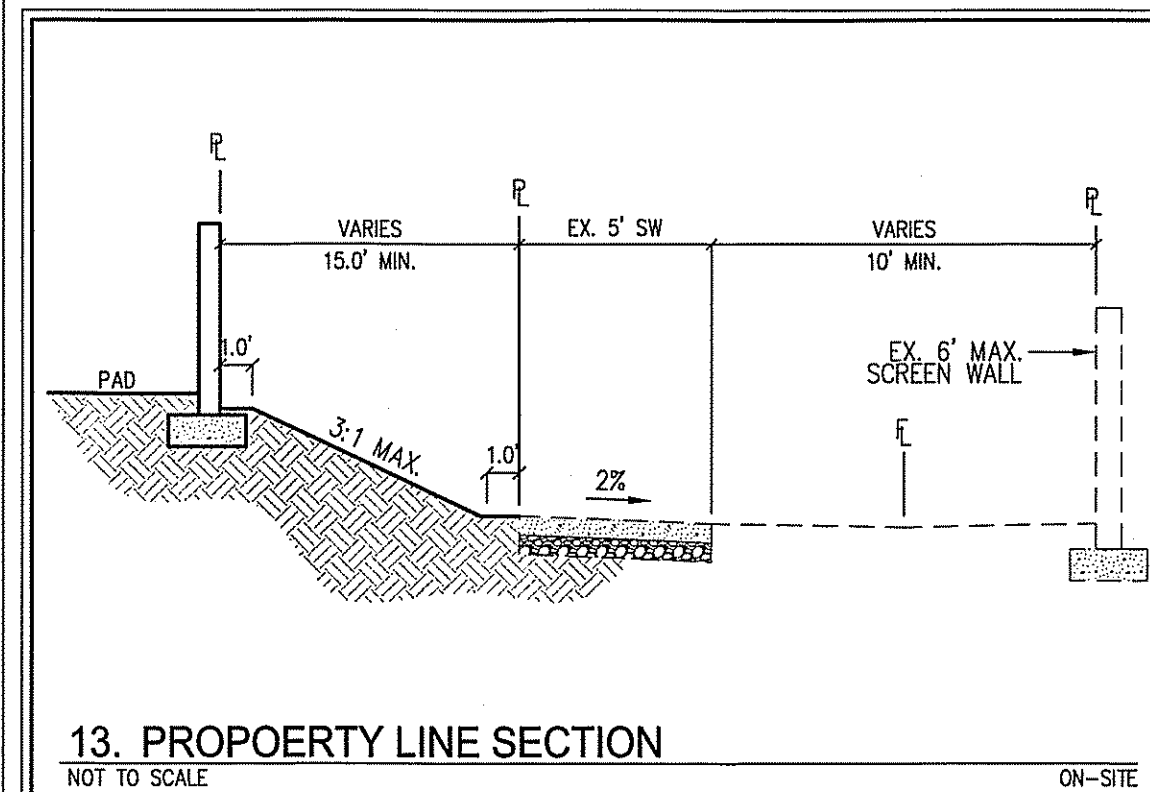
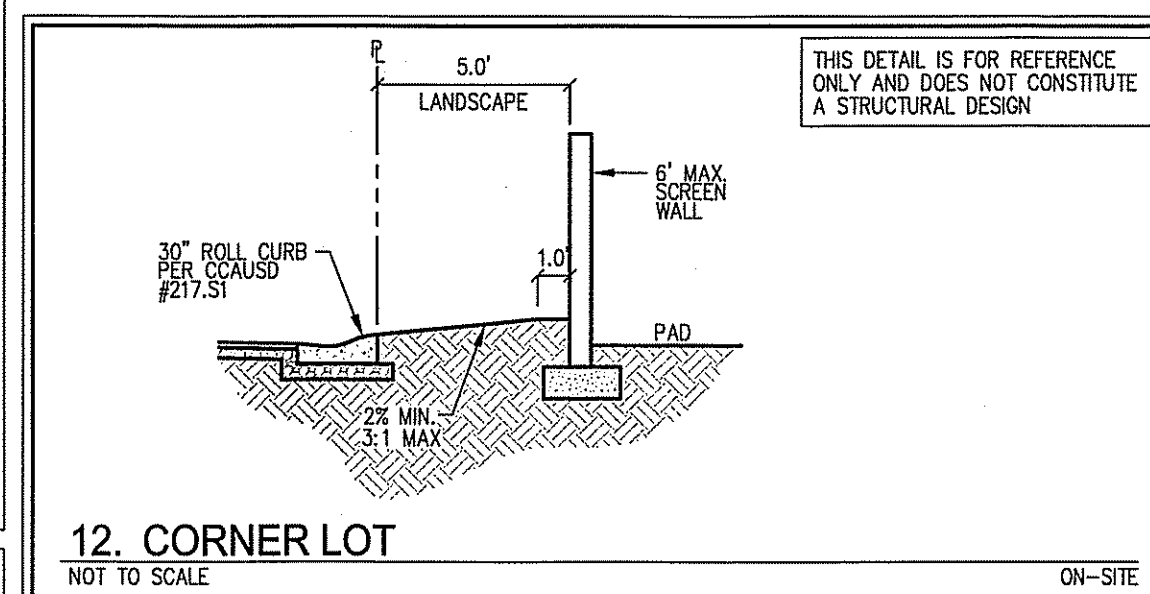
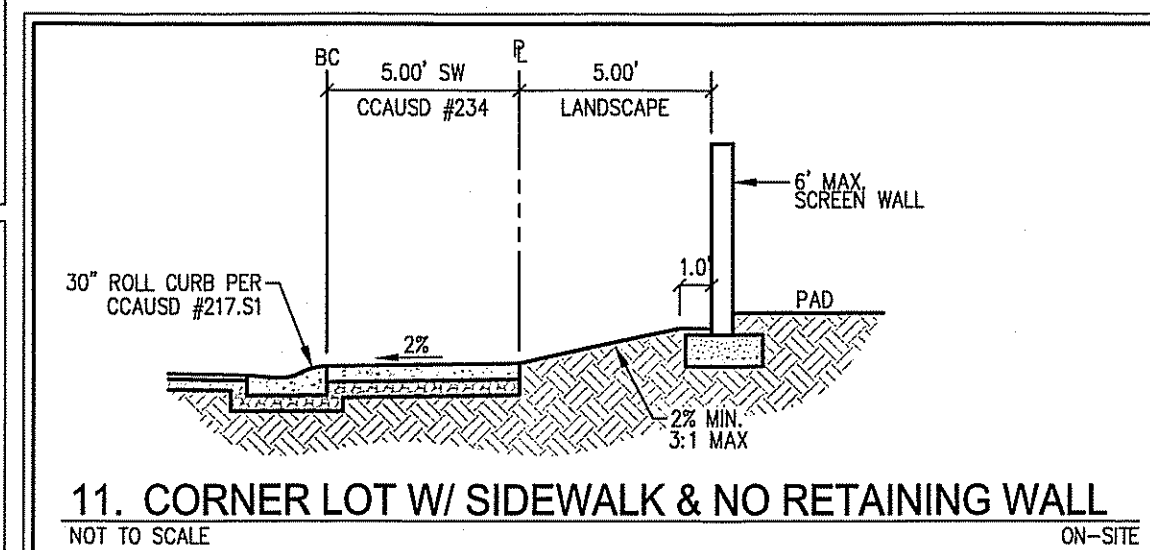
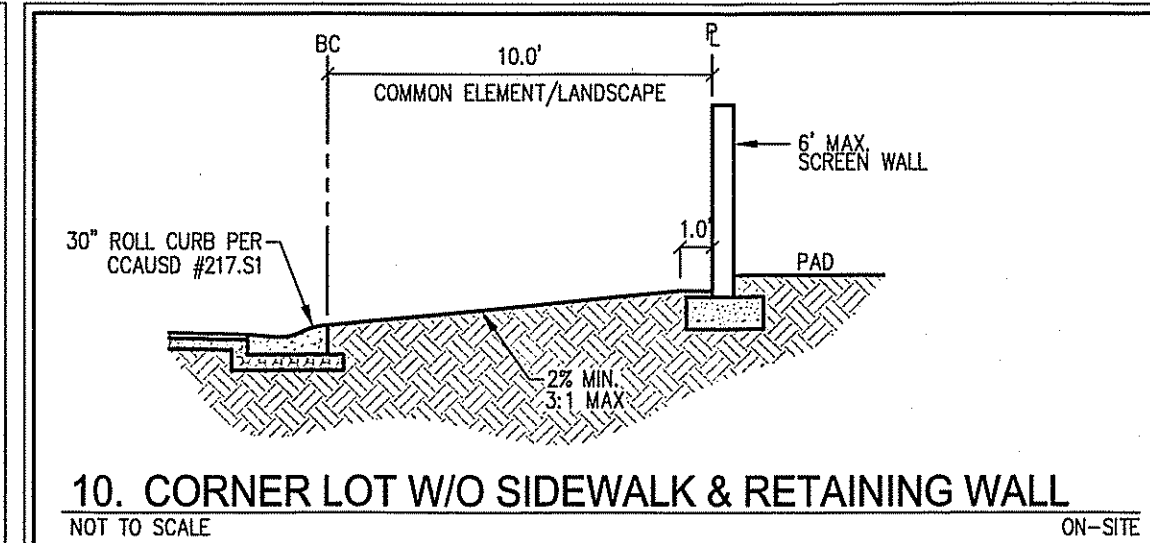
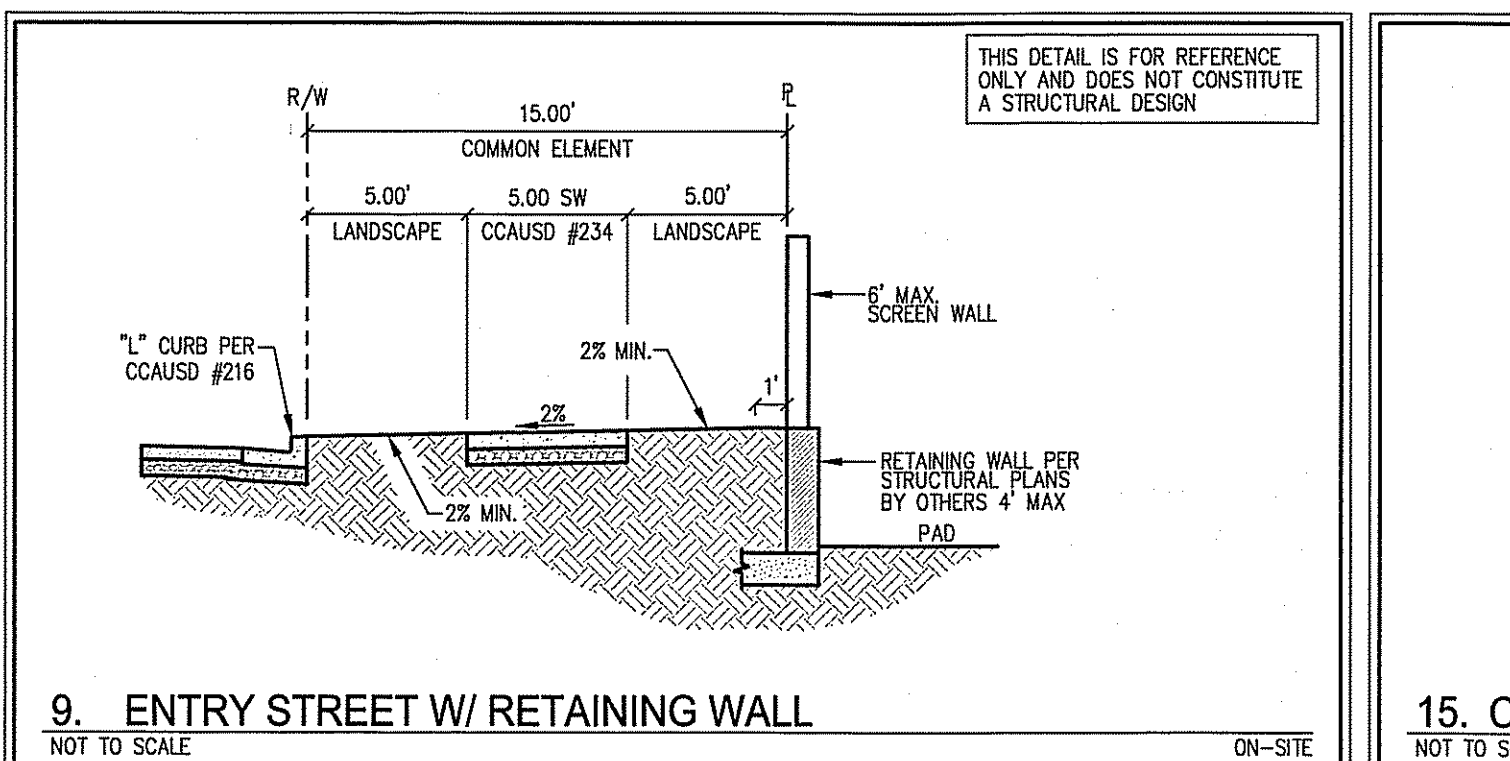
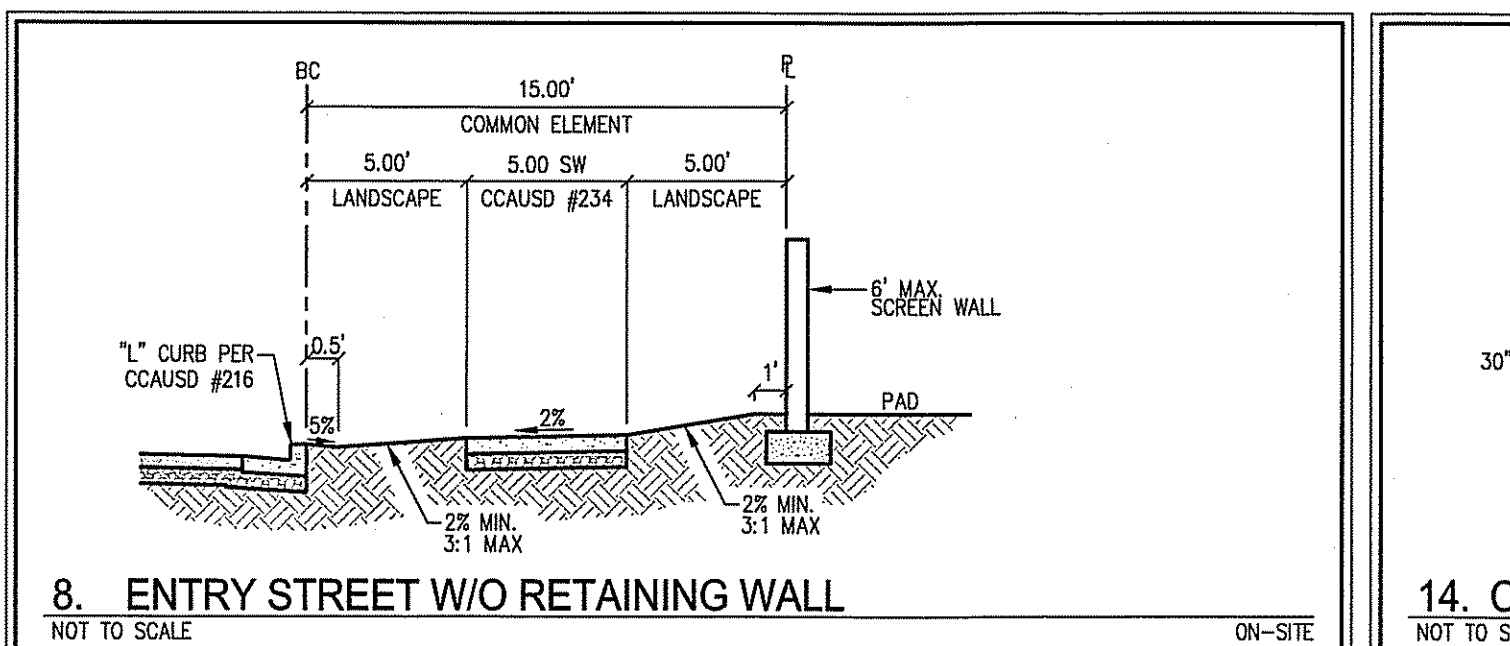
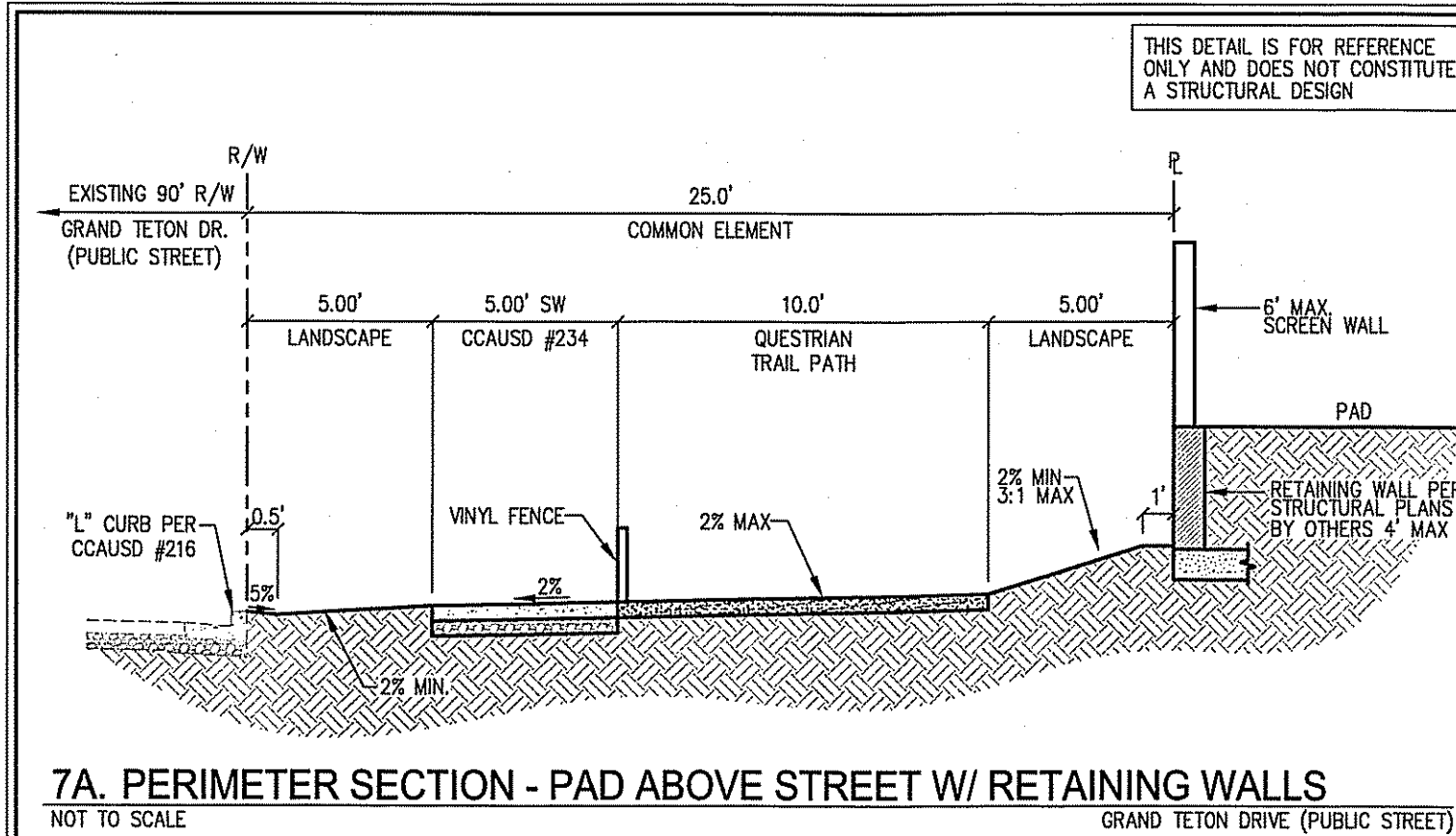
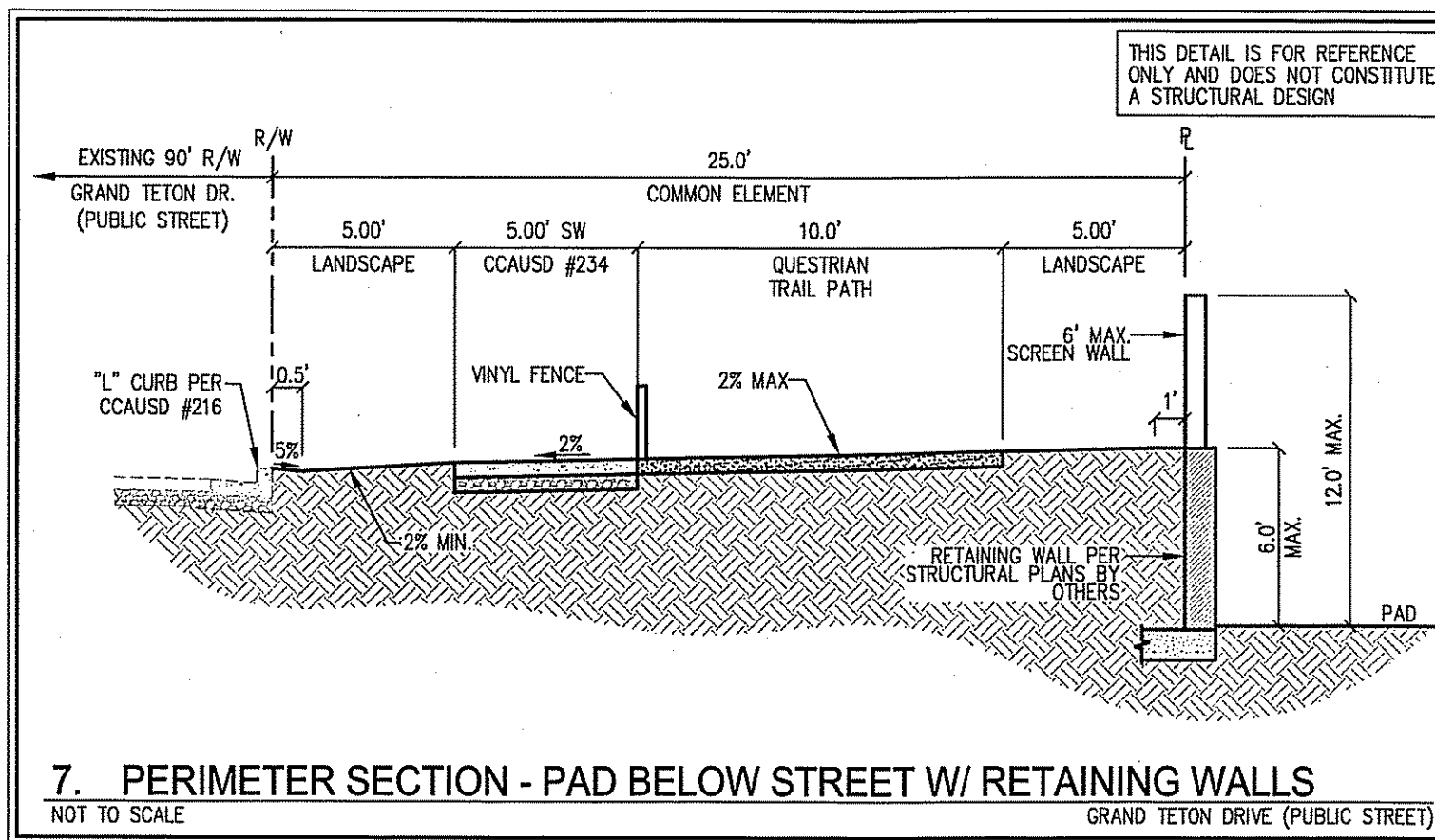
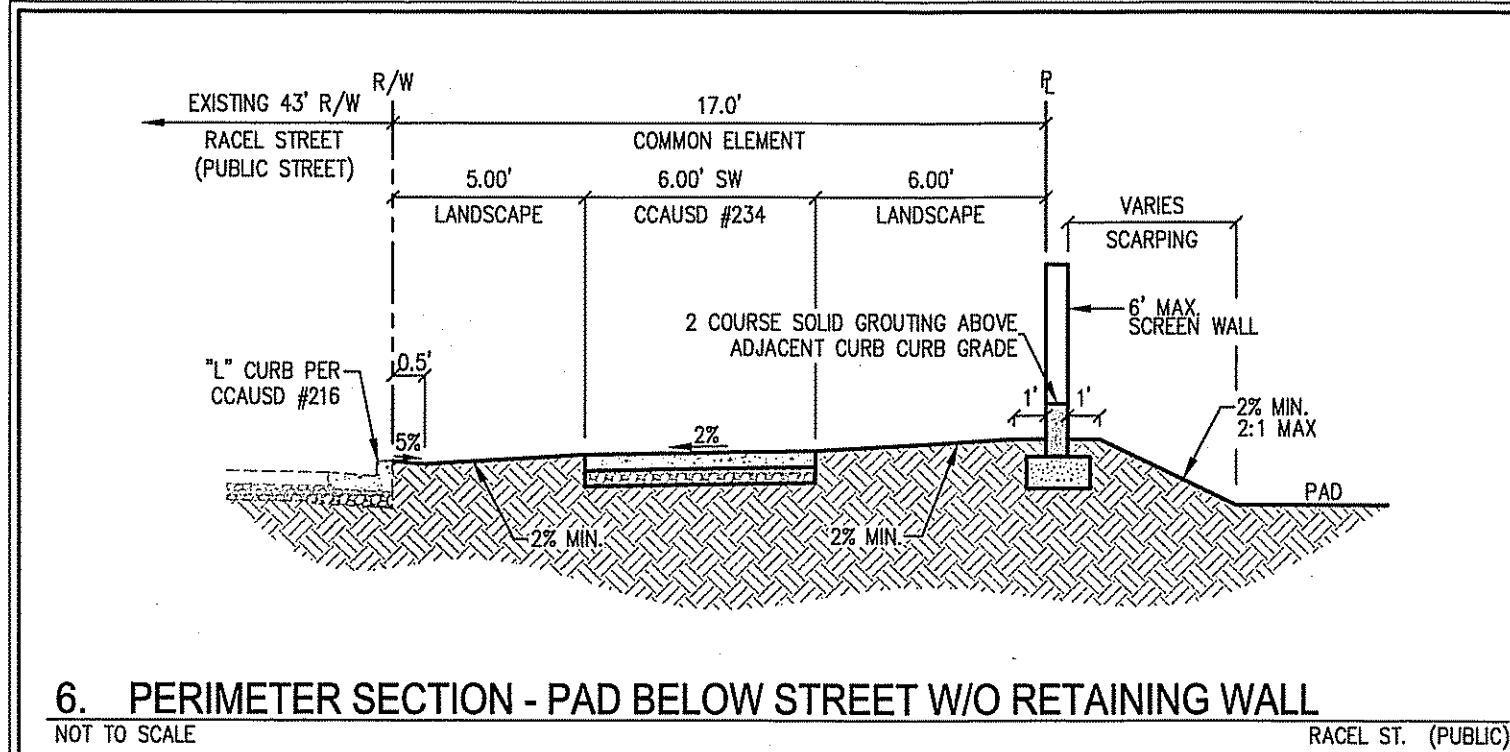
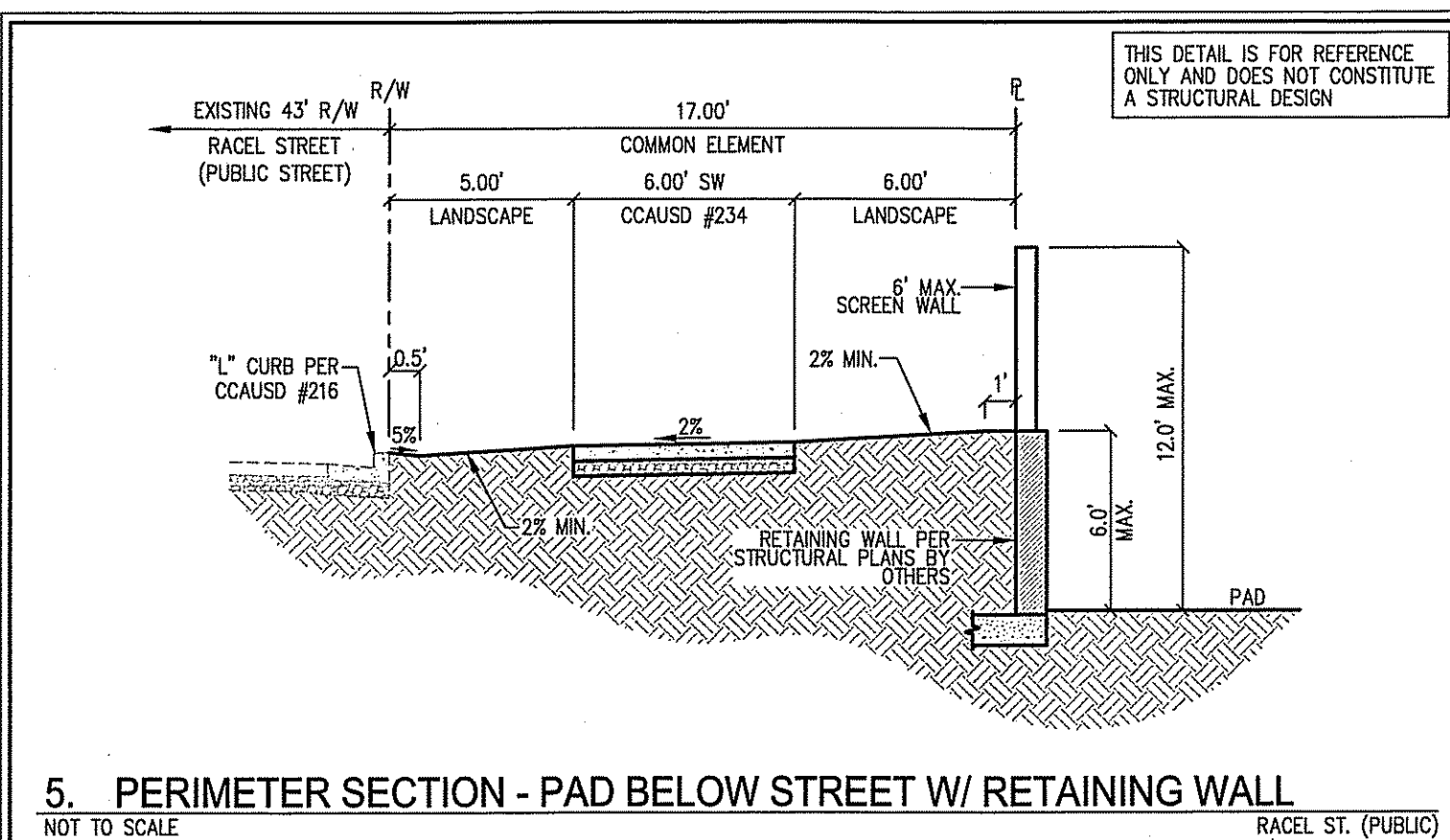
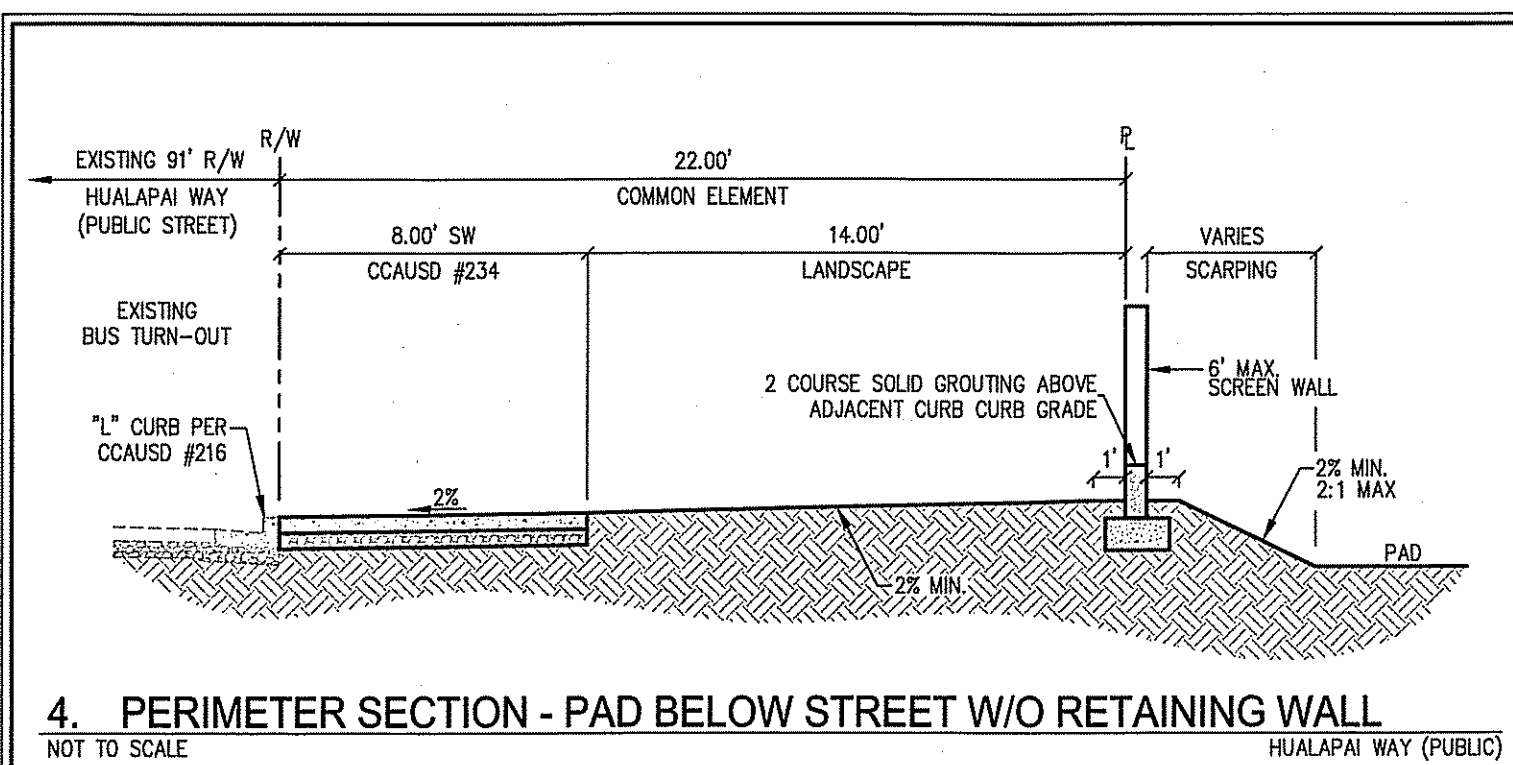
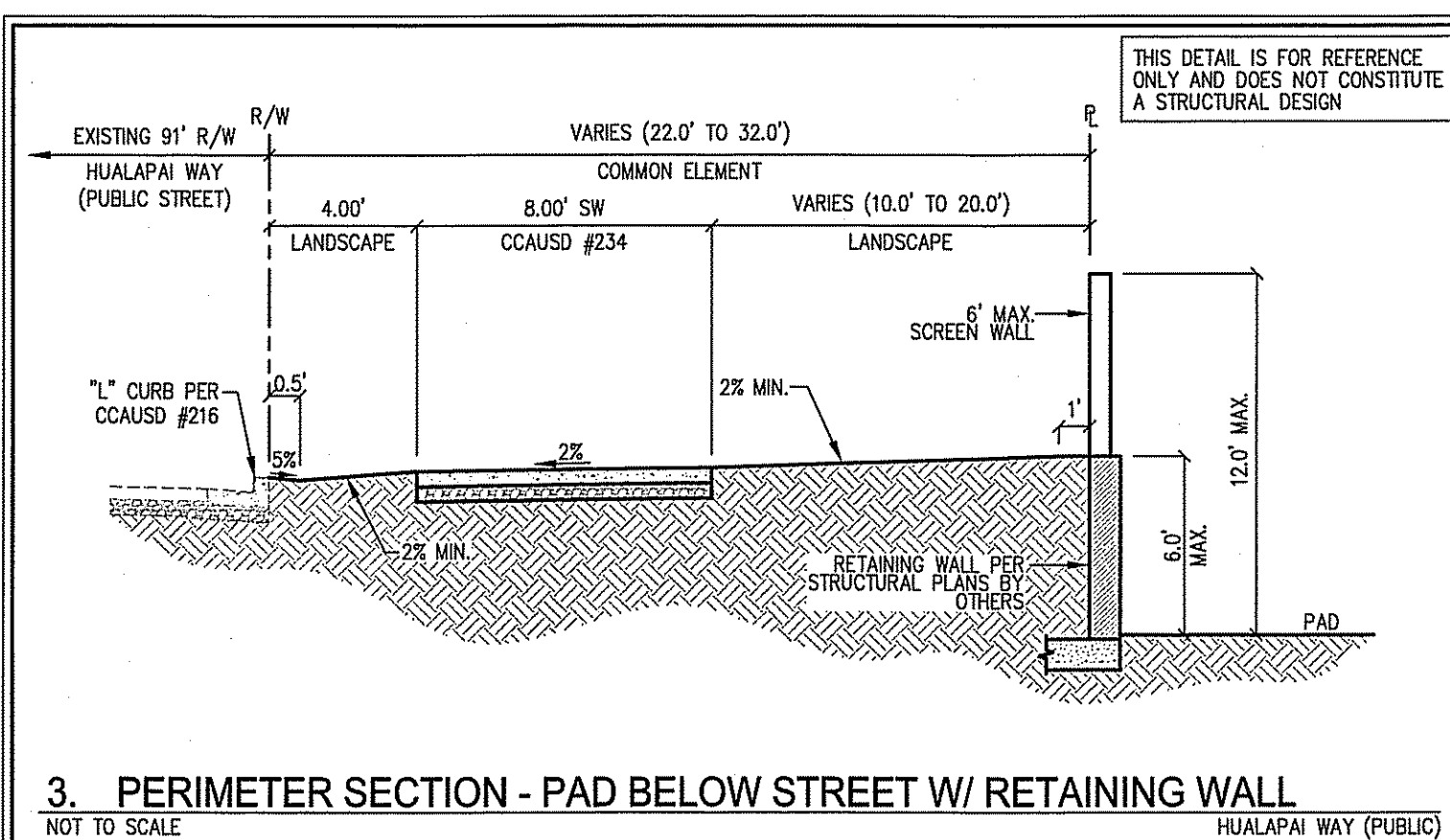
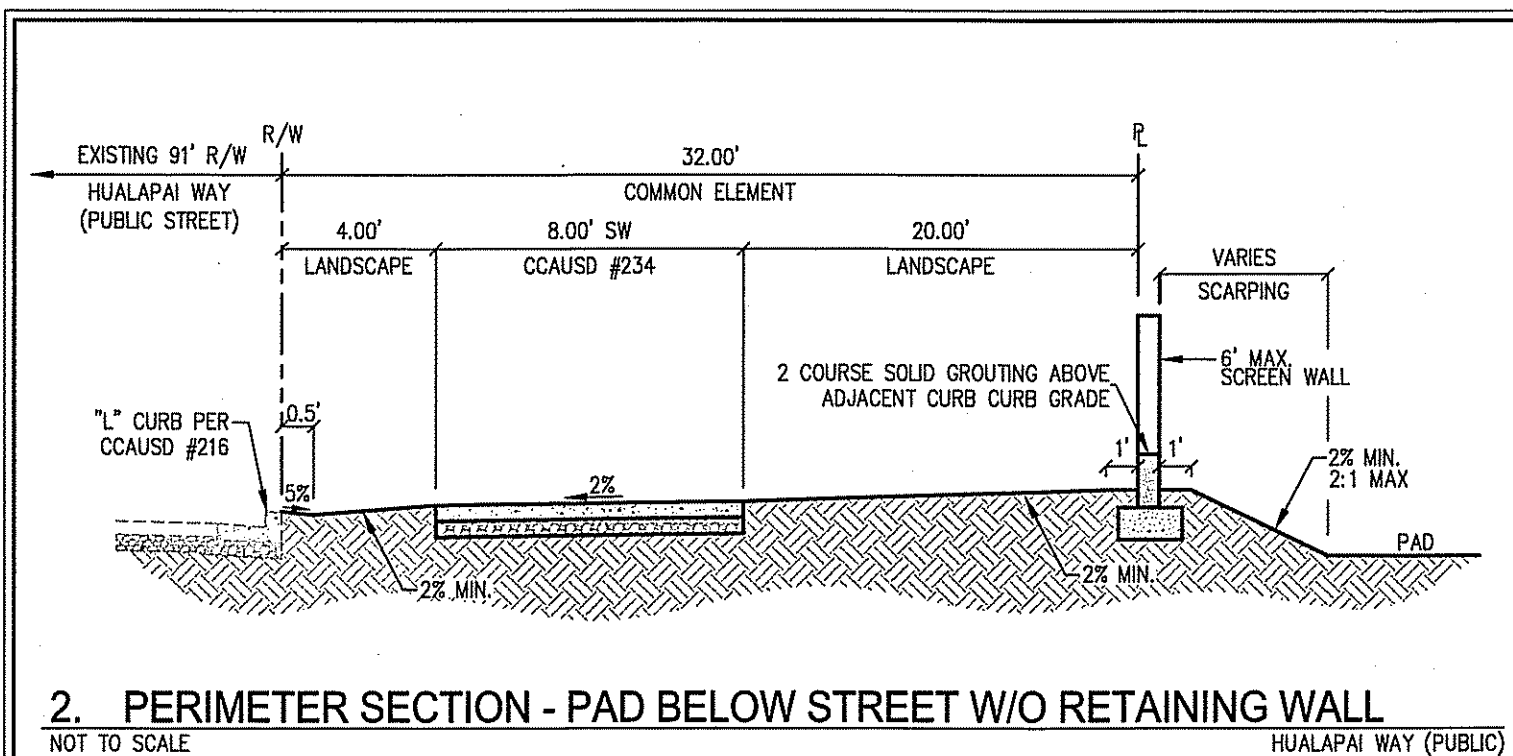
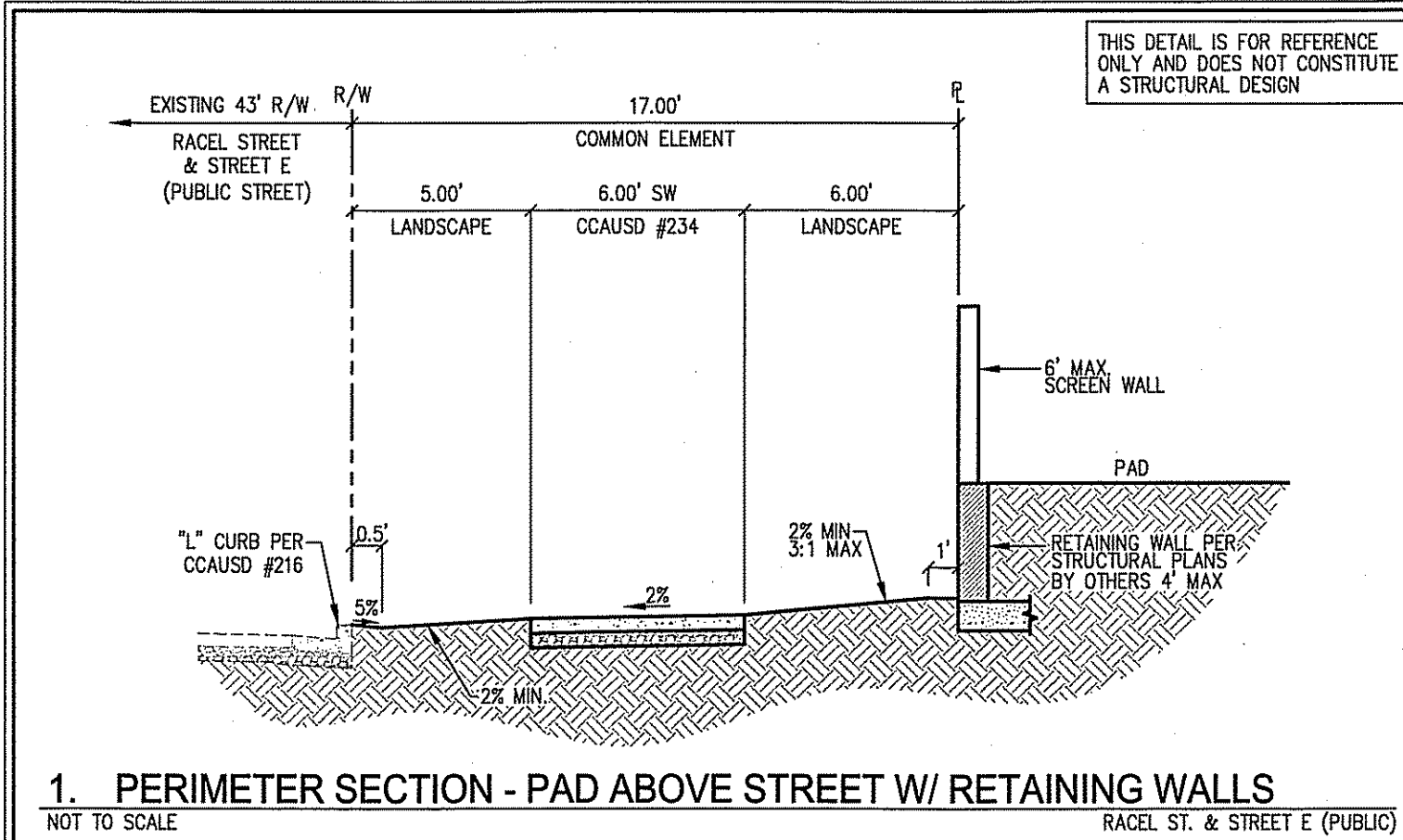
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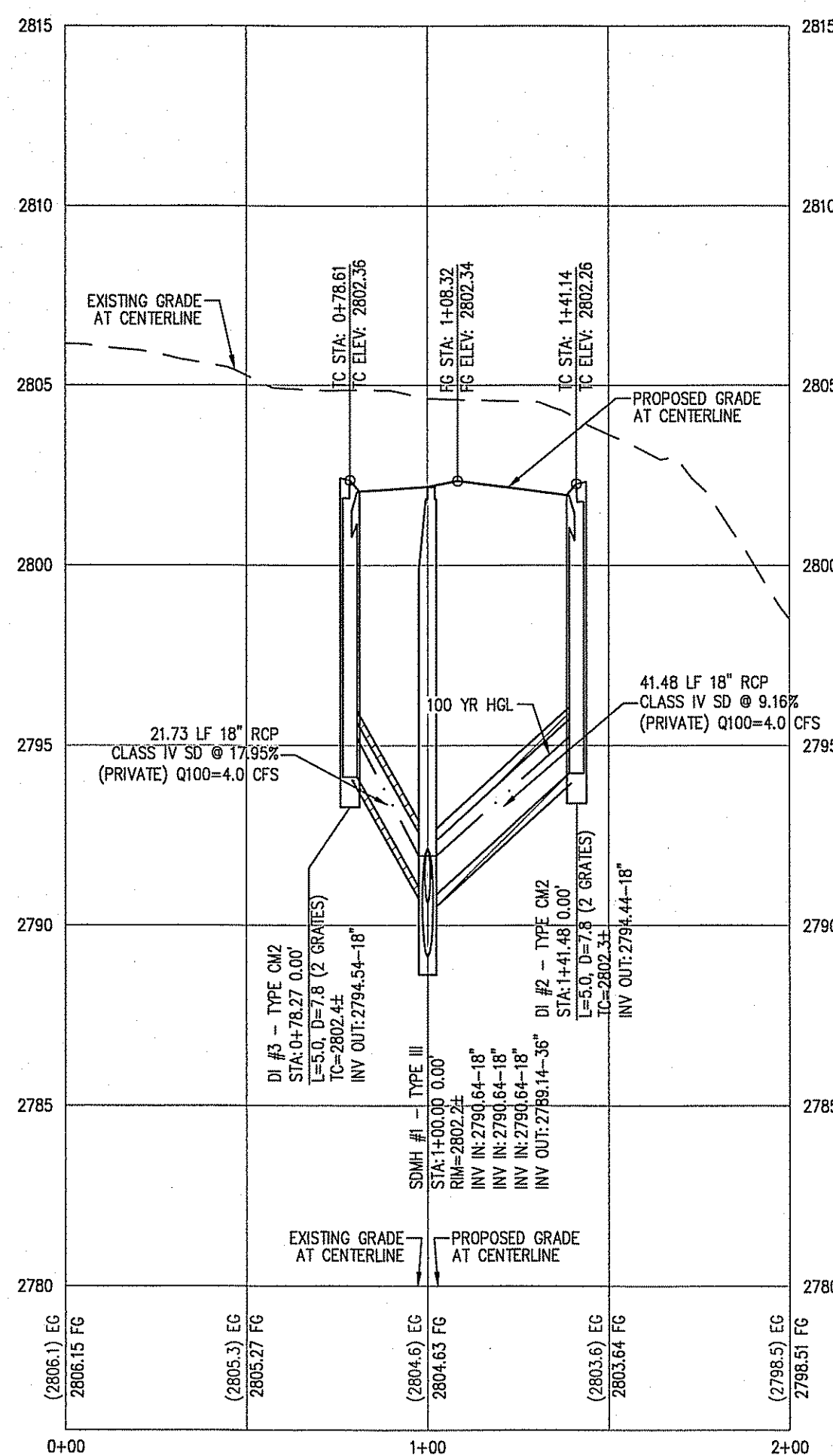
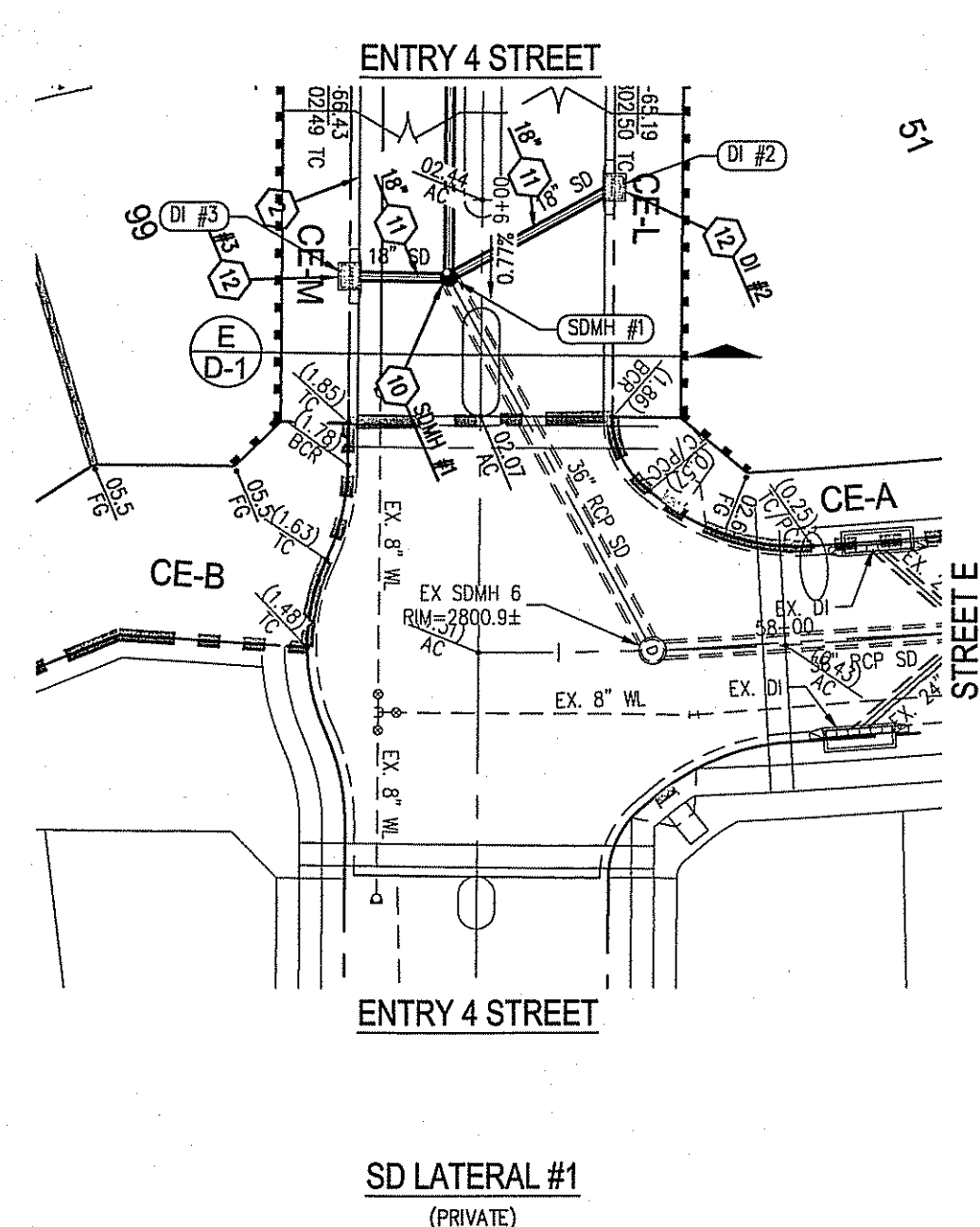
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SHEET 6 OF 10

###







- LEGAL DESCRIPTION**
BEING A PORTION OF THE NORTHWEST QUARTER (NW 1/4) OF
THE SOUTHWEST QUARTER (SW 1/4) OF SECTION 7, TOWNSHIP
19 SOUTH, RANGE 60 EAST M.D.M., CLARK COUNTY, NEVADA.

NORTH 89°11'30" WEST, BEING THE BEARING OF THE SOUTH LINE OF THE SOUTHWEST QUARTER (SW ¼) OF SECTION 7, TOWNSHIP 19 SOUTH, RANGE 60 EAST, M.D.M., AS PER FILE 151, PAGE 14 OF SURVEYS, ON FILE IN THE COUNTY RECORDER'S OFFICE.

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.D. 88 DATUM
PER THE CLARK COUNTY VERTICAL CONTROL LAST REVISED 2003

1. SEE PLAN AND PROFILE SHEETS FOR CENTERLINE AND CURB CURVATURE.
2. FINAL GRADES ADJACENT TO STRUCTURES SHALL BE IN CONFORMANCE WITH BIC 2006, SECTION 2304.11.2.2.
3. THE CONTRACTOR SHALL VERIFY ALL CONDITIONS AND DIMENSIONS AND REPORT ALL DISCREPANCIES TO THE ENGINEER PRIOR TO CONSTRUCTION.
4. ALL IMPROVEMENTS TO BE PROTECTED FROM EROSION BY SWPPP.
5. MAXIMUM/MINIMUM SLOPES AND MINIMUM STREET SECTIONS NOT TO EXCEED THAT SHOWN ON GEOTECH REPORT.
6. SEE DETAIL SHEETS FOR STREET SECTIONS AND DETAILS.
7. ALL PUBLIC AND PRIVATE DRIVEWAY IMPROVEMENTS TO BE BONDED FOR AND INSPECTED.
8. CONSTRUCTION OF BLOCK WALLS REQUIRES A SEPARATE BUILDING PERMIT AND APPROVAL.
9. EXISTING UTILITY LOCATIONS SHOWN HEREIN ARE APPROXIMATE ONLY. CONTRACTOR TO VERIFY LOCATION AND DEPTHS OF ALL UTILITIES, EXISTING UTILITIES AND FACILITIES AND NOTIFY ENGINEER OF ANY DISCREPANCIES PRIOR TO CONSTRUCTION. CONTRACTOR TO PROTECT IN PLACE UTILITIES. CONTRACTOR'S ENGINEER/OWNER SHALL BE NOTIFIED OF PRIOR DAMAGE TO EXISTING FACILITIES PRIOR TO CONSTRUCTION. CONTRACTOR'S ENGINEER/OWNER FOR REPAIR/REPLACING FACILITIES IF ENGINEER/OWNER IS NOT NOTIFIED OF EXISTING DAMAGE PRIOR TO CONSTRUCTION COMMENCEMENT.
10. NO STRUCTURE, VEGETATION, OR OBJECTS OF ANY KIND IS PERMITTED UNDER TWENTY-FOUR (24) INCHES IN HEIGHT IN THE RIGHT-OF-WAY OF THE PROJECT (PERMITS IF CURB EXIST) WITHIN THE SIGHT TRIANGLE ZONES.
11. ALL ELEVATIONS SHOWN, WITH EXCEPTION TO PAVED, FINISHED FLOOR, AND COUNTERT ELEVATIONS, ARE THE VALUE SHOWN PLUS 3300'.

PERIMETER SIDEWALK DISPLAYED FOR CONCEPTUAL PURPOSES
ONLY. MASTER DEVELOPER TO PROVIDE DESIGN AND
CONNECTIONS FOR ONSITE PEDESTRIAN ACCESS

ALL DRAINAGE EASEMENTS AND COMMON LOTS ARE PUBLIC
DRAINAGE EASEMENTS PRIVATELY MAINTAINED BY THE HOA

ALL PRIVATE STREETS ARE P.U. PUBLIC SEWER EASEMENTS AND PUBLIC DRAINAGE EASEMENTS TO BE PRIVATELY MAINTAINED BY THE HOA

ALL UNSITE STORM DRAIN AND THE ASSOCIATED FACILITIES ARE PRIVATELY OWNED AND TO BE PRIVATELY MAINTAINED BY THE HOMEOWNERS ASSOCIATION

SCREEN WALLS ADJACENT TO COMMON LOTS SHALL END NO CLOSER THAN 20' TO BACK OF CURB. RETAINING WALLS SHALL END NO CLOSER THAN 5' TO BACK OF CURB.

AVOID HITTING UNDERGROUND TRAFFIC SIGNAL SYSTEMS AND STREET LIGHT SYSTEM CONDUITS. IT'S COSTLY.

Call

before you do UnderGround

1-702-455-7511

CLARK COUNTY TRAFFIC OPERATIONS
AND
1-702-432-5300

15 MIN. VEGAS AREA
COMPUTERIZED TRAFFIC SYSTEM

Call before you Dig
Avoid cutting underground
utility lines. It's costly.

Call

811

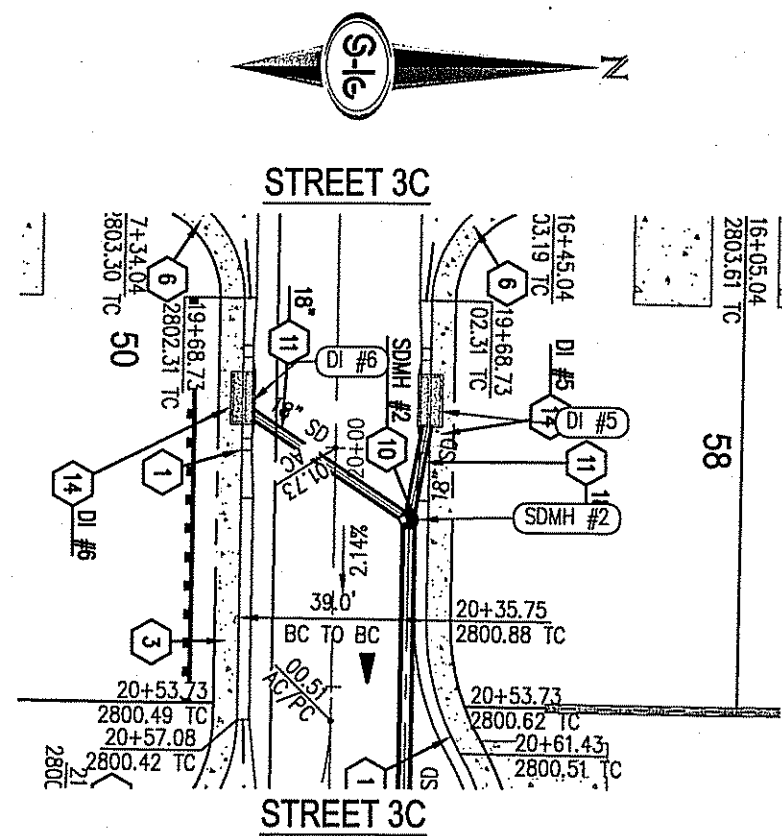
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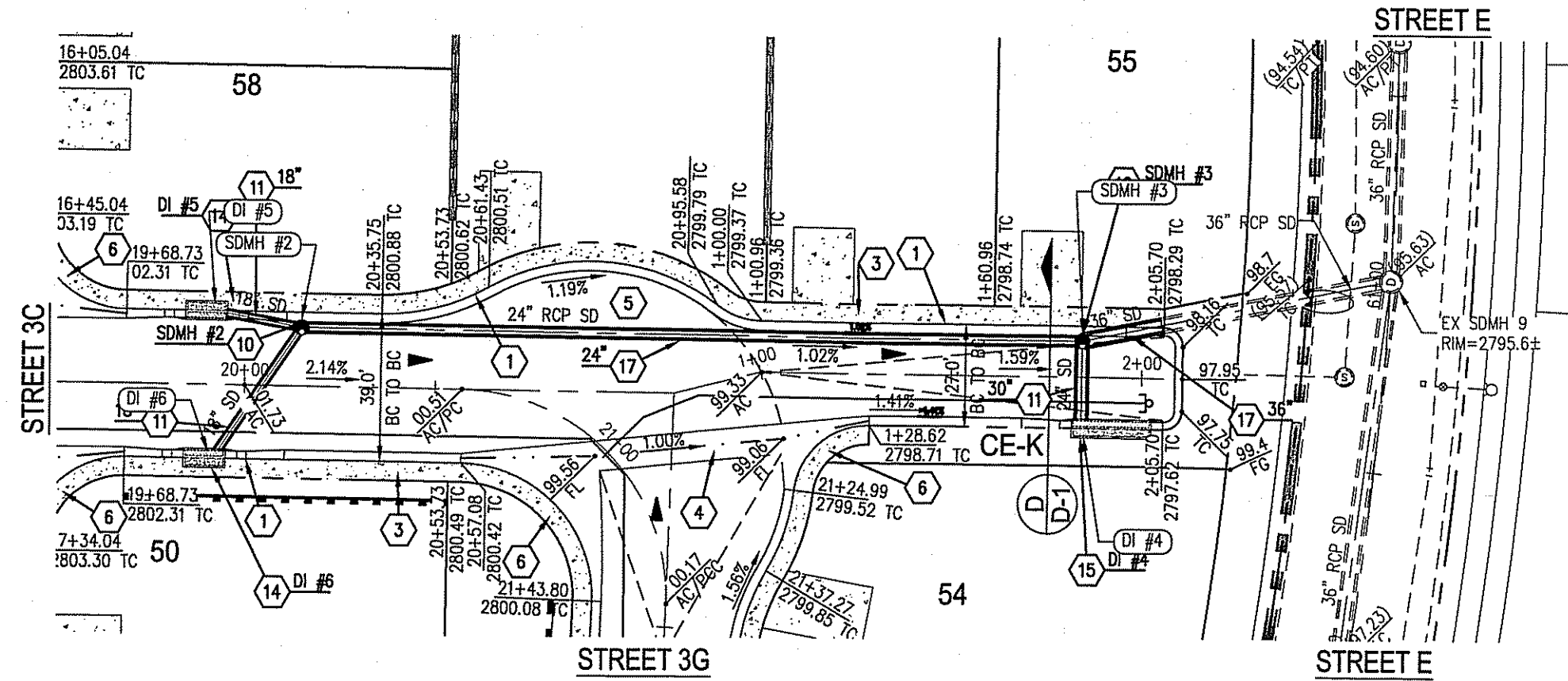
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CLARK COUNTY TRAFFIC OPERATIONS
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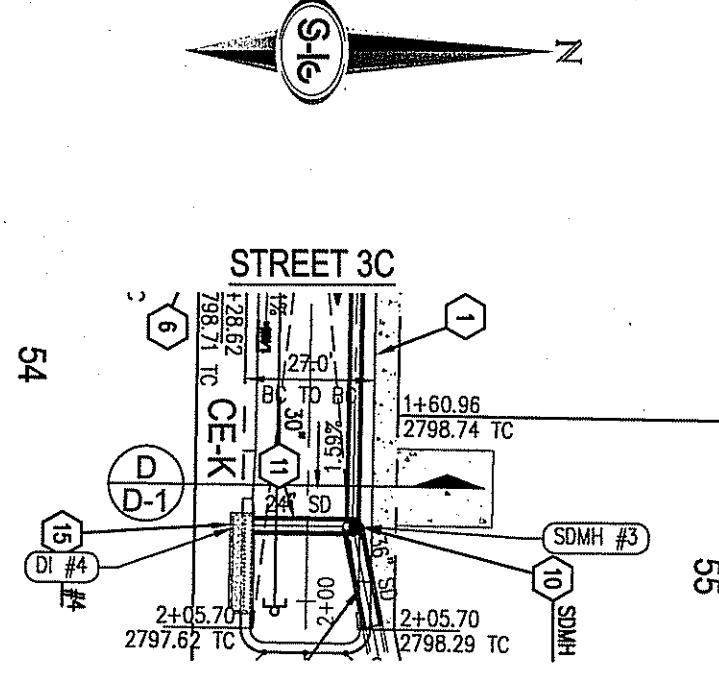
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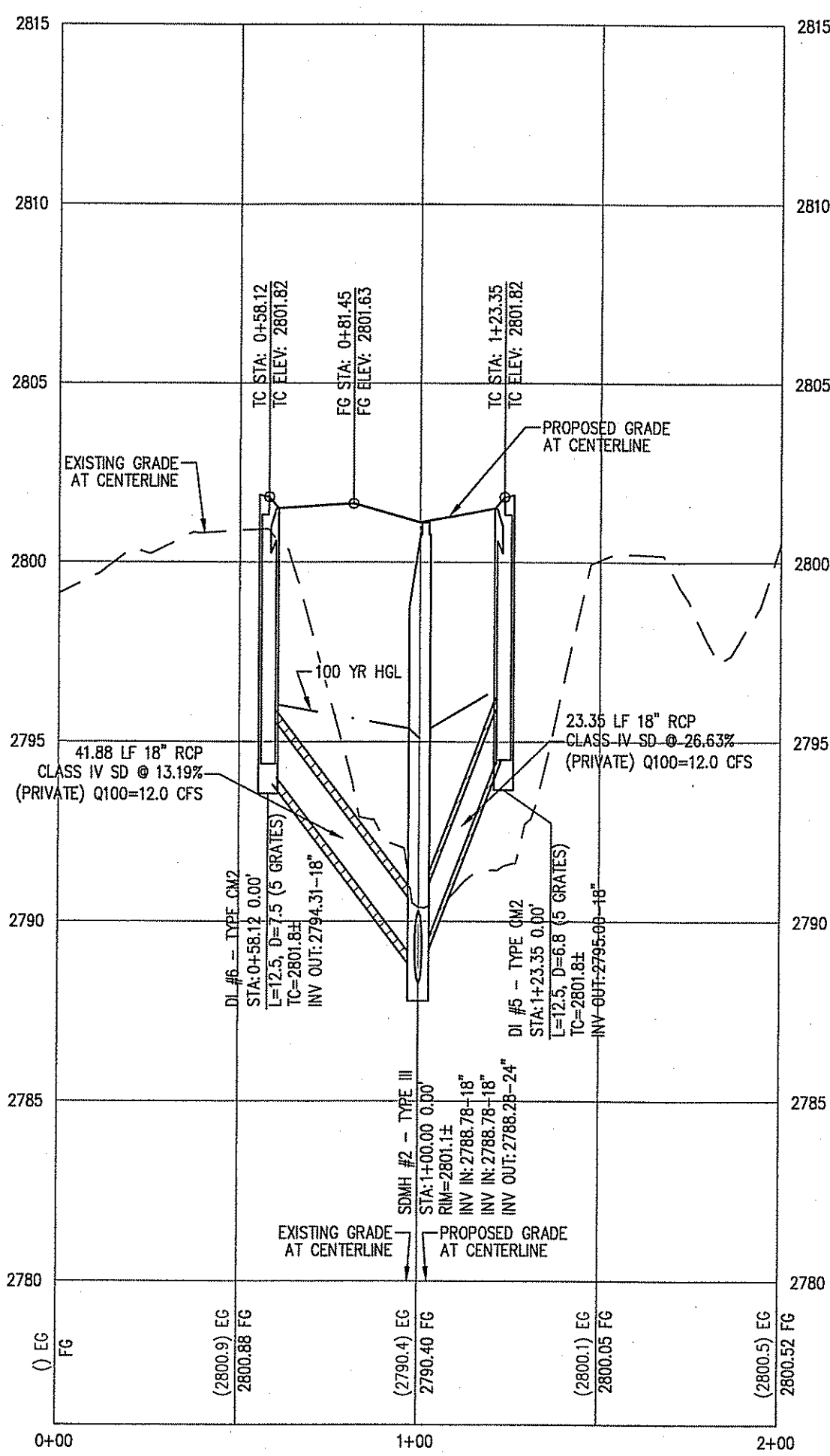
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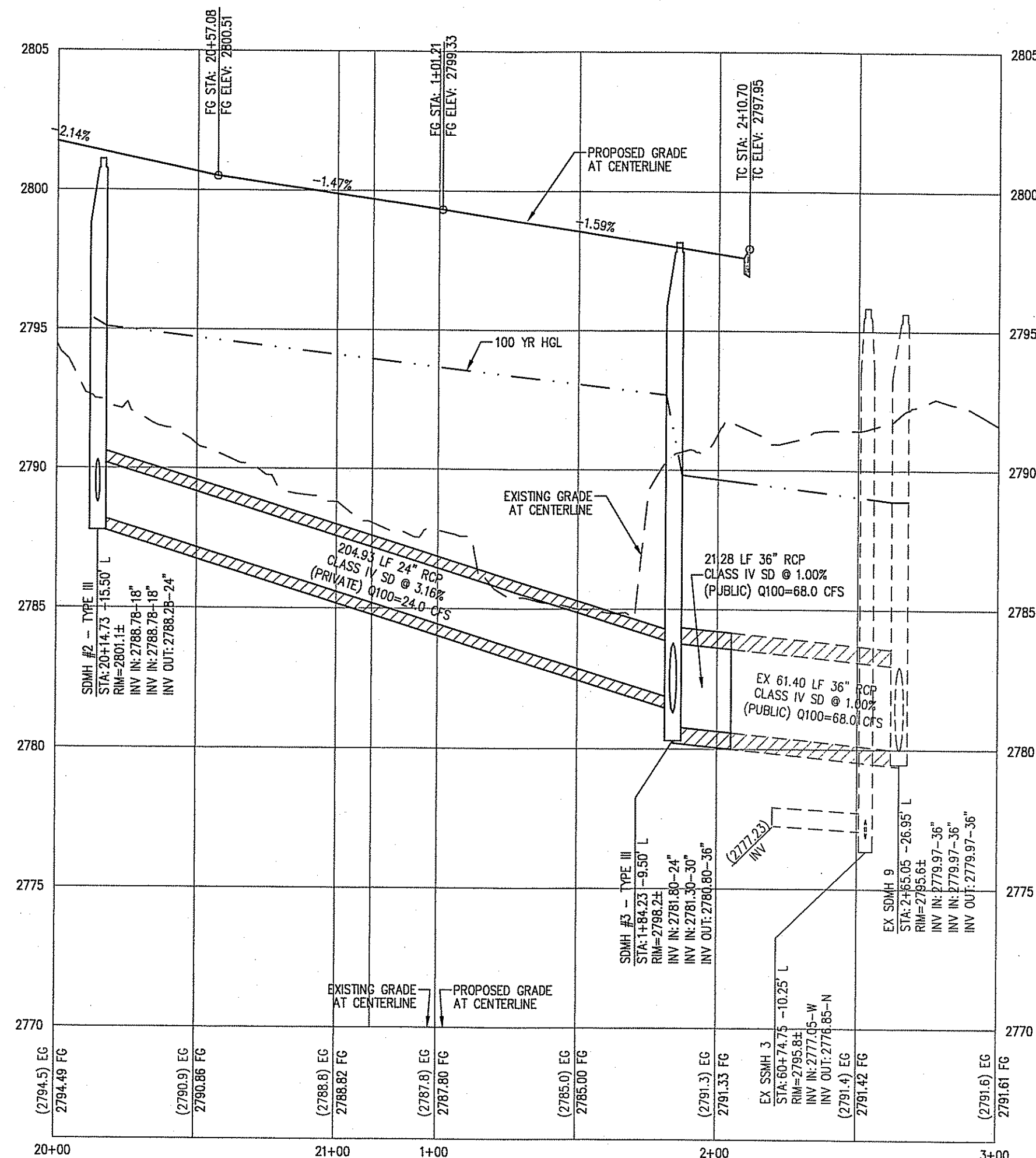
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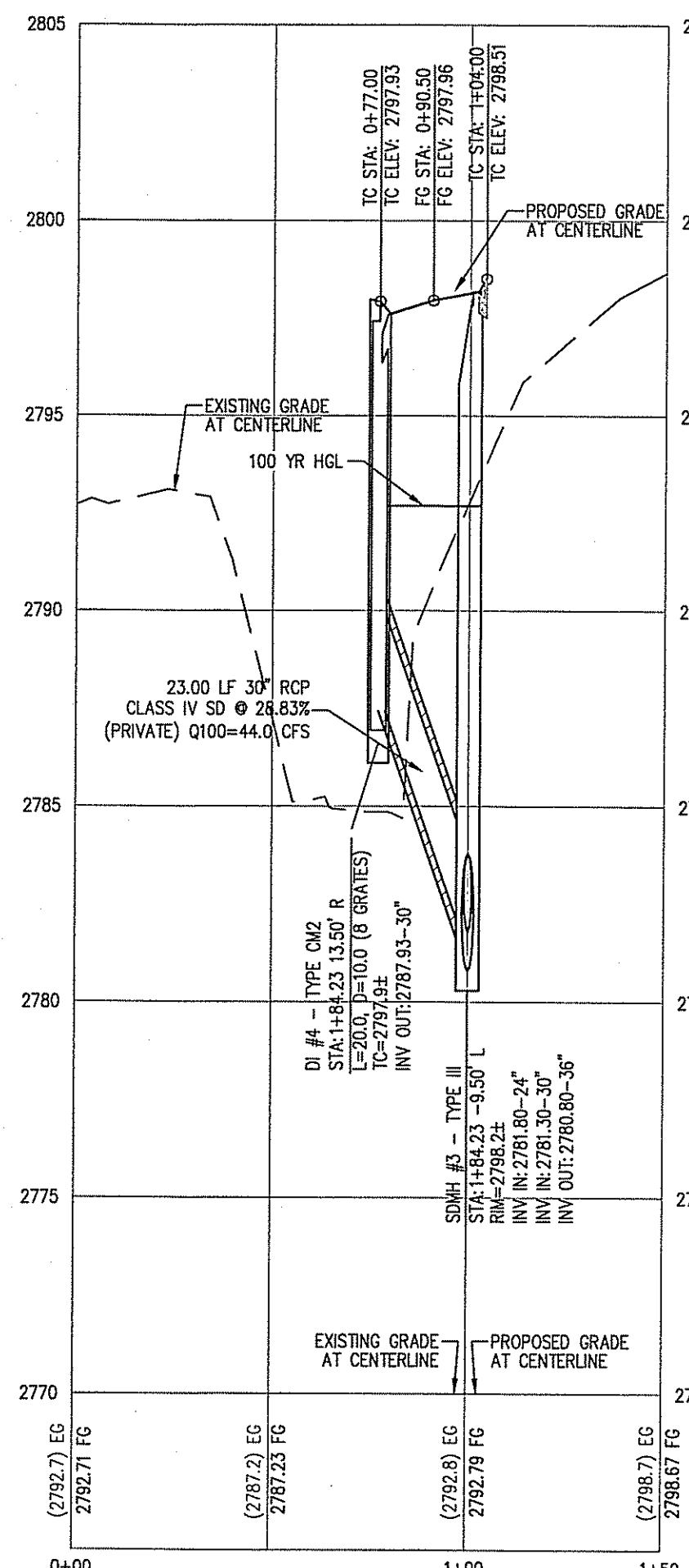
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(PRIVATE)



PROFILE
HORIZ: 1"=40'
VERT: 1"=4'



PROFILE
HORIZ: 1"=40'
VERT: 1"=4'



PROFILE
HORIZ: 1"=40'
VERT: 1"=4'

GRADING NOTES

1. INSTALL 30" ROLL CURB PER CCAUSD NO. 217.51 OVER 6" TYPE II AGGREGATE BASE
2. INSTALL 5" WIDE CONCRETE SIDEWALK (4" THICK OVER 5" TYPE II AGGREGATE BASE) PER CCAUSD #234
3. INSTALL 8" CROSS GUTTER PER DETAIL ON SHEET D-1
4. INSTALL 2" ASPHALT PAVEMENT OVER 4" TYPE II AGGREGATE BASE
5. CONSTRUCT SIDEWALK RAMPS USING ARMOR TILE TRUNCATED DOWNS OR EQUIVALENT CCAUSD NO. 235, CASE 1 & 235.1
6. CONSTRUCT 10' TRANSITION FROM "L" CURB TO MOD. ROLL CURB PER DETAIL ON SHEET D-1
7. INSTALL 6" WIDE CONCRETE SIDEWALK (4" THICK OVER 5" TYPE II AGGREGATE BASE) PER CCAUSD #234
8. INSTALL 8" WIDE CONCRETE SIDEWALK (4" THICK OVER 5" TYPE II AGGREGATE BASE) PER CCAUSD #234
9. INSTALL TYPE III STORM DRAIN MANHOLE PER CCAUSD #406
10. INSTALL CLASS III RCP SD (PRIVATE) PIPE SIZE PER PLAN
11. INSTALL 5.0' MOD. TYPE "CM2" DROP INLET PER CCAUSD #412.1 AND #421
12. INSTALL 10.0' MOD. TYPE "CM2" DROP INLET PER CCAUSD #412.1 AND #421
13. INSTALL 12.5' MOD. TYPE "CM2" DROP INLET PER CCAUSD #412.1 AND #421
14. INSTALL 20.0' MOD. TYPE "CM2" DROP INLET PER CCAUSD #412.1 AND #421
15. INSTALL 22.5' MOD. TYPE "CM2" DROP INLET PER CCAUSD #412.1 AND #421
16. INSTALL CLASS IV RCP SD (PRIVATE) PIPE SIZE PER PLAN

STORMWATER RUNOFF MANAGEMENT

- (REQUIRED FOR ALL SITES GREATER THAN 1 ACRE (43,560 SQ.FT.))
1. THE OWNER, SITE DEVELOPER, CONTRACTOR AND/OR THEIR AUTHORIZED AGENTS SHALL EACH DAY REMOVE ALL SEDIMENT, MUD, CONSTRUCTION DEBRIS, OR OTHER POTENTIAL POLLUTANTS THAT MAY HAVE BEEN DISCHARGED TO, OR ACCUMULATE IN, THE PUBLIC RIGHTS OF WAYS 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 THE CITY OF NORTH LAS VEGAS AND 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 NEVADA STORMWATER GENERAL PERMIT FOR CONSTRUCTION ACTIVITY NV100000, SECTION III.A.5.
 4. AT A MINIMUM, THE CONTRACTOR OR HIS AGENT SHALL INSPECT ALL DISTURBED 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 ANY ACTUAL RAIN EVENT OF 0.5 INCHES OR MORE. THE CONTRACTOR OR HIS AGENT SHALL UPDATE OR MODIFY THE STORMWATER POLLUTION PREVENTION PLAN AS NECESSARY. SOME EXCEPTIONS TO WEEKLY INSPECTIONS MAY APPLY, SUCH AS SUSPENSION OF LAND DISTURBANCE ACTIVITY. REFER TO NEVADA STORMWATER GENERAL PERMIT FOR CONSTRUCTION ACTIVITY NV100000, 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.

FLOOD ZONE

THE PROJECT SITE IS LOCATED WITHIN A FEMA DESIGNATED ZONE X (UNSHADED) AS DERIVED ON FLOOD INSURANCE RATE MAP (FIRM) PANEL 32003C2535F, DATED NOVEMBER 16, 2011. A ZONE X (UNSHADED) IS DESCRIBED AS AN AREA DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOOD.

FLOOD CERTIFICATION

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

STEPHEN M. JONES, P.E. 019638 DATE _____

DISCLAIMER NOTE

EXISTING UTILITY LOCATIONS SHOWN HEREON ARE APPROXIMATE ONLY. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE EXCEPT 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.

LEGAL DESCRIPTION

BEING A PORTION OF THE NORTHWEST QUARTER (NW 1/4) OF THE SOUTHWEST QUARTER (SW 1/4) OF SECTION 7, TOWNSHIP 19 SOUTH, RANGE 60 EAST, M.D.M., AS PER FILE 191, PAGE 14 OF SURVEYS, ON FILE IN THE COUNTY RECORDER'S OFFICE.

BASIS OF BEARING

NORTH 89°11'30" WEST, BEING THE BEARING OF THE SOUTH LINE OF THE SOUTHWEST QUARTER (SW 1/4) OF SECTION 7, TOWNSHIP 19 SOUTH, RANGE 60 EAST, M.D.M., AS PER FILE 191, PAGE 14 OF SURVEYS, ON FILE IN THE COUNTY RECORDER'S OFFICE.

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.S.D. 88 DATUM
PER THE CLARK COUNTY VERTICAL CONTROL, LAST REVISED 2003

GENERAL NOTES

1. SEE PLAN AND PROFILE SHEETS FOR CENTERLINE AND BACK OF CURB CURVE DATA.
2. FINAL GRADES ADJACENT TO STRUCTURES SHALL BE IN CONFORMANCE WITH IBC 2006, SECTION 2304.11.2.2.
3. THE CONTRACTOR SHALL VERIFY ALL CONDITIONS AND DIMENSIONS AND REPORT ALL DISCREPANCIES TO THE ENGINEER.
4. ALL IMPROVEMENTS TO BE PROTECTED FROM EROSION BY SWPPP.
5. MAXIMUM/MINIMUM SLOPES AND MINIMUM STREET SECTIONS NOT TO EXCEED THAT SHOWN ON GEOTECH REPORT.
6. SEE DETAIL SHEETS FOR STREET SECTIONS AND DETAILS.
7. ALL PUBLIC AND PRIVATE DRAINAGE IMPROVEMENTS TO BE BONDED FOR AND INSPECTED.
8. CONSTRUCTION OF BLOCK WALLS REQUIRES A SEPARATE BUILDING PERMIT AND APPROVAL.
9. EXISTING UTILITY LOCATIONS SHOWN HEREON ARE APPROXIMATE ONLY. 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 DAMAGES TO EXISTING FACILITIES PRIOR TO CONSTRUCTION. CONTRACTOR WILL BE RESPONSIBLE FOR REPAIR/REPLACING FACILITIES IF ENGINEER/OWNER IS NOT NOTIFIED OF EXISTING DAMAGE PRIOR TO CONSTRUCTION COMMENCING.
10. 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.
11. ALL ELEVATIONS SHOWN, WITH EXCEPTION TO PAD, FINISHED FLOOR, AND CONTOUR ELEVATIONS, ARE THE VALUE SHOWN PLUS 3.30 FT.

PERIMETER SIDEWALKS

PERIMETER SIDEWALK DISPLAYED FOR CONCEPTUAL PURPOSES ONLY. MASTER DEVELOPER TO PROVIDE DESIGN AND CONNECTIONS FOR ONSITE PEDESTRIAN ACCESS.

DRAINAGE EASEMENT NOTE

ALL DRAINAGE EASEMENTS AND COMMON LOTS ARE PUBLIC DRAINAGE EASEMENTS PRIVATELY MAINTAINED BY THE HOA

PRIVATE STREETS NOTE

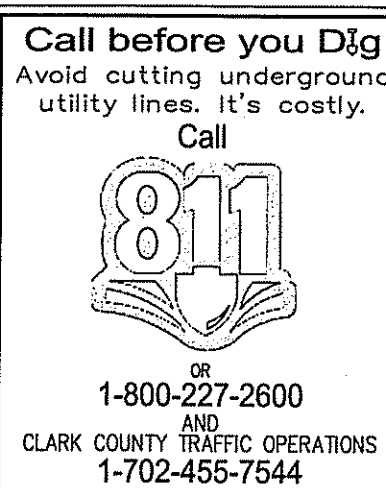
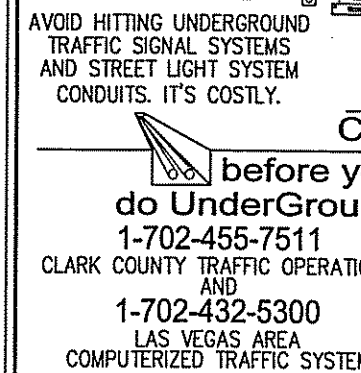
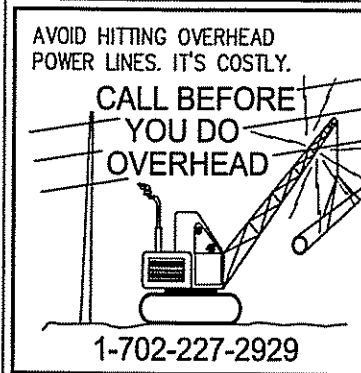
ALL PRIVATE STREETS ARE P.U., PUBLIC SEWER EASEMENTS AND PUBLIC DRAINAGE EASEMENTS TO BE PRIVATELY MAINTAINED BY THE HOA

STORM DRAIN NOTE

ALL ONSITE STORM DRAIN AND THE ASSOCIATED FACILITIES ARE PRIVATELY OWNED AND TO BE PRIVATELY MAINTAINED BY THE HOMEOWNERS ASSOCIATION

WALLS ADJACENT TO COMMON LOTS

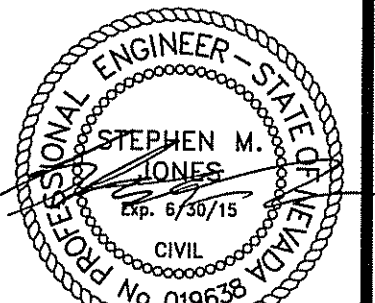
SCREEN WALLS ADJACENT TO COMMON LOTS SHALL END NO CLOSER THAN 20' TO BACK OF CURB. RETAINING WALLS SHALL END NO CLOSER THAN 5' TO BACK OF CURB.



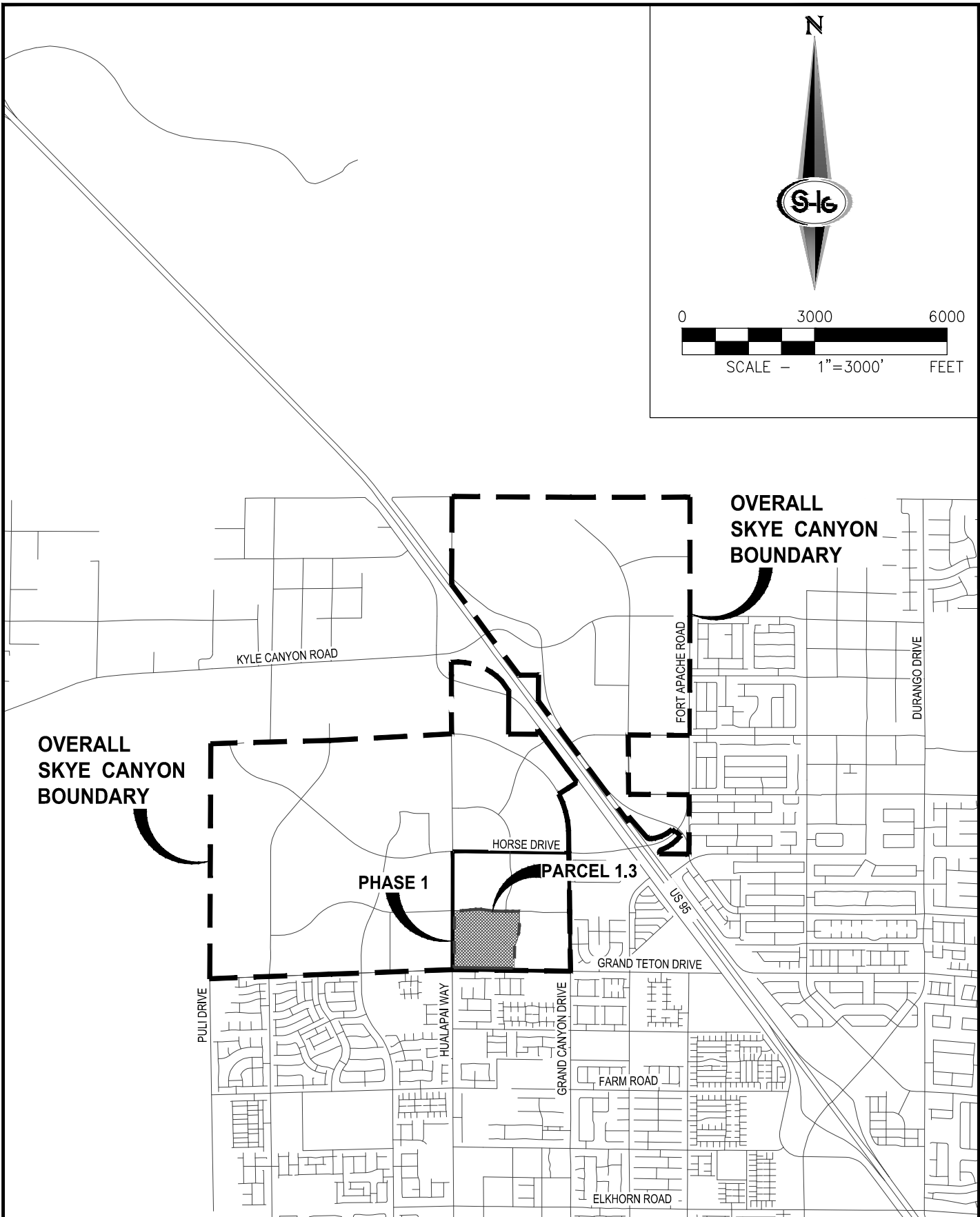
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DATE: 6/24/14
DRAFTER: JTC
DESIGNER: MAK
CHECKED: CAL

PROJECT NO.
OLY1401-002



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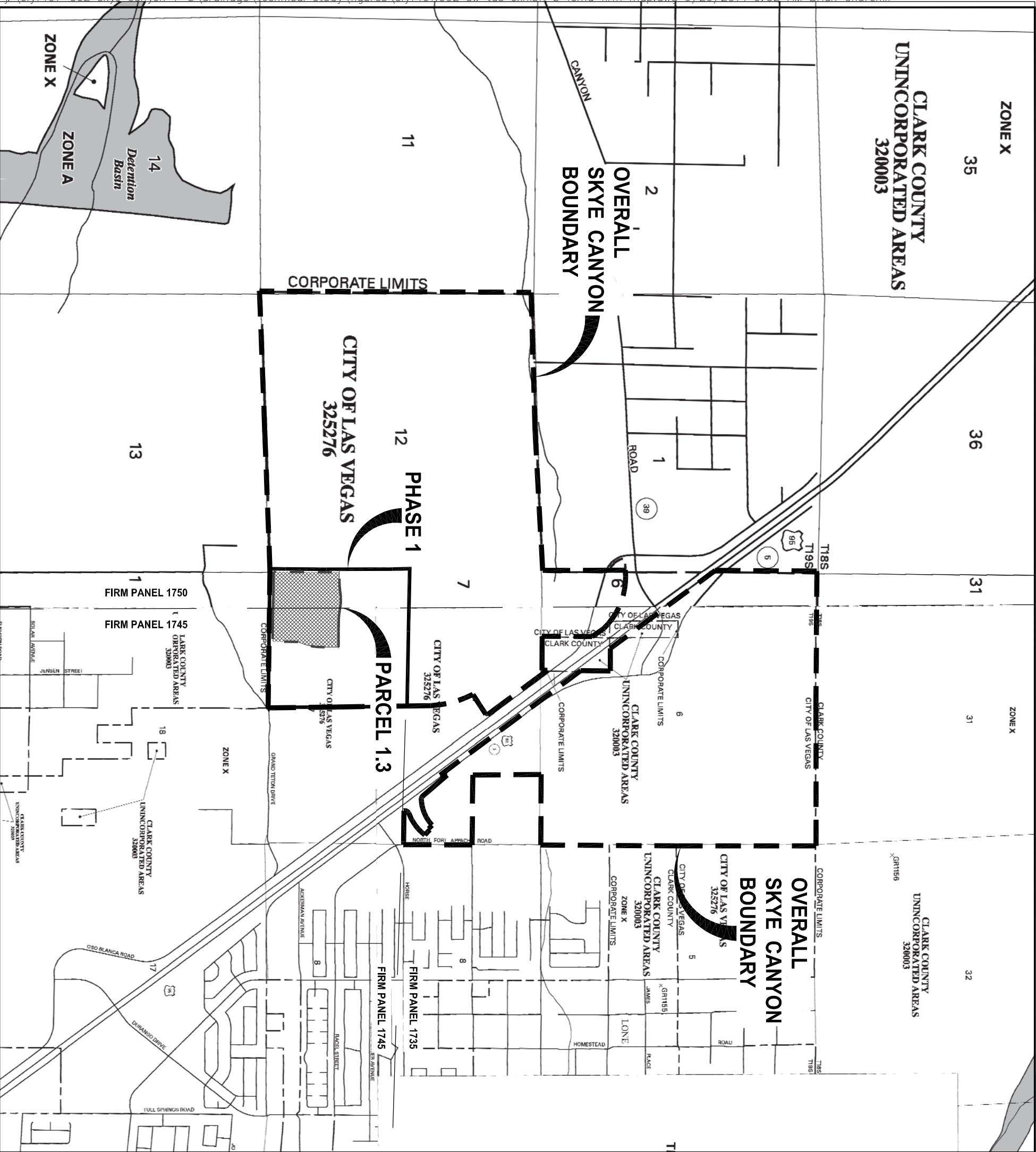


SLATER HANIFAN GROUP
CONSULTING ENGINEERS & PLANNERS
5740 S. ARVILLE STREET #216, LAS VEGAS, NV 89118
PHONE (702) 284-5300 FAX (702) 284-5399

NINETY-FIVE MANAGEMENT, LLC.

SKYE CANYON - PARCEL 1.3
LOCATION MAP

DATE: JUNE 2014	PROJECT NO. OLY1401.002
DRAFTER: BC	
DESIGNER: BC	
CHECKED: SMJ	EXHIBIT A SHEET 1 OF 1





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

PANEL 1750 OF 4090

DATE: MAP NUMBER: 3200031750 E
REVISION: 1
DATE: 09/27/2002

MAP NUMBER: 3200031750 E
MAP REVISION: 1
DATE: 09/27/2002

PANEL 1750 E



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

PANEL 1745 OF 4090

DATE: MAP NUMBER: 3200031745 E
REVISION: 1
DATE: 09/27/2002

MAP NUMBER: 3200031745 E
MAP REVISION: 1
DATE: 09/27/2002

PANEL 1745 E

NO.	DESCRIPTION	DATE	BY	APP. DATE	APP.

NINETY-FIVE MANAGEMENT, LLC.

SKYE CANYON - PARCEL 1.3

FEMA FIRM MAP

DATE: JUNE 2014

DRAFTER: BC

DESIGNER: BC

CHECKED: SWJ

PROJECT NO. OLY1401.002

EXHIBIT B

SHEET 1 OF 1

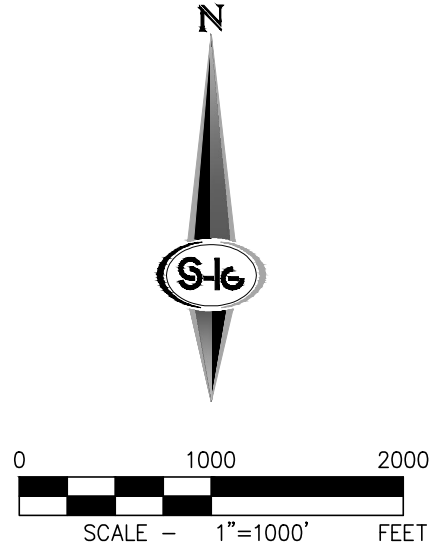
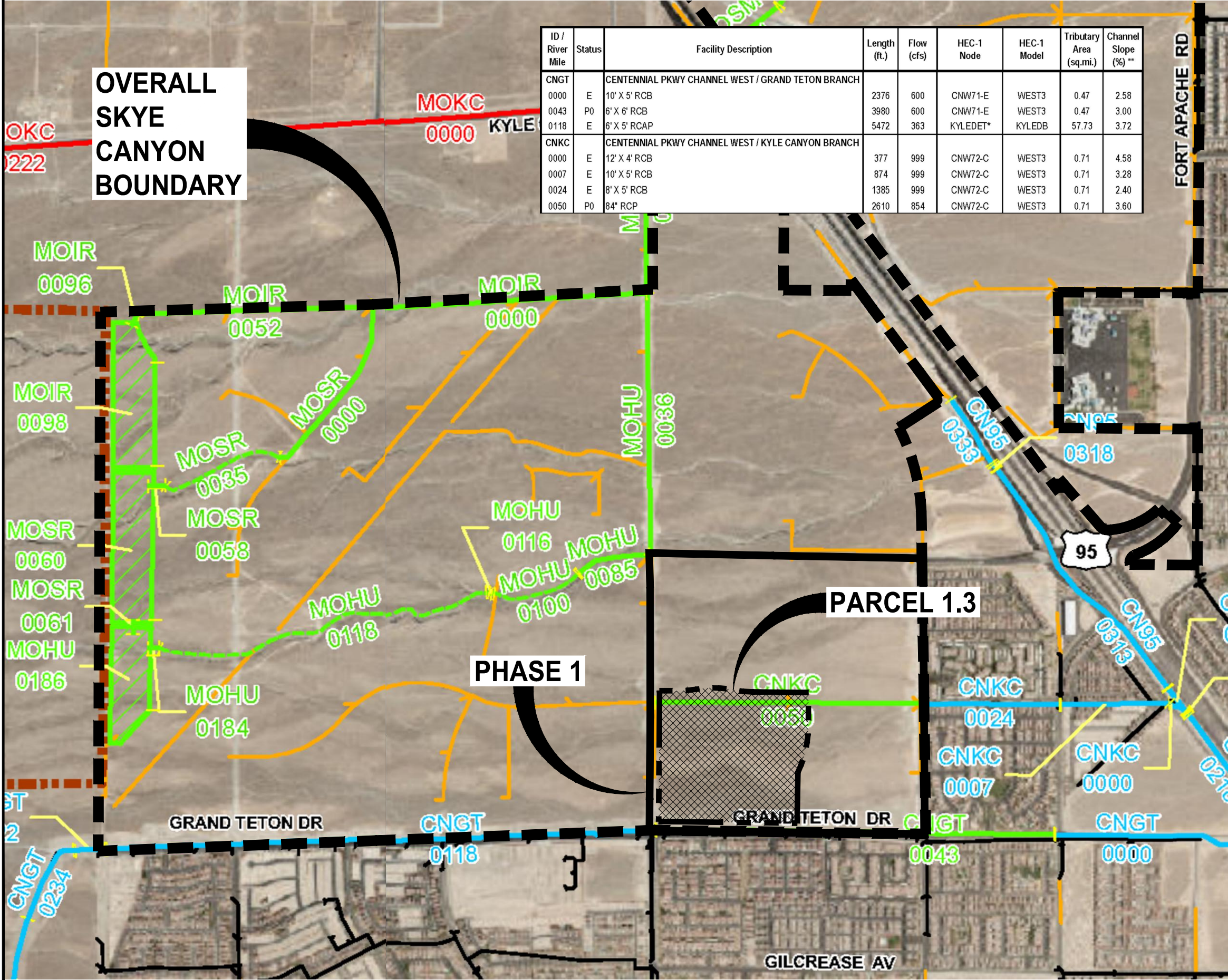


SLATER HANIFAN GROUP

CONSULTING ENGINEERS & PLANNERS

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PHONE (702) 284-5300 FAX (702) 284-5399

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2013
LAS VEGAS VALLEY
FLOOD CONTROL
MASTER PLAN UPDATE
FIGURE F- 13
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	APP.

NINETY-FIVE MANAGEMENT, LLC.

SKYE CANYON - PARCEL 1.3

CCRFGD 2013 MPU FACILITIES MAP

DATE: JUNE 2014

DRAFTER: BC

DESIGNER: BC

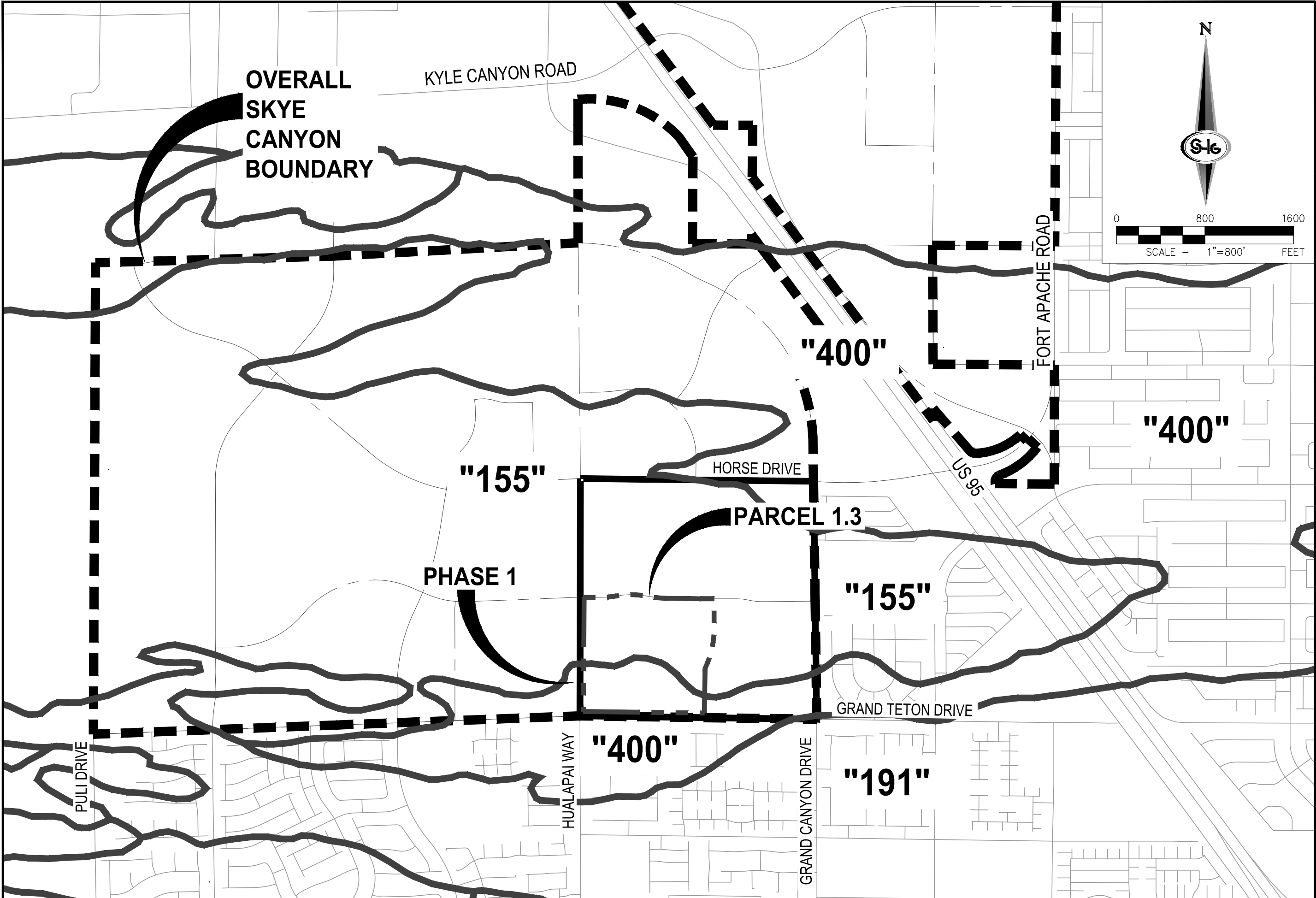
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PROJECT NO. OLY1401.002

EXHIBIT C

SHEET 1 OF 1

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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 1.3 SOILS MAP						
DATE:		JUNE 2014				
DRAFTER:		BC				
DESIGNER:		BC				
CHECKED:		SMJ				
PROJECT NO.		OLY1401.002				
EXHIBIT D						
		SHEET 1 OF 1				

