DS #: 4899

APN: 126.12.810.003

PROJECT: Skye Canyon - Parcel 2.27

SUBMITTAL: 1st

SCANNED BY/DATE:

CHECKED BY/DATE:



CITY OF LAS VEGAS INTER-OFFICE MEMORANDUM				DATE: July 13, 2017
TO: **Land Development Services** Department of Building & Safety				FROM: Albert Sung, P.E. Flood Control Project Engineer Department of Public Works
SUBJECT:	Drainage Study for: **Skye Canyon-Parcel 2.27**			**COPIES TO:** Slater Hanifan Group
Cross Streets:	NEC of Grand Teton Blvd. & Egan Crest Dr.			KAG Development West LLC/ Ninety-Five Management, LLC
File Number:	F:\Depot\DSMemos\DS4899A.doc			Bart Anderson, P.E., DevCo
Parcel Number:	126-12-810-003			CCRFCD
Zoning Action:	TMP-70716			
FEMA Flood Zone	YES	NO	X	
Proposed Storm Drain	YES X	NO		

HISTORY	DATE RECEIVED	DATE REVIEWED	COMMENTS	REVIEW FEES	FEES PAID Payment Trn #
1st Submittal	6/21/2017	7/3/2017 & 7/12/2017	See Comments Below	$400.00	488286: $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. Provide a copy of the zoning/planning conditions associated with this site (**TMP-70716**) 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.
2. An Update to the ***Skye Canyon Phase 2 Infrastructure Drainage Study*** has been submitted for review recently. The subject ***Parcel 2.27*** drainage study cannot be approved prior to the conditional approval of the ***Phase 2 Infrastructure*** study update.
3. No ***Certificate of Occupancy*** on the houses will be issued until after the *Detention Basin #1* has been accepted for Substantial Completion by the City.
4. All roadway and flood control facilities as proposed and approved in ***Skye Canyon Phase 2 Infrastructures*** must be substantially constructed prior to the issuance of occupancy permits .
5. The site is adjacent to or crosses an existing or proposed *Clark County Regional Flood Control District* (CCRFCD) master planned facility. Therefore, CCRFCD concurrence is required prior to final approval of the drainage study.

6. As of the ***Skye Canyon Phase 2 Infrastructure Update*** recently submitted for review, a comment has been issued to revise the proposed connection of the parcel stub (36"-RCP) directly to a new storm drain manhole in the mainline in *Eagle Canyon Avenue* instead of tying to a series of drop inlets at the northeast corner of the subject parcel. Review and revise the grading plan and all pertinent sheets and details accordingly in the next submittal.

7. Provide a calculation of the total energy head where the flow from Pinion Ridge St and the flow discharging from the drainage easement rectangular channel to the west converge. This total energy head also equal to the maximum ponding depth at this location must be compared to all adjacent properties.

8. Check the velocities listed in Developed Condition 100-Year Street Flow Summary table on Exhibit E. Section ID 3 lists a velocity for the minimum slope of 2.4 fps but per the flowmaster output it is shown 5.4 fps. Please clarify.

9. Check input values for Section B (Normal Depth) Cross Section for Rectangular Channel Flowmaster calculations. The input slope for this channel is 4.08% but the grading plans show the channel slope as 4.43%.

10. The following finish floors do not meet the Regional Flood Control District minimum criteria of twice the Q_{100} depth of flow up to 18-inches above the water surface (CCRFCD Manual Section 304.4.E.1) or 6-inch minimum above the highest adjacent top of curb (CCRFCD Manual Section 1602 304.4.E.1). The following finish floors should be revised or alternate flood protection provided.

LOT	FF shown	Min FF
51	2909.30'	2909.62'

11. Provide construction note or clarification of concrete apron intended surrounding the drop inlet located on sheet SD-1, if that is the intention.

12. Lots 37 – 46 adjacent Egan Crest Drive call out retaining wall detail 14 on sheet D-1. Detail 14 provides a retaining wall with a maximum height of 6.0' but the grade differences of these lots and the adjacent ground range between 7.9' and 8.9'. Please check retaining wall height and structure details of these lots.

13. Detail 5 on Sheet D-2 was called out along Lot 27 on Grading Sheet G-5. This detail 5 cannot be located on Sheet D-2. Please clarify

14. 8-inch minimum solid grouted CMU block is required for all lots where the Finished Floor elevation does not meet minimum requirement of twice the Q_{100} depth of flow up to 18-inches above the water surface along Grand Teton Drive.

15. Sheet SD-1 storm drain profile view labels the 36" RCP as public, this should be private storm drain. A storm drain manhole should be placed at the property line of the 36" RCP to delineate where it transitions from a private to a public entity.

16. All public drainage easements must be concrete lined, please revise the plans for the 20' public easement containing the U-channel at the east end of *Foothill Pine Court* and the drainage easement in C.E. "B". Revise the grading plan and all pertinent details accordingly.

17. This drainage study assumes that the project will be constructed in one phase. If improvement plans are submitted to break the project into separate phases, a drainage study update will be required for each phase addressing the interim condition.

NOTE: 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

T/R/S: T19S/R59E/S12
AREA F-12

****
*** FAX TX REPORT ***
****

TRANSMISSION OK

JOB NO.	4662
DESTINATION ADDRESS	7022845399
PSWD/SUBADDRESS	
DESTINATION ID	
ST. TIME	07/13 09:43
USAGE T	00'58
PGS.	3
RESULT	OK

CITY OF LAS VEGAS INTER-OFFICE MEMORANDUM			**DATE:** July 13, 2017
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2. An Update to the ***Skye Canyon Phase 2 Infrastructure Drainage Study*** has been submitted for review recently. The subject ***Parcel 2.27*** drainage study cannot be approved prior to the conditional approval of the ***Phase 2 Infrastructure*** study update

TECHNICAL DRAINAGE STUDY

Skye Canyon Parcel 2.27

City of Las Vegas, Nevada

Job No.: OLY1607.005
Date: June 2017

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



06/19/17

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

Assisted by: Erick Mata, EI

HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL

DRAINAGE STUDY INFORMATION FORM

Name of Development: Skye Canyon – Parcel 2.27 Date: June 2017

Location of Development: a) Descriptive (Cross Streets): North/South: Egan Crest Drive

East/West: Eagle Canyon Avenue

b) Section: 12 Township: 19 South Range: 59 East

c) APN: 126-12-810-003

Name of Owner/Developer: KAG Development West 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: Stanley Okey Amadi, P.E. Telephone No.: 702-284-5300

*E-mail Address: samadi@shg-inc.com Fax No.: 702-284-5399

Firm: Slater Hanifan Group

Address: 5740 S. Arville Street, Suite 216; Las Vegas, NV 89118

Type of Land Development/Land Disturbance Process:

☐	Rezoning	☒	Subdivison 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: +/- 19.5 Acres Being Developed/Disturbed: All

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: Approx. 60 acres

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

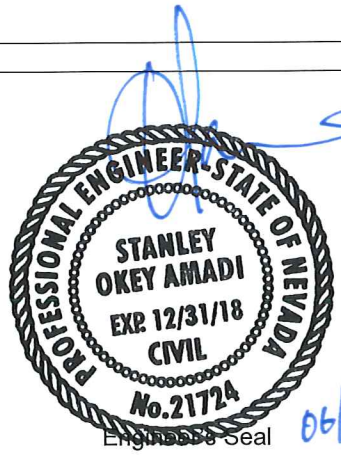
Master Drainage Study for Skye Canyon (SHG, DS4420); *Master Drainage Study for Kyle Canyon* (GCW, DS4091)

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

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

Eagle Canyon - Local storm drain at northeast corner of the project site.

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



Engineer's Seal 06/19/17

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. OLY1607.005***

STANDARD FORM 1

Updated 05/01/2008

HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL

DRAINAGE SUBMITTAL CHECKLIST

Project Name: Skye Canyon Parcel 2.27	Map ID:
Firm Name: Slater Hanifan Group	Engineer: Stanley Okey Amadi, P.E
Address: 5740 S. Arville Street, Suite 216	
City: Las Vegas State: NV Zip: 89118	
Phone Number: 702-284-5300	Fax Number: 702-284-5399
Property Owner: KAG Development West LLC /Ninety-Five Management, LLC	
Address: 114111 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.
-	X	A notarized letter from the adjacent property owner(s) allowing off-site grading or discharge.

II. MAPS AND EXHIBITS

Yes	No	
X	-	A copy of a current Flood Insurance Rate Map (FIRM) with the site delineated.
X	-	A copy of the current CCRFCD Master Plan Update Figure, (F-x), for Flood Control Facilities and Environmental areas with the site delineated.

REFERENCE:	**STANDARD FORM 2**

DRAINAGE SUBMITTAL CHECKLIST

II. MAPS AND EXHIBITS (Continued)

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

III. DRAINAGE PLAN

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

REFERENCE:	STANDARD FORM 2

DRAINAGE SUBMITTAL CHECKLIST

III. DRAINAGE PLAN (Continued)

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

REFERENCE:	STANDARD FORM 2

DRAINAGE SUBMITTAL CHECKLIST

III. DRAINAGE PLAN (Continued)

Yes	No	
-	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.
X	-	Street slopes for perimeter and interior streets. The minimum slope is 0.4 percent.
-	N/A	Location and detail of best management practice (BMP) for parking lots and low impact development (LID) (if required).

IV. HYDROLOGIC ANALYSIS

Yes	No	
X	-	Appropriate soil information and Soils Map for existing and future conditions with subbasins and property delineated.
-	N/A	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 stormwater flows showing basin area, Q_{10} and Q_{100} for both individual basins and combined basin flows, where applicable.
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.
-	N/A	Calculation for impervious area for parking lots and LIDs (if required).

REFERENCE:	STANDARD FORM 2

DRAINAGE SUBMITTAL CHECKLIST

V. HYDRAULIC ANALYSIS

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

REFERENCE:	STANDARD FORM 2

CITY OF LAS VEGAS

MINIMUM DRAINAGE STUDY CRITERIA
STANDARD FORM 2 CHECKLIST SUPPLEMENT

(Revised 5/18/11)

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

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

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

I. GENERAL REQUIREMENT		
Yes	No	
-	N/A	A notarized letter from the adjacent property owner(s) allowing off-site grading. (A copy of the letter must be received prior to final acceptance of the drainage study.) Owner owns offsite areas.
-	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. Expected in July.
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. S.O.A. 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.)

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.

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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LIST OF APPENDICES

Appendix A Drainage Exhibits
- Exhibit A – Location Map
- Exhibit B – FEMA FIRM Panel Map
- Exhibit C – CCRFCD 2013 MPU Facilities Map
- Exhibit D – Soils Map
- Exhibit E – Developed Condition Drainage Map

Appendix B Hydrologic Data
- Precipitation
- Curve Number
- Standard Form 4

Appendix C Developed Condition HEC-1 Analysis

Appendix D Hydraulic Computations
- Street Flow Computations
- Easement Analysis
- Nomograph and Drop Inlet Computation

Appendix E Storm Drain WSPG Analysis

Appendix F Finished Floor Analysis

Appendix G Reference Material
Technical Drainage Study for Skye Canyon – Phase 2 Infrastructure, by SHG
- Approval Letters
- Drainage Exhibits
- WSPG Storm Drain Models
- Pertinent Improvement Plan Sheets

Appendix H Reference Material
Master Drainage Study for Skye Canyon – Update No.3, by SHG
- Approval Letter
- Master Land Use Plan

Appendix I CD of Electronic Files and Improvement Plans

1 INTRODUCTION

1.1 Project Overview & Study Purpose

Ninety-Five Management, LLC is proposing a single-family residential development, identified as *Skye Canyon Parcel 2.27,* within the city limits of Las Vegas, Nevada. The proposed development is approximately 19.53 gross acres in area, and located at the southeast corner of the intersection of Eagle Canyon Avenue and Egan Crest Drive. Entitlement applications for the development have been submitted pending approval by the City of Las Vegas.

The proposed development is located within the master planned Skye Canyon property and specifically in the Phase 2 area supported by the *Technical Drainage Study for Skye Canyon – Phase 2 Infrastructure* (DS4739). All roadways and perimeter drainage infrastructure required for development of Parcel 2.27 has been technically addressed in the Phase 2 Infrastructure drainage study. Parcel 2.27 proposes utilization of drainage facilities provided by the Phase 2 Infrastructure. It is the objective of this study to show conformance to the drainage patterns assumed by the Phase 2 Infrastructure drainage study.

Additionally, the 1,662 acre Skye Canyon property has been master planned and the most recent *Update #3 to the Master Drainage Study for Skye Canyon (DS4420)* was conditionally approved by the City of Las Vegas on August 15, 2016. Parcel 2.27 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 59 East and Section 12, within APN 126-12-810-003. Parcel 2.27 is bound by Eagle Canyon Avenue to the north, Egan Crest Drive to the west, Grand Teton Drive to the south and undeveloped Parcels 2.28 and 2.29 to the east. Improvement for Parcels 2.28 and 2.29 are currently under review by the City of Las Vegas. A location map identifying the site in relation to the major streets in the vicinity has been prepared as Exhibit A, included in Appendix A.

The project consists of construction of single-family residential lots averaging <6,000 ft^2 in area and all associated interior roadways. The typical onsite roadway is proposed as a 49-ft wide private street with roll curb. The adjacent perimeter roadways and storm drain facilities are currently being installed by a separate Phase 2 Infrastructure improvements and are considered existing for development of Parcel 2.27.

Drainage improvements necessary to control storm runoff and satisfy local drainage criteria onsite have been proposed by Parcel 2.27. The proposed drainage improvements are intended to connect into the existing Phase 2 Infrastructure facilities.

1.3 FEMA Flood Zone Designation

The Parcel 2.27 site boundary has been delineated on the current FEMA FIRM Panel Map 32003C1750E, dated September 27, 2002, as Exhibit B included in Appendix A. Per the

FIRM Panel, the project site is located within a FEMA designated unshaded Zone 'X', defined as areas outside the 0.2% (500-year) annual chance floodplain. An unshaded 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, one (1) CCRFCD regional facility alignment is considered pertinent to Parcel 2.27. Although the project site does not impact this regional facility, the following is a summary of facility alignment, per the 2013 MPU.

- CNGT 0118 located south of the project site. This facility is identified as an existing 6'x5' RCAP. Parcel 2.27 does not contribute any flows to this regional alignment.

1.5 Referenced Documents

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

1. *Technical Drainage Study for Skye Canyon – Phase 2 Infrastructure*, prepared by Slater Hanifan Group (hereinafter referred to as the Infrastructure Study, Reference 4), has technically designed the adjacent perimeter roadways and associated drainage infrastructure utilized by Parcel 2.27. The Phase 2 Infrastructure Study has been referenced to show Parcel 2.27 development conformance to the drainage patterns for the perimeter infrastructure in order to prove that the development is in accordance with the master plan for the area. The following specific items have been referenced from the Phase 2 Infrastructure Study and included in Appendix G:
   - The Phase 2 Infrastructure interim condition functions as Parcel 2.27's existing drainage condition.
   - Hydraulic modeling of Eagle Canyon Avenue storm drain for utilization in the developed/ultimate Parcel 2.27 storm drain design.
   - Offsite flow impacts from the adjacent perimeter roadways.

2. *Master Drainage Study for Skye Canyon*, prepared by Slater Hanifan Group (hereinafter referred to as the SHG Master Study), had conceptually master planned the drainage improvements required for the current land plan on the property. The referenced Phase 2 Infrastructure improvements were shown to be in conformance with the master drainage patterns per the SHG Master Study. Therefore, if this study shows Parcel 2.27 is in conformance with drainage patterns presented in the Phase 2 Infrastructure Study, then it is surmised that it is also in conformance with the SHG Master Study. As a result, no reference computations from the SHG Master Study is considered necessary in preparation of this Parcel 2.27 technical study since the materials were already adopted by the Phase 2 Infrastructure Study. However, the landplan from the most recent Update #3 to the SHG Master Study have been provided in Appendix H for informational purposes.

2 METHODOLOGY

2.1 Compliance

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

2.2 Hydrologic Modeling

Modeling:

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

Precipitation:

The site is located outside of the McCarran Airport Rainfall Area. Per the CCRFCD Manual precipitation exhibits, the precipitation values utilized in this study's HEC-1 models are 3.00 and 1.67 inches for the 100-year and 10-year storm event, respectively. Note that the precipitation values have been referenced from the Phase 2 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. The soils information within the watershed was obtained from the NRCS Natural Resources Conservation Service of the Las Vegas Valley Area, Nevada, Part of Clark County (Soil Survey, Reference 3). This study's drainage basins lie within the following soil types delineated on Exhibit D, included in Appendix A:

- Soil 155 – Cave gravelly fine sandy loam, 4 to 15 percent slopes. This soil is composed of 100% HSG 'D'.
- Soil 191 – Dalian very cobbly fine sandy loam, 2 to 8 percent slopes. This soil is composed of 100% HSG 'A'.
- Soil 400 – Tencee very fine sandy loam, 2 to 8 percent slopes. This soil is composed of 100% HSG 'D'.

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

Note that this project proposes lots that are an average of <6,000 ft^2 in area and thus, utilizes a "Commercial" lot curve number per Foot Note 3 of the CCRFCD Manual Table 602A.

Lag Time:

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

2.3 Hydraulic Modeling & Criteria

Street Flow:

Street flows have been analyzed utilizing the FlowMaster Version 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.

3 EXISTING DRAINAGE CONDITION

3.1 Definition/Discussion of Existing Condition

The existing condition considers the Phase 2 infrastructure as existing and the project site composed of existing desert shrub draining in a south easterly direction. The site has been assessed by the Phase 2 Infrastructure study and Master Drainage study in the past. Due to the site being surrounded by perimeter streets provided by the Phase 2 Infrastructure study, there are no impacts to the Parcel 2.27 project site that will differ from what has been previously analyzed in approved studies. As a result, no additional analyses have been performed by this study to demonstrate an existing drainage condition for Parcel 2.27.

4 DEVELOPED DRAINAGE CONDITION

4.1 Definition of Developed Condition

The developed condition considers the Parcel 2.27 area constructed, inclusive of the proposed interior roadway infrastructure. The offsite storm drain improvements in Egan Crest Drive and Eagle Canyon Avenue are installed per the Phase 2 Infrastructure Study. Included in this project are the proposed drainage facilities required to collect and convey storm runoff produced by the entire Parcel 2.27 area and conform to master planned drainage patterns established in the Phase 2 Infrastructure Study.

The offsite drainage areas are adopted to quantify the most conservative flows either from the interim or ultimate conditions dependent on worst condition impacting flows, as illustrated by the Phase 2 Infrastructure Study.

4.2 Discussion of Developed Condition

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

Parcel 2.27 has been assessed as a single basin identified as ON1. As assumed by the Infrastructure study and SHG Master Study, Basin ON1 drains in a northeasterly direction to a lateral stub provided by the Infrastructure study within Eagle Canyon Avenue. As part of the Phase 2 Infrastructure design, prior to Parcel 2.27 construction, drainage berms/ditches are present on Parcel 2.27 which will route all flow toward the provided storm drain stub. Note that the stub was designed to allow bypass to surface flow on Eagle Canyon Avenue in the interim condition; this is no longer the case in the ultimate condition, and therefore, the adjustment has been addressed by a concurrent update to the Infrastructure study (Update No.4 DS4739-4). See Section 4.5 of this report for discussion of proposed facility design.

4.3 Summary of Developed Condition Flows

A summary of the developed condition peak flows, as determined by HEC-1 analysis, has been presented on the Developed Condition Drainage Map (Exhibit E) provided in Appendix A. The applicable HEC-1 analysis has been provided in Appendix C for your reference.

Note that the flow rate for basin ON1 has changed in comparison to what was previously approved by the Master Drainage Study due to a discrepancy in drainage area. The Master Study incorrectly analyzed the site area (basin WML13) as 16.9 acres vs the true area of 18.1 acres. See Table 1 below for the comparison of the Infrastructure flow rates that adopted the Master Drainage Study flows compared to the Parcel 2.27 (Project Site).

Table 1: Summary of Infrastructure Study vs. Parcel 2.27 Comparison		
	Infrastructure Study Ultimate Condition	**Parcel 2.27 Study (Project Site)**
Onsite Parcel Flow Q_{100} (cfs)	49 *(WML13)*	53 *(ON1)*
Facility L6 Flow Collected Q_{100} (cfs)	40	53
Total Bypass Flow Q_{100} (cfs)	**9**	**0**

As a result of the area discrepancy, the flow rate generated by the onsite basin has been reanalyzed and the site now generates an additional 4 cfs over what the Infrastructure Study had reference from the Master Study. Note that in addition to the flow adjustment, the project site intends to collect all onsite flow at the lateral stub provided by the Infrastructure Study (Facility L6). This revised flow collection has been assessed to meet all criteria at the point of connection and through the storm drain mainline.

4.4 Summary of Developed Condition Street Flows

The perimeter roadways have been referenced from the Phase 2 Infrastructure Study or the most current pertinent update. The perimeter street sections have been utilized to assess finished floors at the site boundaries and provide solid grouting recommendations.

Onsite street flows have been quantified by subbasin prorated areas. Three (3) onsite street sections have been assessed and summarized on the Developed Condition Drainage Map (Exhibit E). Note that the sections with erosive velocities (> 5 fps) are considered acceptable since the flow depth is within the right of way where no landscape can be eroded. All other sections generate velocities of <5 fps. All 10-yr street flow criteria is met in the 100-yr event and therefore additional computations for the 10-yr event are not necessary.

4.5 Summary of Drainage Facilities

The site proposes one (1) onsite drainage facility identified by facility tag P1. Facility P1 consists of a 5'x6' NDOT Type II triple grate field inlet. The proposed inlet has been designed to collect the entire flow generated by basin ON1.

Storm Drain

The main onsite storm drain alignment fronting the project site within Eagle Canyon Avenue has been assessed with revised flow to the mainline by Update No.4 to the Infrastructure Study (DS 4739-4) currently under review by the City of Las Vegas. Additionally, the lateral stub facility L6 has been adjusted to accommodate the Parcel 2.27 project site. As a result, all adjusted flow from the site that is impacting the storm drain mainline meets storm drain criteria and has been provided as reference in Appendix G. Note that the lateral wspg model from the site to the mainline has been assessed by this study to match the profile alignment provided. The assessed wspg model has been provided in Appendix E for reference.

Drainage Easement

There are two (2) drainage easements proposed by the project site. The drainage easement located north of lot 1 has been designed to convey all onsite storm flow to the proposed NDOT field inlet. By solid grouting, Lot 1 has been designed to meet 18-inches above the flow depth or submerged weir depth in Section A and provide adequate flood protection. Section B identifies the second easement just north of lot 52. This easement provides a concrete u-channel that conveys partial onsite flow through the easement. See Appendix D for all hydraulic computations.

Note that in an emergency overflow condition all the flow will discharge north and overtop the sidewalk onto Eagle Canyon Avenue. The overflow path onto Eagle Canyon Avenue is located at more than 4-ft below the adjacent nearest finished floor and located more than 140-ft downstream. Therefore, emergency overflow calculations are considered unnecessary and have not been provided.

5 ULTIMATE DRAINAGE CONDITION

5.1 Definition/Discussion of Ultimate Condition

The ultimate condition considers that Skye Canyon is entirely developed, inclusive of the future residential areas bound by the Phase 2 Infrastructure improvements. Since the flow impacting the project site in the developed condition is the same as the ultimate condition, an assessment for the ultimate condition was deemed unnecessary. A conceptual ultimate drainage condition had been defined by the referenced Phase 2 Infrastructure Study, and it has been utilized in comparison of this study's developed condition analysis. See Table 1 of this report for a flow rate comparison assessment.

6 PROPOSED FINISHED FLOORS

The proposed finished floor elevations satisfy the CCRFCD as well as the local City of Las Vegas policy and are elevated a 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.

7 CONCLUSIONS & RECOMMENDATIONS

1. The proposed improvements are not located within a FEMA designated SFHA.

2. The project is adjacent to the existing the regional alignment of CNGT 0118 but does not propose any flow contribution to it.

3. The proposed drainage patterns are in conformance with the Phase 2 Infrastructure Study as well as the SHG Master Study. It is anticipated that the Phase 2 Infrastructure improvements are in place and functioning prior to start of Parcel 2.27 development.

4. The Phase 2 Infrastructure Update No.4 study which has been submitted and is currently under review includes the flow adjustments and lateral stub alignment relocation to accommodate the Parcel 2.27 project site. Parcel 2.27 has allowed for full flow collection from the onsite basin to be conveyed thru the provided lateral stub and into its proposed storm drain facilities. Update No.4 addressed this change and adjust storm drain alignment to the mainline in Eagle Canyon Avenue. Hydraulic analysis and modeling show that the adjustment due to additional surface flows does not adversely impact the Eagle Canyon Avenue facilities.

5. Proposed street flow and storm drain facilities satisfy local and CCRFCD criteria.

6. Proposed finished floors are adequately flood protected meeting criteria against design flows and potential overflow conditions.

7. The grading plan, storm drain profile and detail sheets for this project have been included with this study. These plans support the drainage patterns and conclusions detailed in this study.

8 REFERENCES

1. *Las Vegas Valley Flood Control Master Plan Update.* PBS&J, Louis Berger Group and Parsons Brinckerhoff, 2013.

2. *Hydrologic Criteria and Drainage Design Manual.* Clark County Regional Flood Control District, 1999.

3. *Soil Survey of Las Vegas Valley Area, Nevada.* U.S. Department of Agriculture, Natural Resources Conservation Service, August 2016.

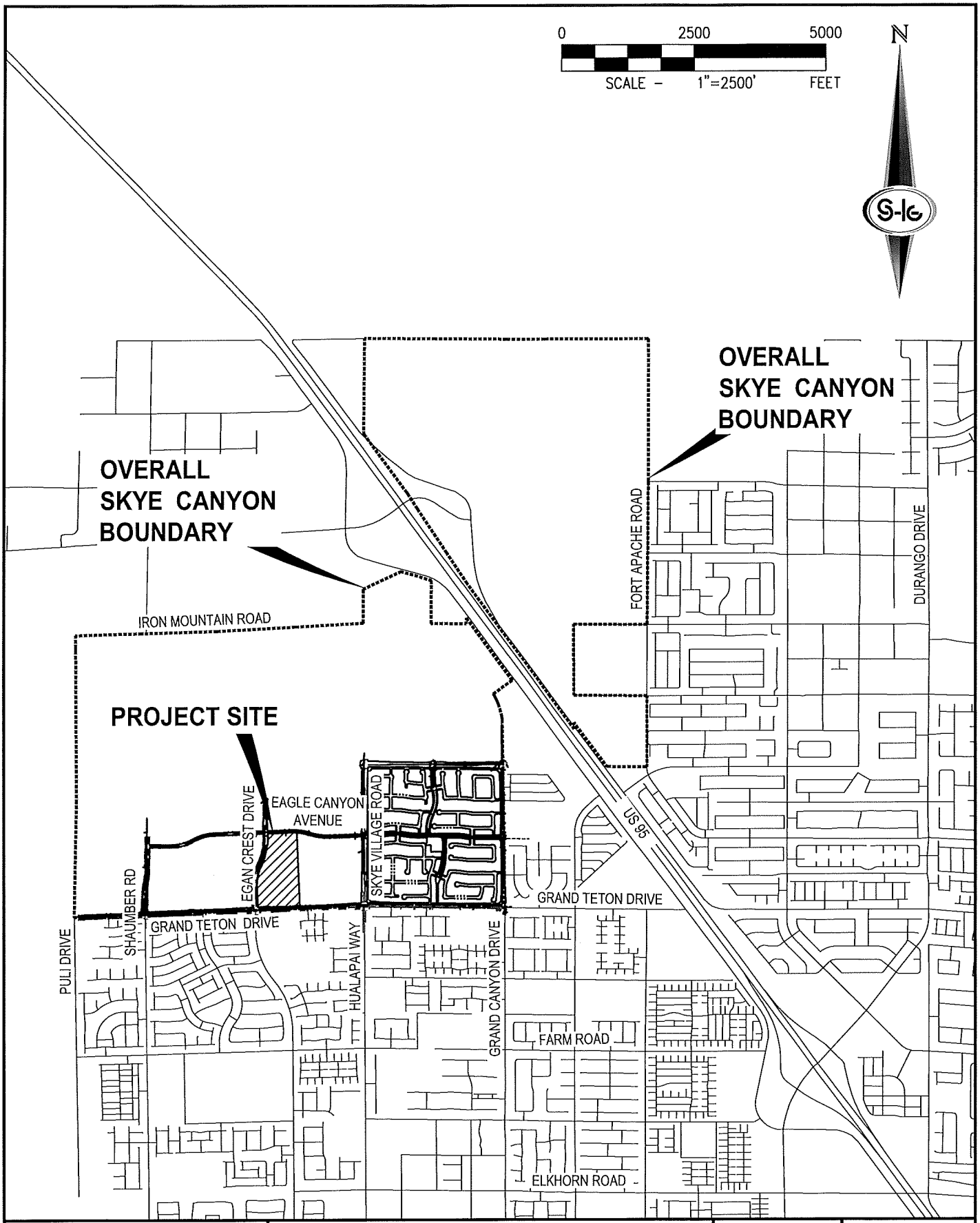
4. *Technical Drainage Study for Skye Canyon – Phase 2 Infrastructure*; Slater Hanifan Group, June 2016.

5. *Master Drainage Study for Skye Canyon – Update No.3*; Slater Hanifan Group, August 2016.

APPENDIX A

Drainage Exhibits

Exhibit A – Location Map
Exhibit B – FEMA FIRM Panel Map
Exhibit C – 2013 CCRFCD MPU Facilities Map
Exhibit D – Soils Map
Exhibit E – Developed Condition Drainage Map



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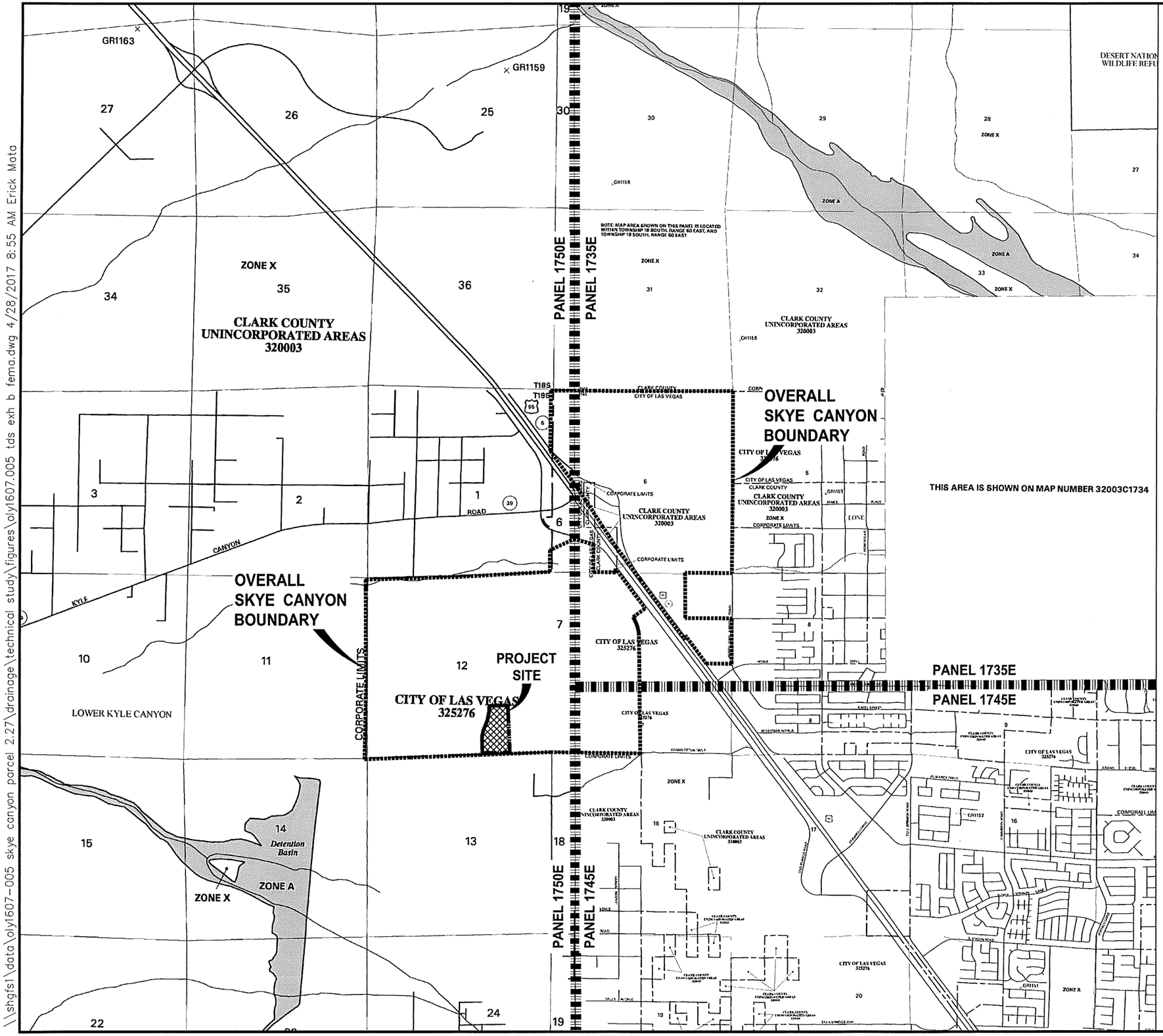
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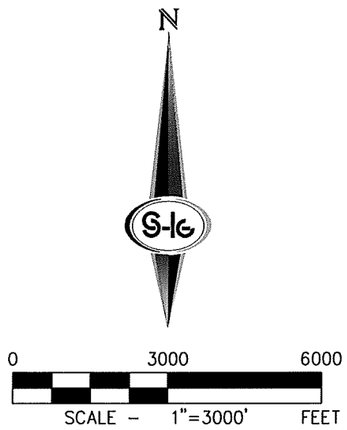
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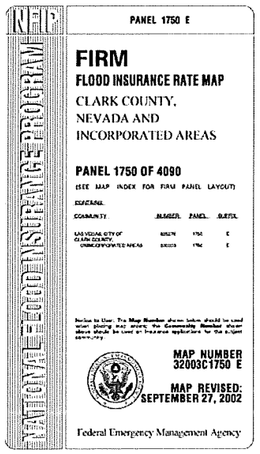
LOCATION MAP

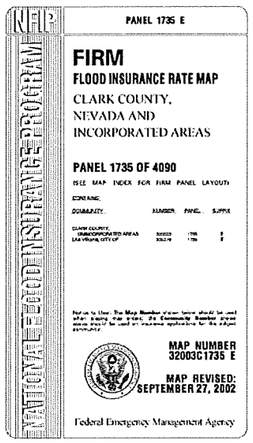
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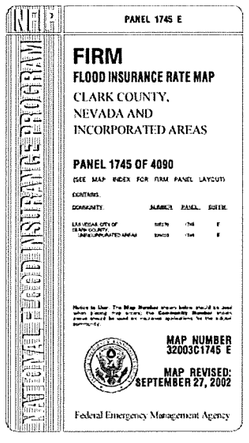
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NINETY-FIVE MANAGEMENT, LLC.

SKYE CANYON - PARCEL 2.27
FEMA FIRM MAP

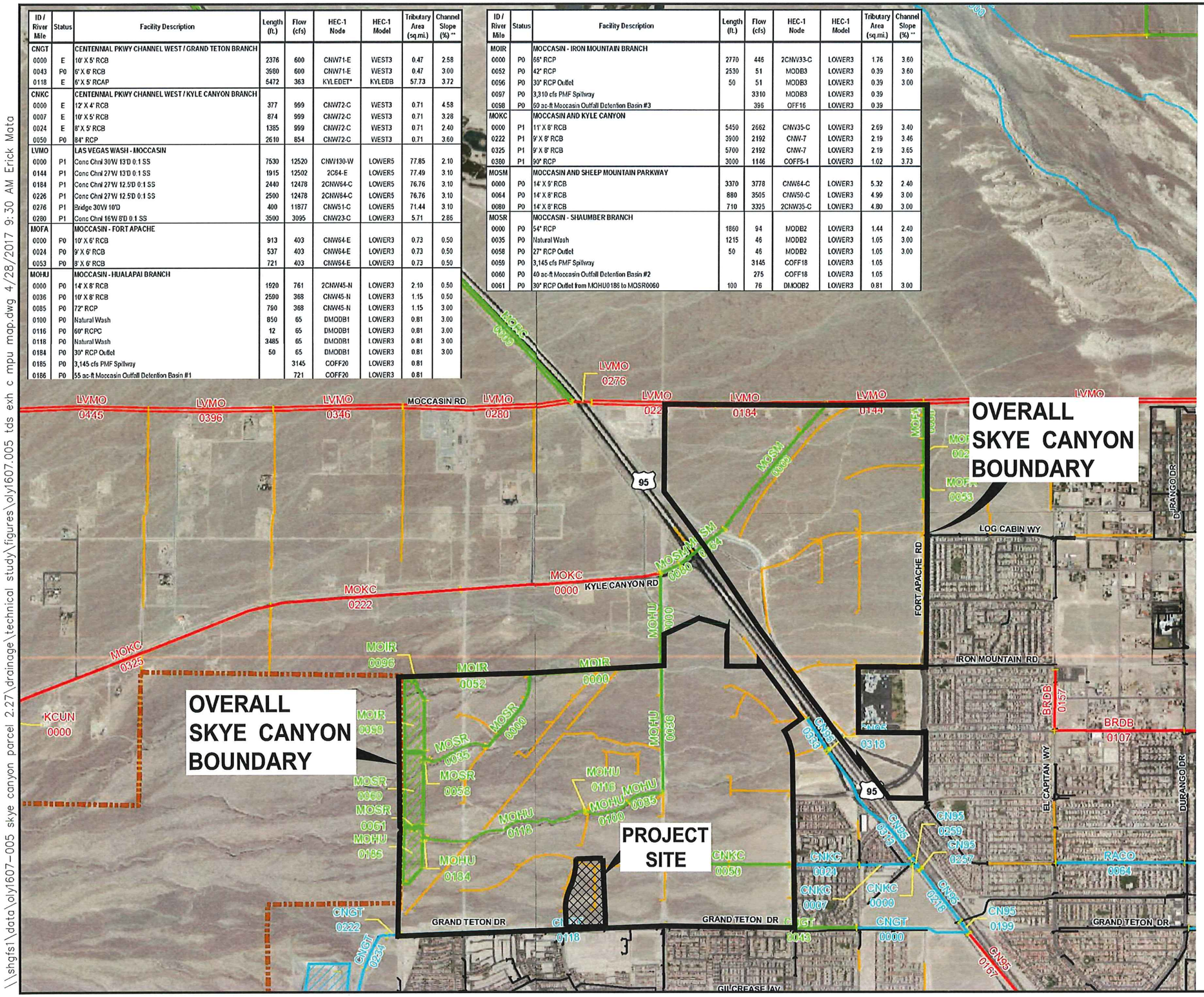
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DESIGNER:	ETM
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PROJECT NO.	OLY1607.005

EXHIBIT B
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ID / River Mile	Status	Facility Description	Length (ft.)	Flow (cfs)	HEC-1 Node	HEC-1 Model	Tributary Area (sq.mi.)	Channel Slope (%) **
CNGT		CENTENNIAL PKWY CHANNEL WEST / GRAND TETON BRANCH						
0000	E	10' X 5' RCB	2376	600	CNW71-E	WEST3	0.47	2.58
0043	P0	6' X 6' 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		CENTENNIAL PKWY CHANNEL WEST / KYLE CANYON BRANCH						
0000	E	12' X 4' RCB	377	999	CNW72-C	WEST3	0.71	4.58
0007	E	10' X 5' RCB	874	999	CNW72-C	WEST3	0.71	3.28
0024	E	8' 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
LVMO		LAS VEGAS WASH - MOCCASIN						
0000	P1	Conc Chnl 30W 13'D 0:1 SS	7530	12520	CNW130-W	LOWER5	77.85	2.10
0144	P1	Conc Chnl 27'W 13'D 0:1 SS	1915	12502	2C64-E	LOWER5	77.49	3.10
0184	P1	Conc Chnl 27'W 12.5'D 0:1 SS	2440	12478	2CNW64-C	LOWER5	76.76	3.10
0226	P1	Conc Chnl 27'W 12.5'D 0:1 SS	2500	12478	2CNW64-C	LOWER5	76.76	3.10
0276	P1	Bridge 30'W 10'D	400	11877	CNW51-C	LOWER5	71.44	3.10
0280	P1	Conc Chnl 16'W 8'D 0:1 SS	3500	3095	CNW23-C	LOWER3	5.71	2.86
MOFA		MOCCASIN - FORT APACHE						
0000	P0	10' X 6' RCB	913	403	CNW64-E	LOWER3	0.73	0.50
0024	P0	9' X 6' RCB	537	403	CNW64-E	LOWER3	0.73	0.50
0053	P0	8' X 6' RCB	721	403	CNW64-E	LOWER3	0.73	0.50
MOHU		MOCCASIN - HUALAPAI BRANCH						
0000	P0	14' X 8' RCB	1920	761	2CNW45-N	LOWER3	2.10	0.50
0036	P0	10' X 8' RCB	2590	368	CNW45-N	LOWER3	1.15	0.50
0085	P0	72" RCP	790	368	CNW45-N	LOWER3	1.15	3.00
0100	P0	Natural Wash	850	65	DMODB1	LOWER3	0.81	3.00
0116	P0	60" RCPC	12	65	DMODB1	LOWER3	0.81	3.00
0118	P0	Natural Wash	3485	65	DMODB1	LOWER3	0.81	3.00
0184	P0	30" RCP Outlet	50	65	DMODB1	LOWER3	0.81	3.00
0185	P0	3,145 cfs PMF Spillway		3145	COFF20	LOWER3	0.81	
0186	P0	55 ac-ft Moccasin Outfall Detention Basin #1		721	COFF20	LOWER3	0.81	

ID / River Mile	Status	Facility Description	Length (ft.)	Flow (cfs)	HEC-1 Node	HEC-1 Model	Tributary Area (sq.mi.)	Channel Slope (%) **
MOIR		MOCCASIN - IRON MOUNTAIN BRANCH						
0000	P0	66" RCP	2770	446	2CNW33-C	LOWER3	1.76	3.60
0052	P0	42" RCP	2530	51	MODB3	LOWER3	0.39	3.60
0096	P0	30" RCP Outlet	50	51	MODB3	LOWER3	0.39	3.00
0097	P0	3,310 cfs PMF Spillway		3310	MODB3	LOWER3	0.39	
0098	P0	60 ac-ft Moccasin Outfall Detention Basin #3		396	OFF16	LOWER3	0.39	
MOKC		MOCCASIN AND KYLE CANYON						
0000	P1	11' X 8' RCB	5450	2662	CNW35-C	LOWER3	2.69	3.40
0222	P1	9' X 8' RCB	3900	2192	CNW-7	LOWER3	2.19	3.46
0325	P1	9' X 8' RCB	5700	2192	CNW-7	LOWER3	2.19	3.65
0360	P1	90" RCP	3000	1146	COFF5-1	LOWER3	1.02	3.73
MOSM		MOCCASIN AND SHEEP MOUNTAIN PARKWAY						
0000	P0	14' X 9' RCB	3370	3778	CNW84-C	LOWER3	5.32	2.40
0064	P0	14' X 8' RCB	880	3505	CNW50-C	LOWER3	4.99	3.00
0080	P0	14' X 8' RCB	710	3325	2CNW35-C	LOWER3	4.80	3.00
MOSR		MOCCASIN - SHAUMBER BRANCH						
0000	P0	54" RCP	1860	94	MODB2	LOWER3	1.44	2.40
0035	P0	Natural Wash	1215	46	MODB2	LOWER3	1.05	3.00
0058	P0	27" RCP Outlet	50	46	MODB2	LOWER3	1.05	3.00
0059	P0	3,145 cfs PMF Spillway		3145	COFF18	LOWER3	1.05	
0060	P0	40 ac-ft Moccasin Outfall Detention Basin #2		275	COFF18	LOWER3	1.05	
0061	P0	30" RCP Outlet from MOHU0186 to MOSR0060	100	76	DMODB2	LOWER3	0.81	3.00



N

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SCALE – 1"=2000' FEET

REGIONAL FLOOD CONTROL DISTRICT

2013
LAS VEGAS VALLEY
FLOOD CONTROL
MASTER PLAN UPDATE

FIGURE F- 7
FIGURE F- 8
FIGURE F- 12
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	APP.

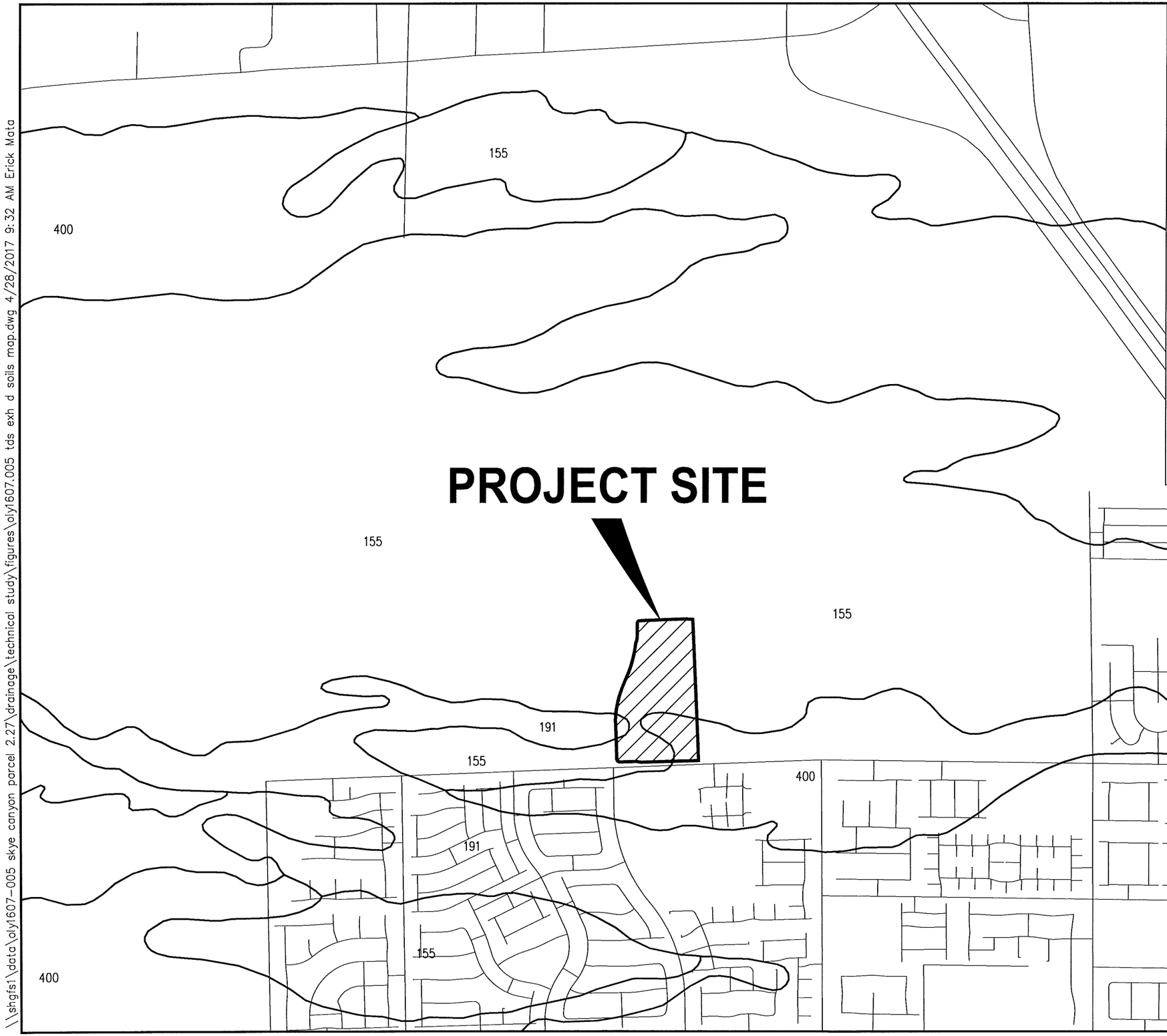
NINETY-FIVE MANAGEMENT, LLC.

SKYE CANYON - PARCEL 2.27
CCRFCD 2013 MPU FACILITIES MAP

DATE:	APRIL 2017
DRAFTER:	ETM
DESIGNER:	ETM
CHECKED:	SOA
PROJECT NO.	OLY1607.005

EXHIBIT C
SHEET 1 OF 1

\\shgfs1\data\oly1607-005 skye canyon parcel 2.27\drainage\technical study\figures\oly1607.005 tds exh c mpu map.dwg 4/28/2017 9:30 AM Erick Mata



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NO.	DESCRIPTION	DATE	BY	APP. DATE	APP.

NINETY-FIVE MANAGEMENT, LLC.

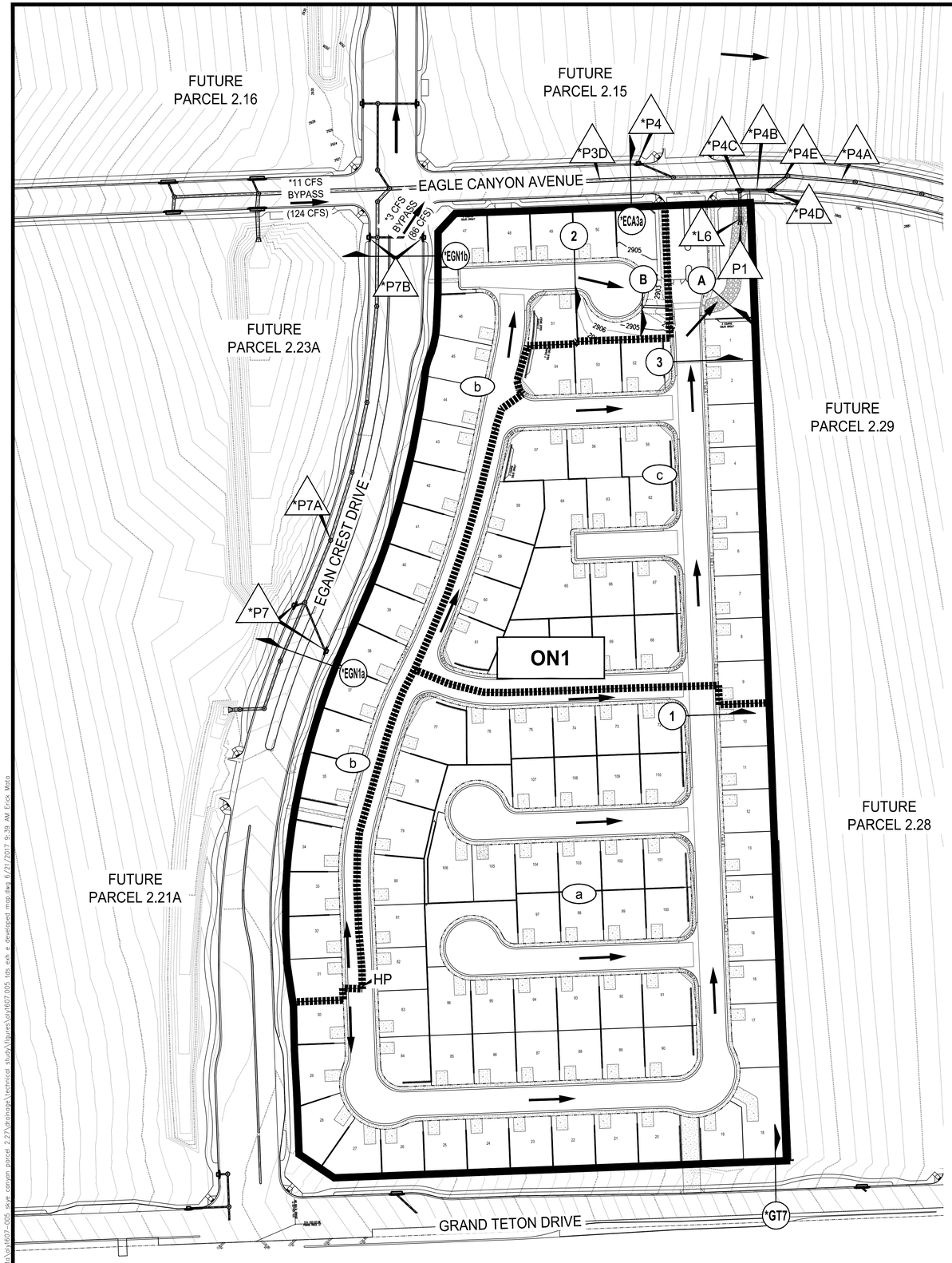
SKYE CANYON - PARCEL 2.27

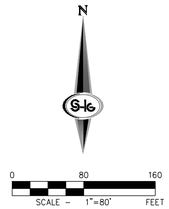
SOILS MAP

DATE: APRIL 2017
DRAFTER: ETM
DESIGNER: ETM
CHECKED: SOA
PROJECT NO.
OLY1607.005

EXHIBIT D
SHEET 3 OF 3

\\shgfs1\data\oly1607-005 skye canyon parcel 2.27\drainage\technical study\figures\oly1607.005 tds exh d soils map.dwg 4/28/2017 9:32 AM Erick Mata





LEGEND	
	BASIN BOUNDARY
ID	BASIN ID
	PRO-RATED SUBBASIN BOUNDARY
ID	PRO-RATED SUBBASIN ID
	FLOW DIRECTION
ID	CONCENTRATION POINT
ID	FLOWMASTER SECTION
ID	FACILITY ID
XX CFS	SURFACE FLOW
(XX CFS)	STORM DRAIN FLOW

Developed Condition Flow Rate Summary

Basin/Concentration Point ID	Area (ac)	Q_{100} (cfs)	Q_{10} (cfs)
ON1	18.1	53	27

Developed Condition Onsite Hydraulic Section Summary

Section ID	Section Description	Q_{100} (cfs)	Slope (%)	Depth (ft)	Velocity (fps)
Section A (Q = ON1)	V-Ditch w/ 3:1 SS and 8-inch riprap	53.0	1.02	1.22	7.56
Section B (Q = ON1)	3-ft wide Concrete U-Channel	11.0	4.08	0.36	10.15

Prorated Flow Summary

Basin ID	Q_{100} (cfs)	Area (acres)	100-yr Unit Flow (cfs/acre)
ON1	53	18.1	2.9
Subbasin ID	**Q_{100} (cfs)**	**Area (acres)**	**100-yr Unit Flow (cfs/acre)**
ON1 (a)	27	9.4	2.9
ON1 (b)	11	3.7	2.9
ON1 (c)	15	5.1	2.9
TOTAL	***53***	***18.1***	

Developed Condition 100-Year Street Flow Summary

Section ID	Slope (%)	Q_{100} (cfs)	Depth (ft)	Velocity (fps)	DxV
1	3.88	27	0.40	5.4	2.2
Q = ON1a	0.66		0.49	2.6	1.3
2	4.16	11	0.29	5.1	1.5
Q = ON1b	0.64		0.40	2.2	0.9
3	3.39	42	0.46	2.4	1.1
Q = ON1(a + c)	0.66		0.57	3.3	1.9
*ECA3a	4.94	17	0.38	5.3	2.0
*EGN1a	2.46	4	0.29	2.9	0.8
*EGN1b	0.50	2.5	0.38	1.6	0.6
*GT7	3.50	2	0.27	3.5	0.9

*Referenced from the Skye Canyon Phase 2 Infrastructure Study.

Recommended Flood Control Facility Summary

Facility ID	Facility Description	Design Flow (cfs) Q_{100}	Notes
P1	Proposed 5'x6' NDOT Type II Inlet	53	
*P3D	Existing 48" RCP	210	
*P4	(2) Existing 5-ft Type CM2 DIs	6	18" RCP North, 30" RCP South Lateral (Q shown is total for both inlets)
*P4A	Existing 48" RCP	269	
*P4B	Existing 36" RCP	53	
*P4C	Existing 5-ft Type CM2 DI	Nuisance	
*P4D	Existing 36" RCP	56	
*P4E	Existing 7.5-ft Type CM2 DI	3	Inlet Grates Replaced with Solid Plates
*P7	(2) Existing 5-ft Type CM2 DIs	3	
*P7A	Existing 36' to 42" RCP Transition	84	
*P7B	(2) Existing 5-ft Type CM2 DIs	2	18" RCP laterals (West Inlet Provided as Nuisance)
*L6	Existing 36" RCP	53	Stub Utilized for Facility P1 Tie In

*Referenced from the Skye Canyon Phase 2 Infrastructure Study.

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NO.	DESCRIPTION	DATE	BY	APP DATE	APP

NINETY-FIVE MANAGEMENT, LLC.

SKYE CANYON - PARCEL 2.27

DEVELOPED CONDITION DRAINAGE MAP

DATE: JUNE 2017
DRAFTER: ETM
DESIGNER: ETM
CHECKED: SOA
PROJECT NO.
OLY1607.005

EXHIBIT E
SHEET 1 OF 1

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APPENDIX B

Hydrologic Data

Precipitation

* REFERENCED FROM PHASE 2 INFRASTRUCTURE STUDY

SLATER HANIFAN GROUP
CONSULTING ENGINEERS & PLANNERS

Precipitation Worksheet
Rainfall Data and Computations

Project: Kyle Canyon Master Drainage Study
Date: 6/1/2010

Data: | **Reference**

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

Rainfall Depth-Duration-Frequency 10-Year, 6-Hour: 1.35 inches — Figure 513*

Rainfall Depth-Duration-Frequency 100-Year, 6-Hour: 2.1 inches — Figure 503*

Precipitation Adjustment Ratios: — Figure 506*

10-Year: 1.24 — Table 501*
100-Year: 1.43 — Table 501*

Six Hour Depth Area Reduction Factors (DARF): — Table 502*
Area (gross acres): 10.0 = 0.0156 square miles
DARF = 1.00

Calculations:

P_{10} = 1.67 10-Year Precipitation (in)
P_{100} = 3.00 100-Year Precipitation (in)

P10/P100= 0.56 HEC-1 Multiple Ratio Value

Equations:

P=(Rainfall)*(Precipitation Adjustment Ratio)*(Depth Area Reduction Factor)

Comments:

* Kyle Canyon West Basins, West of Hualapai

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

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SIX HOUR DEPTH-AREA REDUCTION FACTORS

Drainage Area (Square Miles)	Six-Hour Depth-Area Reduction Factor
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.

Revision	Date

SIX-HOUR STORM DISTRIBUTIONS

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

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

SLATER HANIFAN GROUP
CONSULTING ENGINEERS & PLANNERS

Soil Data & Curve Number Computation

Project Name & Number: Skye Canyon Parcel 2.27
Date: 6/20/2017
By: ETM

Data:

Reference:
Exhibit D
NRCS Soil Data

Soil Type - Soil Survey Area & Version, Soil Description				A	B	C	D
LV	155	Las Vegas Valley 2016	Cave gravelly fine sandy loam, 4 to 15 percent slopes	0%	0%	0%	100%
LV	191	Las Vegas Valley 2016	Dalian very cobbly fine sandy loam, 2 to 8 percent slopes	100%	0%	0%	0%
LV	400	Las Vegas Valley 2016	Tencee very gravelly fine sandy loam, 2 to 8 percent slopes	0%	0%	0%	100%

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

*Commercial land use per Note 3

DEVELOPED CONDITION

BASIN ID	SURVEY AREA	SOIL TYPE	SUBAREA PERCENT	LAND USE	HYDROLOGIC SOIL GROUP				LAND USE CN				SUBAREA ACRES	CURVE NUMBER
					A	B	C	D	A	B	C	D		
ON1	LV	155	83.0%	Residential (<6,000 sf)*	0%	0%	0%	100%	89	92	94	95	15.05	78.82
	LV	191	1.7%	Residential (<6,000 sf)*	100%	0%	0%	0%	89	92	94	95	0.30	1.47
	LV	400	15.4%	Residential (<6,000 sf)*	0%	0%	0%	100%	89	92	94	95	2.79	14.61
		TOTAL PERCENT	100.0%	TOTAL AREA & COMPOSITE CURVE NUMBER:									18.14	94.9

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Standard Form 4 Computations

SLATER HANIFAN GROUP
CONSULTING ENGINEERS & PLANNERS

HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL
TIME OF CONCENTRATION

Project Name & Number: Skye Canyon Parcel 2.27
Description:
By: ETM
Date: 6/20/2017

SUB-BASIN DATA						INITIAL / OVERLAND TIME (Ti)			TRAVEL TIME (Tt)					Tc	Tc Check Urbanized Basins		Tlag
DESIG:	DEV./EX. (D or E)	CN	K [1]	AREA Ac	AREA Mi^2 [2]	INITIAL LENGTH Feet	SLOPE %	Ti Min [3]	TRAVEL LENGTH Feet	SLOPE %	V1 VELOCITY FPS [4]	V2 VELOCITY FPS [5]	Tt Min [6]	Tc Calc. [7]	Total Length Feet [8]	Tc Check [9]	Tlag Hours [10]
DEVELOPED CONDITION																	
ON1	D	94.9	0.863	18.14	0.0283	115	1.00	4.58	1850	1.30	2.30	3.49	10.07	14.65	1965	20.917	0.146

[1] K = 0.0132 (CN) - 0.39
[2] A = Area/640
[3] Ti = (1.8 (1.1-K) L^0.5)/S^0.33
[4] For Existing Conditions: V1 = 14.8 * (S/100)^0.5
For Developed Conditions: V1 = 20.2 * (S/100)^0.5
[5] For Existing Conditions: V2 = 29.4 * (S/100)^0.5
For Developed Conditions: V2 = 30.6 * (S/100)^0.5
[6] Tt = L/(60*V)
[7] Tc = Ti + Tt
[8] Total L = Initial L + Travel L
[9] Tc = (L/180) + 10
[10] Tlag = (0.6*Tc)/60
[11] Min Tlag =0.05
Note: For Travel Time Calcs: V1 applies to first 500 feet and V2 applies to remaining distance.

REFERENCE :

STANDARD FORM 4

APPENDIX C

Developed Condition HEC-1 Analysis

DEV

```
1*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*              JUN  1998                *
*            VERSION 4.1                *
*                                       *
*  RUN DATE   14JUN17  TIME  15:40:05   *
*                                       *
*****************************************
```

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

```
X     X  XXXXXXX   XXXXX          X
X     X  X        X     X        XX
X     X  X        X              X
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

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

                        *DIAGRAM
            1           ID     SLATER HANIFAN GROUP
            2           ID     SKYE CANYON PARCEL 2.27
            3           ID     DEVELOPED CONDITION
            4           ID
            5           ID     RETURN PERIOD ------- 100-YR & 10-YR
            6           ID     DISTRIBUTION -------- 6-HOUR SDN3
            7           ID     PROJECT NO. ---------- OLY1607.005
            8           ID     FILENAME ------------ DEV.H1
            9           ID     DATE ----------------- JUNE 2017
           10           ID     MODELED BY ---------- ETM
           11           ID
           12           ID        PRECIPITATION STORM EVENT RATIOS
           13           ID        STORM EVENT             RATIO
           14           ID        10-YR                   0.56
           15           ID        100-YR                  1.00
           16           ID
           17           IT       5       0       0     300
           18           IO       5       0       0
           19           IN       5       0       0
           20           JR    PREC    1.00    0.56
                        *
           21           KK     ON1
           22           KM   DEVELOPED SITE ENTRY
           23           BA  0.0283
           24           PB    3.00
           25           PC       0   0.020   0.057   0.070   0.087   0.108   0.124   0.130   0.130   0.130
           26           PC   0.130   0.130   0.130   0.133   0.140   0.142   0.148   0.158   0.172   0.181
           27           PC   0.190   0.197   0.199   0.200   0.201   0.204   0.214   0.229   0.241   0.249
           28           PC   0.251   0.256   0.270   0.278   0.281   0.283   0.295   0.322   0.352   0.409
           29           PC   0.499   0.590   0.710   0.744   0.781   0.812   0.819   0.835   0.851   0.856
           30           PC   0.860   0.868   0.876   0.888   0.910   0.926   0.937   0.950   0.970   0.976
           31           PC   0.982   0.985   0.987   0.989   0.990   0.993   0.993   0.994   0.995   0.998
           32           PC   0.998   0.999       1
           33           LS       0    94.9
           34           UD   0.146
                        *
           35           ZZ
```

1 SCHEMATIC DIAGRAM OF STREAM NETWORK

```
 INPUT
  LINE      (V) ROUTING          (--->) DIVERSION OR PUMP FLOW

   NO.      (.) CONNECTOR        (<---) RETURN OF DIVERTED OR PUMPED FLOW

    21         ON1

 (***) RUNOFF ALSO COMPUTED AT THIS LOCATION
```


```
1*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*              JUN  1998                *
*            VERSION 4.1                *
*                                       *
*  RUN DATE   14JUN17  TIME  15:40:05   *
*                                       *
*****************************************
```

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


SLATER HANIFAN GROUP
SKYE CANYON PARCEL 2.27
DEVELOPED CONDITION

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

DISTRIBUTION -------- 6-HOUR SDN3
PROJECT NO. --------- OLY1607.005
FILENAME ------------ DEV.H1
DATE ---------------- JUNE 2017
MODELED BY ---------- ETM

PRECIPITATION STORM EVENT RATIOS

STORM EVENT	RATIO
10-YR	0.56
100-YR	1.00

18 IO OUTPUT CONTROL VARIABLES

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

IT HYDROGRAPH TIME DATA

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

COMPUTATION INTERVAL .08 HOURS
TOTAL TIME BASE 24.92 HOURS

ENGLISH UNITS

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

JP MULTI-PLAN OPTION
NPLAN 1 NUMBER OF PLANS

JR MULTI-RATIO OPTION
RATIOS OF PRECIPITATION
1.00 .56
1

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

OPERATION	STATION	AREA	PLAN		RATIOS APPLIED TO PRECIPITATION RATIO 1 1.00	RATIO 2 .56
HYDROGRAPH AT						
+	ON1	.03	1	FLOW	53.	27.
				TIME	3.58	3.58

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

APPENDIX D

Hydraulic Computations

Street Flow Computations

Section 1 (Max Slope)
Worksheet for Irregular Channel

Project Description	
Worksheet	Section 1 (Max Slope)
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Channel Slope	3.88	%
Discharge	27.00	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	0.40	ft
Elevation Range	0.00 to 0.48	
Flow Area	5.0	ft²
Wetted Perimeter	34.29	ft
Top Width	34.08	ft
Actual Depth	0.40	ft
Critical Elevation	0.52	ft
Critical Slope	0.55	%
Velocity	5.42	ft/s
Velocity Head	0.46	ft
Specific Energy	0.85	ft
Froude Number	2.50	
Flow Type	Supercritical	

Calculation Messages:
Flow is divided.

Roughness Segments		
Start Station	End Station	Mannings Coefficient
0+00.00	0+07.50	0.013
0+07.50	0+41.50	0.016
0+41.50	0+49.00	0.013

Natural Channel Points	
Station (ft)	Elevation (ft)
0+00.00	0.48
0+05.00	0.38
0+05.38	0.38
0+06.50	0.00
0+07.50	0.08
0+07.50	0.12
0+24.50	0.46
0+41.50	0.12
0+41.50	0.08

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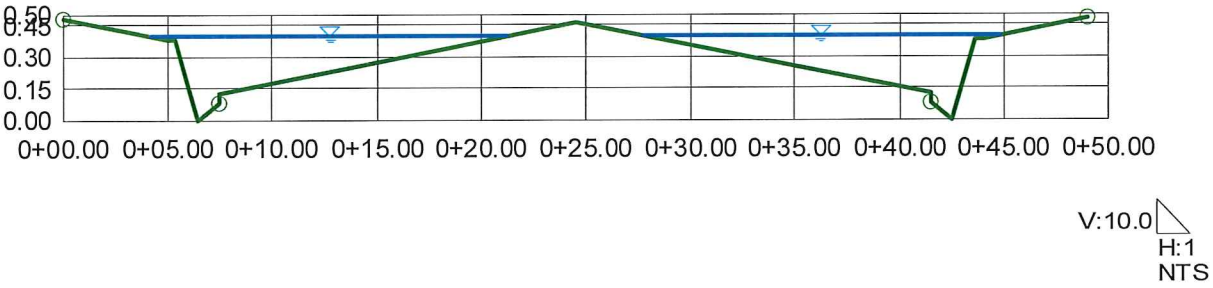
Section 1 (Max Slope)
Worksheet for Irregular Channel

Natural Channel Points	
Station (ft)	Elevation (ft)
0+42.50	0.00
0+43.62	0.38
0+44.00	0.38
0+49.00	0.48

Section 1 (Max Slope)
Cross Section for Irregular Channel

Project Description	
Worksheet	Section 1 (Max Slope)
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

Section Data		
Mannings Coefficient	0.015	
Channel Slope	3.88	%
Water Surface Elevation	0.40	ft
Elevation Range	0.00 to 0.48	
Discharge	27.00	cfs



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Section 1 (Min Slope)
Worksheet for Irregular Channel

Project Description	
Worksheet	Section 1 (Min Slope)
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Channel Slope	0.66	%
Discharge	24.00	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	0.49	ft
Elevation Range	0.00 to 0.48	
Flow Area	9.2	ft²
Wetted Perimeter	49.25	ft
Top Width	49.00	ft
Actual Depth	0.49	ft
Critical Elevation	0.50	ft
Critical Slope	0.58	%
Velocity	2.61	ft/s
Velocity Head	0.11	ft
Specific Energy	0.60	ft
Froude Number	1.06	
Flow Type	Supercritical	

Calculation Messages:
Water elevation exceeds lowest end station by 0.1284027e-1 ft.

Roughness Segments		
Start Station	End Station	Mannings Coefficient
0+00.00	0+07.50	0.013
0+07.50	0+41.50	0.016
0+41.50	0+49.00	0.013

Natural Channel Points	
Station (ft)	Elevation (ft)
0+00.00	0.48
0+05.00	0.38
0+05.38	0.38
0+06.50	0.00
0+07.50	0.08
0+07.50	0.12
0+24.50	0.46
0+41.50	0.12
0+41.50	0.08

Section 1 (Min Slope)
Worksheet for Irregular Channel

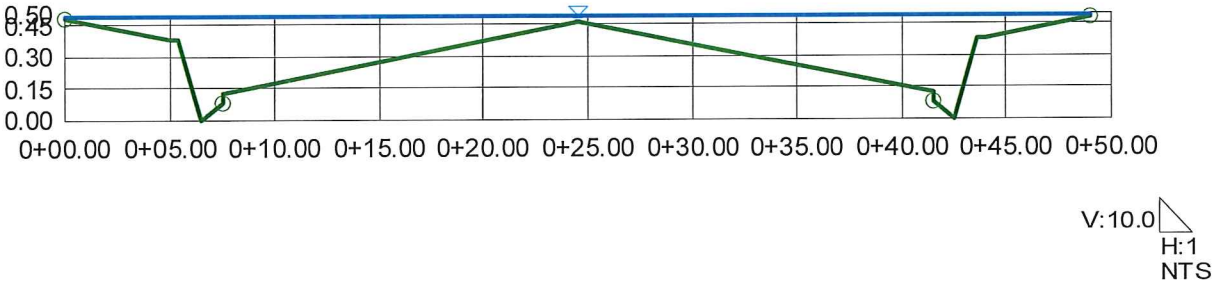
Natural Channel Points	
Station (ft)	Elevation (ft)
0+42.50	0.00
0+43.62	0.38
0+44.00	0.38
0+49.00	0.48

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Section 1 (Min Slope)
Cross Section for Irregular Channel

Project Description	
Worksheet	Section 1 (Min Slope)
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

Section Data	
Mannings Coefficient	0.015
Channel Slope	0.66 %
Water Surface Elevation	0.49 ft
Elevation Range	0.00 to 0.48
Discharge	24.00 cfs



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Section 2 (Max Slope)
Worksheet for Irregular Channel

Project Description	
Worksheet	Section 2 (Max Slope)
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Channel Slope	4.16	%
Discharge	11.00	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	0.29	ft
Elevation Range	0.00 to 0.48	
Flow Area	2.2	ft²
Wetted Perimeter	20.76	ft
Top Width	20.57	ft
Actual Depth	0.29	ft
Critical Elevation	0.40	ft
Critical Slope	0.49	%
Velocity	5.08	ft/s
Velocity Head	0.40	ft
Specific Energy	0.69	ft
Froude Number	2.76	
Flow Type	Supercritical	

Calculation Messages:
Flow is divided.

Roughness Segments		
Start Station	End Station	Mannings Coefficient
0+00.00	0+07.50	0.013
0+07.50	0+41.50	0.016
0+41.50	0+49.00	0.013

Natural Channel Points	
Station (ft)	Elevation (ft)
0+00.00	0.48
0+05.00	0.38
0+05.38	0.38
0+06.50	0.00
0+07.50	0.08
0+07.50	0.12
0+24.50	0.46
0+41.50	0.12
0+41.50	0.08

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Section 2 (Max Slope)
Worksheet for Irregular Channel

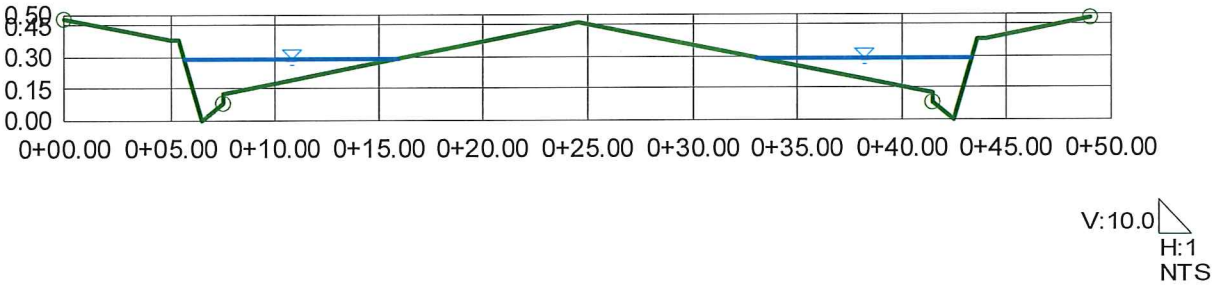
Natural Channel Points	
Station (ft)	Elevation (ft)
0+42.50	0.00
0+43.62	0.38
0+44.00	0.38
0+49.00	0.48

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Section 2 (Max Slope)
Cross Section for Irregular Channel

Project Description	
Worksheet	Section 2 (Max Slope)
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

Section Data		
Mannings Coefficient	0.013	
Channel Slope	4.16	%
Water Surface Elevation	0.29	ft
Elevation Range	0.00 to 0.48	
Discharge	11.00	cfs



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Section 2 (Min Slope)
Worksheet for Irregular Channel

Project Description	
Worksheet	Section 2 (Min Slope)
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Channel Slope	0.64	%
Discharge	11.00	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	0.40	ft
Elevation Range	0.00 to 0.48	
Flow Area	5.0	ft²
Wetted Perimeter	34.39	ft
Top Width	34.17	ft
Actual Depth	0.40	ft
Critical Elevation	0.40	ft
Critical Slope	0.62	%
Velocity	2.20	ft/s
Velocity Head	0.08	ft
Specific Energy	0.47	ft
Froude Number	1.01	
Flow Type	Supercritical	

Calculation Messages:
Flow is divided.

Roughness Segments

Start Station	End Station	Mannings Coefficient
0+00.00	0+07.50	0.013
0+07.50	0+41.50	0.016
0+41.50	0+49.00	0.013

Natural Channel Points

Station (ft)	Elevation (ft)
0+00.00	0.48
0+05.00	0.38
0+05.38	0.38
0+06.50	0.00
0+07.50	0.08
0+07.50	0.12
0+24.50	0.46
0+41.50	0.12
0+41.50	0.08

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Section 2 (Min Slope)
Worksheet for Irregular Channel

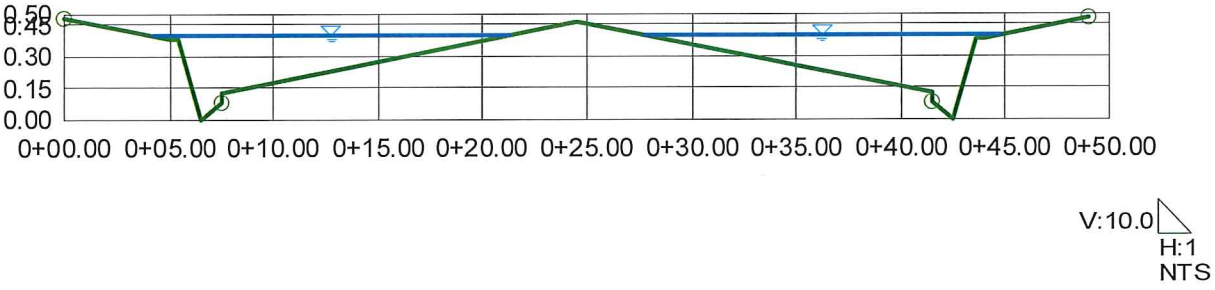
Natural Channel Points	
Station (ft)	Elevation (ft)
0+42.50	0.00
0+43.62	0.38
0+44.00	0.38
0+49.00	0.48

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Section 2 (Min Slope)
Cross Section for Irregular Channel

Project Description	
Worksheet	Section 2 (Min Slope)
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

Section Data	
Mannings Coefficient	0.015
Channel Slope	0.64 %
Water Surface Elevation	0.40 ft
Elevation Range	0.00 to 0.48
Discharge	11.00 cfs



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Section 3 (Max Slope)
Worksheet for Irregular Channel

Project Description	
Worksheet	Section 3 (Max Slope)
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Channel Slope	3.39	%
Discharge	42.00	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	0.46	ft
Elevation Range	0.00 to 0.48	
Flow Area	7.8	ft²
Wetted Perimeter	47.60	ft
Top Width	47.38	ft
Actual Depth	0.46	ft
Critical Elevation	0.59	ft
Critical Slope	0.52	%
Velocity	5.39	ft/s
Velocity Head	0.45	ft
Specific Energy	0.92	ft
Froude Number	2.35	
Flow Type	Supercritical	

Roughness Segments

Start Station	End Station	Mannings Coefficient
0+00.00	0+07.50	0.013
0+07.50	0+41.50	0.016
0+41.50	0+49.00	0.013

Natural Channel Points

Station (ft)	Elevation (ft)
0+00.00	0.48
0+05.00	0.38
0+05.38	0.38
0+06.50	0.00
0+07.50	0.08
0+07.50	0.12
0+24.50	0.46
0+41.50	0.12
0+41.50	0.08
0+42.50	0.00
0+43.62	0.38
0+44.00	0.38

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Section 3 (Max Slope)
Worksheet for Irregular Channel

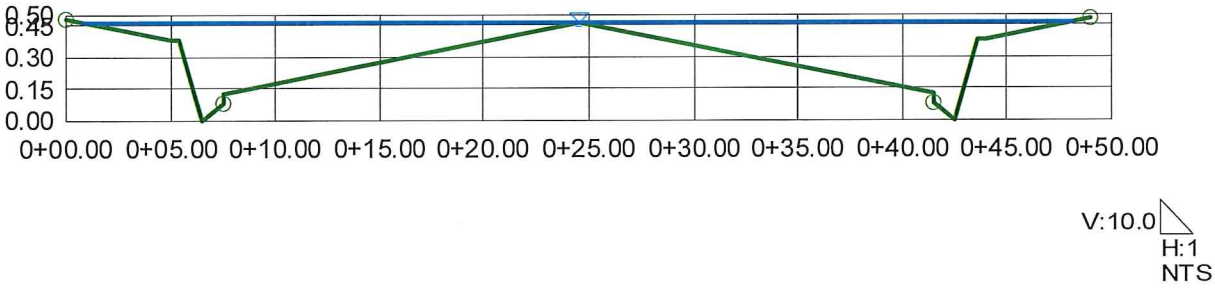
Natural Channel Points	
Station (ft)	Elevation (ft)
0+49.00	0.48

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Section 3 (Max Slope)
Cross Section for Irregular Channel

Project Description	
Worksheet	Section 3 (Max Slope)
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

Section Data		
Mannings Coefficient	0.015	
Channel Slope	3.39	%
Water Surface Elevation	0.46	ft
Elevation Range	0.00 to 0.48	
Discharge	42.00	cfs



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Section 3 (Min Slope)
Worksheet for Irregular Channel

Project Description	
Worksheet	Section 3 (Min Slope)
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Channel Slope	0.66	%
Discharge	42.00	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	0.57	ft
Elevation Range	0.00 to 0.48	
Flow Area	12.9	ft²
Wetted Perimeter	49.40	ft
Top Width	49.00	ft
Actual Depth	0.57	ft
Critical Elevation	0.59	ft
Critical Slope	0.51	%
Velocity	3.26	ft/s
Velocity Head	0.17	ft
Specific Energy	0.73	ft
Froude Number	1.12	
Flow Type	Supercritical	

Calculation Messages:
Water elevation exceeds lowest end station by 0.87817621e-1 ft.

Roughness Segments

Start Station	End Station	Mannings Coefficient
0+00.00	0+07.50	0.013
0+07.50	0+41.50	0.016
0+41.50	0+49.00	0.013

Natural Channel Points

Station (ft)	Elevation (ft)
0+00.00	0.48
0+05.00	0.38
0+05.38	0.38
0+06.50	0.00
0+07.50	0.08
0+07.50	0.12
0+24.50	0.46
0+41.50	0.12
0+41.50	0.08

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Section 3 (Min Slope)
Worksheet for Irregular Channel

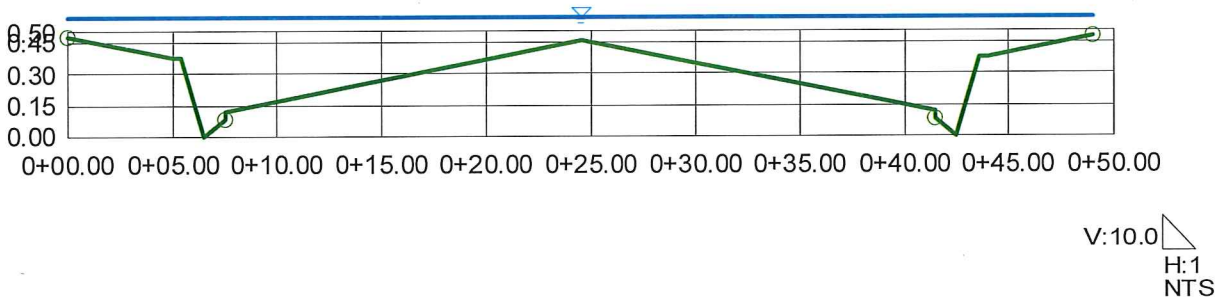
Natural Channel Points	
Station (ft)	Elevation (ft)
0+42.50	0.00
0+43.62	0.38
0+44.00	0.38
0+49.00	0.48

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Section 3 (Min Slope)
Cross Section for Irregular Channel

Project Description	
Worksheet	Section 3 (Min Slope)
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

Section Data	
Mannings Coefficient	0.015
Channel Slope	0.66 %
Water Surface Elevation	0.57 ft
Elevation Range	0.00 to 0.48
Discharge	42.00 cfs



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Easement Analysis

Section A (Normal Depth)
Worksheet for Irregular Channel

Project Description	
Worksheet	Section A (Normal Depth)
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Channel Slope	1.02	%
Discharge	53.00	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	1.22	ft
Elevation Range	0.00 to 2.96	
Flow Area	7.0	ft²
Wetted Perimeter	9.89	ft
Top Width	9.53	ft
Actual Depth	1.22	ft
Critical Elevation	1.50	ft
Critical Slope	0.40	%
Velocity	7.56	ft/s
Velocity Head	0.89	ft
Specific Energy	2.11	ft
Froude Number	1.56	
Flow Type	Supercritical	

Roughness Segments

Start Station	End Station	Mannings Coefficient
0+00.00	0+08.50	0.037
0+08.50	0+11.50	0.013
0+11.50	0+20.00	0.037

Natural Channel Points

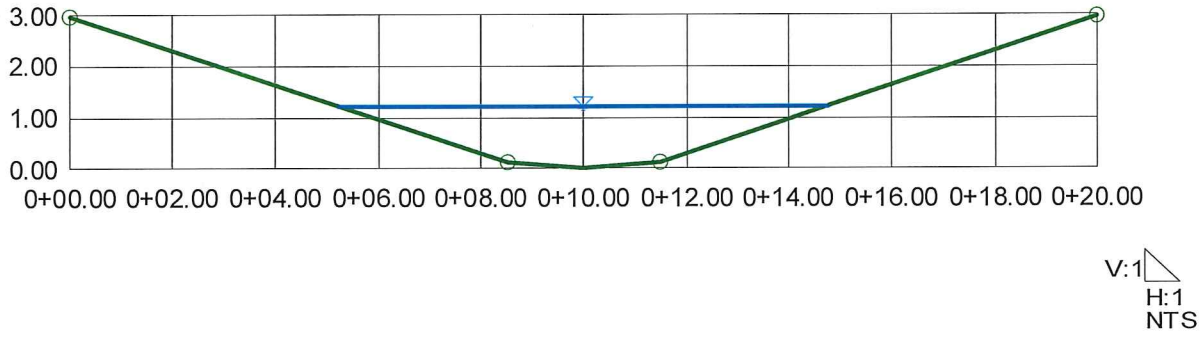
Station (ft)	Elevation (ft)
0+00.00	2.96
0+08.50	0.13
0+10.00	0.00
0+11.50	0.13
0+20.00	2.96

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Section A (Normal Depth)
Cross Section for Irregular Channel

Project Description	
Worksheet	Section A (Normal Depth)
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

Section Data		
Mannings Coefficient	0.016	
Channel Slope	1.02	%
Water Surface Elevation	1.22	ft
Elevation Range	0.00 to 2.96	
Discharge	53.00	cfs



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Section A (Weir Depth)
Worksheet for Broad Crested Weir

Project Description	
Worksheet	Section A (Weir Depth)
Type	Broad Crested Weir
Solve For	Headwater Elevation

Input Data		
Discharge	53.00	cfs
Crest Elevation	0.00	ft
Tailwater Elevation	1.22	ft
Crest Surface Type	Paved	
Crest Breadth	5.00	ft
Crest Length	20.00	ft

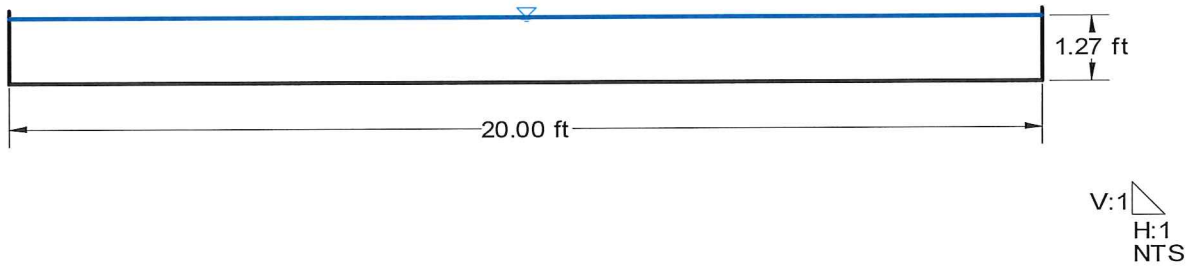
Results		
Headwater Elevation	1.27	ft
Headwater Height Above Crest	1.27	ft
Tailwater Height Above Crest	1.22	ft
Discharge Coefficient	3.08	US
Submergence Factor	0.60	
Adjusted Discharge Coefficient	1.86	US
Flow Area	25.4	ft²
Velocity	2.09	ft/s
Wetted Perimeter	22.54	ft
Top Width	20.00	ft

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Section A (Weir Depth)
Cross Section for Broad Crested Weir

Project Description	
Worksheet	Section A (Weir Depth)
Type	Broad Crested Weir
Solve For	Headwater Elevation

Section Data		
Discharge	53.00	cfs
Headwater Elevation	1.27	ft
Crest Elevation	0.00	ft
Tailwater Elevation	1.22	ft
Crest Surface Type	Paved	
Crest Breadth	5.00	ft
Crest Length	20.00	ft



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CONSULTING ENGINEERS & PLANNERS

Rip Rap Sizing Computation

Project Name & Number: OLY1607.005
Date: 6/21/2017
By: ETM

Location: Section A

Known Information: **Reference:**

Rip Rap protection at

V =	Velocity (fps)	7.6	WSPG Hydraulic / Flowmaster Calculations
S_g =	Specific Gravity of Rock (typ=2.5)	2.5	Use Typical
s =	Longitudinal Channel Slope (ft/ft)	0.0102	Grading Plan

Solve For:

d_{50} = 0.60 ft - Average Rock Size

d_{50} =	**7**	**in**	**- Average Rock Size**
Thickness =	**14**	**in**	**- Thickness of Rip Rap protection**
Manning's 'n' =	**0.036**		**- Roughness Coefficient**

Equations:

Based upon a Stable Channel Lining

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

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

Recommendations:

* Provided 8-in Riprap

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

5740 S. Arville St., Suite 216 - Las Vegas, NV 89118
Ph. 702-284-5300 - Fx. 702-284-5399

Section B (Normal Depth)
Worksheet for Rectangular Channel

Project Description	
Worksheet	Section B (Normal Depth)
Flow Element	Rectangular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Mannings Coefficient	0.013	
Channel Slope	4.08	%
Bottom Width	3.00	ft
Discharge	11.00	cfs

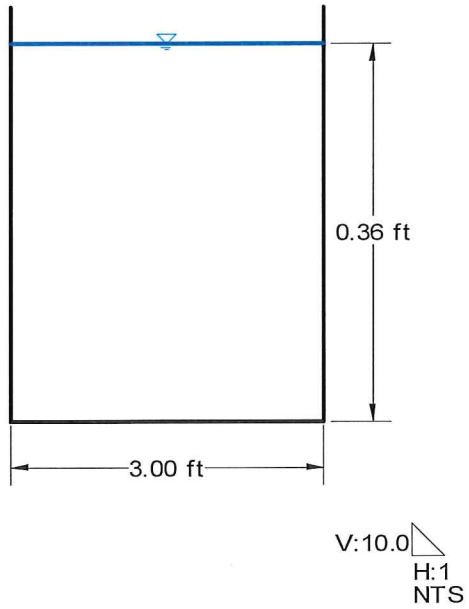
Results		
Depth	0.36	ft
Flow Area	1.1	ft²
Wetted Perimeter	3.72	ft
Top Width	3.00	ft
Critical Depth	0.75	ft
Critical Slope	0.47	%
Velocity	10.15	ft/s
Velocity Head	1.60	ft
Specific Energy	1.96	ft
Froude Number	2.98	
Flow Type	Supercritical	

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Section B (Normal Depth)
Cross Section for Rectangular Channel

Project Description	
Worksheet	Section B (Normal Depth)
Flow Element	Rectangular Channel
Method	Manning's Formula
Solve For	Channel Depth

Section Data		
Mannings Coefficient	0.013	
Channel Slope	4.08	%
Depth	0.36	ft
Bottom Width	3.00	ft
Discharge	11.00	cfs



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Section B (Weir Depth)
Worksheet for Broad Crested Weir

Project Description	
Worksheet	Section B (Weir Depth)
Type	Broad Crested Weir
Solve For	Headwater Elevation

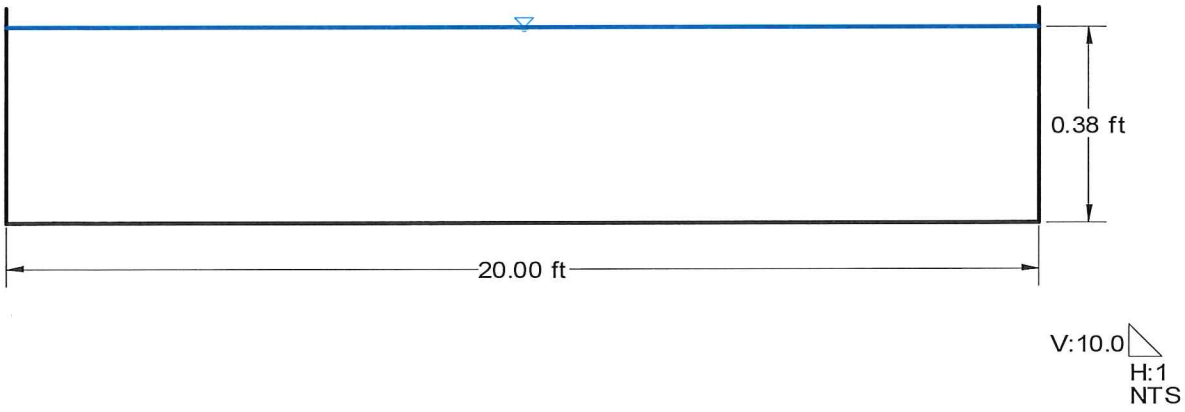
Input Data		
Discharge	11.00	cfs
Crest Elevation	0.00	ft
Tailwater Elevation	0.36	ft
Crest Surface Type	Paved	
Crest Breadth	5.00	ft
Crest Length	20.00	ft

Results		
Headwater Elevation	0.38	ft
Headwater Height Above Crest	0.38	ft
Tailwater Height Above Crest	0.36	ft
Discharge Coefficient	2.99	US
Submergence Factor	0.79	
Adjusted Discharge Coefficient	2.36	US
Flow Area	7.6	ft^2
Velocity	1.45	ft/s
Wetted Perimeter	20.76	ft
Top Width	20.00	ft

Section B (Weir Depth)
Cross Section for Broad Crested Weir

Project Description	
Worksheet	Section B (Weir Depth)
Type	Broad Crested Weir
Solve For	Headwater Elevation

Section Data		
Discharge	11.00	cfs
Headwater Elevation	0.38	ft
Crest Elevation	0.00	ft
Tailwater Elevation	0.36	ft
Crest Surface Type	Paved	
Crest Breadth	5.00	ft
Crest Length	20.00	ft

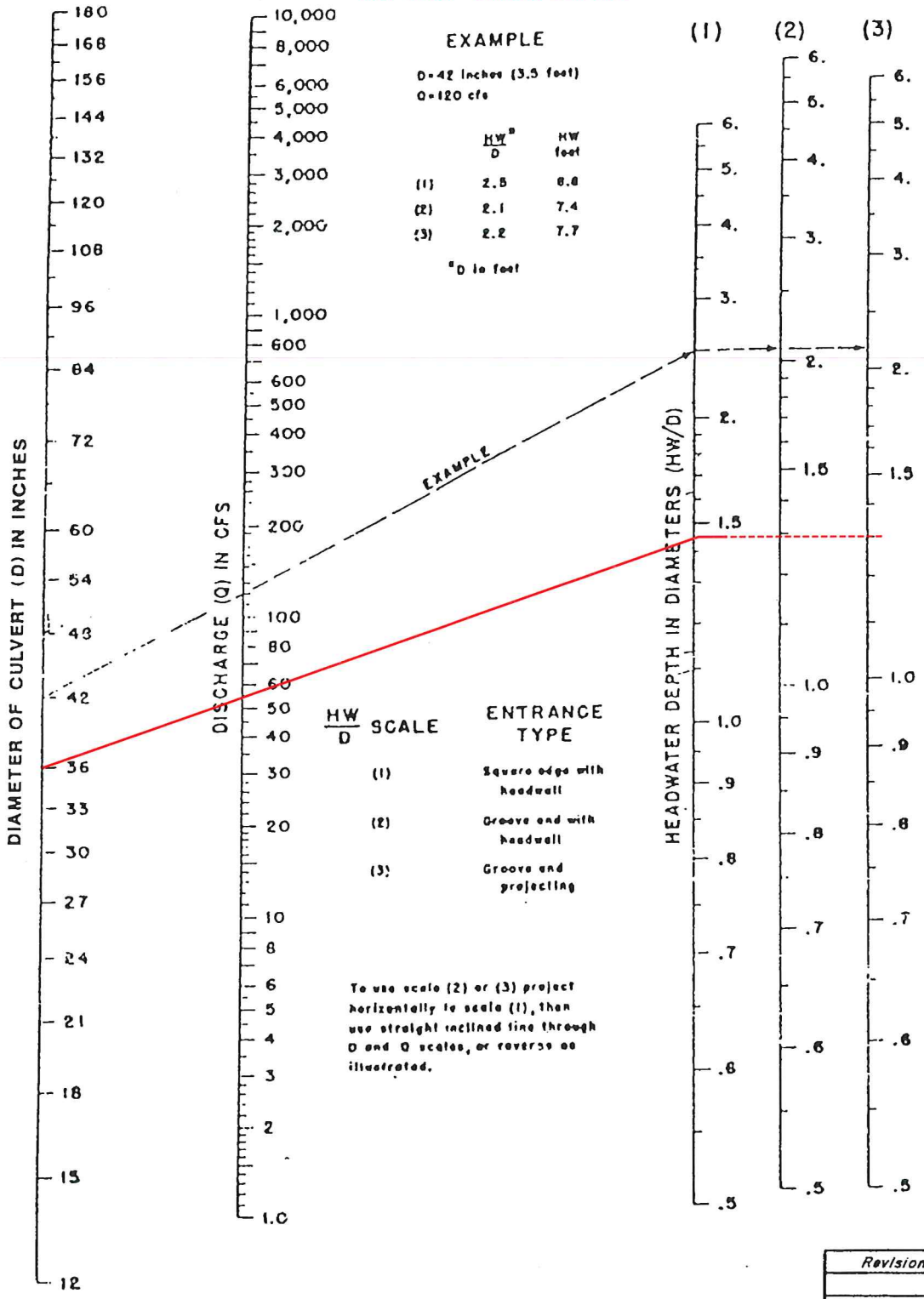


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37 Brookside Road Waterbury, CT 06708 USA +1-203-755-1666

Nomograph and Drop Inlet Computations

NOMOGRAPH – INLET CONTROL RCP

36" RCP-Q100=53 cfs



HW/D	1.45
D	36
HW	4.4

Revision	Date

WRC ENGINEERING

REFERENCE:
USDOT, FHWA, HDS, No. 5, 1985

FIGURE 1005

Grate Inlet Sizing Computation

SLATER HANIFAN GROUP
CONSULTING ENGINEERS & PLANNERS

Project Name & Number: Skye Canyon Parcel 2.27
Date: 6/20/2017
By: ETM

Notes:

Facility ID:	Facility P1
Drainage Condition:	Developed
Source of Flow:	Q100= Basin ON1
Inlet Type:	NDOT Type 2
Inlet Size:	5'x6'

Known Information:

Q =	Flow (cfs)	53.0
W =	Width of Grate (ft)	5.00
L =	Length of Grate (ft)	6.00
D =	Diameter of Circle (in)	
Cf =	Clogging Factor (%)	50

Weir Conditions:

$$HW = (Q/(Cw*Pc))^{2/3}$$

Cw =	Weir Coefficient	3.30
P =	Perimeter of grate (ft)	22.0
Pc =	Perimeter (w/clogging) (ft)	11.0
HW =	Headwater depth (ft)	1.29

Orifice Conditions:

$$HW = (Q/(Co*Ac))^2/2*g$$

Co =	Orifice Coefficient	0.67
Ag =	Grate Area (ft^2)	30.00
Gf =	Grate Opening Factor	0.67
Ac =	Grate Open Area (w/ clogging) (ft^2)	10.05
g =	Gravity (fps)	32.20
HW =	Headwater depth (ft)	0.96

Output:

Worst Case Scenario Occurs Under Weir Conditions

Headwater Depth = 1.29 ft with grate

APPENDIX E

Storm Drain WSPG Analyses

```
0
T1 SKYE CANYON PARCEL 2.27
T2 BY OLYMPIA COMPANIES
T3 EAGLE CANYON LATERAL P4-L1 THRU PARCEL 2.27
SO    1000.002886.16 36                          2894.61
R     1033.232887.93 36       .013                              38.   1
JX    1033.232887.93 36 36    .013      3.0       2887.93      90.00
R     1074.452890.13 36       .013                              90.   1
JX    1074.452890.13 36       .013
R     1114.202892.25 36       .013                               0.   1
SH    1114.202892.25 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.
CD  54  4              4.5
CD  60  4              5.
CD  66  4              5.5
CD  72  4              6.
CD  78  4              6.5
```

53.0

DATE: 6/20/2017
TIME: 11:10

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														
CD	54	4			4.50														
CD	60	4			5.00														
CD	66	4			5.50														
CD	72	4			6.00														
CD	78	4			6.50														

F 0 5 1 5 P PAGE NO 3

WATER SURFACE PROFILE - TITLE CARD LISTING

HEADING LINE NO 1 IS -

SKYE CANYON PARCEL 2.27

HEADING LINE NO 2 IS -

BY OLYMPIA COMPANIES

HEADING LINE NO 3 IS -

EAGLE CANYON LATERAL P4-L1 THRU PARCEL 2.27

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	2886.16	36	2894.61

ELEMENT NO 2 IS A REACH

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	1033.23	2887.93	36	0.013	0.00	0.00	38.00	1

ELEMENT NO 3 IS A JUNCTION

U/S DATA	STATION	INVERT	SECT	LAT-1	LAT-2	N	Q3	Q4	INVERT-3	INVERT-4	PHI 3	PHI 4
	1033.23	2887.93	36	36	0	0.013	3.0	0.0	2887.93	0.00	90.00	0.00

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 4 IS A REACH

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	1074.45	2890.13	36	0.013	0.00	0.00	90.00	1

ELEMENT NO 5 IS A JUNCTION

U/S DATA	STATION	INVERT	SECT	LAT-1	LAT-2	N	Q3	Q4	INVERT-3	INVERT-4	PHI 3	PHI 4
	1074.45	2890.13	36	0	0	0.013	0.0	0.0	0.00	0.00	0.00	0.00

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 6 IS A REACH

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	1114.20	2892.25	36	0.013	0.00	0.00	0.00	1

ELEMENT NO 7 IS A SYSTEM HEADWORKS

U/S DATA	STATION	INVERT	SECT	W S ELEV
	1114.20	2892.25	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

LICENSEE: SLATER HANIFAN GROUP F0515P PAGE 1

WATER SURFACE PROFILE LISTING

SKYE CANYON PARCEL 2.27
BY OLYMPIA COMPANIES
EAGLE CANYON LATERAL P4-L1 THRU PARCEL 2.27

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	2886.16	8.450	2894.610	56.0	7.92	0.974	2895.584	0.00	2.427		3.00	0.00	0.00	0	0.00
33.23	0.05326					.007049	0.23			1.250			0.00		
1033.23	2887.93	7.085	2895.015	56.0	7.92	0.974	2895.989	0.00	2.427		3.00	0.00	0.00	0	0.00
JUNCT STR	0.00000					.006681	0.00						0.00		
1033.23	2887.93	7.288	2895.218	53.0	7.50	0.873	2896.091	0.00	2.366		3.00	0.00	0.00	0	0.00
41.22	0.05337					.006314	0.26			1.212			0.00		
JUNCT STR	0.00000					.006314	0.00						0.00		
1074.45	2890.13	5.652	2895.782	53.0	7.50	0.873	2896.655	0.00	2.366		3.00	0.00	0.00	0	0.00
39.75	0.05333					.006314	0.25			1.213			0.00		
1114.20	2892.25	3.826	2896.076	53.0	7.50	0.873	2896.949	0.00	2.366		3.00	0.00	0.00	0	0.00#

SKYE CANYON PARCEL 2.27
BY OLYMPIA COMPANIES
EAGLE CANYON LATERAL P4-L1 THRU PARCEL 2.27



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‡

APPENDIX F

Finished Floor Analysis

SKYE CANYON PARCEL 2.27
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	3	2902.57	2902.19	0.57	2903.33	2903.07	2903.9	OK	OK	
2	3	2902.97	2902.59	0.57	2903.73	2903.47	2904.6	OK	OK	
3	3	2903.36	2902.98	0.57	2904.12	2903.86	2905.0	OK	OK	
4	3	2903.76	2903.38	0.57	2904.52	2904.26	2905.4	OK	OK	
5	3	2904.15	2903.77	0.57	2904.91	2904.65	2905.8	OK	OK	
6	3	2904.55	2904.17	0.57	2905.31	2905.05	2906.2	OK	OK	
7	3	2904.91	2904.53	0.57	2905.67	2905.41	2906.6	OK	OK	
8	3	2905.30	2904.92	0.57	2906.06	2905.80	2906.9	OK	OK	
9	3	2905.69	2905.31	0.57	2906.45	2906.19	2907.3	OK	OK	
10	1	2906.45	2906.07	0.49	2907.05	2906.95	2907.9	OK	OK	
11	1	2907.34	2906.96	0.49	2907.94	2907.84	2908.8	OK	OK	
12	1	2908.22	2907.84	0.49	2908.82	2908.72	2909.7	OK	OK	
13	1	2909.02	2908.64	0.49	2909.62	2909.52	2910.5	OK	OK	
14	1	2910.00	2909.62	0.49	2910.60	2910.50	2911.5	OK	OK	
15	1	2910.90	2910.52	0.49	2911.50	2911.40	2912.4	OK	OK	
16	1	2911.80	2911.42	0.49	2912.40	2912.30	2913.3	OK	OK	
17	1	2912.28	2911.90	0.49	2912.88	2912.78	2913.8	OK	OK	
18	1	2912.89	2912.51	0.49	2913.49	2913.39	2915.5	OK	OK	
19	1	2913.21	2912.83	0.49	2913.81	2913.71	2915.1	OK	OK	
20	1	2914.08	2913.70	0.49	2914.68	2914.58	2915.5	OK	OK	
21	1	2915.57	2915.19	0.49	2916.17	2916.07	2917.0	OK	OK	
22	1	2917.71	2917.33	0.49	2918.31	2918.21	2919.2	OK	OK	
23	1	2919.91	2919.53	0.49	2920.51	2920.41	2921.4	OK	OK	
24	1	2922.11	2921.73	0.49	2922.71	2922.61	2923.6	OK	OK	
25	1	2924.32	2923.94	0.49	2924.92	2924.82	2925.8	OK	OK	
26	1	2925.85	2925.47	0.49	2926.45	2926.35	2927.3	OK	OK	
27	1	2926.71	2926.33	0.49	2927.31	2927.21	2928.4	OK	OK	
28	1	2927.62	2927.24	0.49	2928.22	2928.12	2929.9	OK	OK	
29	1	2929.39	2929.01	0.49	2929.99	2929.89	2930.9	OK	OK	
30	1	2930.44	2930.06	0.49	2931.04	2930.94	2931.9	OK	OK	
31	2	2930.49	2930.11	0.4	2930.91	2930.99	2931.9	OK	OK	
32	2	2930.14	2929.76	0.4	2930.56	2930.64	2931.6	OK	OK	
33	2	2928.93	2928.55	0.4	2929.35	2929.43	2930.4	OK	OK	
34	2	2927.73	2927.35	0.4	2928.15	2928.23	2929.2	OK	OK	
35	2	2925.74	2925.36	0.4	2926.16	2926.24	2927.2	OK	OK	
36	2	2923.24	2922.86	0.4	2923.66	2923.74	2924.7	OK	OK	
37	2	2920.85	2920.47	0.4	2921.27	2921.35	2922.3	OK	OK	
38	2	2918.73	2918.35	0.4	2919.15	2919.23	2920.2	OK	OK	
39	2	2916.65	2916.27	0.4	2917.07	2917.15	2918.1	OK	OK	
40	2	2915.01	2914.63	0.4	2915.43	2915.51	2916.5	OK	OK	
41	2	2913.57	2913.19	0.4	2913.99	2914.07	2915.0	OK	OK	
42	2	2912.13	2911.75	0.4	2912.55	2912.63	2913.6	OK	OK	
43	2	2910.77	2910.39	0.4	2911.19	2911.27	2912.2	OK	OK	
44	2	2909.98	2909.60	0.4	2910.40	2910.48	2911.6	OK	OK	
45	2	2909.60	2909.22	0.4	2910.02	2910.10	2911.2	OK	OK	
46	2	2909.21	2908.83	0.4	2909.63	2909.71	2910.7	OK	OK	
47	2	2910.31	2909.93	0.4	2910.73	2910.81	2912.3	OK	OK	
48	2	2909.13	2908.75	0.4	2909.55	2909.63	2910.6	OK	OK	
49	2	2907.63	2907.25	0.4	2908.05	2908.13	2909.1	OK	OK	
50	2	2906.14	2905.76	0.4	2906.56	2906.64	2907.6	OK	OK	
51	2	2907.26	2906.88	0.4	2907.68	2907.76	2909.3	OK	OK	
52	3	2904.54	2904.16	0.57	2905.30	2905.04	2906.0	OK	OK	
53	3	2906.49	2906.11	0.57	2907.25	2906.99	2907.9	OK	OK	
54	2	2908.24	2907.86	0.4	2908.66	2908.74	2909.7	OK	OK	
55	3	2904.66	2904.28	0.57	2905.42	2905.16	2906.1	OK	OK	
56	3	2906.96	2906.58	0.57	2907.72	2907.46	2908.4	OK	OK	
57	3	2908.83	2908.45	0.57	2909.59	2909.33	2910.4	OK	OK	
58	2	2912.28	2911.90	0.4	2912.70	2912.78	2913.7	OK	OK	
59	2	2913.57	2913.19	0.4	2913.99	2914.07	2915.0	OK	OK	
60	2	2914.87	2914.49	0.4	2915.29	2915.37	2916.3	OK	OK	
61	2	2916.00	2915.62	0.4	2916.42	2916.50	2917.5	OK	OK	
62	3	2905.10	2904.72	0.57	2905.86	2905.60	2906.6	OK	OK	
63	3	2906.75	2906.37	0.57	2907.51	2907.25	2908.2	OK	OK	

SKYE CANYON PARCEL 2.27
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	3	2907.64	2907.26	0.57	2908.40	2908.14	2909.6	OK	OK	
65	3	2907.64	2907.26	0.57	2908.40	2908.14	2909.7	OK	OK	
66	3	2906.75	2906.37	0.57	2907.51	2907.25	2908.2	OK	OK	
67	3	2905.10	2904.72	0.57	2905.86	2905.60	2906.6	OK	OK	
68	3	2906.86	2906.48	0.57	2907.62	2907.36	2908.3	OK	OK	
69	3	2908.90	2908.52	0.57	2909.66	2909.40	2910.4	OK	OK	
70	3	2910.93	2910.55	0.57	2911.69	2911.43	2912.4	OK	OK	
71	3	2913.31	2912.93	0.57	2914.07	2913.81	2914.8	OK	OK	
72	1	2906.86	2906.48	0.49	2907.46	2907.36	2908.3	OK	OK	
73	1	2908.90	2908.52	0.49	2909.50	2909.40	2910.4	OK	OK	
74	1	2910.93	2910.55	0.49	2911.53	2911.43	2912.4	OK	OK	
75	1	2912.96	2912.58	0.49	2913.56	2913.46	2914.4	OK	OK	
76	1	2914.82	2914.44	0.49	2915.42	2915.32	2916.3	OK	OK	
77	2	2921.30	2920.92	0.4	2921.72	2921.80	2923.2	OK	OK	
78	2	2924.65	2924.27	0.4	2925.07	2925.15	2926.1	OK	OK	
79	2	2927.18	2926.80	0.4	2927.60	2927.68	2928.6	OK	OK	
80	2	2928.71	2928.33	0.4	2929.13	2929.21	2930.2	OK	OK	
81	2	2929.94	2929.56	0.4	2930.36	2930.44	2931.4	OK	OK	
82	2	2930.49	2930.11	0.4	2930.91	2930.99	2931.9	OK	OK	
83	1	2930.49	2930.11	0.49	2931.09	2930.99	2931.9	OK	OK	
84	1	2929.55	2929.17	0.49	2930.15	2930.05	2931.0	OK	OK	
85	1	2923.80	2923.42	0.49	2924.40	2924.30	2925.3	OK	OK	
86	1	2921.60	2921.22	0.49	2922.20	2922.10	2923.1	OK	OK	
87	1	2919.40	2919.02	0.49	2920.00	2919.90	2920.9	OK	OK	
88	1	2917.19	2916.81	0.49	2917.79	2917.69	2918.6	OK	OK	
89	1	2915.15	2914.77	0.49	2915.75	2915.65	2916.6	OK	OK	
90	1	2913.84	2913.46	0.49	2914.44	2914.34	2915.3	OK	OK	
91	1	2912.64	2912.26	0.49	2913.24	2913.14	2914.1	OK	OK	
92	1	2914.97	2914.59	0.49	2915.57	2915.47	2916.4	OK	OK	
93	1	2917.30	2916.92	0.49	2917.90	2917.80	2918.8	OK	OK	
94	1	2919.59	2919.21	0.49	2920.19	2920.09	2921.0	OK	OK	
95	1	2921.82	2921.44	0.49	2922.42	2922.32	2923.3	OK	OK	
96	1	2922.17	2921.79	0.49	2922.77	2922.67	2924.1	OK	OK	
97	1	2919.28	2918.90	0.49	2919.88	2919.78	2920.7	OK	OK	
98	1	2916.95	2916.57	0.49	2917.55	2917.45	2918.4	OK	OK	
99	1	2914.62	2914.24	0.49	2915.22	2915.12	2916.1	OK	OK	
100	1	2912.29	2911.91	0.49	2912.89	2912.79	2913.7	OK	OK	
101	1	2909.37	2908.99	0.49	2909.97	2909.87	2910.8	OK	OK	
102	1	2911.66	2911.28	0.49	2912.26	2912.16	2913.1	OK	OK	
103	1	2913.96	2913.58	0.49	2914.56	2914.46	2915.4	OK	OK	
104	1	2916.25	2915.87	0.49	2916.85	2916.75	2917.7	OK	OK	
105	1	2918.35	2917.97	0.49	2918.95	2918.85	2919.8	OK	OK	
106	1	2919.42	2919.04	0.49	2920.02	2919.92	2921.4	OK	OK	
107	1	2916.25	2915.87	0.49	2916.85	2916.75	2917.7	OK	OK	
108	1	2913.96	2913.58	0.49	2914.56	2914.46	2915.4	OK	OK	
109	1	2911.66	2911.28	0.49	2912.26	2912.16	2913.1	OK	OK	
110	1	2909.37	2908.99	0.49	2909.97	2909.87	2910.8	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 D_{100}) + F/L

4: City of Las Vegas minimum allowable finished floor elevation = T.C. @ high side of lot + 6-inches

5: These lots have an adjacent solid grouted wall that protects the FF.

City of Las Vegas Finished Floor Criteria:

-The finished floor shall be set a vertical distance above the gutter flowline of at least twice the depth of flow in the gutter flowline up to a maximum of 18 inches above the WSEL in the street.

-The finished floor shall be set a vertical distance of at least 6-inches above the highest adjacent top of curb.

Adjacent/Perimeter Street Check									
Lot Number	Street	High TC[1]	High FL[2]	Section	Flow Depth[3]	Min FF[4]	Design FF	Check	Solid Grout
18	Grand Teton	2904.10	2903.60	GT7	0.27	2904.14	2915.5	OK	No
19	Grand Teton	2906.95	2906.45	GT7	0.27	2906.99	2915.1	OK	No
20	Grand Teton	2911.40	2910.90	GT7	0.27	2911.44	2915.5	OK	No
21	Grand Teton	2914.60	2914.10	GT7	0.27	2914.64	2917.0	OK	No
22	Grand Teton	2917.69	2917.19	GT7	0.27	2917.73	2919.2	OK	No
23	Grand Teton	2920.55	2920.05	GT7	0.27	2920.59	2921.4	OK	No
24	Grand Teton	2923.69	2923.19	GT7	0.27	2923.73	2923.6	CHECK	Yes
25	Grand Teton	2926.45	2925.95	GT7	0.27	2926.49	2925.8	CHECK	Yes
26	Grand Teton	2928.41	2927.91	GT7	0.27	2928.45	2927.3	CHECK	Yes
27	Grand Teton	2930.86	2930.36	GT7	0.27	2930.90	2928.4	CHECK	Yes
28	Egan Crest	2934.70	2934.20	EGN1a	0.29	2934.78	2929.9	CHECK	Yes
29	Egan Crest	2935.87	2935.37	EGN1a	0.29	2935.95	2930.9	CHECK	Yes
30	Egan Crest	2935.91	2935.41	EGN1a	0.29	2935.99	2931.9	CHECK	Yes
31	Egan Crest	2935.76	2935.26	EGN1a	0.29	2935.84	2931.9	CHECK	Yes
32	Egan Crest	2935.43	2934.93	EGN1a	0.29	2935.51	2931.6	CHECK	Yes
33	Egan Crest	2934.80	2934.30	EGN1a	0.29	2934.88	2930.4	CHECK	Yes
34	Egan Crest	2933.71	2933.21	EGN1a	0.29	2933.79	2929.2	CHECK	Yes
35	Egan Crest	2930.81	2930.31	EGN1a	0.29	2930.89	2927.2	CHECK	Yes
36	Egan Crest	2929.45	2928.95	EGN1a	0.29	2929.53	2924.7	CHECK	Yes
37	Egan Crest	2927.31	2926.81	EGN1a	0.29	2927.39	2922.3	CHECK	Yes
38	Egan Crest	2925.65	2925.15	EGN1b	0.38	2925.91	2920.2	CHECK	Yes
39	Egan Crest	2924.47	2923.97	EGN1b	0.38	2924.73	2918.1	CHECK	Yes
40	Egan Crest	2923.10	2922.60	EGN1b	0.38	2923.36	2916.5	CHECK	Yes
41	Egan Crest	2921.83	2921.33	EGN1b	0.38	2922.09	2915.0	CHECK	Yes
42	Egan Crest	2920.83	2920.33	EGN1b	0.38	2921.09	2913.6	CHECK	Yes
43	Egan Crest	2920.02	2919.52	EGN1b	0.38	2920.28	2912.2	CHECK	Yes
44	Egan Crest	2919.39	2918.89	EGN1b	0.38	2919.65	2911.6	CHECK	Yes
45	Egan Crest	2918.96	2918.46	EGN1b	0.38	2919.22	2911.2	CHECK	Yes
46	Egan Crest	2918.50	2918.00	EGN1b	0.38	2918.76	2910.7	CHECK	Yes
47	Egan Crest	2918.10	2917.60	EGN1b	0.38	2918.36	2912.3	CHECK	Yes
47	Eagle Canyon	2917.07	2916.57	ECA3a	0.38	2917.33	2912.3	CHECK	Yes
48	Eagle Canyon	2915.15	2914.65	ECA3a	0.38	2915.41	2910.6	CHECK	Yes
49	Eagle Canyon	2913.29	2912.79	ECA3a	0.38	2913.55	2909.1	CHECK	Yes
50	Eagle Canyon	2910.90	2910.40	ECA3a	0.38	2911.16	2907.6	CHECK	Yes
51	California Pines	2909.12	2908.74	2	0.40	2909.54	2909.3	CHECK	Yes
52	Pinion Ridge	2902.69	2902.31	3	0.57	2903.45	2906.0	OK	No
54	California Pines	2909.45	2909.07	2	0.40	2909.87	2909.7	CHECK	Yes
55	Pinion Ridge	2903.60	2903.22	3	0.57	2904.36	2906.1	OK	No
57	California Pines	2910.74	2910.36	2	0.40	2911.16	2910.4	CHECK	Yes
61	Lodge Pine	2915.96	2915.58	3	0.57	2916.72	2917.5	OK	No
62	Pinion Ridge	2903.93	2903.55	3	0.57	2904.69	2906.6	OK	No
67	Pinion Ridge	2904.85	2904.47	3	0.57	2905.61	2906.6	OK	No
68	Pinion Ridge	2905.21	2904.83	3	0.57	2905.97	2908.3	OK	No
72	Lodge Pine	2906.52	2906.14	1	0.49	2907.12	2908.3	OK	No
77	Lodge Pine	2916.21	2915.83	1	0.49	2916.81	2923.2	OK	No
84	Western Pine	2925.27	2924.89	1	0.49	2925.87	2931.0	OK	No
90	Pinion Ridge	2912.49	2912.11	1	0.49	2913.09	2915.3	OK	No
91	Pinion Ridge	2912.09	2911.71	1	0.49	2912.69	2914.1	OK	No
100	Pinion Ridge	2910.06	2909.68	1	0.49	2910.66	2913.7	OK	No
101	Pinion Ridge	2909.31	2908.93	1	0.49	2909.91	2910.8	OK	No
110	Pinion Ridge	2907.26	2906.88	1	0.49	2907.86	2910.8	OK	No

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

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

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

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

Drainage Easements Check							
Lot Number	High TC/FL[1]	Section	Flow Depth[2]	Min FF[3]	Design FF	Check	Solid Grout
1	2901.27	A	1.27	2904.04	2903.90	CHECK	Yes
52	2903.68	B	0.38	2905.56	2906.00	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.

APPENDIX G

Reference Material

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

Approval Letters

* MOST RECENT APPROVAL LETTER

CITY OF LAS VEGAS INTER-OFFICE MEMORANDUM				DATE: January 19, 2017
TO: **Land Development Services** Department of Building & Safety				FROM: Albert Sung, P.E. Flood Control Project Engineer Department of Public Works
SUBJECT:	Drainage Study for: **Skye Canyon – Phase 2 Infrastructure Update # 3**			**COPIES TO:** Slater Hanifan Group, Inc.
Cross Streets:	NWC of Grand Teton Blvd. & Hualapai Way			Section 12, LLC / Ninety Five Mgmt.
File Number:	F:\Depot\DSMemos\DS4739F.doc			Bart Anderson, P.E., DevCo
Parcel Number:	Portion of 126-12-000-001			CCRFCD
Zoning Action:	TMP-58560			
FEMA Flood Zone	YES	NO	X	
Proposed Storm Drain	YES X	NO		

HISTORY	DATE RECEIVED	DATE REVIEWED	COMMENTS	REVIEW FEES	FEES PAID Payment Trn #
1st Submittal & Supplemental	6/18/2015, 8/4/2015	8/26/2015	Not Approved	$400.00	402578: $400
2nd Submittal	10/19/2015	11/02/2015	Not Approved	$400.00	419048: $400
3rd Submittal	11/19/2015 & Supplemental	1/7/2016	Conditional Approval	$400.00	423549: $400
4th Submittal	4/4/2016	4/13/2016	Conditional Approval	$100.00	438958: $100
5th Submittal & CCRFCD	5/12/2016 & 5/16/2016	6/8/2016 & 6/21/2016	See Comments Below	$100.00	443735: $100
6th Submittal	12/15/2016 & 1/17/2017	1/19/2017	See Comments Below	$100.00	469104: $100
			TOTAL FEES (LDDRS):	**$1,500.00**	----

REMARKS: UPDATE #3 revise storm drain system capture and collection points based upon Parcel development.

5th Submittal: Update #2 and CCRFCD concurrence received. Revised Memo on 6/21/2016, Approved "At Risk".

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

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

A Flood Control Master Plan Amendment (MPA) shall be updated to reflect the latest Master Plan for the Skye Canyon Development and approved by the City prior to submitting residential development plans outside of the shadow of protection from Detention Basin #1 and outside of the limits of the Phase 2 pods.

Detention Basin #1 and the Phase 2 Infrastructure are required to be substantially complete prior to the final inspection of the first Unit in Phase 2. No Certificate of Occupancy on the houses will be issued until after the detention basin has been accepted for Substantial Completion by the City.

1. Note that the ***Skye Canyon Master Drainage Study*** has not been approved in the current stage. The subject *Skye Canyon Infrastructure Phase 2* drainage study is approved **"At Risk"** until the final approval of the Master Drainage Study. Any changes required by the Master Drainage Study to the Phase 2 area shall require a drainage study update to the ***Phase 2 Infrastructure Study*** and any required facility changes to the Phase 2 Infrastructure shall be provided at the developers' cost.
2. The ***Skye Canyon Phase 2 Development*** is based on the sole protection of a planned ***Skye Canyon Detention Basin #1*** from major storm flood events. The Detention Basin #1 drainage study has been approved.
3. Building Permits for onsite developments within Phase 2 will be issued subject to the construction and substantial completion of the ***Skye Canyon Detention Basin #1.*** The notice of Substantial Completion from the City of Las Vegas, Department of Public Works is required for the release of Occupancy Permits for any development within Phase 2.
4. The site is adjacent to or crosses an existing or proposed *Clark County Regional Flood Control District* (CCRFCD) master planned facility. CCRFCD concurrence has been provided for the Phase 2 Infrastructure.
5. The impacts to existing downstream neighborhoods of the long term discharge from the detention basin(s) and the Phase 2 developments without the associated regional outfall facilities is a major concern of both the City and the Clark County Regional Flood Control District. Flood Control understands that these interim impacts are addressed with Skye Canyon Detention Basin #1. The proposed interim impact solution was included as a part of the Skye Canyon Detention Basin #1 improvements until the overall Skye Canyon MPU facilities are completed.
6. The drainage study for Phase 2 Infrastructure assumes that the project will be constructed in one phase. It was noted within this Addendum response that the developer desires to phase the construction of the improvements. If improvement plans are submitted to break the Phase 2 Infrastructure into separate phases, a drainage study update will be required for each phase addressing the interim condition.
7. The development of Parcel 2.23B, identified as Parcel WML9 on Exhibit E2, drains through the future park and onto Eagle Canyon (WC10A) near Station 41+00 on Sheet C-03. The roadway plans shall incorporate the proposed drainage facilities as the 60 cfs will impact the 17-foot sidewalk & amenity zone. Provide concrete low flow channel connection through the17-foot sidewalk & amenity zone.
8. The provided Phase 2 Infrastructure plans only show the proposed drainage facilities. The complete improvement plans will require additional review for impacts with other needed infrastructure; i.e. sanitary sewer, water, gas, etc. Any changes to the proposed storm drain system shall require a drainage study update.
9. The Storm Drain Plans have been revised to accommodate the proposed cross fall street sections and include added nuisance inlets at low points within the intersections.
10. The plans show preliminary mass grading with collection facilities within the parcels to intercept the flows prior to entering the infrastructure roadway improvements. It was noted that the inlet collection system needs to incorporate stormwater quality (SWQ) features and Best Management Practices (BMP's) at these interim collection points. This information will be provided and shown on the SWPPP, a copy of which shall be provided to Flood Control prior to permits. Additionally, the mass grading plan (Sheet GR-03) shows sheet flow from Basin ON2-IB discharging directly onto Hualapai Way without any interim collection. Revise to incorporate interim collection.
11. All drainage facilities proposed in this ***Phase 2 Infrastructure Study*** are considered interim facilities and must be maintained by the Master Developer until the facilities are dedicated to and formally accepted by the *City of Las Vegas.*

12. Since the streets network and the associated storm drain facilities will eventually be accepted by the City, the engineer must coordinate with *City of Las Vegas Streets & Sanitation Department* for their review and approval prior to the final approval of the subject drainage study.

13. The provided WSPG Model shows that the storm drain in *Eagle Canyon Avenue* exceeds the maximum allowed velocity (25 fps) per the *CCRFCD Hydrologic & Hydraulic Design Manual*. A *Special Construction Note* has been added to the plan & profile sheets that call out the special construction requirement and the required special inspection for the additional sacrificial concrete.

14. Structural plans for the storm drain improvements must be submitted for review. Provide a soil report, structural calculations and specifications, wet stamped structural sets and a grading plan to the *City of Las Vegas Building Department* for processing (call *Building Department* to confirm their submittal requirements). The engineer must provide a copy of *Building Department* approval of the structures to *City Flood Control Section* prior to the final acceptance of the technical drainage study.

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

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

16. Technical drainage studies are required for each of the future PODs. Final approval for the infrastructure study must be obtained prior to final approval of the impacted POD drainage studies.

17. A note on the Grading Plans has been provided that "*Property Owner is responsible to maintain the best management practices such as but not limited to the removal of accumulated sediment and debris and care of the vegetation.*"

18. A numbering system for the manholes and inlets has been provided. It was noted in the response that the project may be divided into additional phases.

19. Show the size of all the proposed riprap areas. The rip-rap pads are shown on the GR-Sheets and some of the SD-Sheets include the pad size. Add the pad size to the grading plans and revise all pertinent plans and callouts accordingly.

20. Revise the pipe penetration detail to include a concrete collar with dowelled rebar connections. The detail has not been provided at this time and was noted that it will be a part of the Structural Details.

21. Provide details for the transition structure modifications to accommodate the 66"-RCP connection and the removal of the existing facilities to allow construction of the proposed improvements. The detail has not been provided at this time and was noted that it will be a part of the Structural Details.

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

END OF REMARKS
AYS/PBJ

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

Drainage Exhibits

- MAP UTILIZED AS THE EXISTING CONDITION -

100-Year Ditch Flow Hydraulic Summary				
Cross Section ID	Slope (%)	Q_{100} (cfs)	Normal Depth (ft)	Description
1I	0.65	35	0.79	Earthen Lined Trap. Channel; 10-ft Bottom, 3:1 SS, Min. 2.0-ft Depth
1I-1	3.70	11	0.24	Earthen Lined Trap. Channel; 10-ft Bottom, 3:1 SS, Min. 2.0-ft Depth
2I	0.90	19	0.51	Earthen Lined Trap. Channel; 10-ft Bottom, 3:1 SS, Min. 2.0-ft Depth
3I	1.90	32	0.55	Earthen Lined Trap. Channel; 10-ft Bottom, 3:1 SS, Min. 2.0-ft Depth
6I	0.80	59	1.00	Earthen Lined Trap. Channel; 10-ft Bottom, 3:1 SS, Min. 2.0-ft Depth
7I	1.50	85	0.60	Earthen Lined Trap. Channel; 26.5-ft Bottom, 3:1 SS, Min. 2.0-ft Depth
8I	0.90	85	0.96	Earthen Lined Trap. Channel; 15-ft Bottom, 4:1&3:1 SS, Min. 2.0-ft Depth
9I	0.50	60	1.15	Earthen Lined Trap. Channel; 10-ft Bottom, 3:1 SS, Min. 2.5-ft Depth
10I	0.50	35	0.85	Earthen Lined Trap. Channel; 10-ft Bottom, 3:1 SS, Min. 2.0-ft Depth
11I	1.90	27.5	0.46	Earthen Lined Trap. Channel; 12-ft Bottom, 3:1 SS, Min. 2.0-ft Depth
12I	0.50	27.5	0.67	Earthen Lined Trap. Channel; 12-ft Bottom, 3:1 SS, Min. 2.0-ft Depth

Interim Condition Prorated Flow Summary			
Basin	Q_{100} (cfs)	Area (acres)	Unit Flow (cfs/acre)
ON1-I	170	62.6	2.7
ON2-I	176	57.4	3.1
ON3-I	94	32.6	2.9
ON4-I	90	29.4	3.1
Subbasin	**Q_{100} (cfs)**	**Area (acres)**	**Unit Flow (cfs/acre)**
ON1-IA	85	31.4	2.7
ON1-IB	85	31.3	2.7
TOTAL	***170***	***62.6***	
ON2-IA	60	19.7	3.1
ON2-IB	61	19.8	3.1
ON2-IC	55	17.9	3.1
TOTAL	***176***	***57.4***	
ON3-IA	26	9.1	2.9
ON3-IB	59	20.4	2.9
ON3-IC	9	3.2	2.9
TOTAL	***94***	***32.6***	
ON4-IA	19	6.3	3.1
ON4-IB	35	11.3	3.1
ON4-IC	36	11.8	3.1
TOTAL	***90***	***29.4***	

100-Year Street Flow Summary Interim Condition						
Cross Section	Slope (%)	Q_{100} (cfs)	Depth (ft)	Velocity (fps)	DxV	
ECA1	4.90	30	0.45	6.0	2.7	
ECA2	4.90	43	0.50	6.5	3.2	
ECA2b	2.00	13	0.40	3.5	1.4	
ECA3a	4.94	5	0.28	4.0	1.1	
ECA3b	4.94	42	0.49	6.5	3.2	
ECA4	0.50	51	0.71	3.3	2.3	
EGN1a	2.46	4	0.29	2.9	0.8	
*EGN1b	0.50	2.5	0.38	1.6	0.6	
EGN2	0.50	3	0.33	1.5	0.5	
*SHA	2.75	2.5	0.29	3.0	0.9	
*SHA (West Half)	2.75	2.5	0.26	2.3	0.6	
SHA1	2.75	5	0.30	3.2	1.0	
**GT3	3.80	10	0.40	5.6	2.2	
***GT4	3.80	5	0.34	4.3	1.5	
**GT5	4.30	3	0.30	4.1	1.2	
***GT6	3.40	4	0.33	3.9	1.3	
***GT7	3.50	2	0.27	3.5	0.9	
***GT8	3.30	2	0.28	3.4	0.9	
***GT9	3.60	2	0.27	3.5	0.9	
*HU2	0.57	61	0.92	3.9	3.6	
*HU2B	0.57	45	0.84	3.6	3.0	

REFERENCED SECTION

* Modeled as Half Streets
** Basin GTD3 +Bypass and/or Onsite Street Basin
*** Basin GTD9 +Bypass and/or Onsite Street Basin

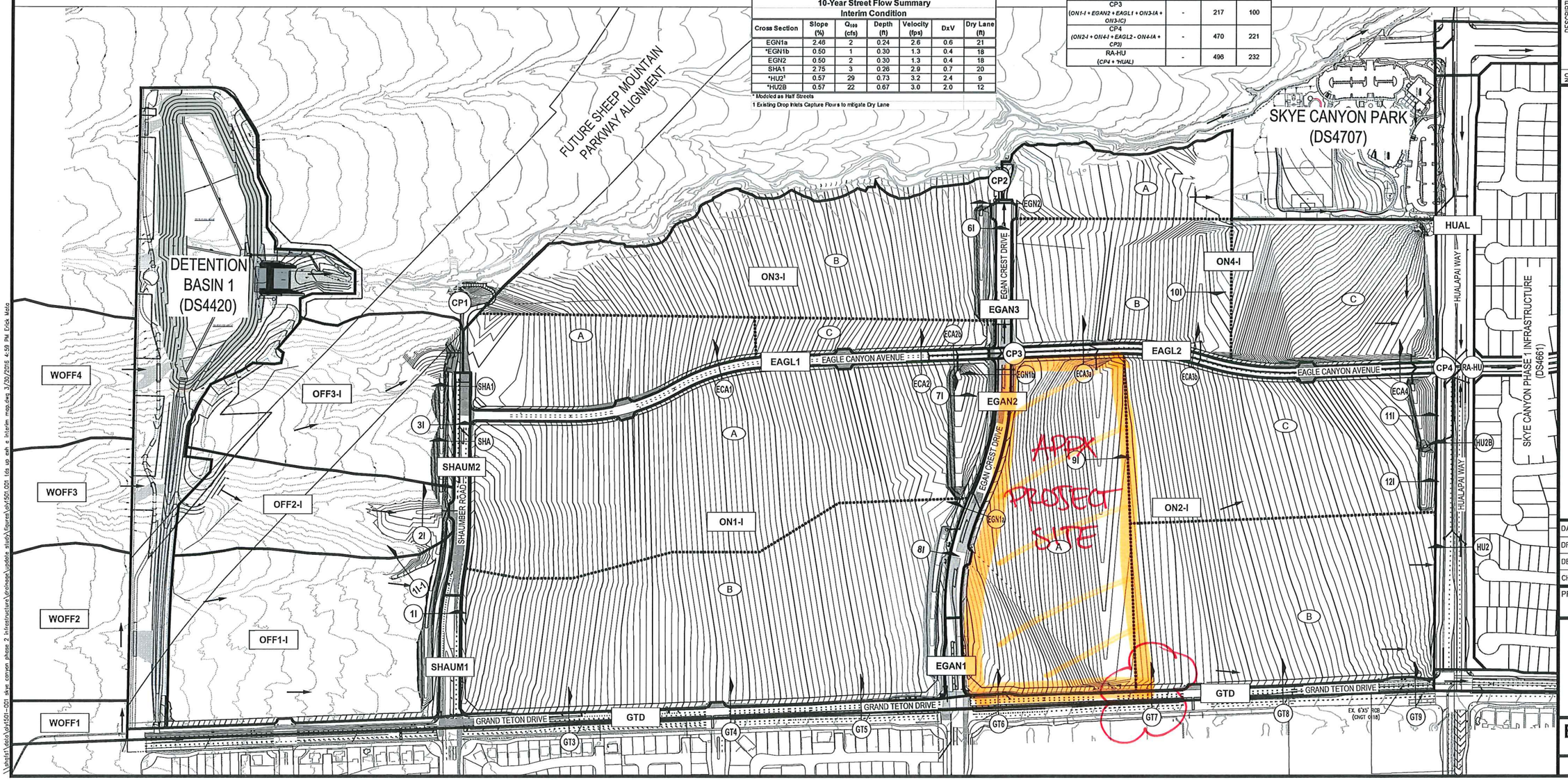
Basin Flow Rate Summary (Interim Condition)			
Basin/Concentration Point ID	Area (ac)	Q_{100} (cfs)	Q_{10} (cfs)
ON1-I	62.6	170	78
ON2-I	57.4	176	83
ON3-I	32.6	94	44
ON4-I	29.4	90	43
OFF1-I	19.7	35	11
OFF2-I	8.8	19	6
OFF3-I	13.6	32	12
EAGL1	2.3	8	4
EAGL2	1.9	7	4
EGAN1	0.6	2	1
EGAN2	2.2	8	4
EGAN3	0.9	3	2
GTD	5.9	18	10
*HUAL	9.2	26	11
SHAUM1	1.0	4	2
SHAUM2	1.4	5	3

*REFERENCED FROM THE SKYE CANYON PHASE 1 STUDY.

10-Year Street Flow Summary Interim Condition						
Cross Section	Slope (%)	Q_{100} (cfs)	Depth (ft)	Velocity (fps)	DxV	Dry Lane (ft)
EGN1a	2.46	2	0.24	2.6	0.6	21
*EGN1b	0.50	1	0.30	1.3	0.4	18
EGN2	0.50	2	0.30	1.3	0.4	18
SHA1	2.75	3	0.26	2.9	0.7	20
*HU2[1]	0.57	29	0.73	3.2	2.4	9
*HU2B	0.57	22	0.67	3.0	2.0	12

* Modeled as Half Streets
1 Existing Drop Inlets Capture Flows to mitigate Dry Lane

Concentration Points Summary (Interim Condition)			
Basin/Concentration Point ID	Area (ac)	Q_{100} (cfs)	Q_{10} (cfs)
CP1 (OFF1-I + OFF2-I + OFF3-I + SHAUM)	-	92	32
CP2 (ON3-IB + EGAN3)	-	62	30
CP3 (ON1-I + EGAN2 + EAGL1 + ON3-IA + ON3-IC)	-	217	100
CP4 (ON2-I + ON4-I + EAGL2 - ON4-IA + CP3)	-	470	221
RA-HU (CP4 + *HUAL)	-	496	232



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 - PHASE 2 INFRASTRUCTURE

INTERIM CONDITION DRAINAGE MAP

DATE: APRIL 2016
DRAFTER: ETM
DESIGNER: ETM
CHECKED: SOA
PROJECT NO. OLY1501.001

EXHIBIT E
SHEET 1 OF 1

\\slater\data\olyl\v\501-001 skye canyon phase 2 infrastructure\drainage\update studies\figures\olyl501.001 tds up xrfs + interim map.dwg 3/30/2016 4:59 PM Erick Vela

* REFERENCED SECTIONS

100-Year Street Flow Summary
Ultimate Condition

Cross Section	Slope (%)	Q_{100} (cfs)	Depth (ft)	Velocity (fps)	DxV
ECA1	4.90	33	0.46	6.1	2.8
ECA2	4.90	99	0.62	8.5	5.2
ECA2b	2.00	47	0.58	4.7	2.7
ECA3a	4.94	17	0.38	5.3	2.0
ECA3b	4.94	13	0.36	4.9	1.8
ECA3c	4.94	32	0.46	6.1	2.8
ECA4	0.50	25	0.58	2.5	1.4
EGN1a	2.46	4	0.29	2.9	0.8
*EGN1b	0.50	2.5	0.38	1.6	0.6
EGN2	0.50	4	0.35	1.6	0.5
*SHA	2.75	4	0.33	3.3	1.1
*SHA (West Half)	2.75	4	0.28	2.5	0.7
SHA1	2.75	3	0.26	2.9	0.7
*HU2	0.57	59	0.92	3.8	3.5
*HU2B	0.57	41	0.82	3.5	2.9

* Modeled as Half Streets

Referenced Ultimate Condition Flow Rate Summary
Concentration Points

Basin/Concentration Point ID	Area (sq. mi)	Q_{100} (cfs)	Q_{10} (cfs)
WC10A Q = WML9 + WPRK5	0.03	60	30
WC10B Q = WC10A + WL4B + WEGL1	0.05	99	48
WC11 Q = WML10 + WEGN3	0.07	127	61
WC12 Q = WC10B + WC11	0.11	226	109
WC13 Q = WC12 + WL6B + WL7 + WML13 + WEGL2	0.17	352	170
WC14 Q = WML14 + WL8 + WSKV3 + WSKV4	0.24	485	236
WC20 Q = WPF5 + WML2 + WSHA5	0.05	86	42
WC22A Q = WL4A + WL5A + WL5B	0.05	67	43

Ultimate Condition Prorated Flow Summary

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

Referenced Ultimate Condition Flow Rate Summary

Basin/Concentration Point ID	Area (ac)	Q_{100} (cfs)	Q_{10} (cfs)
WL4A	8.0	23	10
WL4B	8.9	27	12
WL5A	10.9	32	15
WL5B	3.8	12	5
WL6B	10.6	30	14
WL7	11.5	34	16
WL8	17.4	48	22
WML10	11.6	38	19
WML11	16.0	48	23
WML13	16.4	49	25
WML14	19.2	59	29
WML2	27.4	78	38
WML9	16.4	55	28
WPF4	5.7	19	9
WPF5	0.4	1	0
WPRK5	2.0	5	2
WEST ROADWAY BASINS			
WEGL1	3.4	12	6
WEGL2	3.3	12	7
WEGN2	2.1	2	1
WEGN3	3.3	10	6
WSHA4	1.4	6	3
WSHA5	2.4	8	5
WSKV3	4.2	14	7
WSKV4	4.5	15	8

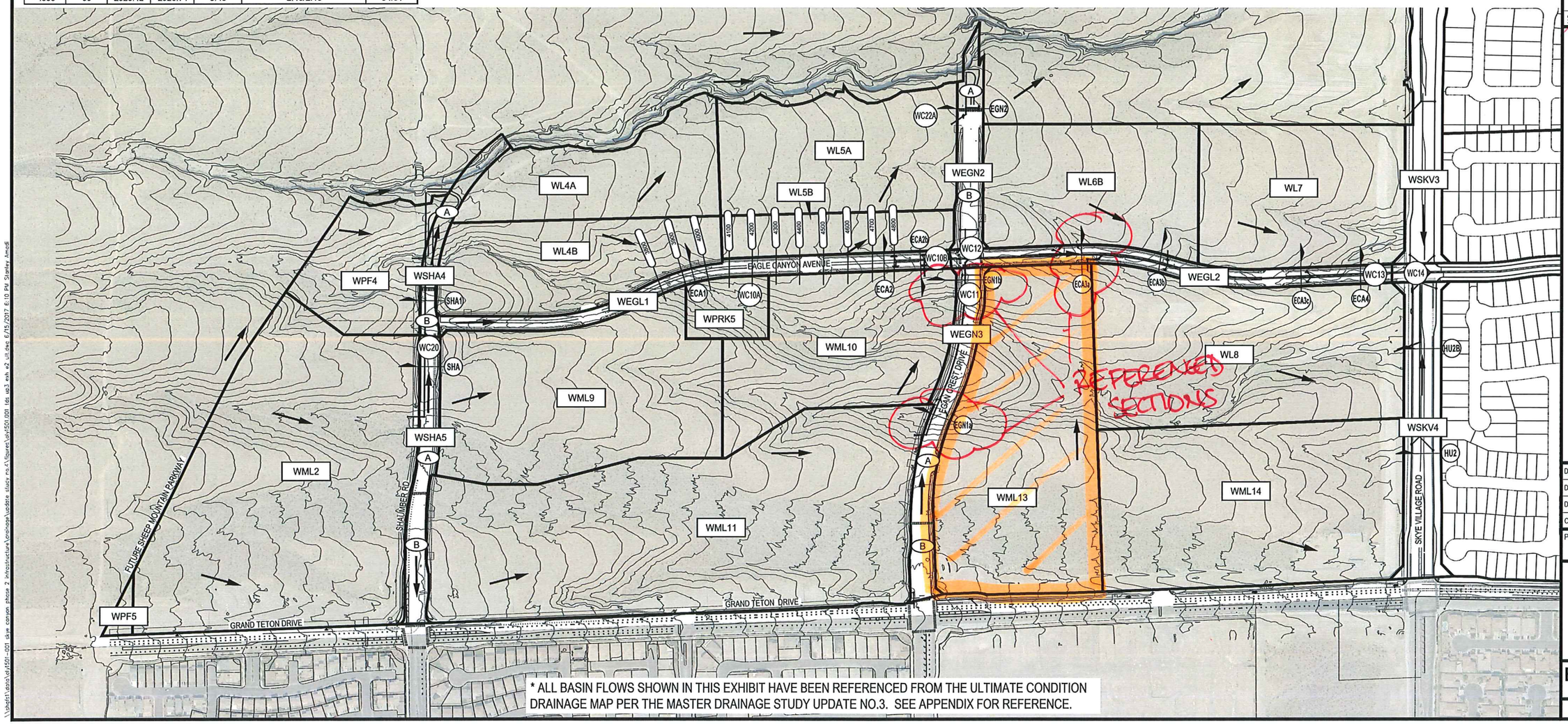
HEC-RAS Summary Table

River Sta	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Vel Chnl (ft/s)	Overbank Left/Right Velocity (ft/sec)	Top Width (ft)
-3800	99	2974.12	2974.74	8.43	2.13/2.13	54.61
-3900	99	2969.22	2969.84	8.43	2.13/2.13	54.61
-4000	99	2964.32	2964.94	8.43	2.13/2.13	54.61
-4100	99	2959.42	2960.04	8.43	2.13/2.13	54.61
-4200	99	2954.52	2955.14	8.43	2.13/2.13	54.61
-4300	99	2949.62	2950.24	8.43	2.13/2.13	54.61
-4400	99	2944.72	2945.34	8.44	2.13/2.13	54.59
-4500	99	2939.82	2940.44	8.43	2.13/2.13	54.61
-4600	99	2934.92	2935.54	8.44	2.13/2.13	54.59
-4700	99	2930.02	2930.64	8.43	2.13/2.13	54.61
-4800	99	2925.12	2925.74	8.43	2.13/2.13	54.61

10-Year Street Flow Summary
Ultimate Condition

Cross Section	Slope (%)	Q_{100} (cfs)	Depth (ft)	Velocity (fps)	DxV	Dry Lane (ft)
EGN1a	2.46	2	0.24	2.6	0.6	21
*EGN1b	0.50	1	0.30	1.3	0.4	18
EGN2	0.50	2	0.30	1.3	0.4	18
SHA1	2.75	1	0.18	2.8	0.5	24
*HU2[1]	0.57	29	0.73	3.2	2.4	9
*HU2B	0.57	22	0.67	3.0	2.0	12

* Modeled as Half Streets
1 Existing Drop Inlets Capture Flows to mitigate Dry Lane



* ALL BASIN FLOWS SHOWN IN THIS EXHIBIT HAVE BEEN REFERENCED FROM THE ULTIMATE CONDITION DRAINAGE MAP PER THE MASTER DRAINAGE STUDY UPDATE NO.3. SEE APPENDIX FOR REFERENCE.

N

0 200 400
SCALE - 1"=200' FEET

LEGEND

- BASIN BOUNDARY
- PRO-RATED SUBBASIN BOUNDARY
- ID — BASIN ID
- ID — PRO-RATED SUBBASIN ID
- ID — CONCENTRATION POINT ID
- FLOW DIRECTION
- ID — FLOWMASTER SECTION

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.

OLYMPIA COMPANIES

SKYE CANYON - PHASE 2 INFRASTRUCTURE UPDATE NO.4

ULTIMATE CONDITION DRAINAGE MAP

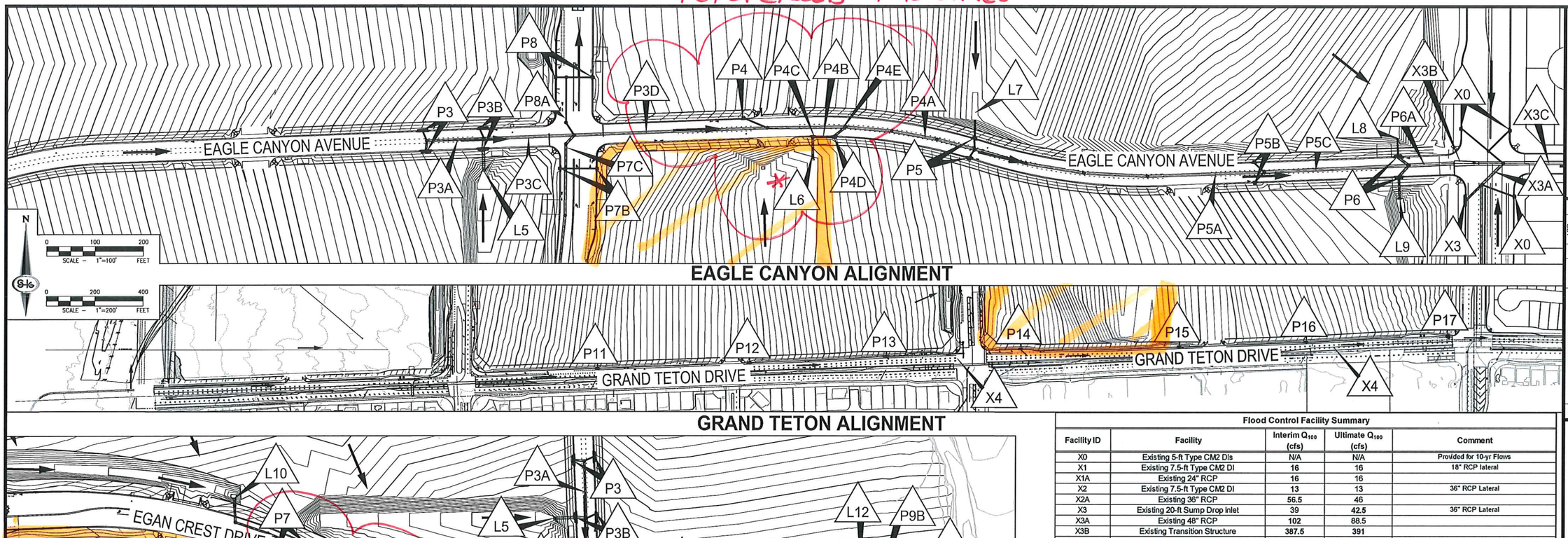
DATE: JUNE 2016
DRAFTER: ETM
DESIGNER: ETM
CHECKED: SMJ
PROJECT NO. OLY1501.001

EXHIBIT E2
SHEET 1 OF 1

* REFERENCED SECTIONS

\\plotter\data\olf\1501-001 skye canyon phase 2 infrastructure\cad\site plans\1501-001 fds sp3 exh e2 ult dwg 6/15/2017 6:10 PM Stanley Amadi

* REFERENCED FACILITIES



Flood Control Facility Summary

Facility ID	Facility	Interim Q_{100} (cfs)	Ultimate Q_{100} (cfs)	Comment
X0	Existing 5-ft Type CM2 DIs	N/A	N/A	Provided for 10-yr Flows
X1	Existing 7.5-ft Type CM2 DI	16	16	18" RCP lateral
X1A	Existing 24" RCP	16	16	
X2	Existing 7.5-ft Type CM2 DI	13	13	36" RCP Lateral
X2A	Existing 36" RCP	56.5	46	
X3	Existing 20-ft Sump Drop Inlet	39	42.5	36" RCP Lateral
X3A	Existing 48" RCP	102	88.5	
X3B	Existing Transition Structure	387.5	391	
X3C	Existing 72" RCP	460	479.5	
X4	Existing 6' X 5' RCB	N/A	N/A	Grand Teton Alignment
P1	Proposed 5-ft Type CM2 DI	2	2	18" RCP lateral
P1A	Proposed 36" RCP	54	79	
P1B	Proposed 36" RCP	56	81	
P1C	Proposed 36" RCP	59	84	
P1D	Proposed 36" RCP	91	103	
P2	(2) Proposed 5-ft Type CM2 Sump DIs	6	6	18" RCP lateral (Q shown is total for both inlets)
P3	(2) Proposed 20-ft Type CM2 DIs	30	52	18" RCP North, 36" RCP South Lateral (Q shown is total for both inlets)
P3A	Proposed 36" RCP	30	52	18" RCP North, 48" RCP South Lateral
P3B	(2) Proposed 20-ft Type CM2 DIs	26	36	Q shown is total for both inlets
P3C	Proposed 48" RCP	128	124	
P3D	Proposed 48" RCP	218	210	
P4	(2) Proposed 5-ft Type CM2 DIs	8	6	18" RCP North, 30" RCP South Lateral (Q shown is total for both inlets)
P4A	Proposed 48" RCP	262	269	
P4B	Proposed 36" RCP	60	53	
P4C	Proposed 5-ft Type CM2 DI	Nuisance	Nuisance	
P4D	Proposed 36" RCP	56	56	
P4E	Proposed 7.5-ft Type CM2 DI	3	3	Inlet Grates to be Replaced with Solid Plates
P5	(2) Proposed 7.5-ft Type CM2 DIs	14	8	24" RCP North, 18" RCP South Lateral
P5A	Proposed 48" RCP	292	289	
P5B	(2) Proposed 5-ft Type CM2 Nuisance DIs	Nuisance	10	Q shown is total for both inlets
P5C	Proposed 54" RCP	292	299	
P6	(2) Proposed 17.5-ft Type CM2 Sump DIs	51	41	42" RCP laterals (Q shown is total for both inlets)
P6A	Proposed 66" RCP	387.5	391	
P7	(2) Proposed 5-ft Type CM2 DIs	3	3	18" RCP laterals (Q shown is total for both inlets)
P7A	Proposed 36' to 42" RCP Transition	88	84	
P7B	(2) Proposed 5-ft Type CM2 DIs	2	2	18" RCP laterals (West Inlet Provided as Nuisance)
P7C	Proposed 42" RCP	90	86	
P8	(2) Proposed 5-ft Type CM2 Nuisance DIs	Nuisance	Nuisance	18" RCP laterals
P8A	Proposed 18" RCP	Nuisance	Nuisance	
P9	Proposed 7.5-ft Type CM2 DIs	2	2	18" RCP Lateral
P9A	Proposed 36" RCP	62	71	
P9B	Proposed 10-ft Type CM2 DIs	2	2	36" RCP Lateral
P9C	Proposed 36" RCP	62	71	
P11 thru P14	(4) Proposed 15-ft Type CM2 DIs	Varies	Varies	Tie into Facility X4
P15	Proposed 7.5-ft Type CM2 DI	2.0	2.0	Tie into Facility X4
P16	Proposed 10-ft Type CM2 DI	2.0	2.0	Tie into Facility X4
P17	Proposed 12.5-ft Type CM2 DI	2.0	2.0	Tie into Facility X4
L2	Proposed 36" RCP	54	79	
L3	Proposed 30" RCP	32	19	
L5	Proposed 48" RCP	85	36	
L6	Proposed 36" RCP	40	53	
L7	Proposed 24" RCP	16	12	
L8	Proposed 24" RCP	17	17	
L9	Proposed 36" RCP	27.5	34	
L10	Proposed 36" RCP	85	81	
L12	Proposed 36" RCP	59	67	
L13	Proposed 36" RCP	27.5	17.0	

1 - 'L' denotes proposed lateral stub
2 - 'P' denotes a proposed facility
3 - 'X' denotes an existing facility
4 - 'Q' in Bold denotes design flow rate

* REFERENCED → STUB TIE-IN

SLATER HANIFAN GROUP
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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 - PHASE 2 INFRASTRUCTURE UPDATE NO.4

STORM DRAIN SCHEMATIC MAP

DATE: JUNE 2017
DRAFTER: ETM
DESIGNER: ETM
CHECKED: SOA
PROJECT NO. OLY1501.001

EXHIBIT F
SHEET 1 OF 1

\\district\data\oly\501-001 skye canyon phase 2 infrastructure\drainage\update study no.4\figures\oly1501-001 sds3 exh 1 sd.dwg 6/15/2017 8:03 PM Stanley Arnold

WSPG Storm Drain Models

TECHNICAL DRAINAGE STUDY UPDATE No.4

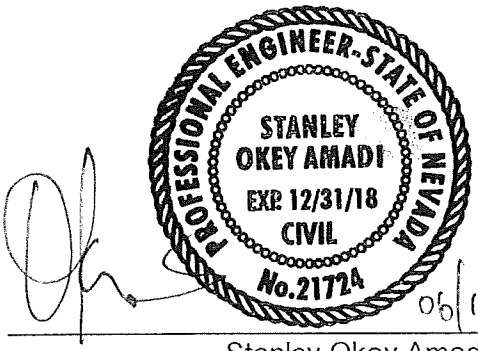
Skye Canyon
(Phase 2 Infrastructure)

City of Las Vegas, Nevada

Job No.: OLY1501.001
Date: June 2017

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



06/19/17

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

Assisted by: Erick Mata, E.I

Eagle Canyon Avenue (U-ECA)

```
0
T1 SKYE CANYON INFRASTRUCTURE - PHASE 2 (UPDATE NO.4)
T2 BY OLYMPIA COMPANIES
T3 EAGLE CANYON - TRUNK STORM DRAIN
SO   0613.002823.35 72                          2829.26
R    0900.002830.52 72       .013                                        1
JX   0900.002830.52 72 48    .013    88.5        2832.52        45.00
R    0950.002831.58 72       .013                                        1
WE   0950.002831.58 72       .013
TS   1000.002835.61 66       .013                                        1
WX   1000.002835.61 66       .013
R    1093.002837.13 66       .013                                        1
JX   1093.002838.13 54 42 42.013    54.5    37.52839.132839.13 45.00 45.00

R    1389.502839.63 54       .013                                        1
JX   1394.502840.13 48 18 18.013     5.0     5.02842.632842.63 45.00 45.00
R    1632.002854.48 48       .013                                  5.    1
R    1762.002862.62 48       .013                                  5.    1
R    1883.002868.57 48       .013                                  5.    1
R    1992.002873.94 48       .013                                  5.    1
JX   1992.002873.94 48 18 24.013     4.0    16.02876.442875.94 75.00 75.00
R    2072.002877.87 48       .013                                  5.    1
R    2167.002882.51 48       .013                                  5.    1
R    2262.002885.16 48       .013                                  5.    1
JX   2262.002885.16 48 36    .013    56.0        2886.16        38.00
R    2422.002888.80 48       .013                                        1
JX   2422.002888.80 48 18    .013     3.0        2891.30        45.00
R    2820.002903.13 48       .013                                        1
JX   2820.002903.13 48 42    .013    86.0        2903.63        45.00
R    3004.002908.81 48       .013                                  60.   1
JX   3004.002908.81 48 36 18.013    52.0    18.02909.812911.31 60.00 45.00
R    3024.002910.72 48       .013                                        1
JX   3024.002910.72 48 48    .013    18.0        2912.12        90.00
R    3060.002912.43 48       .013                                        1
SH   3060.002912.43 48
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.
CD  54  4               4.5
CD  60  4               5.
CD  66  4               5.5
CD  72  4               6.
CD  78  4               6.5
```

PARCEL 2.27
TIE IN LOCATION

0
Q 36.0
→→

DATE: 6/15/2017
TIME: 16: 5

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														
CD	54	4			4.50														
CD	60	4			5.00														
CD	66	4			5.50														
CD	72	4			6.00														
CD	78	4			6.50														

F 0 5 1 5 P PAGE NO 3

WATER SURFACE PROFILE - TITLE CARD LISTING

HEADING LINE NO 1 IS -

SKYE CANYON INFRASTRUCTURE - PHASE 2 (UPDATE NO.4)

HEADING LINE NO 2 IS -

BY OLYMPIA COMPANIES

HEADING LINE NO 3 IS -

EAGLE CANYON - TRUNK STORM DRAIN

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
	613.00	2823.35	72	2829.26

ELEMENT NO 2 IS A REACH

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	900.00	2830.52	72	0.013	0.00	0.00	0.00	1

ELEMENT NO 3 IS A JUNCTION

U/S DATA	STATION	INVERT	SECT	LAT-1	LAT-2	N	Q3	Q4	INVERT-3	INVERT-4	PHI 3	PHI 4
	900.00	2830.52	72	48	0	0.013	88.5	0.0	2832.52	0.00	45.00	0.00

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 4 IS A REACH

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	950.00	2831.58	72	0.013	0.00	0.00	0.00	1

ELEMENT NO 5 IS A WALL ENTRANCE

U/S DATA	STATION	INVERT	SECT	FP
	950.00	2831.58	72	0.013

ELEMENT NO 6 IS A TRANSITION

U/S DATA	STATION	INVERT	SECT	N
	1000.00	2835.61	66	0.013

ELEMENT NO 7 IS A WALL EXIT

U/S DATA	STATION	INVERT	SECT
	1000.00	2835.61	66

ELEMENT NO 8 IS A REACH

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	1093.00	2837.13	66	0.013	0.00	0.00	0.00	1

ELEMENT NO 9 IS A JUNCTION

U/S DATA	STATION	INVERT	SECT	LAT-1	LAT-2	N	Q3	Q4	INVERT-3	INVERT-4	PHI 3	PHI 4
	1093.00	2838.13	54	42	42	0.013	54.5	37.5	2839.13	2839.13	45.00	45.00

ELEMENT NO 10 IS A REACH

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	1389.50	2839.63	54	0.013	0.00	0.00	0.00	1

ELEMENT NO 11 IS A JUNCTION

U/S DATA	STATION	INVERT	SECT	LAT-1	LAT-2	N	Q3	Q4	INVERT-3	INVERT-4	PHI 3	PHI 4
	1394.50	2840.13	48	18	18	0.013	5.0	5.0	2842.63	2842.63	45.00	45.00

F 0 5 1 5 P PAGE NO 3

WATER SURFACE PROFILE - ELEMENT CARD LISTING

ELEMENT NO 12 IS A REACH

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	1632.00	2854.48	48	0.013	0.00	0.00	5.00	1

ELEMENT NO 13 IS A REACH

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	1762.00	2862.62	48	0.013	0.00	0.00	5.00	1

ELEMENT NO 14 IS A REACH

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	1883.00	2868.57	48	0.013	0.00	0.00	5.00	1

ELEMENT NO 15 IS A REACH

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	1992.00	2873.94	48	0.013	0.00	0.00	5.00	1

ELEMENT NO 16 IS A JUNCTION

U/S DATA	STATION	INVERT	SECT	LAT-1	LAT-2	N	Q3	Q4	INVERT-3	INVERT-4	PHI 3	PHI 4
	1992.00	2873.94	48	18	24	0.013	4.0	16.0	2876.44	2875.94	75.00	75.00

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 17 IS A REACH

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	2072.00	2877.87	48	0.013	0.00	0.00	5.00	1

ELEMENT NO 18 IS A REACH

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	2167.00	2882.51	48	0.013	0.00	0.00	5.00	1

```
 ELEMENT NO  19 IS A REACH                *        *     *
                  U/S DATA   STATION    INVERT  SECT              N                                  RADIUS  ANGLE  ANG PT  MAN H
                               2262.00 2885.16   48             0.013                                   0.00   0.00    5.00      1

 ELEMENT NO  20 IS A JUNCTION             *        *     *     *                 *                 *              *
                  U/S DATA   STATION    INVERT  SECT LAT-1 LAT-2   N      Q3       Q4    INVERT-3 INVERT-4  PHI 3   PHI 4
                               2262.00 2885.16   48    36     0  0.013     56.0      0.0  2886.16     0.00   38.00    0.00
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  21 IS A REACH                *        *     *
                  U/S DATA   STATION    INVERT  SECT              N                                  RADIUS  ANGLE  ANG PT  MAN H
                               2422.00 2888.80   48             0.013                                   0.00   0.00    0.00      1

 ELEMENT NO  22 IS A JUNCTION             *        *     *     *                 *                 *              *
                  U/S DATA   STATION    INVERT  SECT LAT-1 LAT-2   N      Q3       Q4    INVERT-3 INVERT-4  PHI 3   PHI 4
                               2422.00 2888.80   48    18     0  0.013      3.0      0.0  2891.30     0.00   45.00    0.00
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   4

                    WATER SURFACE PROFILE - ELEMENT CARD LISTING

 ELEMENT NO  23 IS A REACH                *        *     *
                  U/S DATA   STATION    INVERT  SECT              N                                  RADIUS  ANGLE  ANG PT  MAN H
                               2820.00 2903.13   48             0.013                                   0.00   0.00    0.00      1

 ELEMENT NO  24 IS A JUNCTION             *        *     *     *                 *                 *              *
                  U/S DATA   STATION    INVERT  SECT LAT-1 LAT-2   N      Q3       Q4    INVERT-3 INVERT-4  PHI 3   PHI 4
                               2820.00 2903.13   48    42     0  0.013     86.0      0.0  2903.63     0.00   45.00    0.00
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  25 IS A REACH                *        *     *
                  U/S DATA   STATION    INVERT  SECT              N                                  RADIUS  ANGLE  ANG PT  MAN H
                               3004.00 2908.81   48             0.013                                   0.00   0.00   60.00      1

 ELEMENT NO  26 IS A JUNCTION             *        *     *     *                 *                 *              *
                  U/S DATA   STATION    INVERT  SECT LAT-1 LAT-2   N      Q3       Q4    INVERT-3 INVERT-4  PHI 3   PHI 4
                               3004.00 2908.81   48    36    18  0.013     52.0     18.0  2909.81  2911.31  60.00   45.00
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  27 IS A REACH                *        *     *
                  U/S DATA   STATION    INVERT  SECT              N                                  RADIUS  ANGLE  ANG PT  MAN H
                               3024.00 2910.72   48             0.013                                   0.00   0.00    0.00      1

 ELEMENT NO  28 IS A JUNCTION             *        *     *     *                 *                 *              *
                  U/S DATA   STATION    INVERT  SECT LAT-1 LAT-2   N      Q3       Q4    INVERT-3 INVERT-4  PHI 3   PHI 4
                               3024.00 2910.72   48    48     0  0.013     18.0      0.0  2912.12     0.00   90.00    0.00
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  29 IS A REACH                *        *     *
                  U/S DATA   STATION    INVERT  SECT              N                                  RADIUS  ANGLE  ANG PT  MAN H
                               3060.00 2912.43   48             0.013                                   0.00   0.00    0.00      1

 ELEMENT NO  30 IS A SYSTEM HEADWORKS                      *                 *
                  U/S DATA   STATION    INVERT  SECT                                          W S ELEV
                               3060.00 2912.43   48                                             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 ♀
LICENSEE: SLATER HANIFAN GROUP                          F0515P                                                   PAGE    1
                                                WATER SURFACE PROFILE LISTING
                        SKYE CANYON INFRASTRUCTURE - PHASE 2 (UPDATE NO.4)
                        BY OLYMPIA COMPANIES
                        EAGLE CANYON - TRUNK STORM DRAIN

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

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

   613.00  2823.35    4.010  2827.360     479.5   23.88    8.853  2836.213   0.00    5.621              6.00     0.00   0.00    0   0.00
    70.92  0.02498                                        .020090     1.42                  3.757                      0.00
   683.92  2825.12    4.102  2829.224     479.5   23.28    8.414  2837.638   0.00    5.621              6.00     0.00   0.00    0   0.00
    88.77  0.02498                                        .018416     1.63                  3.757                      0.00
   772.69  2827.34    4.284  2831.623     479.5   22.19    7.649  2839.272   0.00    5.621              6.00     0.00   0.00    0   0.00
    58.23  0.02498                                        .016459     0.96                  3.757                      0.00
   830.92  2828.79    4.483  2833.277     479.5   21.16    6.954  2840.231   0.00    5.621              6.00     0.00   0.00    0   0.00
    40.67  0.02498                                        .014774     0.60                  3.757                      0.00
   871.59  2829.81    4.700  2834.510     479.5   20.18    6.321  2840.831   0.00    5.621              6.00     0.00   0.00    0   0.00
    28.41  0.02498                                        .013347     0.38                  3.757                      0.00
   900.00  2830.52    4.944  2835.464     479.5   19.24    5.747  2841.211   0.00    5.621              6.00     0.00   0.00    0   0.00
JUNCT STR  0.00000                                        .018387     0.00                                           0.00
   900.00  2830.52    3.332  2833.852     391.0   24.25    9.128  2842.980   0.00    5.292              6.00     0.00   0.00    0   0.00
    50.00  0.02120                                        .024400     1.22                  3.468                      0.00
   950.00  2831.58    3.305  2834.885     391.0   24.49    9.314  2844.199   0.00    5.292              6.00     0.00   0.00    0   0.00
TRANS STR  0.08060                                        .019055     0.95                                           0.00
  1000.00  2835.61    4.540  2840.150     391.0   18.64    5.395  2845.545   0.00    5.168              5.50     0.00   0.00    0   0.00
 WALL  EXIT                                                                                                          0.00
  1000.00  2835.61    4.539  2840.149     391.0   18.65    5.398  2845.547   0.00    5.168              5.50     0.00   0.00    0   0.00
     8.18  0.01634                                        .013339     0.11                  4.120                      0.00
  1008.18  2835.74    4.560  2840.304     391.0   18.56    5.351  2845.655   0.00    5.168              5.50     0.00   0.00    0   0.00
    61.83  0.01634                                        .012762     0.79                  4.120                      0.00                ♀
LICENSEE: SLATER HANIFAN GROUP                          F0515P                                                   PAGE    2
                                                        Page 2
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WATER SURFACE PROFILE LISTING

SKYE CANYON INFRASTRUCTURE - PHASE 2 (UPDATE NO.4)
BY OLYMPIA COMPANIES
EAGLE CANYON - 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 PIER	AVBPR
L/ELEM	SO					SF AVE	HF			NORM DEPTH			ZR		
1070.01	2836.75	4.825	2841.579	391.0	17.70	4.865	2846.444	0.00	5.168		5.50	0.00	0.00	0	0.00
22.99	0.01634					.011978	0.28			4.120			0.00		
1093.00	2837.13	5.168	2842.298	391.0	16.87	4.422	2846.720	0.00	5.168		5.50	0.00	0.00	0	0.00
JUNCT STR	0.00000					.017417	0.00						0.00		
1093.00	2838.13	5.209	2843.339	299.0	18.80	5.488	2848.827	0.00	4.385		4.50	0.00	0.00	0	0.00
296.50	0.00506					.023118	6.85			4.500			0.00		
1389.50	2839.63	10.838	2850.468	299.0	18.80	5.488	2855.956	0.00	4.385		4.50	0.00	0.00	0	0.00
JUNCT STR	0.10000												0.00		
1394.50	2840.13	2.787	2842.917	289.0	30.92	14.841	2857.758	0.00	3.963		4.00	0.00	0.00	0	0.00
237.50	0.06042					.055460	13.17			2.752			0.00		
1632.00	2854.48	2.908	2857.388	289.0	29.54	13.545	2870.933	0.00	3.963		4.00	0.00	0.00	0	0.00
70.99	0.06262					.050304	3.57			2.716			0.00		
1702.99	2858.93	3.014	2861.939	289.0	28.45	12.566	2874.505	0.00	3.963		4.00	0.00	0.00	0	0.00
59.01	0.06262					.045764	2.70			2.716			0.00		
1762.00	2862.62	3.162	2865.782	289.0	27.12	11.424	2877.206	0.00	3.963		4.00	0.00	0.00	0	0.00
15.82	0.04917					.043162	0.68			2.986			0.00		
1777.82	2863.40	3.178	2866.576	289.0	26.99	11.311	2877.887	0.00	3.963		4.00	0.00	0.00	0	0.00
105.18	0.04917					.041003	4.31			2.986			0.00		
1883.00	2868.57	3.347	2871.917	289.0	25.73	10.284	2882.201	0.00	3.963		4.00	0.00	0.00	0	0.00
7.31	0.04927					.038901	0.28			2.984			0.00		
1890.31	2868.93	3.364	2872.294	289.0	25.62	10.189	2882.483	0.00	3.963		4.00	0.00	0.00	0	0.00
60.57	0.04927					.037325	2.26			2.984			0.00		

WATER SURFACE PROFILE LISTING

SKYE CANYON INFRASTRUCTURE - PHASE 2 (UPDATE NO.4)
BY OLYMPIA COMPANIES
EAGLE CANYON - 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 PIER	AVBPR
L/ELEM	SO					SF AVE	HF			NORM DEPTH			ZR		
1950.88	2871.91	3.567	2875.481	289.0	24.42	9.262	2884.743	0.00	3.963		4.00	0.00	0.00	0	0.00
41.12	0.04927					.035621	1.46			2.984			0.00		
1992.00	2873.94	3.848	2877.788	289.0	23.29	8.421	2886.209	0.00	3.963		4.00	0.00	0.00	0	0.00
JUNCT STR	0.00000					.037623	0.00						0.00		
1992.00	2873.94	3.074	2877.014	269.0	25.96	10.465	2887.479	0.00	3.951		4.00	0.00	0.00	0	0.00
13.53	0.04913					.039592	0.54			2.820			0.00		
2005.53	2874.61	3.096	2877.701	269.0	25.77	10.311	2888.012	0.00	3.951		4.00	0.00	0.00	0	0.00
66.47	0.04913					.037405	2.49			2.820			0.00		
2072.00	2877.87	3.254	2881.124	269.0	24.57	9.373	2890.497	0.00	3.951		4.00	0.00	0.00	0	0.00
39.34	0.04884					.034253	1.35			2.826			0.00		
2111.34	2879.79	3.404	2883.196	269.0	23.60	8.650	2891.846	0.00	3.951		4.00	0.00	0.00	0	0.00
33.77	0.04884					.031859	1.08			2.826			0.00		
2145.11	2881.44	3.617	2885.058	269.0	22.50	7.864	2892.922	0.00	3.951		4.00	0.00	0.00	0	0.00
21.89	0.04884					.031405	0.69			2.826			0.00		
2167.00	2882.51	3.951	2886.461	269.0	21.45	7.148	2893.609	0.00	3.951		4.00	0.00	0.00	0	0.00
2.99	0.02789					.033326	0.10			4.000			0.00		
2169.99	2882.59	4.000	2886.594	269.0	21.41	7.116	2893.710	0.00	3.951		4.00	0.00	0.00	0	0.00
92.01	0.02789					.034835	3.21			4.000			0.00		
2262.00	2885.16	5.005	2890.165	269.0	21.41	7.116	2897.281	0.00	3.951		4.00	0.00	0.00	0	0.00
JUNCT STR	0.00000					.028529	0.00						0.00		
2262.00	2885.16	9.449	2894.609	213.0	16.95	4.461	2899.070	0.00	3.879		4.00	0.00	0.00	0	0.00
160.00	0.02275					.021988	3.52			3.220			0.00		

WATER SURFACE PROFILE LISTING

SKYE CANYON INFRASTRUCTURE - PHASE 2 (UPDATE NO.4)
BY OLYMPIA COMPANIES
EAGLE CANYON - 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 PIER	AVBPR

* REFERENCED HGL

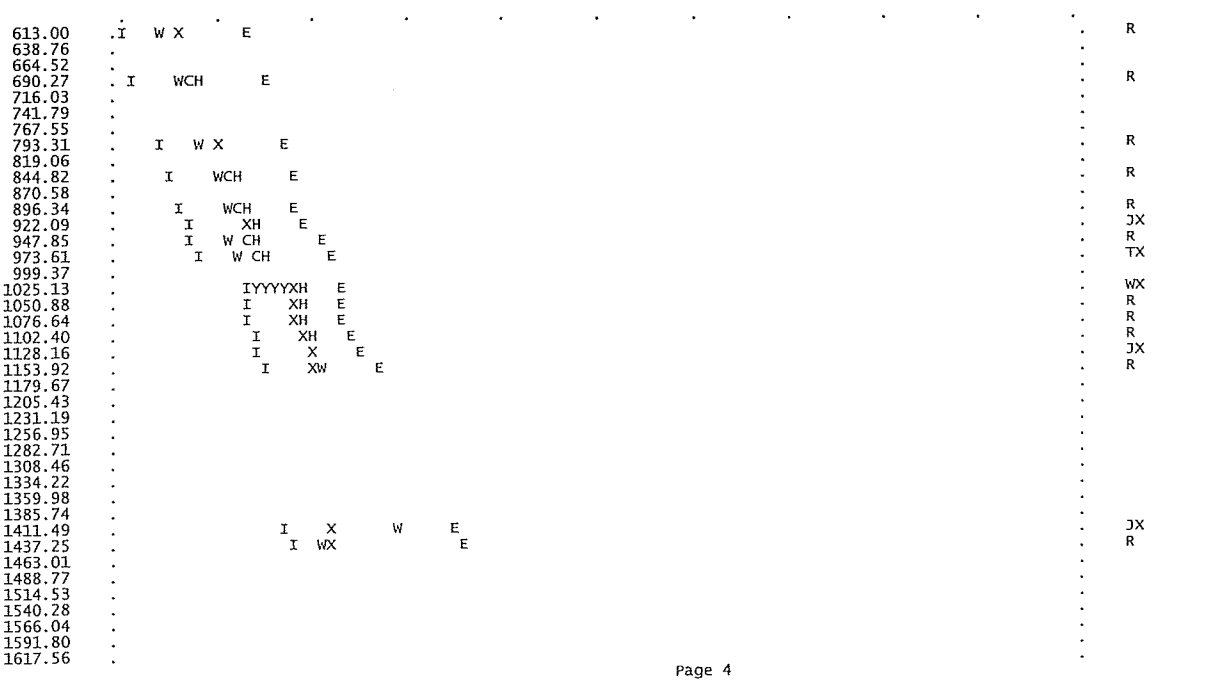
L/ELEM	SO					SF AVE	HF			NORM DEPTH			ZR		
2422.00	2888.80	9.550	2898.350	213.0	16.95	4.461	2902.811	0.00	3.879		4.00	0.00	0.00	0	0.00
JUNCT STR	0.00000					.021680	0.00						0.00		
2422.00	2888.80	9.791	2898.591	210.0	16.71	4.337	2902.928	0.00	3.872		4.00	0.00	0.00	0	0.00
398.00	0.03601					.021373	8.51			2.633			0.00		
2820.00	2903.13	4.184	2907.314	210.0	16.71	4.337	2911.651	0.00	3.872		4.00	0.00	0.00	0	0.00
JUNCT STR	0.00000					.014412	0.00						0.00		
2820.00	2903.13	8.490	2911.620	124.0	9.87	1.512	2913.132	0.00	3.345		4.00	0.00	0.00	0	0.00
184.00	0.03087					.007452	1.37			1.980			0.00		
3004.00	2908.81	4.556	2913.366	124.0	9.87	1.512	2914.878	0.00	3.345		4.00	0.00	0.00	0	0.00
JUNCT STR	0.00000					.004432	0.00						0.00		
3004.00	2908.81	6.213	2915.023	54.0	4.30	0.287	2915.310	0.00	2.209		4.00	0.00	0.00	0	0.00
20.00	0.09550					.001413	0.03			0.941			0.00		
3024.00	2910.72	4.346	2915.066	54.0	4.30	0.287	2915.353	0.00	2.209		4.00	0.00	0.00	0	0.00
JUNCT STR	0.00000					.001020	0.00						0.00		
3024.00	2910.72	4.665	2915.385	36.0	2.86	0.127	2915.512	0.00	1.787		4.00	0.00	0.00	0	0.00
14.23	0.04750					.000624	0.01			0.915			0.00		
3038.23	2911.40	4.000	2915.396	36.0	2.86	0.127	2915.523	0.00	1.787		4.00	0.00	0.00	0	0.00
7.61	0.04750					.000585	0.00			0.915			0.00		
3045.84	2911.76	3.629	2915.387	36.0	3.00	0.140	2915.527	0.00	1.787		4.00	0.00	0.00	0	0.00
4.31	0.04750					.000569	0.00			0.915			0.00		
3050.15	2911.96	3.413	2915.375	36.0	3.15	0.154	2915.529	0.00	1.787		4.00	0.00	0.00	0	0.00
3.44	0.04750					.000615	0.00			0.915			0.00		

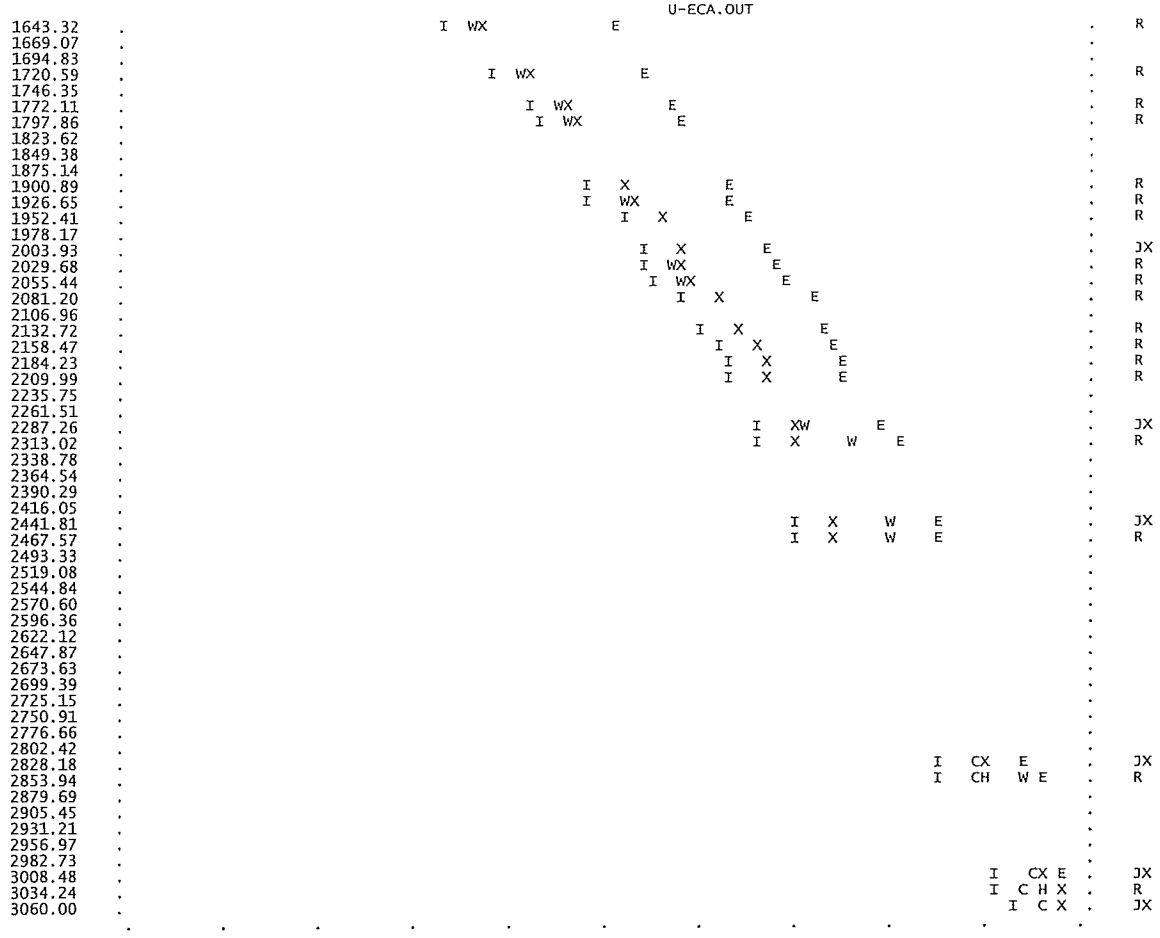
WATER SURFACE PROFILE LISTING

SKYE CANYON INFRASTRUCTURE - PHASE 2 (UPDATE NO.4)
BY OLYMPIA COMPANIES
EAGLE CANYON - 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 PIER	AVBPR
L/ELEM	SO					SF AVE	HF			NORM DEPTH			ZR		
3053.59	2912.13	3.236	2915.362	36.0	3.31	0.170	2915.532	0.00	1.787		4.00	0.00	0.00	0	0.00
2.97	0.04750					.000677	0.00			0.915			0.00		
3056.56	2912.27	3.080	2915.347	36.0	3.47	0.187	2915.534	0.00	1.787		4.00	0.00	0.00	0	0.00
2.60	0.04750					.000751	0.00			0.915			0.00		
3059.16	2912.39	2.940	2915.330	36.0	3.64	0.205	2915.535	0.00	1.787		4.00	0.00	0.00	0	0.00
0.84	0.04750					.000808	0.00			0.915			0.00		
3060.00	2912.43	2.894	2915.324	36.0	3.70	0.212	2915.536	0.00	1.787		4.00	0.00	0.00	0	0.00

SKYE CANYON INFRASTRUCTURE - PHASE 2 (UPDATE NO.4)
BY OLYMPIA COMPANIES
EAGLE CANYON - TRUNK STORM DRAIN





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?

Revised Parcel 2.27 Lateral Stub (P4-L1)

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0
T1 SKYE CANYON PARCEL 2.27
T2 BY OLYMPIA COMPANIES
T3 EAGLE CANYON LATERAL P4-L1 THRU PARCEL 2.27
SO    1000.002886.16 36                                  2894.61
R     1029.002887.72 36        .013                                        38.    1
JX    1029.002887.93 36 36     .013       3.0           2887.93          90.00
R     1068.002890.02 36        .013                                        90.    1
JX    1068.002890.24 36        .013
R     1106.002892.25 36        .013                                         0.    1
SH    1106.002892.25 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.
CD   54  4                 4.5
CD   60  4                 5.
CD   66  4                 5.5
CD   72  4                 6.
CD   78  4                 6.5
```

0
Q 53.0
↦

DATE: 6/19/2017
TIME: 9:37

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														
CD	54	4			4.50														
CD	60	4			5.00														
CD	66	4			5.50														
CD	72	4			6.00														
CD	78	4			6.50														

F 0 5 1 5 P

WATER SURFACE PROFILE - TITLE CARD LISTING

HEADING LINE NO 1 IS -

SKYE CANYON PARCEL 2.27

HEADING LINE NO 2 IS -

BY OLYMPIA COMPANIES

HEADING LINE NO 3 IS -

EAGLE CANYON LATERAL P4-L1 THRU PARCEL 2.27

F 0 5 1 5 P

WATER SURFACE PROFILE - ELEMENT CARD LISTING

ELEMENT NO 1 IS A SYSTEM OUTLET

U/S DATA	STATION	INVERT	SECT	W S ELEV
	1000.00	2886.16	36	2894.61

ELEMENT NO 2 IS A REACH

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	1029.00	2887.72	36	0.013	0.00	0.00	38.00	1

ELEMENT NO 3 IS A JUNCTION

U/S DATA	STATION	INVERT	SECT	LAT-1	LAT-2	N	Q3	Q4	INVERT-3	INVERT-4	PHI 3	PHI 4
	1029.00	2887.93	36	36	0	0.013	3.0	0.0	2887.93	0.00	90.00	0.00

ELEMENT NO 4 IS A REACH

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	1068.00	2890.02	36	0.013	0.00	0.00	90.00	1

ELEMENT NO 5 IS A JUNCTION

U/S DATA	STATION	INVERT	SECT	LAT-1	LAT-2	N	Q3	Q4	INVERT-3	INVERT-4	PHI 3	PHI 4
	1068.00	2890.24	36	0	0	0.013	0.0	0.0	0.00	0.00	0.00	0.00

ELEMENT NO 6 IS A REACH

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	1106.00	2892.25	36	0.013	0.00	0.00	0.00	1

ELEMENT NO 7 IS A SYSTEM HEADWORKS

U/S DATA	STATION	INVERT	SECT	W S ELEV
	1106.00	2892.25	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
LICENSEE: SLATER HANIFAN GROUP

F0515P

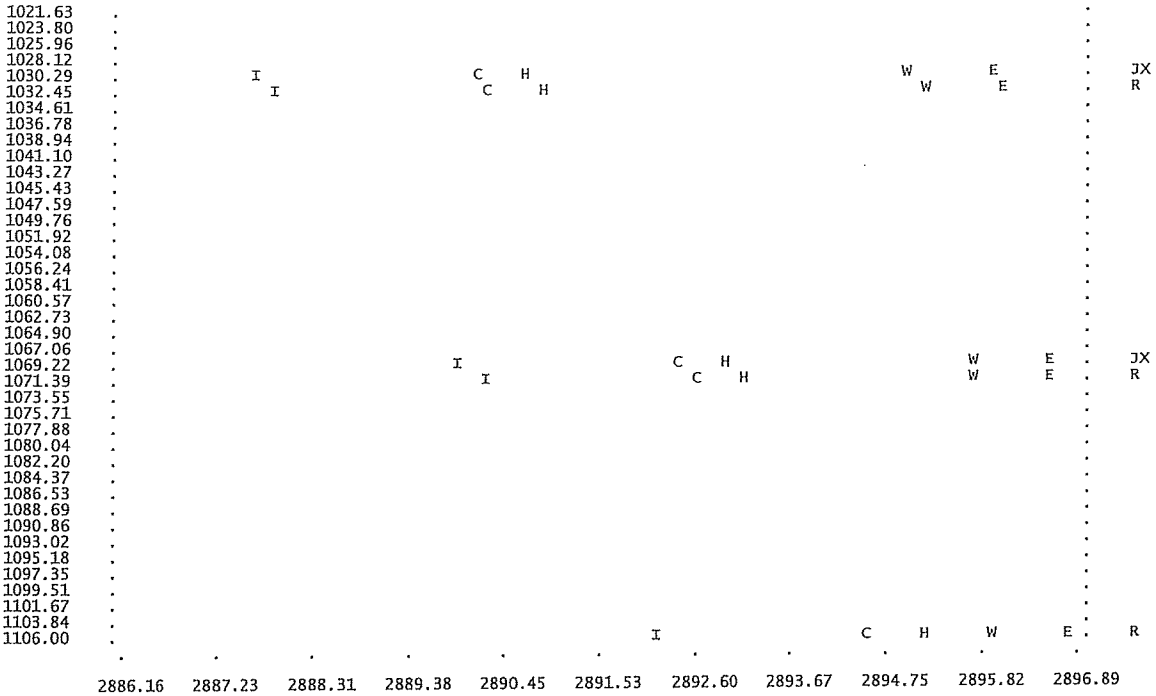
WATER SURFACE PROFILE LISTING

SKYE CANYON PARCEL 2.27
BY OLYMPIA COMPANIES
EAGLE CANYON LATERAL P4-L1 THRU PARCEL 2.27

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	2886.16	8.450	2894.610	56.0	7.92	0.974	2895.584	0.00	2.427		3.00	0.00	0.00	0	0.00
29.00	0.05379					.007049	0.20			1.247			0.00		
1029.00	2887.72	7.265	2894.985	56.0	7.92	0.974	2895.959	0.00	2.427		3.00	0.00	0.00	0	0.00
JUNCT STR	0.00000					.006681	0.00						0.00		
1029.00	2887.93	7.259	2895.189	53.0	7.50	0.873	2896.062	0.00	2.366		3.00	0.00	0.00	0	0.00
39.00	0.05359					.006314	0.25			1.211			0.00		
1068.00	2890.02	5.718	2895.738	53.0	7.50	0.873	2896.611	0.00	2.366		3.00	0.00	0.00	0	0.00
JUNCT STR	0.00000					.006314	0.00						0.00		
1068.00	2890.24	5.498	2895.738	53.0	7.50	0.873	2896.611	0.00	2.366		3.00	0.00	0.00	0	0.00
38.00	0.05289					.006314	0.24			1.215			0.00		
1106.00	2892.25	3.771	2896.021	53.0	7.50	0.873	2896.894	0.00	2.366		3.00	0.00	0.00	0	0.00

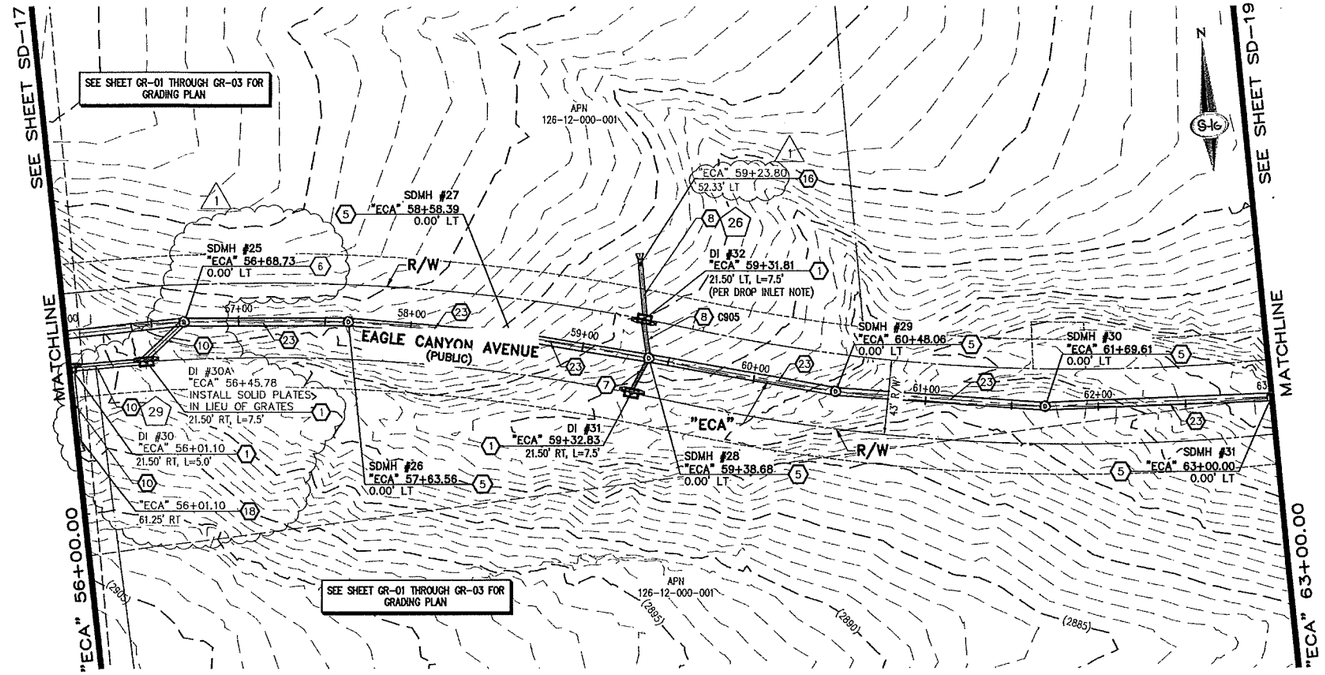
SKYE CANYON PARCEL 2.27
BY OLYMPIA COMPANIES
EAGLE CANYON LATERAL P4-L1 THRU PARCEL 2.27

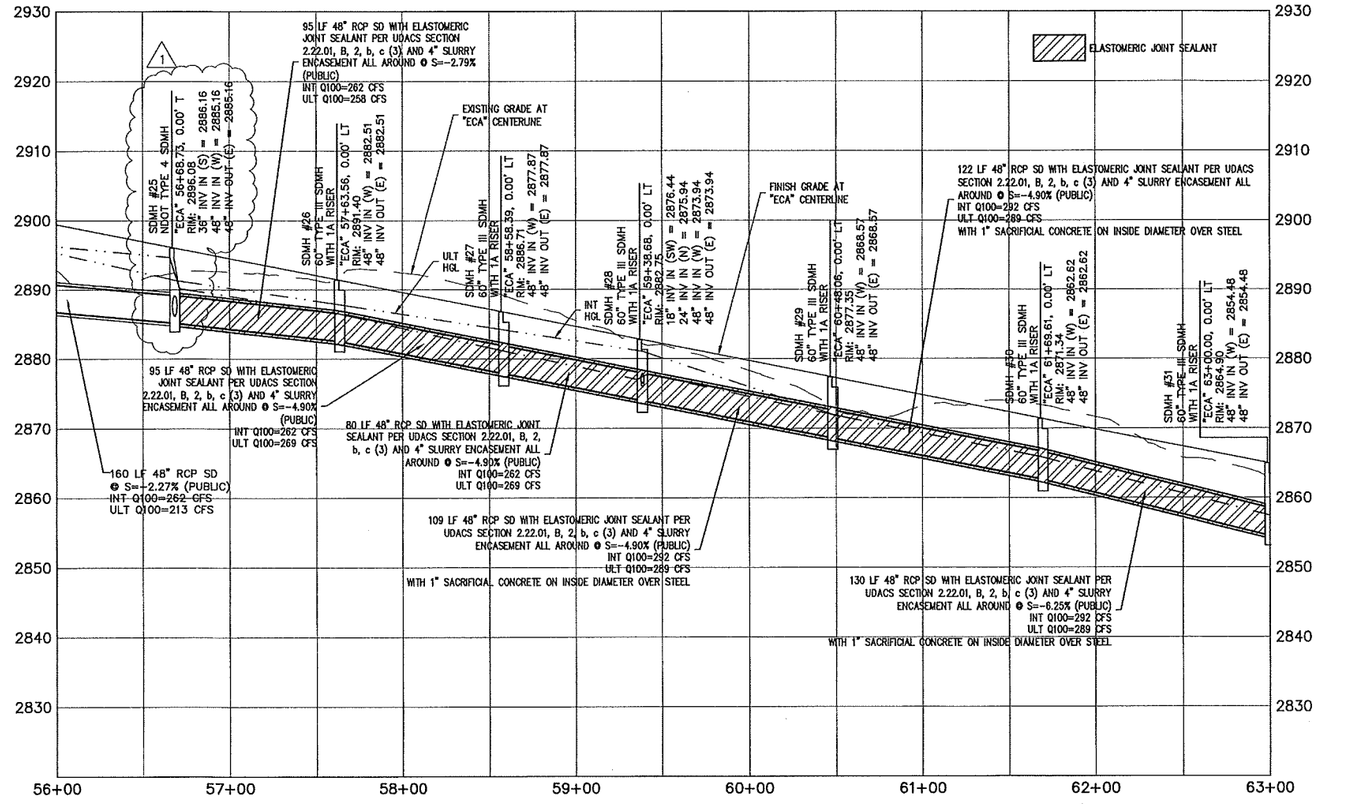
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1008.65     .                                                                                                                    .
1010.82     .                                                                                                                    .
1012.98     .                                                                                                                    .
1015.14     .                                                                                                                    .
1017.31     .                                                                                                                    .
1019.47     .                                                                                                                    .
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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.

Pertinent Improvement Plan Sheets





STORM DRAIN NOTES

1. CONSTRUCT TYPE "CM2" DROP INLET (USDCCA STD. DWG. NO. 412.1)
2. REMOVE EXISTING LATERAL STUB AND CONSTRUCT RCB PLUG (SEE DETAIL 5, DRAWING SD-25)
3. CONSTRUCT 60" TYPE I MANHOLE (USDCCA STD. DWG. NO. 403.1)
4. CONSTRUCT 60" TYPE III MANHOLE (USDCCA STD. DWG. NO. 406.1)
5. CONSTRUCT 60" TYPE III MANHOLE WITH TYPE 1A RISER (USDCCA STD. DWG. NO. 406.1 AND 406.1)
6. CONSTRUCT NDOT TYPE 4 MANHOLE (NDOT STD. PLAN R-4.3.2)
7. INSTALL 18" RCP OR WATER QUALITY C905 AS SHOWN ON PROFILES (USDCCA STD. DWG. NO. 503.2)
8. INSTALL 24" RCP OR WATER QUALITY C905 AS SHOWN ON PROFILES (USDCCA STD. DWG. NO. 503.2)
9. INSTALL 30" RCP (USDCCA STD. DWG. NO. 503.2)
10. INSTALL 36" RCP (USDCCA STD. DWG. NO. 503.2)
11. INSTALL 42" RCP (USDCCA STD. DWG NO. 503.2)
12. INSTALL 54" RCP (USDCCA STD. DWG. NO. 503.2)
13. INSTALL 60" RCP (USDCCA STD. DWG. NO. 503.2)
14. INSTALL 66" RCP (USDCCA STD. DWG. NO. 503.2)
15. INSTALL 18" RCP END SECTION (NDOT STD. PLAN R-2.3.1)
16. INSTALL 24" RCP END SECTION (NDOT STD. PLAN R-2.3.1)
17. INSTALL 30" RCP END SECTION (NDOT STD. PLAN R-2.3.1)
18. INSTALL 36" RCP END SECTION (NDOT STD. PLAN R-2.3.1)
19. INSTALL 42" RCP END SECTION (NDOT STD. PLAN R-2.3.1)
20. PIPE PENETRATION (SEE DETAIL 4, DRAWING SD-25)
21. CONSTRUCT CONCRETE COLLAR (SEE DETAIL 2, DRAWING SD-25)
22. CONSTRUCT BRICK AND MORTAR PLUG (SEE DETAIL 1, DRAWING SD-25)
23. INSTALL 48" RCP (USDCCA STD. DWG NO. 503.2)
24. INSTALL 48" RCP END SECTION (NDOT STD. PLAN R-2.3.1)
25. INSTALL DRIVEWAY (USDCCA STD. DWG NO. 224)
26. CONSTRUCT TYPE "CM" DROP INLET (USDCCA STD. DWG. NO. 422)

NOTES

1. ALL RCP SHALL BE CLASS III UNLESS OTHERWISE SHOWN.
2. ALL PIPE LENGTHS ARE MEASURED ALONG PIPE CENTERLINE TO CENTER OF MANHOLE OR INSIDE EDGE OF DI OR RCB/RCA.
3. ALL DROP INLETS SHALL INCLUDE STORM WATER MANAGEMENT STAMP AND DETAIL PER USDCCA STD. DWG. NO. 421.
4. SEE STRUCTURAL PLANS FOR ADDITIONAL STRUCTURAL DETAILS AND CONNECTIONS.
5. ALL PIPES ARE PUBLICLY MAINTAINED.
6. ADD SPECIAL INSPECTION REQUIRED FOR PIPE SEGMENTS WITH SACRIFICIAL CONCRETE.

APPROVED FOR CONSTRUCTION

LVVWD WILL HAVE TO BE PRESENT AND VIEW INSTALLATION OF STORM DRAIN THAT WILL BE INSTALLED THAT MAY AFFECT THE WATER MAINS

LVVWD ENGINEERING SERVICES MANAGER — DATE
PROJECT NO. 124568

DROP INLET NOTE

WHERE 10 FEET PARALLEL SEPARATION IS NOT PRACTICABLE:

CAST-IN-PLACE MONOLITHIC POUR WITH WATERSTOP BETWEEN SLAB AND WALLS. BASE, WALLS AND TOP TO BE CONSTRUCTED WITH WATERSTOPS, CENTER BULB, OR FLAT STRIP (VINYLEX, GREENSTREAK PLASTIC PRODUCTS OR APPROVED EQUAL).

LEGEND

(1) STORM DRAIN LATERAL # (SEE SHEETS SD-20 THRU SD-24)

I CERTIFY THAT THIS GRADING PLAN IS IN CONFORMANCE WITH THE APPROVED TECHNICAL DRAINAGE STUDY DS-4739A ON FILE AT THE CITY OF LAS VEGAS FOR THE SUBJECT PROJECT

JERRY SLATER, P.E. 14167 — DATE

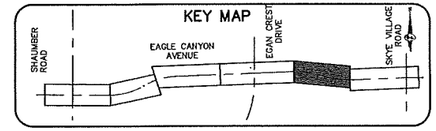
FLOOD ZONE

THE PROJECT SITE IS LOCATED WITHIN A FEMA DESIGNATED ZONE "X" (OUTSIDE THE 500-YEAR FLOOD PLAIN) ON THE FLOOD INSURANCE RATE MAP (FIRM) PANEL: 32003C1750C, DATED SEPTEMBER 27, 2002

NOTE:

PROPERTY OWNER IS RESPONSIBLE TO MAINTAIN THE BEST MANAGEMENT PRACTICES, SUCH AS BUT NOT LIMITED TO, THE REMOVAL OF ACCUMULATED SEDIMENT AND DEBRIS AND CARE OF VEGETATION.

KEY MAP



40 0 40 80
SCALE FEET

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

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

Call before you Dig Call 811 or 1-800-227-2600

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.
1	REVISED STORM DRAIN	6/20/17	JJS		

NINETY-FIVE MANAGEMENT LLC

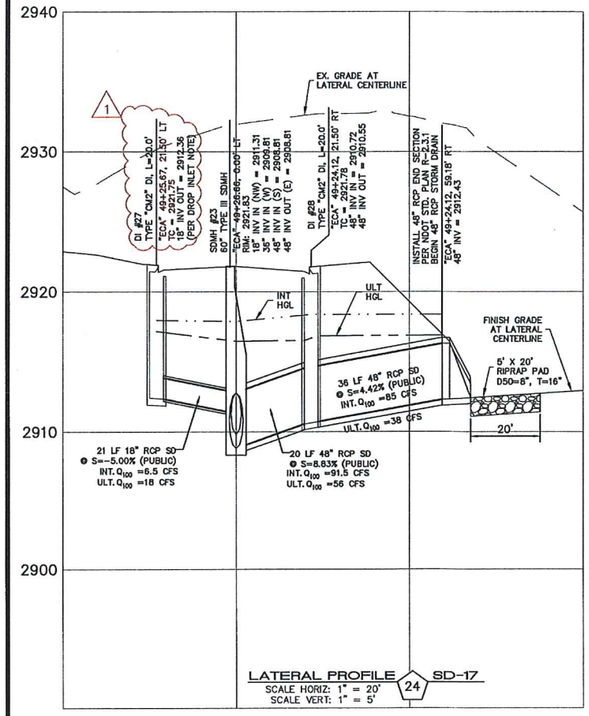
SKYE CANYON II PHASE 2 MASS GRADING
EAGLE CANYON AVENUE PLAN AND PROFILE
"ECA" 56+00.00 TO "ECA" 63+00.00

DATE: 8/3/16
DRAFTER: JAS
DESIGNER: DAM
CHECKED: JSR

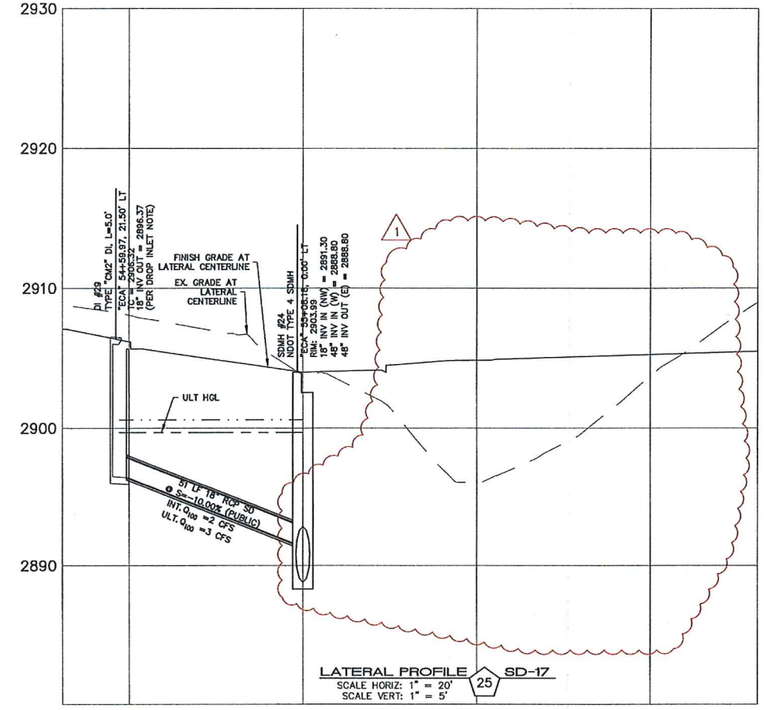
PROJECT NO.
OLY1501-001

PROFESSIONAL ENGINEER — STATE OF NEVADA — JERRY SLATER — Exp. 06/30/2018 — CIVIL — No. 14167 — 6.19.17

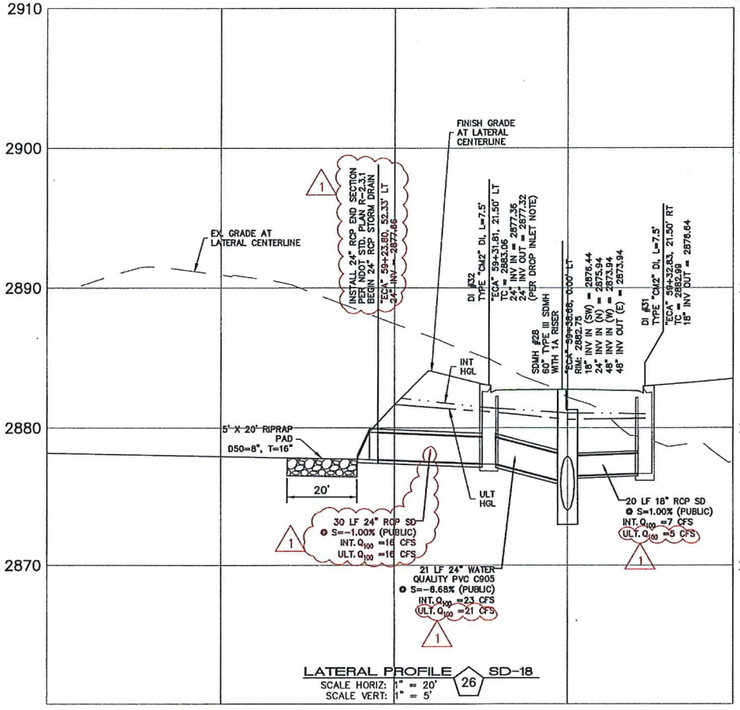
SD-18
SHEET 21 OF 32



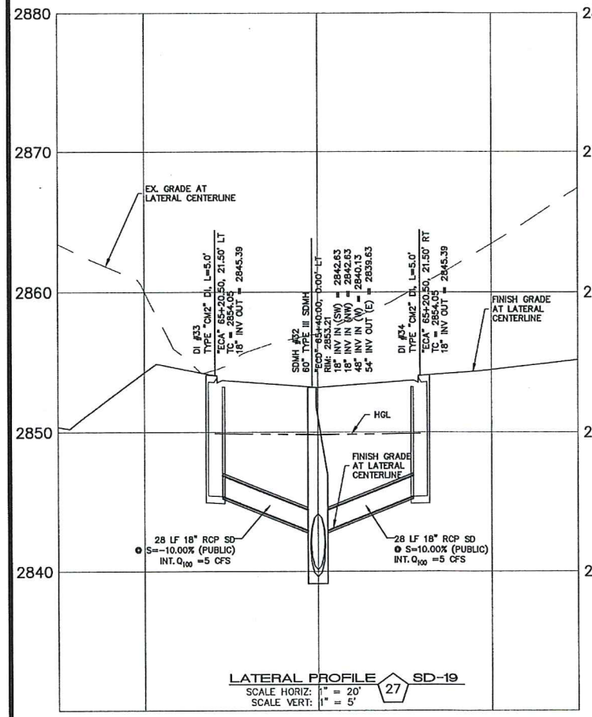
LATERAL PROFILE 24 SD-17
SCALE HORIZ: 1" = 20'
SCALE VERT: 1" = 5'



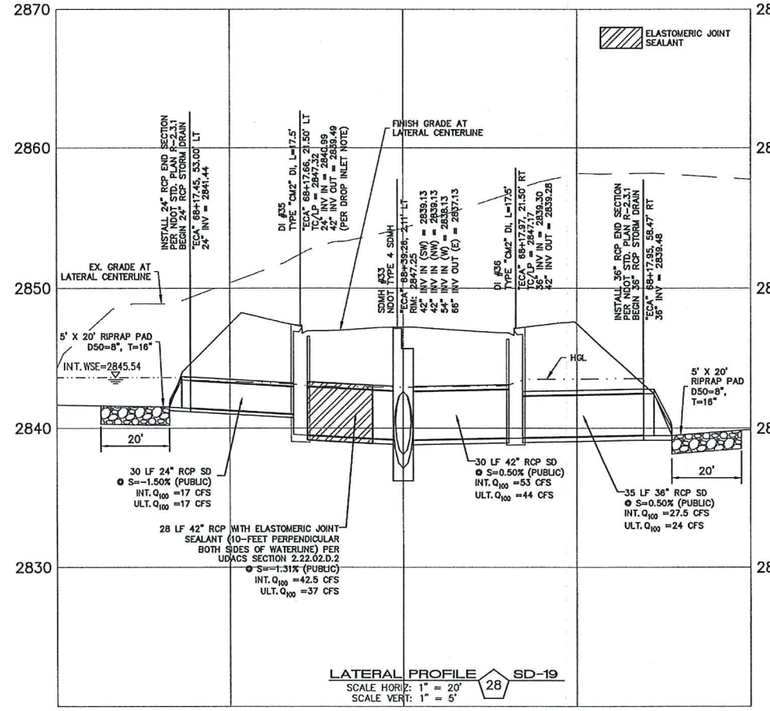
LATERAL PROFILE 25 SD-17
SCALE HORIZ: 1" = 20'
SCALE VERT: 1" = 5'



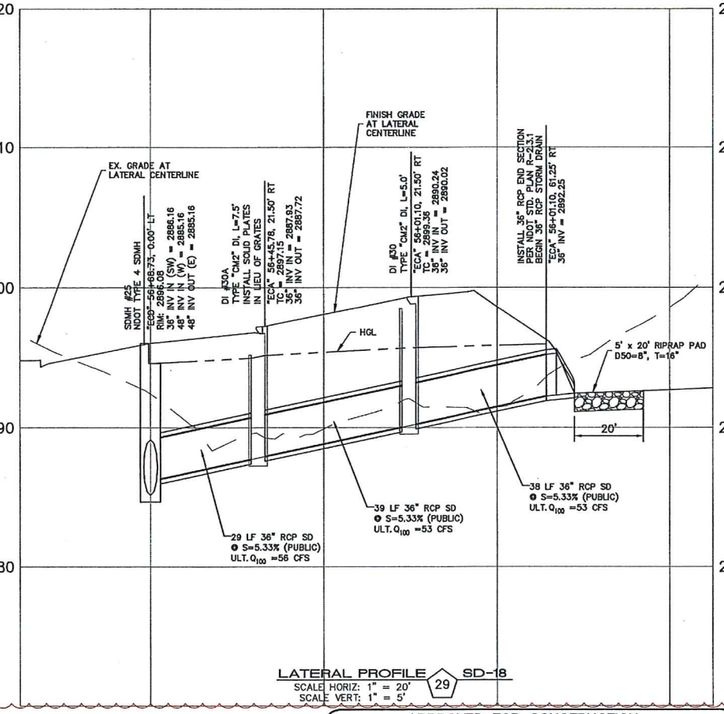
LATERAL PROFILE 26 SD-18
SCALE HORIZ: 1" = 20'
SCALE VERT: 1" = 5'



LATERAL PROFILE 27 SD-19
SCALE HORIZ: 1" = 20'
SCALE VERT: 1" = 5'



LATERAL PROFILE 28 SD-19
SCALE HORIZ: 1" = 20'
SCALE VERT: 1" = 5'



LATERAL PROFILE 29 SD-18
SCALE HORIZ: 1" = 20'
SCALE VERT: 1" = 5'

DROP INLET NOTE

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APPROVED FOR CONSTRUCTION

LVVWD WILL HAVE TO BE PRESENT AND VIEW INSTALLATION OF STORM DRAIN THAT WILL BE INSTALLED THAT MAY AFFECT THE WATER MAINS

LVVWD ENGINEERING SERVICES MANAGER — DATE
PROJECT NO. 124588

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.
1	REVISED STORM DRAIN	9/20/17	JJS		

NINETY-FIVE MANAGEMENT LLC

SKYE CANYON II PHASE 2 MASS GRADING

STORM DRAIN LATERAL PROFILES

DATE: 8/3/16
DRAFTER: JAS
DESIGNER: DAM
CHECKED: JSR
PROJECT NO. OLY1501-001

PROFESSIONAL ENGINEER — STATE OF NEVADA — JERRY J. SLATER — Exp. 08/30/2018 — CIVIL — No. 14167

SD-24
SHEET 27 OF 32

APPENDIX H

Reference Material

Master Drainage Study for Skye Canyon – Update No.3, by SHG

Approval Letter

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

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

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

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

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

10th Submittal - Phase 2 interim impacts.

Revised Memo – National Monument Drainage Impacts

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

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

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

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

6. This Master Study notes that drainage study updates for both Phase 1 and Phase 2 to accommodate the increased system flows impacting these Phases are necessary. A detailed analysis & review of the required updates will determine the system impacts and if any needed system upgrades are necessary to maintain HCDDM criteria.

7. ***Exhibit 1***: The developed condition Exhibit 1 shall be updated to include the coordinated Kyle Canyon Interchange drainage improvements. The size of the downstream facilities shall be reviewed based upon the interchange improvements.

8. ***Exhibit 1***: The developed condition Exhibit 1 shows that a portion of the developed flows will drain north of Moccasin into the BLM land and the National Monument to mimic existing drainage patterns. Concentrated flow discharges to the north shall require BLM and National Park Service concurrence.

9. ***Exhibit J***: The proposed facility 14 that drains from EC18 easterly to the proposed DB3 shall be a permanent facility meeting the requirements of Title 20 and shall be constructed as a permanent MPU facility with this development.

10. ***Exhibit J***: The proposed onsite DB1 & DB2 facilities shall include the collection facilities as a part of the detention basins areas.

11. ***Exhibit J***: The proposed changes to DB1 will impact the alignment and size of the ultimate collection facility that drains to DB1. The proposed facility shall remain an open channel to allow flow interception from the west in this undeveloped drainage.

12. The ***Master Land Use Plan*** has been provided however, any further changes to the adopted Master Land Use Plan shall require a complete update to the Master Drainage Study.

13. A copy of the approved 404 Permit from the Army Corps of Engineers has been provided.

14. The Phasing Plan for Phase 1 & 2 have addressed the interim condition and associated downstream impacts to address the impact of the long term discharge from the outfall of the Detention Basin #1. This includes upgrading the existing storm drain system near the intersection of Brent Lane and Fort Apache. These improvements have been included in the Detention Basin #1 improvements.

15. Flood Control requires an interim condition drainage analysis in support of the Phasing Plan that clearly shows the impacts to each Phase, existing washes, upstream concentration points and the downstream concentration points. Flood Control needs to make sure that each Phase of Development is protected during the interim and full build-out of this overall project. The current Phasing Plan does not adequately address these issues beyond Phase 2.

16. The interim conditions of the Phasing Plan need to address the impact of the long term discharge from the outfall of any future detention basins. It is noted that Only Detention Basin #1 has been reviewed. The technical review of Detention Basin #2 will determine the impacts downstream along the Iron Mountain Road alignment and/or other needed facilities to mitigate that impact. The provided Basin Attenuated Outfall Exhibit is only conceptual in nature and is subject to further review as a part of the technical reviews. Existing flow conditions do not have a drawn out discharge from a detention basin. This discharge impact must be accounted for in the interim condition without negatively impacting the existing downstream neighborhoods.

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

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

The following comments are repeated until they are complete:

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

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

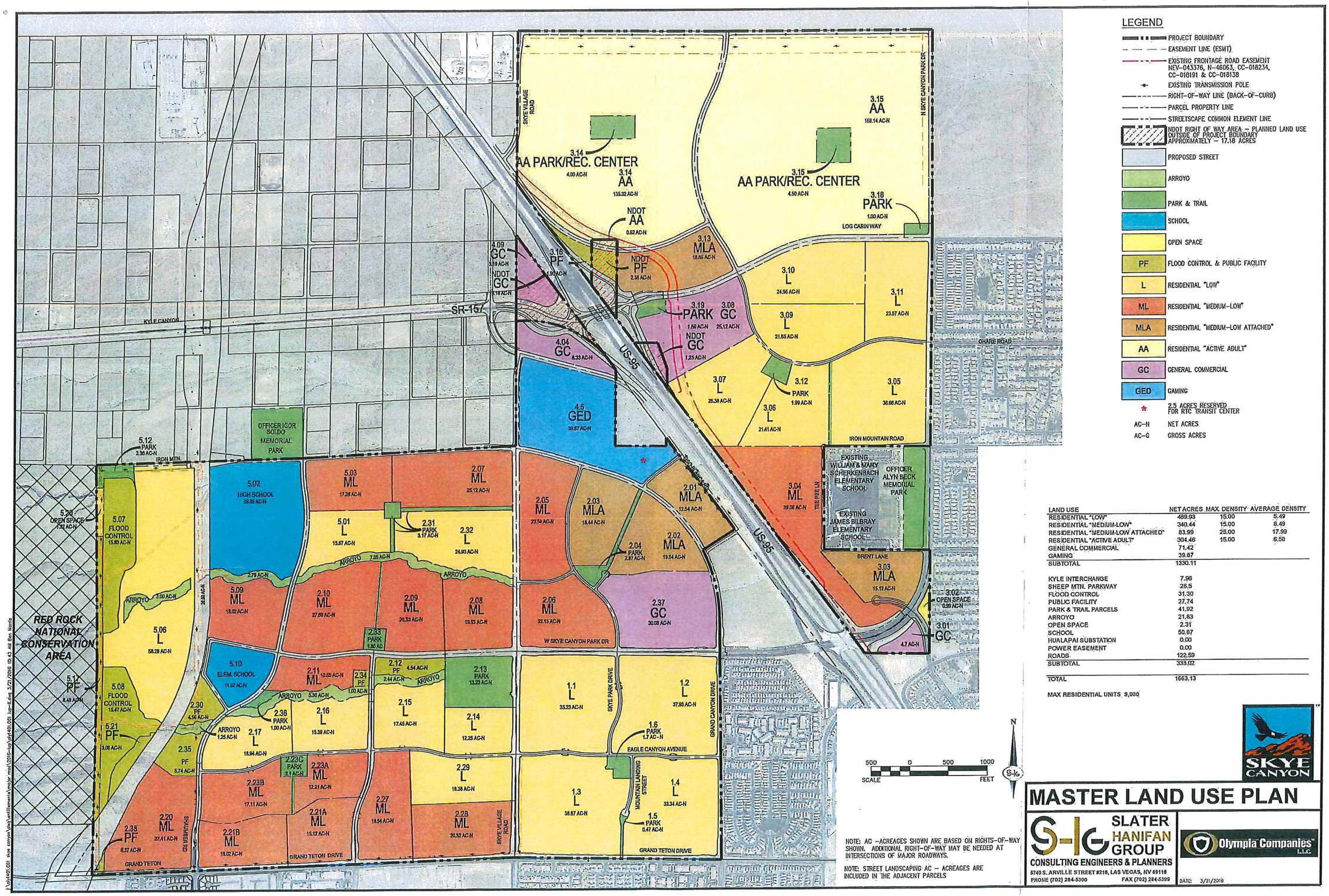
year. If the proposed construction has not been completed in that time period, the *City of Las Vegas* reserves the right to require additional conditions and/or submission and acceptance of a complete drainage study update prior to further construction of a project.

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

END OF REMARKS
Osk/pbj

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

Master Land Use Plan



LAND USE	NET ACRES	MAX DENSITY	AVERAGE DENSITY
RESIDENTIAL "LOW"	489.93	15.00	5.49
RESIDENTIAL "MEDIUM-LOW"	340.44	15.00	8.49
RESIDENTIAL "MEDIUM-LOW ATTACHED"	83.99	25.00	17.99
RESIDENTIAL "ACTIVE ADULT"	304.46	15.00	6.50
GENERAL COMMERCIAL	71.42		
GAMING	39.87		
SUBTOTAL	1330.11		
KYLE INTERCHANGE	7.96		
SHEEP MTN. PARKWAY	26.5		
FLOOD CONTROL	31.30		
PUBLIC FACILITY	27.74		
PARK & TRAIL PARCELS	41.92		
ARROYO	21.83		
OPEN SPACE	2.31		
SCHOOL	50.87		
HUALAPAI SUBSTATION	0.00		
POWER EASEMENT	0.00		
ROADS	122.59		
SUBTOTAL	333.02		
TOTAL	1663.13		

MAX RESIDENTIAL UNITS 9,000

NOTE: AC –ACREAGES SHOWN ARE BASED ON RIGHTS-OF-WAY SHOWN. ADDITIONAL RIGHT-OF-WAY MAY BE NEEDED AT INTERSECTIONS OF MAJOR ROADWAYS.

NOTE: STREET LANDSCAPING AC – ACREAGES ARE INCLUDED IN THE ADJACENT PARCELS

SKYE CANYON

MASTER LAND USE PLAN

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

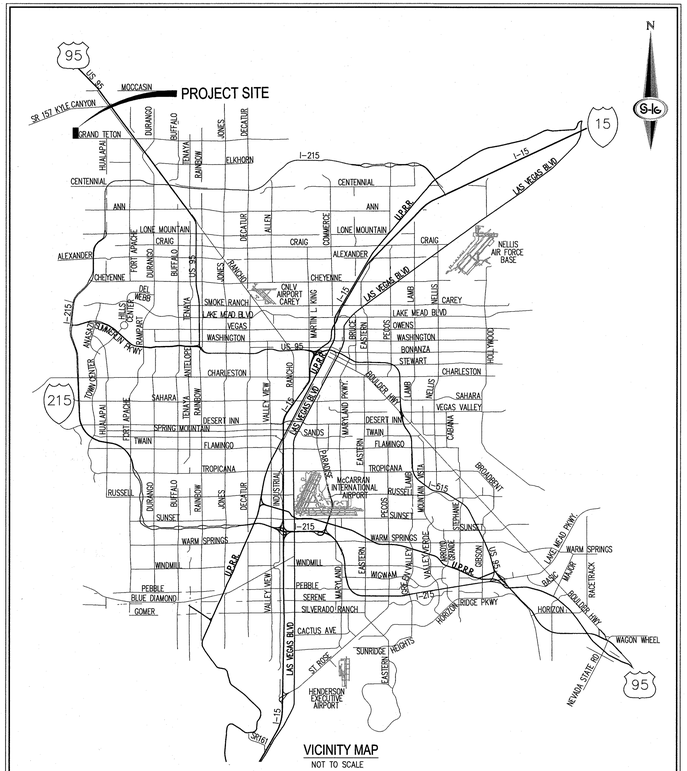
Olympia Companies LLC

DATE: 3/21/2016

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APPENDIX I

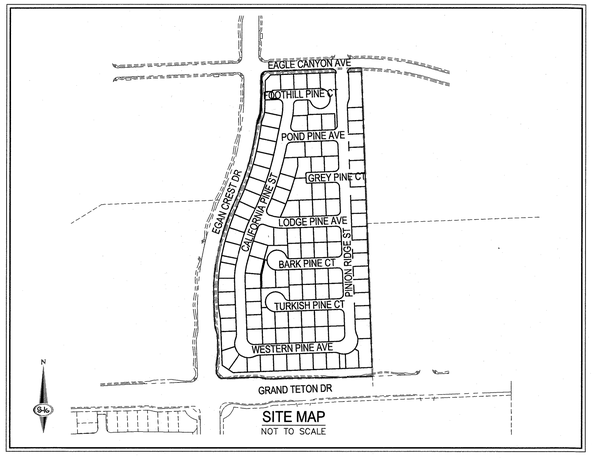
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NINETY FIVE MANAGEMENT LLC

IMPROVEMENT PLANS
FOR
SKYE CANYON II PARCEL 2.27

CITY OF LAS VEGAS, NEVADA
RESIDENTIAL SUBDIVISION
APN: 126-12-810-003



SHEET INDEX

NO.	SHEET	TITLE
1	C-1	COVER SHEET
2	C-2	GENERAL NOTES
3	C-3	LEGEND, ABBREVIATIONS, AND QUANTITIES
4	G-1	GRADING PLAN I
5	G-2	GRADING PLAN II
6	G-3	GRADING PLAN III
7	G-4	GRADING PLAN IV
8	G-5	GRADING PLAN V
9	G-6	GRADING PLAN VI
10	D-1	STREET SECTIONS AND GRADING DETAILS I
11	D-2	GRADING DETAILS II
12	D-3	GRADING DETAILS III
13	SD-1	PLAN AND PROFILE -- STORM DRAIN FIELD INLET

APPROVALS

CITY ENGINEER–ALLEN PAVELKA PE, #9029 DATE

APPROVAL OF THESE PLANS BY THE CITY ENGINEER IS LIMITED TO THOSE IMPROVEMENTS CONSTRUCTED IN THE DEDICATED 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 DATE
BUILDING AND SAFETY

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 STATUES AND / OR PUBLIC UTILITY COMMISSION RULES AND REGULATIONS.

APPROVED FOR CONSTRUCTION

LAS VEGAS VALLEY WATER DISTRICT ENGINEERING SERVICES MANAGER
DATE: ADD FIELD PROJECT NO. ######
LVVWD APPROVED FIRE FLOW XXXX GPM AT 20 PSI RESIDUAL
SHEETS: ADD FIELD

APPROVAL BY THE FIRE DEPARTMENT HAVING JURISDICTION IS REQUIRED PRIOR TO OBTAINING FINAL APPROVAL FROM LAS VEGAS VALLEY WATER DISTRICT.

NV ENERGY DATE

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

SOUTHWEST GAS CORPORATION DATE

COX COMMUNICATIONS LAS VEGAS, INC. DATE

LEGAL DESCRIPTION

BEING A PORTION OF SECTION 12, TOWNSHIP 19 SOUTH, RANGE 59 EAST M.D.M., CLARK COUNTY, NEVADA.

BENCHMARK

BM 7LV90 7NWS CITY OF LAS VEGAS RIVET AND ROUND PLATE IN CONCRETE CYLINDER, SOUTHEAST CORNER OF HUALAPAI WAY AND IRON MOUNTAIN ROAD.

ELEV: 2840.13 FEET (865.67 METERS) (NAVD 1988)

BASIS OF BEARINGS

SOUTH 00°34'18" EAST, BEING THE BEARING OF THE EAST LINE OF THE NORTHEAST QUARTER (NE ¼) OF SECTION 12, TOWNSHIP 19 SOUTH, RANGE 59 EAST, M.D.M., AS PER FILE 151, PAGE 14 OF SURVEYS, ON FILE IN THE COUNTY RECORDER'S OFFICE.

FEMA FLOOD ZONE INFORMATION

THE PROJECT SITE IS NOT LOCATED WITHIN A FEMA DESIGNATED ZONE 'X' (AREA OUTSIDE THE 500 YEAR FLOODPLAIN), PER THE FEMA FIRM PANEL 23003C1750E DATED SEPTEMBER 27, 2002

PROJECT INFORMATION

ACREAGE (GROSS):	= 19.53± AC
ACREAGE (NET):	= 19.53± AC
ACREAGE (NET–NET):	= 19.53± AC
DENSITY (LOTS/NET ACRE):	= 5.63± DU/NET AC
ZONING:	= T–D
TOTAL NO. OF RESIDENTIAL LOTS	= 110
TOTAL NO. OF COMMON ELEMENTS *	= 9
MINIMUM LOT SIZE	= 4,177.5 SF±
MAXIMUM LOT SIZE	= 8,880.3 SF±
PROVIDED OPEN SPACE	= 98,045 SF±

EARTHWORK SUMMARY (UNADJUSTED)

CUT	46,326 CY.
FILL	149,766 CY.
NET	103,440 CY.

OWNER	DEVELOPER	ENGINEER
K A G DEVELOPMENT WEST, LLC OLYMPIA COMPANIES 11411 SOUTHERN HIGHLANDS #300 LAS VEGAS NV, 89141 PH (702) 220–6565	NINETY FIVE MANAGEMENT, LLC 11411 SOUTHERN HIGHLANDS #300 LAS VEGAS NV, 89141 PH (702) 220–6565	SLATER HANIFAN GROUP, INC. 5740 S. ARVILLE STREET, SUITE 216 LAS VEGAS, NV 89118 PH: (702) 284–5300 FX: (702) 284–5399 CONTACT: TIM MULROONEY

SWPPP NOTE

NOTE: ALL LAND SURFACE AREA DISTURBANCES OVER 1 ACRE REQUIRE A STORMWATER DISCHARGE PERMIT ISSUED BY THE NEVADA DIVISION OF ENVIRONMENTAL PROTECTION (NDEP). A PHASED CONSTRUCTION UNIT IN A CONTIGUOUS SUBDIVISION IS CONSIDERED UNDER CONSTRUCTION UNTIL ALL STRIPPED SURFACE AREAS HAVE BEEN COVERED BY PAVING, BUILDING CONSTRUCTION OR PLANTING. A STORMWATER DISCHARGE PERMIT APPLICATION AND ASSOCIATED INFORMATION MAY BE DOWNLOADED FROM THE WEB SITE: HTTP://WWW.STATE.NV.US/BWPC/STORM01.HTM .PROJECTS THAT DISTURB MORE THEN ONE ACRE OF LAND MUST SUBMIT TO NDEP A "NOTICE OF INTENT" FOR INCLUSION UNDER STORMWATER PERMIT NO. NVR100000 ALONG WITH THE APPROPRIATE FILLING FEE.

GEOTECHNICAL ENGINEER

PREPARED BY: GEOTEK RESIDENTIAL, LLC
ADDRESS: 6835 ESCONDIDO ST # A, LAS VEGAS, NV 89119
PHONE: (702) 897–1424
PROJECT No. 12208–LVR
DATED: MARCH 30, 2016

DEVIATIONS FROM STANDARDS

NONE







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.

CITY OF LAS VEGAS, NV

NINETY FIVE MANAGEMENT LLC

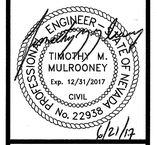
SKYE CANYON II PARCEL 2.27

COVER SHEET

S 12
T 19
R 59

DATE: 6/21/17
DRAFTER: JM
DESIGNER: MAK
CHECKED: TM

PROJECT NO.
OLY1607-005



C-1
SHEET 1 OF 13

J:\oly\1607-005 skye canyon parcel 2.27\dwg\improv\oly1607-005 cvr.dwg 6/21/2017 11:34 AM Erwin Sacundo

STORMWATER RUNOFF MANAGEMENT

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

1. THE OWNER, SITE DEVELOPER, CONTRACTOR AND/OR THEIR AUTHORIZED AGENTS SHALL EACH DAY REMOVE ALL SEDIMENT ,MUD, CONSTRUCTION DEBRIS, OR OTHER POTENTIAL POLLUTANTS THAT MAY HAVE BEEN DISCHARGED TO, OR ACCUMULATE IN, THE PUBLIC RIGHTS OF WAYS OF CLARK COUNTY AS A RESULT OF CONSTRUCTION ACTIVITIES ASSOCIATED WITH THIS SITE DEVELOPMENT OR CONSTRUCTION PROJECT. SUCH MATERIALS SHALL BE PREVENTED FROM ENTERING THE STORM SEWER SYSTEM.
2. ADDITIONAL CONSTRUCTION SITE DISCHARGE BEST MANAGEMENT PRACTICES MAY BE REQUIRED OF THE OWNER AND HIS OR HER AGENTS DUE TO UNFORESEEN EROSION PROBLEMS OR IF THE SUBMITTED PLAN DOES NOT MEET THE PERFORMANCE STANDARDS SPECIFIED IN TITLE 24.40 AND THE LAS VEGAS VALLEY CONSTRUCTION SITE BEST MANAGEMENT PRACTICES MANUAL.
3. TEMPORARY OR PERMANENT STABILIZATION PRACTICES WILL BE INSTALLED ON DISTURBED AREAS AS SOON AS PRACTICABLE AND NO LATER THAN 14 DAYS AFTER THE CONSTRUCTION ACTIVITY IN THAT PORTION OF THE SITE HAS TEMPORARILY OR PERMANENTLY CEASED. SOME EXCEPTIONS MAY APPLY; REFER TO NEVADA STORMWATER GENERAL PERMIT FOR CONSTRUCTION ACTIVITY 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, WHICHEVER IS EARLIER. SEDIMENT MUST BE REMOVED WHEN BMP DESIGN CAPACITY HAS BEEN REDUCED BY 50 PERCENT OR MORE.

2.2 CITY OF LAS VEGAS SEWER NOTES

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

LAS VEGAS VALLEY WATER DISTRICT (LVVWD) STANDARD NOTES

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

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

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

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

GRADING NOTES

1. INDICATED GRADES OTHER THAN T.C., F.G. & GUTTER F.L. ARE ROUGH GRADES.
2. THE ROUGH GRADING PLANS SHALL BE ON THE JOB SITE AT ALL TIMES. THE ROUGH GRADING SHALL BE FINISHED IN CONFORMANCE WITH THE LINES AND GRADES SHOWN ON THE PLANS. THE GRADING QUANTITIES ARE BASED ON THE ELEVATION AND DETAILS SHOWN ON THE PLANS. ANY DEVIATIONS FROM THE PLANS WILL RESULT IN QUANTITY CHANGES.
3. CARE SHALL BE EXERCISED IN GRADING CORNER LOTS.
4. ROUGH PAD ELEVATIONS SHALL BE GRADED TO WITHIN 0.1' OF THE PAD ELEVATIONS SHOWN ON THE PLANS. WHEN GRADING IS COMPLETE PER THE PLANS, THE CONTRACTOR SHALL NOTIFY THE ENGINEER SO THAT THE LOTS CAN BE INSPECTED. AT THAT TIME THE ENGINEER SHALL ALSO DECIDE IF ANY ADDITIONAL DITCHES OR BERMS ARE REQUIRED. THE CONTRACTOR IS REQUESTED NOT TO REMOVE ANY OF HIS ROUGH GRADING EQUIPMENT UNTIL HE RECEIVES GRADING APPROVAL FROM THE ENGINEER.
5. SOILS REPORT PREPARED BY GEOTEK RESIDENTIAL, LLC, PROJECT NO. 12208-LVR, DATED MARCH 30, 2016.
6. EARTHWORK QUANTITIES (RAW):
   -CUT = 46,326 CUBIC YARDS.
   -FILL = 149,766 CUBIC YARDS

   A) THE ABOVE QUANTITIES DO NOT REFLECT LOSSES DUE TO SUBSIDENCE OR SHRINKAGE.
   B) THE ABOVE QUANTITIES DO REFLECT USING NATIVE MATERIAL IN LIEU OF TYPE I GRAVEL BASE MATERIAL FOR STREET SECTIONS.
   C) THE ABOVE QUANTITIES DO NOT REFLECT ANY EARTHWORK WHICH MAY BE REQUIRED BY THE ENGINEER TO CONSTRUCT ADDITIONAL PROTECTIVE DITCHES OR BERMS NOT SHOWN ON THESE DRAWINGS.

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 # 6325, FOR HYDRANT SPECIFICATIONS, AND HYDRANT INSTALLATION SPECIFICATIONS.
2. ONLY FIRE HYDRANTS THAT ARE ON THE LAS VEGAS VALLEY WATER DISTRICT'S – **APPROVED PRODUCTS** LIST ARE ALLOWED TO BE INSTALLED.
3. A PERMIT IS REQUIRED FROM LAS VEGAS FIRE AND RESCUE FOR ALL INSTALLATION OF ON-SITE WATER LINES AND FIRE HYDRANTS. THE PERMIT AND CONTRACTORS MATERIAL TEST CERTIFICATE FOR UNDERGROUND PIPING FORM SHALL BE OBTAINED FROM THE FIRE PROTECTION ENGINEER BEFORE COMMENCEMENT OF WORK [IFC 105.7.12]
4. ON ANT RESIDENTIAL OR COMMERCIAL INSTALLATIONS, FIRE HYDRANTS SHALL BE INSTALLED AND FIRE APPARATUS ACCESS ROADS SHALL BE MAINTAINED BEFORE COMMENCEMENT OF ANY COMBUSTIBLE CONSTRUCTION. ALL FIRE HYDRANTS SHALL BE IN GOOD WORKING ORDER AND SHALL BE CAPABLE OF DELIVERING THE REQUIRED FIRE FLOW. [IFC 3310, 3312]
5. TO IDENTIFY THE FIRE HYDRANT LOCATIONS, THE CONTRACTOR SHALL PLACE A BLUE REFLECTIVE MARKER AT THE CENTER LINE OF THE STREET ADJACENT TO THE FIRE HYDRANTS. [IFC 507.5.7.3]
6. ALL UNDERGROUND INSPECTIONS, PRESSURE AND FLUSH VERIFICATIONS OF ALL FIRE HYDRANTS AND FIRE LINES, SHALL BE CONDUCTED BEFORE COVERING THE LINES. CENTER LOADING IS ACCEPTABLE FOR THE HYDRO TESTS WITH PRIOR FIRE PREVENTION APPROVAL. [IFC 106.3]
7. ALL ON-SITE UNDERGROUND WATER MAINS AND MATERIALS SHALL BE U.L. LISTED, A.W.W.A APPROVED AND SHALL BE RATED FOR THE APPROPRIATE WORKING PRESSURE. [IFC 507.2.1, NFPA 24]
8. PAINTING OF CURBS, FIRE HYDRANTS, PADS, PROTECTION OF FIRE HYDRANTS FROM PHYSICAL DAMAGE, AND ALL OTHER WORK NECESSARY PER PLANS SHALL BE COMPLETED BEFORE APPROVAL BY LAS VEGAS FIRE AND RESCUE, FIRE PREVENTION DIVISION. [IFC 507]
9. PRIVATE HYDRANTS SHALL BE PANTED RED. [IFC 507.5.7.1]
10. PRIOR TO THE FINAL OCCUPANCY, A FIRE FLOW TEST SHALL BE WITNESSED BY LAS VEGAS FIRE AND RESCUE, FIRE PREVENTION DIVISION TO VERIFY AVAILABILITY OF THE REQUIRED FIRE FLOW. [IFC 507]
11. FIRE HYDRANT SPACING SHALL BE AS FOLLOWS: [IFC C102]
    - RESIDENTIAL- 500 FT UNSPRINKLERED; 600 FT SPRINKLERED.
    - COMMERCIAL- 300 FT UNSPRINKLERED; 400 FT SPRINKLERED.
12. WHERE NEW WATER MAINS ARE EXTENDED ALONG STREETS OR NEW STREETS ARE INSTALLED WHERE FIRE HYDRANTS ARE NOT NEEDED FOR PROTECTION OF THE STRUCTURES, FIRE HYDRANTS SHALL BE INSTALLED AT A MAXIMUM OF 1,000 FT SPACING, TO PROVIDE FOR TRANSPORTATION HAZARDS. WHERE STREETS ARE PROVIDED WITH MEDIAN DIVIDERS OR HAVE FOUR (4) OR MORE TRAFFIC LANES AND HAVE A TRAFFIC COUNT OF MORE THAN 30,000 PER DAY, HYDRANTS ARE REQUIRED ON EACH SIDE OF THE STREET SPACED AT 500 FT ON AN ALTERNATING BASIS. [IFC C102.8]
13. NO FIRE HYDRANTS SHALL BE LOCATED WITHIN THE RADIUS OF A CUL-DE-SAC OR WITHIN 20 FEET OF THE PERIMETER OF THE RADIUS OF THE CUL-DE-SAC.
14. NO FIRE HYDRANTS SHALL BE LOCATED WITHIN 6 FT OF ANY CURB RETURN, DRIVEWAY, POWER POLE, STREETLIGHT OR ANY OTHER OBSTRUCTION. [IFC C102.12]
15. A MAXIMUM DISTANCE FROM A FIRE HYDRANT TO A ONE-TWO FAMILY DWELLING SHALL NOT EXCEED 300 FT, AS MEASURED BY AN APPROVED ROUTE. [IFC C102.4]
16. THE MAXIMUM DISTANCE FROM A FIRE HYDRANT TO A FIRE DEPARTMENT CONNECTION (FDC) SHALL NOT EXCEED 100 FT, AS MEASURED BY AN APPROVED ROUTE. [IFC C102.7]
17. THE MAXIMUM DISTANCE FROM A HYDRANT TO THE END OF A DEAD-END STREET SHALL NOT EXCEED 200 FT. [IFC C102.6]
18. TWO (2) SOURCES OF SUPPLY ARE REQUIRED WHENEVER THERE ARE 4 OR MORE FIRE HYDRANTS/SPRINKLER LEAD-INS ARE INSTALLED ON A SINGLE SYSTEM. SECTIONAL CONTROL VALVES SHALL BE INSTALLED SO THAT NO MORE THAN 2 FIRE HYDRANTS CAN BE OUT OF SERVICE DUE TO A BREAK IN A WATER MAIN. [IFC C104]
19. ALL FIRE APPARATUS ACCESS ROADS SHALL BE PAVED TO PROVIDE ALL-WEATHER DRIVING CAPABILITIES, AND SHALL BE DESIGNED AND MAINTAINED TO SUPPORT THE IMPOSED LOADS OF THE FIRE APPARATUS. [IFC 503.2.3]
20. THE GRADIENT FOR THE FIRE APPARATUS ACCESS ROADS SHALL NOT EXCEED 12% ANGLES OF APPROACH AND ANGLES OF DEPARTURE SHALL NOT EXCEED 6% FOR 25 FEET PRIOR TO OR AFTER THE GRADE CHANGE. ADJACENT TO THE STRUCTURES GRADIENT SHALL NOT EXCEED 6%. [IFC 503.2.7, 503.2.8]
21. THE TURNING RADIUS OF THE FIRE APPARATUS ACCESS ROADS SHALL BE NO LESS THAN 52 FEET OUTSIDE AND 28 FEET INSIDE TURNING RADIUS. [IFC 503.2.4]
22. VERTICAL CLEARANCE OF ALL FIRE APPARATUS ACCESS ROADS SHALL NOT BE LESS THAN 13 FT 6 INS. [IFC 503.2.1]
23. FIRE DEPARTMENT ACCESS ROADS SHALL HAVE A MINIMUM UNOBSTRUCTED WIDTH OF NOT LESS THAN 40 FT FLOW LINE TO FLOW LINE WITH PARALLEL PARKING PERMITTED ON BOTH SIDES. NOT LESS THAN 32 FT WIDE, FLOW LINE TO FLOW LINE, WHERE PARKING IS PERMITTED ONLY ON ONE SIDE OF THE FIRE APPARATUS ACCESS ROAD. NOT LESS THAN 24 FT WIDE, FLOW LINE TO FLOW LINE, WHERE NO PARKING IS PERMITTED ON EITHER SIDE. FIRE LANES THROUGH PARKING LOTS SHALL BE NOT LESS THAN 24 FT. [IFC 503.2.1.1]
24. A FIRE APPARATUS ACCESS ROAD SHALL BE REQUIRED WHEN ANY PORTION OF AN EXTERIOR WALL OF THE FIRST STORY IS LOCATED MORE THAN 150 FT FROM A FIRE DEPARTMENT VEHICLE ACCESS. THE DISTANCE COULD BE INCREASED TO 250 FT IF THE BUILDING IS SPRINKLERED. [IFC 503.1.1]
25. APPROVED SECONDARY FIRE APPARATUS ACCESS SHALL BE PROVIDED FOR 100 OR MORE DWELLING UNITS, ROAD(S) WITH DEAD-ENDS OR WITH A SINGLE POINT OF ACCESS IN EXCESS OF 600 FT. COMMERCIAL AND INDUSTRIAL DEVELOPMENTS WHERE BUILDINGS EXCEED 2 STORIES OR 30 FEET IN HEIGHT, OR EXCEEDING 62,000 SQUARE FEET IN AREA. [IFC 503.1.2]
26. ALL DEAD-END FIRE APPARATUS ROADS AND/OR FIRE LANES, PUBLIC OR PRIVATE, IN EXCESS OF 150 FT IN LENGTH SHALL BE PROVIDED WITH AN APPROVED TURN AROUND HAVING A MINIMUM DIAMETER OF 81 FT. [IFC 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. [IFC 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 IFC 503.6 AND IFC APPENDIX M.

2.5 CITY OF LAS VEGAS GRADING NOTES

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

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

COMPACTION TESTING WILL BE PERFORMED BY THE OWNER OR HIS REPRESENTATIVE.

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 CONNECTION WATER.
9. THE CONTRACTOR SHALL MAINTAIN THE STREETS, SIDEWALKS AND ALL OTHER PUBLIC RIGHT-OF-WAY IN A CLEAN, SAFE AND USABLE CONDITION. ALL SPILLS OF SOIL, ROCK OR CONSTRUCTION DEBRIS SHALL BE PROMPTLY REMOVED FROM THE PUBLICLY OWNED PROPERTY DURING CONSTRUCTION AND UPON COMPLETION OF THE PROJECT. 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.

SOUTHWEST GAS CONSTRUCTION NOTES

1. IN THE EVENT OF NATURAL GAS EMERGENCIES CALL 911 AND 1-877-860-3020
2. THERE SHALL BE A MINIMUM HORIZONTAL AND VERTICAL CLEARANCE OF 12-INCHES BETWEEN NATURAL GAS FACILITIES AND ANY UNDERGROUND FACILITIES AND/OR STRUCTURES, INCLUDING BUT NOT LIMITED TO WATER, SEWER, STORM DRAIN, COMMUNICATIONS, AND ELECTRIC
3. FOR VALVE ADJUSTMENT CONTACT 702-668-6107 48 HOURS PRIOR TO CONSTRUCTION.
4. IN THE EVENT OF NATURAL GAS CONFLICT WITH PROPOSED UTILITIES AND/OR STRUCTURES CONTACT 702-365-2099

CAUTION: HIGH PRESSURE GAS

CALL SOUTHWEST GAS AT 702-400-1789 FOR STANDBY WHEN EXCAVATING OVER OR NEAR HIGH PRESSURE GAS LINES 48 HOURS PRIOR TO CONSTRUCTION

2.1 CITY OF LAS VEGAS GENERAL NOTES

1. ALL CONSTRUCTION AND MATERIALS SHALL BE IN ACCORDANCE WITH THE "UNIFORM STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION OFF-SITE IMPROVEMENTS, CLARK COUNTY AREA NEVADA", LATEST ISSUE; THE "UNIFORM STANDARD DRAWINGS FOR PUBLIC WORKS CONSTRUCTION, CLARK COUNTY AREA NEVADA", LATEST REVISED EDITION; THE "SUMMERLIN IMPROVEMENT STANDARDS" FOR WORK IN THE SUMMERLIN AREA; AND OTHER APPLICABLE APPROVED STANDARDS ISSUED BY THE CONTROLLING AGENCY; THE UNIFORM BUILDING CODE; AND ALL LOCAL CITY CODES AND ORDINANCES APPLICABLE, EXCEPT AS NOTED ON THIS SHEET AS "DEVIATIONS FROM STANDARDS".
2. THE EXISTENCE AND LOCATION OF ANY OVERHEAD OR UNDERGROUND UTILITY LINES, PIPES, OR STRUCTURES SHOWN ON THESE PLANS ARE OBTAINED BY A RESEARCH OF THE AVAILABLE RECORDS. EXISTING UTILITIES AS SHOWN FROM 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 INTERFERENCE'S 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 SATISFACTORY TO THE CITY ENGINEER AND OWNING UTILITY COMPANY AT THE EXPENSE OF THE CONTRACTOR.
4. ALL CONSTRUCTION SHALL BE AS SHOWN ON THESE PLANS, ANY REVISIONS SHALL HAVE 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 (½") ABOVE LIP OF ALL GUTTERS AFTER COMPACTION, EXCEPT AT SIDEWALK RAMPS AND CROSS GUTTERS.
9. CURB AND GUTTER FOUND TO BE UNACCEPTABLE TO THE CITY OF LAS VEGAS SHALL BE REMOVED AND REPLACED PER STANDARD DRAWING 216.
10. SIDEWALK RAMPS SHALL BE CONSTRUCTED IN EACH QUADRANT OF AN INTERSECTION PER STANDARD DRAWING 235. EXACT LOCATION OF RAMPS MAY BE ADJUSTED IN THE FIELD BY A CITY INSPECTOR.
11. CONTRACTOR SHALL PROVIDE ALL NECESSARY HORIZONTAL AND VERTICAL TRANSITIONS BETWEEN NEW CONSTRUCTION AND EXISTING SURFACES TO PROVIDE FOR PROPER DRAINAGE AND FOR INGRESS AND EGRESS TO NEW CONSTRUCTION. THE EXTENT OF THE TRANSITIONS TO BE AS SHOWN ON PLANS.
12. ALL GRADING WORK SHALL CONFORM TO THE SOILS REPORT AS PREPARED BY GEOTEK RESIDENTIAL, LLC, REPORT #12208-LVR, MARCH 30, 2016 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.R.S. STATUTE NO. 625.380 & CITY OF LAS VEGAS TITLE 18, APPENDIX D.
15. UTILITY COMPANY METER BOXES, MANHOLE LIDS, VALVE COVERS, ETC., SHALL BE LOCATED OUT OF DRIVEWAYS, DRIVEWAY APRONS, FLOWLINES, AND CROSS GUTTERS UNLESS WRITTEN APPROVAL IS GRANTED BY THE UTILITY COMPANY AND THE CITY ENGINEER.

WALL NOTES:

16. ALL WALLS, NEW OR EXISTING, ARE ONLY SHOWN ON CIVIL PLANS FOR THE PURPOSE OF REVIEWING GRADING RELATIONSHIPS; FLOOD CONTROL AND SIGHT DISTANCE AT INTERSECTIONS. NEW WALLS REQUIRE A SEPARATE PERMIT AND INSPECTION BY THE BUILDING DEPARTMENT.
17. ASPHALT MIX DESIGN MUST BE SUBMITTED AND APPROVED BY THE CITY ENGINEER PRIOR TO THE PLACEMENT OF ASPHALT WITHIN CITY RIGHT OF WAY.
18. CONTRACTOR SHALL ADJUST ALL NEW AND EXISTING INLETS, VALVE BOXES, MANHOLE RIMS, AND SEWER CLEAN OUTS, ETC. TO FINISH GRADE AS APPLICABLE WHETHER OR NOT THEY ARE SHOWN ON THE PLANS.
19. MATERIALS, HANDLING AND PLACEMENT OF PORTLAND CEMENT CONCRETE SHALL BE IN ACCORDANCE WITH APPLICAB

ABBREVIATIONS

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

SPECIAL NOTE

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

NOTICE TO CONTRACTOR

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

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

LEGEND

EXISTING	PROPOSED	DESCRIPTION
(1900)	1900	5' CONTOUR
		1' CONTOUR
		STRIPING
		SEWER MANHOLE
		CURB AND GUTTER
EX 8" PVC SS	8" PVC SS	SANITARY SEWER PIPE AND FLOW ARROW
EX 8" PVC WTR	8" PVC WTR	WATER PIPE
		WATER GATE VALVE
		FIRE HYDRANT
		WATER BLOW-OFF
		WATER LATERAL W/ METER
		SANITARY SEWER LATERAL
		STREETLIGHT
		EDGE OF PAVEMENT
		TRAFFIC SIGN
PAD= XXXX FF= XXXX	PAD= XXXX FF= XXXX	PAD ELEVATION FINISHED FLOOR ELEVATION
TC=XXXX	TC=XXXX	ELEVATION
		RETAINING WALL
		STORM DRAIN W/ MANHOLE

	EXISTING GAS GATE VALVE
UNKN	EXISTING UNKNOWN MANHOLE
GAS	EXISTING GAS, SIZE PER PLAN
	EXISTING POWER POLE
	EXISTING TRAFFIC SIGNAL
	EXISTING WALL
	WATER PIPE FITTING
POC	WATER POINT OF CONNECTION
POC	SEWER POINT OF CONNECTION
	DAYLIGHT LINE
	STREET CENTERLINE
	RIGHT-OF-WAY
	MATCHLINE
	BOUNDARY LINE
	PHASE LINE
	PROPERTY LINE
	FLOWLINE
	SAWCUT
	CUT/FILL TRANSITION LINE
	SIDEWALK
	EX STRIPING TO BE OBLITERATED
	GRADE BREAK LINE
	REFLECTIVE RAISED PAVEMENT MARKERS
BWV	BACK WATER VALVE
	WROUGHT IRON FENCE
	PONY WALL
	DECORATIVE PERIMETER WALL
	DECORATIVE PERIMETER RETAINING WALL
	PROPOSED CURB AND GUTTER WITH RIGHT-OF-WAY AT BACK OF CURB
	EXISTING CURB AND GUTTER WITH RIGHT-OF-WAY AT BACK OF CURB
	FUTURE CURB AND GUTTER WITH RIGHT-OF-WAY AT BACK OF CURB
	PROPOSED SCARP AREA
	DRIVEWAY
	PROPOSED RIP RAP
	SIGHT VISIBILITY ZONE PER STD DWG NO. 201.2
	HANDICAP RAMP

QUANTITIES

			PRIVATE	PUBLIC
DRAINAGE				
1.	60" TYPE III STORM DRAIN MANHOLE	EA	–	–
2.	5' X 6' TYPE II DROP INLET	EA	1	–
3.	10.0' TYPE "CM2" DROP INLET	EA	–	–
4.	12.5' TYPE "CM2" DROP INLET	EA	–	–
5.	20.0' TYPE "CM2" DROP INLET	EA	–	–
6.	18" RCP CLASS IV STORM DRAIN	LF	–	–
7.	24" RCP CLASS IV STORM DRAIN	LF	–	–
8.	30" RCP CLASS IV STORM DRAIN	LF	–	–
9.	3.0' CONCRETE U-CHANNEL	LF	36	–
10.	RIPRAP D50=8", THK=16"	SF	2,955	–
11.	8' WIDE CONCRETE VALLEY GUTTER W/10" TYPE I AGGREGATE BASE	SF	5,120	–
12.	3' WIDE CONCRETE VALLEY GUTTER	SF	293	–
13.	SIDEWALK UNDER DRAIN	EA	3	–
SEWER SYSTEM				
1.	4" PVC SEWER LATERAL (PRIVATE)	LF	–	–
2.	8" PVC SEWER PIPE (PUBLIC)	LF	–	–
3.	STANDARD 48" SEWER MANHOLE (PUBLIC)	EA	–	–
4.	8" SEWER PIPE CAP	EA	–	–
5.	BACK WATER VALVE	EA	–	–
6.	8" C-900 WATER QUALITY SEWER PIPE (PUBLIC)	EA	–	–
7.				
WATER SYSTEM				
1.	FIRE HYDRANT ASSEMBLY W/6" GATE VALVE PER UDACS PLATE NO. 40	EA	–	–
2.	6" PVC WATER PIPE (CLASS 150)	LF	–	–
3.	8" PVC WATER PIPE (CLASS 150)	LF	–	–
4.	8" DIP WATER PIPE (CLASS 53)	LF	–	–
5.	8" GATE VALVE WITH VALVE BOX PER UDACS PLATE NO. 30 & 39	EA	–	–
6.	8" X 6" TEE PER UDACS PLATE NO. 31	EA	–	–
7.	8" X 8" TEE PER UDACS PLATE NO. 31	EA	–	–
8.	8" 5 DEGREE BEND WITH RESTRAINED JOINTS	EA	–	–
9.	8" 11.25 DEGREE BEND PER UDACS PLATE NO. 31	EA	–	–
10.	8" 22.5 DEGREE BEND PER UDACS PLATE NO. 31	EA	–	–
11.	8" 45 DEGREE BEND PER UDACS PLATE NO. 31	EA	–	–
12.	8" 90 DEGREE BEND PER UDACS PLATE NO. 31	EA	–	–
13.	CAP AND 2" BLOW-OFF ASSEMBLY W/CAP PER UDACS PLATE NO. 36	EA	–	–
14.	1" COPPER SERVICE W/ 3/4" METER PER UDACS PLATE NO. 2	EA	–	–
15.	1" COPPER SERVICE W/ 1" METER PER UDACS PLATE NO. 4	EA	–	–
16.	1" COPPER SERVICE W/ 3/4" METER & 1" RPPA PER UDACS PLATE NO. 4 & 8	EA	–	–
		EA	–	
STREET IMPROVEMENTS				
1.	2" A.C. PAVEMENT W/ 4" TYPE II OVER 6" TYPE I AGGREGATE BASE	SY	–	–
2.	STANDARD 18" TYPE "L" ISLAND CURB & GUTTER W/6" TYPE I AGGREGATE BASE	LF	–	–
3.	STANDARD 8" TYPE "A" ISLAND CURB W/6" TYPE I AGGREGATE BASE	LF	–	–
4.	STANDARD 30" TYPE "ROLL" CURB & GUTTER W/6" TYPE I AGGREGATE BASE	LF	–	–
5.	4' WIDE CONCRETE SIDEWALK W/4" TYPE II AGGREGATE BASE	SF	–	–
6.				–
7.				
TRAFFIC SIGNALS				
1.	30" STOP SIGN WITH POST (R1-1)	EA	–	–
2.	9" STREET NAME SIGN (D-3, BROWN W/ WHITE LETTERS)(6 POLES x 2 PER POLE=12)	EA	–	–
3.	BLUE COLORED REFLECTIVE RAISED PAVEMENT MARKER	EA	–	–
4.	CROSSWALK MARKINGS	LF	–	–
5.				
6.				
7.				
8.				
DRY UTILITIES				
1.	100W H.P.S. LUMINAIRE STREET LIGHT W/DECORATIVE POLE	EA	–	–
2.	1-1/4" PVC STREET LIGHT CONDUIT WITH (2) #4 AND (1) #8 CONDUCTORS	LF	–	–
3.	NO. 3-1/2 PULL BOX W/METAL COVER	EA	–	–
4.	150 AMP SERVICE PEDESTAL (IRR)	EA	–	–
5.	200 AMP SERVICE PEDESTAL (STLT)	EA	–	–
6.				

APPROVED FOR CONSTRUCTION

LAS VEGAS VALLEY WATER DISTRICT ENGINEERING SERVICES MANAGER

DATE _____ PROJECT No. ADD FIELD

LVVWD APPROVED FIRE FLOW FIELD GPM AT 20 PSI RESIDUAL







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.

CITY OF LAS VEGAS, NV

NINETY FIVE MANAGEMENT LLC

SKYE CANYON II PARCEL 2.27

LEGEND, ABBREVIATIONS, AND QUANTITIES

S 12
T 19
R 59

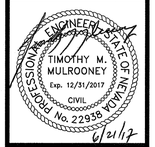
DATE: 6/21/17

DRAFTER: JM

DESIGNER: MAK

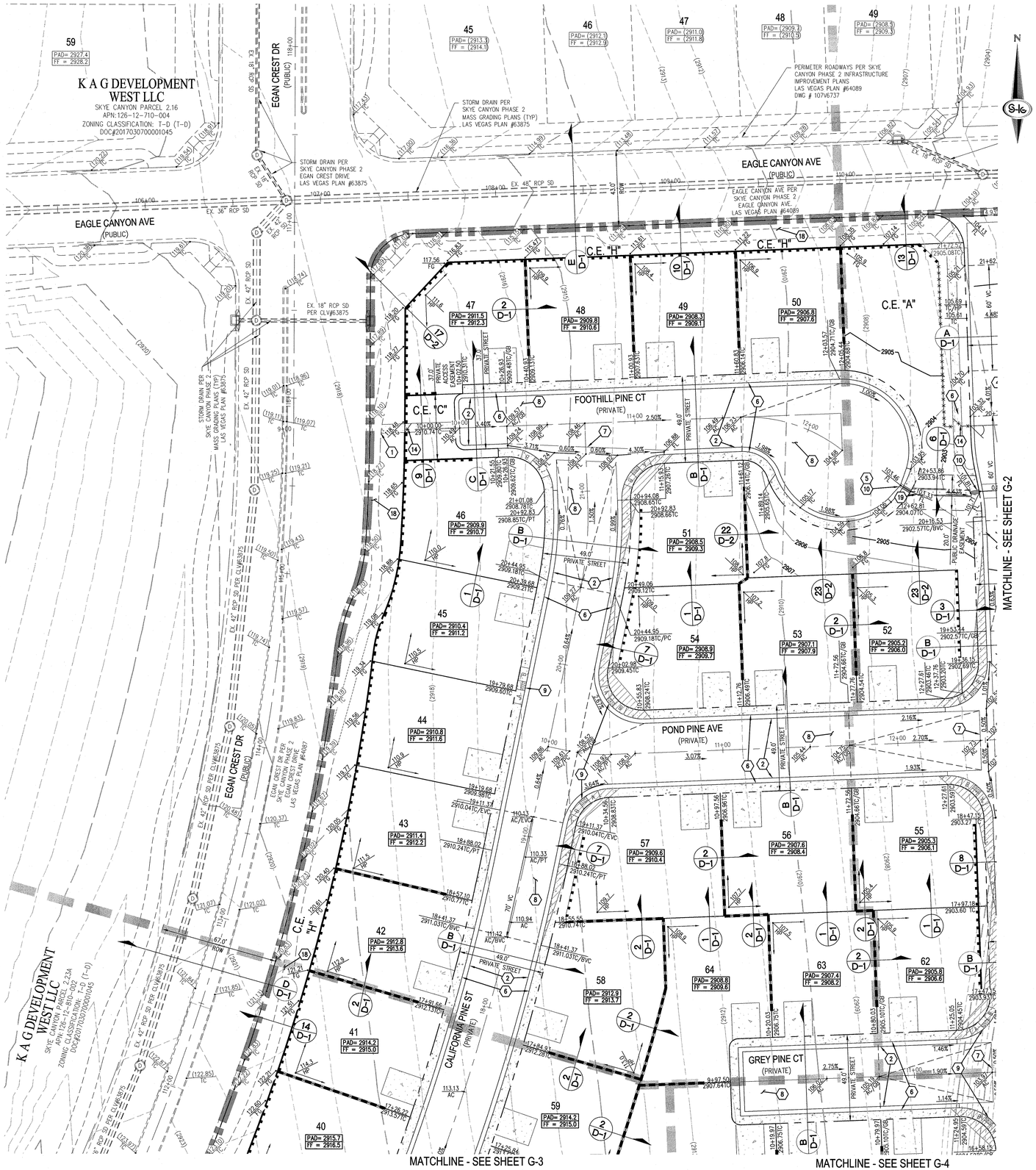
CHECKED: TM

PROJECT NO.
OLY1607-005



C-3
SHEET 3 OF 13

J:\oly\607-005 skye canyon parcel 2.27\dwg\vmpra\oly\607-005 cvr.dwg 6/21/2017 11:34 AM Erwin Sacundo



0 30 60
SCALE - 1"=30' FEET

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

SURVEY NOTE

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

ELEVATION NOTE

ADD 2800 TO ALL SPOT GRADES WHERE THE HUNDREDS AND THOUSANDS PLACES ARE OMITTED FOR ACTUAL ELEVATION (I.E. 01.00 REPRESENTS 2801.00)

SOILS REPORT

SOILS REPORT BY GEOTEK RESIDENTIAL, LLC

PROJECT NO. 12208-LVR DATED March 30, 2016

UPDATED SOILS REPORT BY ADD FIELD
ADD FIELD
PROJECT NO. 12208-LVR DATED ADD FIELD

EARTHWORKS

EARTHWORK QUANTITIES (RAW):
CUT= 46,326 CU YDS
FILL= 149,766 CU YDS

EXPORTED MATERIAL TO BE DISPOSED OF AT AN APPROVED LICENSED DISPOSAL FACILITY OR AT A SITE WITH AN APPROVED AND ACTIVE GRADING PERMIT.

DISCLAIMER NOTE

1) EXISTING UTILITY LOCATIONS SHOWN HEREON ARE APPROXIMATE ONLY. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE EXACT VERTICAL AND HORIZONTAL LOCATION OF ALL EXISTING UNDERGROUND UTILITIES PRIOR TO COMMENCING CONSTRUCTION. NO REPRESENTATION IS MADE THAT ALL EXISTING UTILITIES ARE SHOWN HEREON. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR UTILITIES NOT SHOWN IN THEIR PROPER LOCATION.

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

GRADING NOTES

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

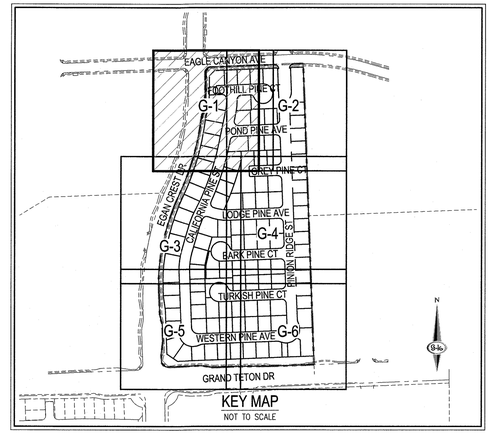
LAS VEGAS VALLEY CONSTRUCTION SITE BMP GUIDELINES

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

1. THE OWNER, SITE DEVELOPER, CONTRACTOR, AND/OR THEIR AUTHORIZED AGENTS SHALL EACH DAY REMOVE ALL SEDIMENT, MUD, CONSTRUCTION DEBRIS, OR OTHER POTENTIAL POLLUTANTS THAT MAY HAVE BEEN DISCHARGED TO, OR ACCUMULATED IN, THE PUBLIC RIGHTS OF WAY OF CLARK COUNTY AS A RESULT OF CONSTRUCTION ACTIVITIES ASSOCIATED WITH THIS SITE DEVELOPMENT OR CONSTRUCTION PROJECT. SUCH MATERIALS SHALL BE PREVENTED FROM ENTERING THE STORM SEWER SYSTEM.
2. ADDITIONAL CONSTRUCTION SITE DISCHARGE BEST MANAGEMENT PRACTICES MAY BE REQUIRED OF THE OWNER AND HIS OR HER AGENTS DUE TO UNFORESEEN EROSION PROBLEMS OR IF THE SUBMITTED PLAN DOES NOT MEET THE PERFORMANCE STANDARDS SPECIFIED IN CLARK COUNTY TITLE 24.40 AND IN THE LAS VEGAS VALLEY CONSTRUCTION SITE BMP GUIDANCE MANUAL.
3. TEMPORARY OR PERMANENT STABILIZATION PRACTICES WILL BE INSTALLED ON DISTURBED AREAS AS SOON AS PRACTICABLE AND NO LATER THAN 14 DAYS AFTER THE CONSTRUCTION ACTIVITY IN THAT PORTION OF THE SITE HAS TEMPORARILY OR PERMANENTLY CEASED. SOME EXCEPTIONS MAY APPLY; REFER TO THE NEVADA STORMWATER GENERAL PERMIT FOR CONSTRUCTION ACTIVITY 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 A RAIN EVENT OF 0.5 INCHES OR MORE. THE CONTRACTOR OR HIS AGENT SHALL UPDATE OR MODIFY THE STORMWATER POLLUTION PREVENTION PLAN AS NECESSARY. SOME EXCEPTIONS TO WEEKLY INSPECTIONS MAY APPLY, SUCH AS SUSPENSION OF LAND DISTURBANCE ACTIVITIES. REFER TO THE NEVADA STORMWATER GENERAL PERMIT FOR CONSTRUCTION ACTIVITY NVR100000, SECTION III.A.12.
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 DEPICTED ON FLOOD INSURANCE RATE MAP (FIRM) PANEL 23003C1750E, DATED SEPTEMBER 27, 2002. A ZONE X (UNSHADED) IS DESCRIBED AS AN AREA DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOOD PLAIN.



GRADING NOTES

1. FIELD VERIFY AND CONNECT TO EXISTING CURB, GUTTER AND/OR SIDEWALK
2. CONSTRUCT 30" ROLL CURB AND GUTTER PER CCAUSD NO. 217.S1. CURB FLOW LINES LESS THAN 0.60% GRADE SHALL BE WATER TESTED. ANY CURB THAT DOES NOT FLOW SHALL BE REMOVED AND REPLACED AT NO COST TO THE CITY.
3. CONSTRUCT "L" TYPE CURB AND GUTTER PER CCAUSD NO. 216
4. CONSTRUCT "A" TYPE ISLAND CURB PER CCAUSD NO. 219
5. CONSTRUCT 10' ROLL CURB TO L CURB TRANSITION PER DETAIL 21 ON SHEET D-2
6. CONSTRUCT 5' WIDE SIDEWALK PER CCAUSD NO. 234
7. CONSTRUCT 6' WIDE CROSS GUTTER PER DETAIL 20 ON SHEET D-2
8. INSTALL 2" ASPHALT PAVEMENT OVER 4" TYPE II AGGREGATE BASE
9. CONSTRUCT SIDEWALK RAMP USING ARMOR TILE TRUNCATED DOMES OR EQUIVALENT PER CCAUSD NO. 235, CASE I & 235.1
10. CONSTRUCT SIDEWALK DRAIN PER CCAUSD NO. 236
11. CONSTRUCT 5' X 6' (TRIPLE GRATE) NDOT TYPE II INLET PER NDOT STD. R-4.2.1 AND DETAIL ON SHEET D-3
12. RIP RAP D50=8" THICKNESS=16" W/ 6" FINE AGGREGATE BASE (PER SPEC 706.0303) COMPACTED TO 90% OVER FILTER FABRIC
13. CONSTRUCT 8' CROSS GUTTER PER CCAUSD NO. 228
14. INSTALL WROUGHT IRON FENCE W/ACCESS GATES, DESIGN BY OTHERS
15. INSTALL WROUGHT IRON FENCE, DESIGN BY OTHERS
16. INSTALL WROUGHT IRON GATES PER DETAIL 19 ON SHEET D-2
17. CONSTRUCT 24' WIDE COMMERCIAL DRIVEWAY PER CCAUSD NO. 224
18. PERIMETER LANDSCAPE TO BE CONSTRUCTED BY MASTER DEVELOPER
19. CONSTRUCT CONCRETE CHANNEL PER DETAIL 25 ON SHEET D-2
20. CONSTRUCT 3' WIDE CONCRETE VALLEY GUTTER PER DETAIL 26 ON SHEET D-2

SEE SHEET C-3 FOR ABBREVIATIONS, LEGEND, AND QUANTITIES

BONDABLE DRAINAGE QUANTITIES (PRIVATE)

8' WIDE CONCRETE VALLEY GUTTER W/10" TYPE I AGGREGATE BASE	SF	5,120
SIDEWALK UNDER DRAIN	EA	3
RIPRAP D50=6", THK=12"	SF	2,955
3.0' CONCRETE U-CHANNEL	LF	36
3.0' CONCRETE VALLEY GUTTER	SF	293
5' X 6' TYPE II DROP INLET	EA	1

DRAINAGE EASEMENT NOTE

ALL DRAINAGE EASEMENTS AND COMMON LOTS ARE PUBLIC DRAINAGE EASEMENTS PRIVATELY MAINTAINED BY THE H.O.A.

FLOOD CERTIFICATION

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

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

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

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

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

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.

CITY OF LAS VEGAS, NV

NINETY FIVE MANAGEMENT LLC

SKYE CANYON II PARCEL 2.27
GRADING PLAN I

S:12 T:19 R:59

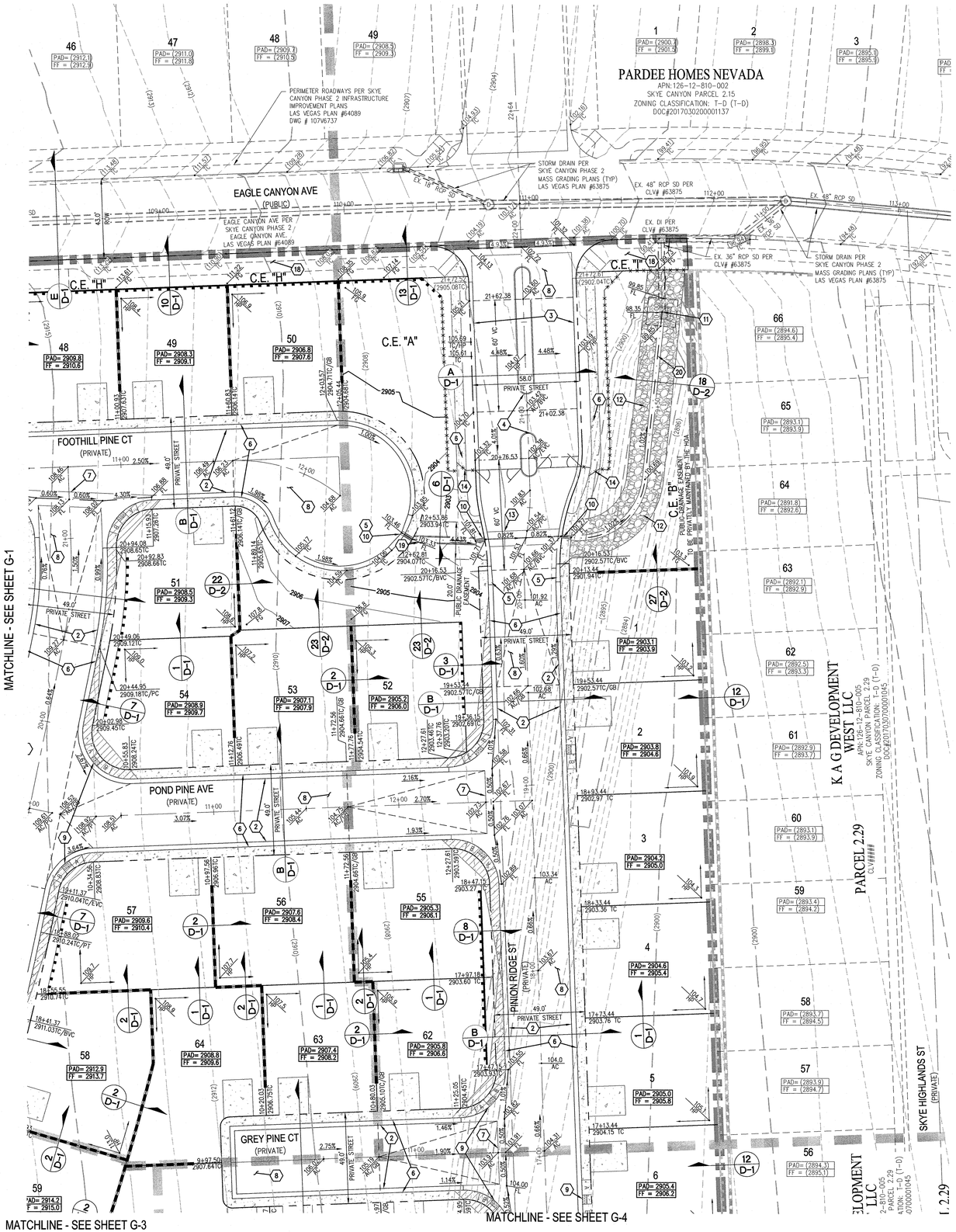
DATE: 6/21/17
DRAFTER: JM
DESIGNER: MAK
CHECKED: TM

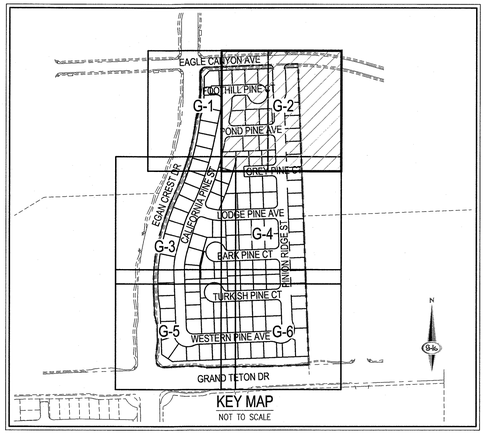
PROJECT NO.
OLY1607-005

TIMOTHY M. MULROONEY — STATE OF NEVADA — PROFESSIONAL ENGINEER — No. 22938 — CIVIL — Exp. 12/31/2017 — 6/21/17

G-1
SHEET 4 OF 13

z:\olv1607-005 skye canyon parcel 2.27\dwg\mcrov\olv1607-005 grd.dwg 6/21/2017 11:35 AM Erwin Socundo





SCALE - 1"=30' (0, 30, 60 FEET)

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SOILS REPORT BY GEOTEK RESIDENTIAL, LLC

PROJECT NO. 12208-LVR DATED March 30, 2016

UPDATED SOILS REPORT BY ADD FIELD
ADD FIELD
PROJECT NO. 12208-LVR DATED ADD FIELD

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BONDABLE DRAINAGE QUANTITIES (PRIVATE)

8' WIDE CONCRETE VALLEY GUTTER W/10" TYPE I AGGREGATE BASE	SF	5,120
SIDEWALK UNDER DRAIN	EA	3
RIPRAP D50=6", THK=12"	SF	2,955
3.0' CONCRETE U-CHANNEL	LF	36
3.0' CONCRETE VALLEY GUTTER	SF	293
5' X 6' TYPE II DROP INLET	EA	1

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FLOOD ZONE

THE PROJECT SITE IS LOCATED WITHIN A FEMA DESIGNATED ZONE X (UNSHADED) AS DEPICTED ON FLOOD INSURANCE RATE MAP (FIRM) PANEL 2300J0175OE, DATED SEPTEMBER 27, 2002. A ZONE X (UNSHADED) IS DESCRIBED AS AN AREA DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOOD PLAIN.

FLOOD CERTIFICATION

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

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

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

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

Call before you Dig
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Call 811
OR
1-800-227-2600

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.

CITY OF LAS VEGAS, NV

NINETY FIVE MANAGEMENT LLC

SKYE CANYON II PARCEL 2.27

GRADING PLAN II

S 12
T 19
R 59

DATE: 6/21/17
DRAFTER: JM
DESIGNER: MAK
CHECKED: TM

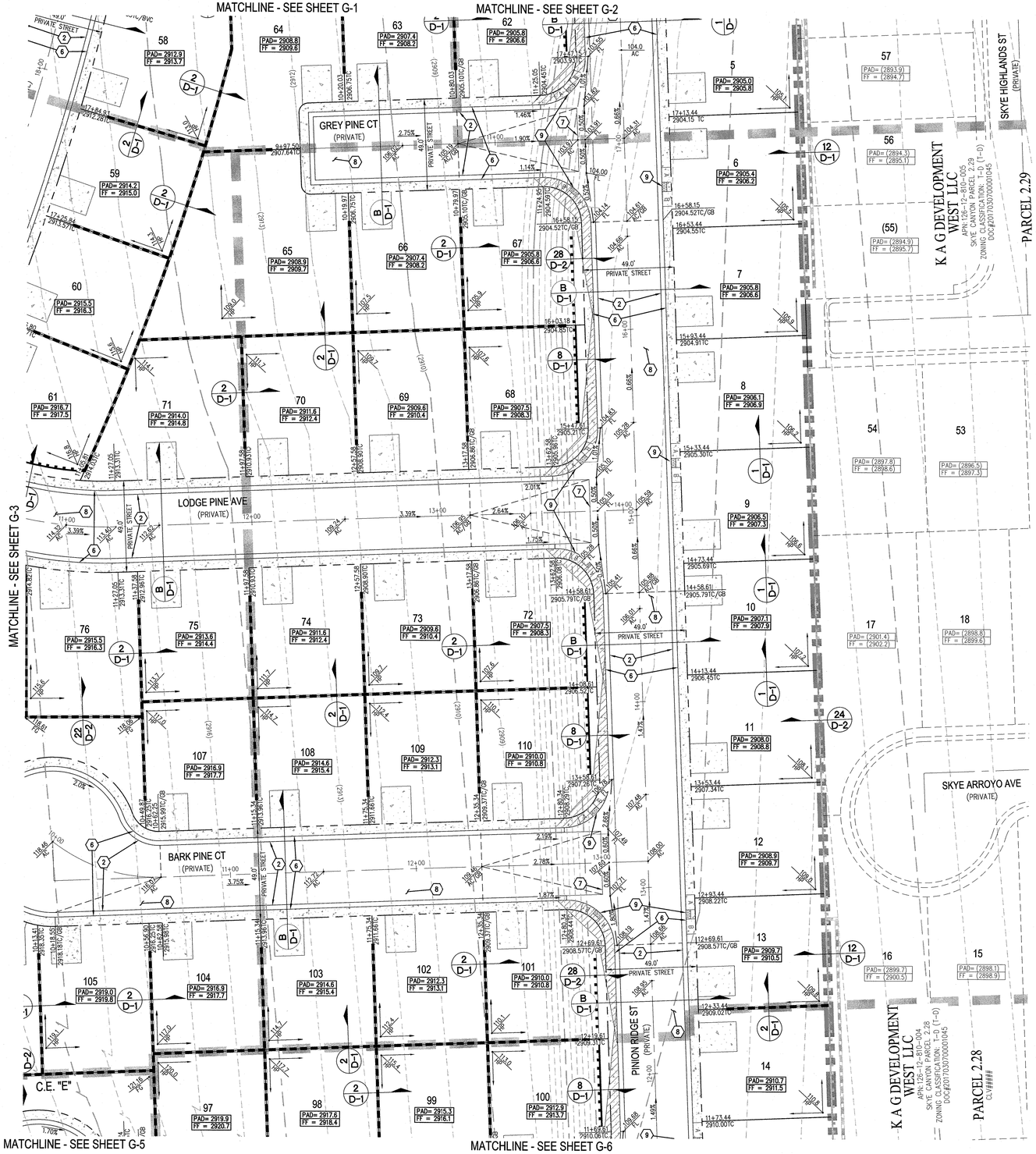
PROJECT NO.
OLY1607-005

PROFESSIONAL ENGINEER — STATE OF NEVADA — TIMOTHY M. MULROONEY — Exp. 12/31/2017 — CIVIL — No. 22938 — 6/21/17

G-2
SHEET 5 OF 13

J:\oly\1607-005 skye canyon parcel 2.27\dwg\mpcon\oly1607-005 grd dwg, 6/21/2017 11:35 AM Erwin Sicuondo


MATCHLINE - SEE SHEET G-1
MATCHLINE - SEE SHEET G-4
MATCHLINE - SEE SHEET G-5
MATCHLINE - SEE SHEET G-6
K A G DEVELOPMENT WEST LLC
SKYE CANYON PARCEL 2.23A
APN 125-12-610-002
ZONING CLASSIFICATION: T-N-E
DOC #20170307:0000145
CALIFORNIA PINE ST (PRIVATE)
EGAN CREST DR (PUBLIC)
LODGE PINE AVE (PRIVATE)
GREY PINE CT (PRIVATE)
BARK PINE CT (PRIVATE)
PRIVATE STREET
C.E. "H"
C.E. "D"
C.E. "E"
C.E. "G"
STORM DRAIN PIPE
SKYE CANYON PHASE 2
LAS VEGAS PLAN #6087
EGAN CREST DR
SKYE CANYON PHASE 2
LAS VEGAS PLAN #6087
PRIVATE ACCESS & PUBLIC UTILITY EASEMENT
PAD= 2912.8 FF = 2913.6
PAD= 2914.2 FF = 2915.0
PAD= 2915.7 FF = 2916.5
PAD= 2917.3 FF = 2918.1
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PAD= 2917.6 FF = 2918.4
PAD= 2919.9
PAD= 2917.6 FF = 2918.4
PRIVATE STREET
49.0' ROW
70' VC
18+57.10 2910.77TC
18+41.37 2911.03TC/BVC
18+55.55 2910.74TC
18+41.37 2911.03TC/BVC
17+84.03 2912.28TC
17+84.03 2912.28TC
17+24.22 2913.57TC
17+25.84 2913.57TC
16+60.78 2915.01TC
16+15.41 2916.00TC/GB
16+15.41 2916.00TC/GB
16+15.90 2916.01TC
16+54.56 2916.65TC/GB
16+66.69 2914.91TC
16+75.41 2916.00TC/GB
16+76.23 2916.91TC/HP
14+87.75 2920.51TC/PT
14+66.92 2921.30TC/GB
14+87.75 2920.51TC/PT
14+66.92 2921.30TC/GB
14+54.97 2921.78TC
14+37.63 2922.30TC/PT
14+20.24 2923.24TC
13+80.00 2924.91TC/EVC
13+57.72 2925.41TC/PT
13+54.90 2925.84TC/PT
13+54.90 2926.71TC/BVC
13+79.75 2926.51TC
13+54.90 2925.84TC/PT
13+20.00 2926.71TC/BVC
12+99.86 2927.19TC
12+73.32 2927.73TC
12+61.87 2927.96TC
12+61.87 2927.96TC
12+25.00 2928.71TC
12+14.22 2928.93TC
11+97.58 2910.93TC
11+97.58 2908.90TC
11+75.34 2911.56TC
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10+49.87 2916.25TC/GB
10+49.87 2915.98TC/GB
10+14.41 2918.31TC/GB
10+18.55 2918.18TC/GB
10+42.58 2916.25TC/GB
10+42.58 2915.98TC/GB
9+97.50 2907.64TC
10+20.03 2906.75TC
10+19.87 2906.76TC
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EX. 42" RCP SD PER CLV#53575
EX. 36" RCP SD PER CLV#53575
EX. 36" RCP SD PER CLV#53575
EX. 36



N

SCALE – 1"=30' (0, 30, 60 FEET)

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

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ADD 2800 TO ALL SPOT GRADES WHERE THE HUNDREDS AND THOUSANDS PLACES ARE OMITTED FOR ACTUAL ELEVATION (I.E. 01.00 REPRESENTS 2801.00)

SOILS REPORT

SOILS REPORT BY GEOTEK RESIDENTIAL, LLC

PROJECT NO. 12208-LVR DATED March 30, 2016

UPDATED SOILS REPORT BY ADD FIELD
ADD FIELD
PROJECT NO. 12208-LVR DATED ADD FIELD

EARTHWORKS

EARTHWORK QUANTITIES (RAW):
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FILL= 149,766 CU YDS

EXPORTED MATERIAL TO BE DISPOSED OF AT AN APPROVED LICENSED DISPOSAL FACILITY OR AT A SITE WITH AN APPROVED AND ACTIVE GRADING PERMIT.

DISCLAIMER NOTE

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

GRADING NOTES

1. FINAL GRADES ADJACENT TO STRUCTURES SHALL BE IN CONFORMANCE WITH IBC 2012, SECTION 2304.11.2.2.
2. THE CONTRACTOR SHALL VERIFY ALL CONDITIONS AND DIMENSIONS AND REPORT ALL DISCREPANCIES TO THE ENGINEER.
3. ALL IMPROVEMENTS TO BE PROTECTED FROM EROSION BY SWPPP.
4. MAXIMUM/MINIMUM SLOPES AND MINIMUM STREET SECTIONS NOT TO EXCEED THAT SHOWN ON GEOTECH REPORT.
5. SEE DETAIL SHEET FOR STREET SECTIONS AND DETAILS.
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9. NO STRUCTURE, VEGETATION, OR OBJECTS OF ANY KIND IS PERMITTED OVER TWENTY-FOUR (24) INCHES IN HEIGHT (MEASURED FROM THE TOP OF THE ADJACENT CURB IF CURB EXIST) WITHIN THE SIGHT VISIBILITY ZONES.

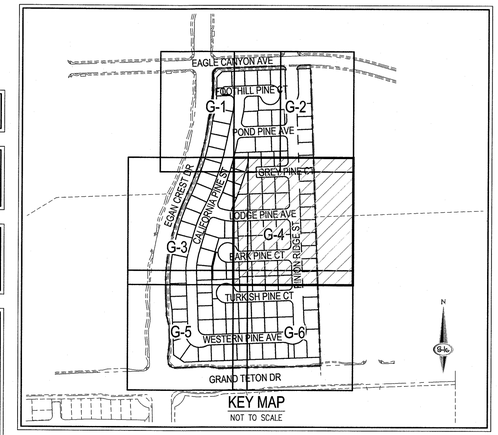
LAS VEGAS VALLEY CONSTRUCTION SITE BMP GUIDELINES

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

1. THE OWNER, SITE DEVELOPER, CONTRACTOR, AND/OR THEIR AUTHORIZED AGENTS SHALL EACH DAY REMOVE ALL SEDIMENT, MUD, CONSTRUCTION DEBRIS, OR OTHER POTENTIAL POLLUTANTS THAT MAY HAVE BEEN DISCHARGED TO, OR ACCUMULATED IN, THE PUBLIC RIGHTS OF WAY OF CLARK COUNTY AS A RESULT OF CONSTRUCTION ACTIVITIES ASSOCIATED WITH THIS SITE DEVELOPMENT OR CONSTRUCTION PROJECT. SUCH MATERIALS SHALL BE PREVENTED FROM ENTERING THE STORM SEWER SYSTEM.
2. ADDITIONAL CONSTRUCTION SITE DISCHARGE BEST MANAGEMENT PRACTICES MAY BE REQUIRED OF THE OWNER AND HIS OR HER AGENTS DUE TO UNFORESEEN EROSION PROBLEMS OR IF THE SUBMITTED PLAN DOES NOT MEET THE PERFORMANCE STANDARDS SPECIFIED IN CLARK COUNTY TITLE 24.40 AND IN THE LAS VEGAS VALLEY CONSTRUCTION SITE BMP GUIDANCE MANUAL.
3. TEMPORARY OR PERMANENT STABILIZATION PRACTICES WILL BE INSTALLED ON DISTURBED AREAS AS SOON AS PRACTICABLE AND NO LATER THAN 14 DAYS AFTER THE CONSTRUCTION ACTIVITY IN THAT PORTION OF THE SITE HAS TEMPORARILY OR PERMANENTLY CEASED. SOME EXCEPTIONS MAY APPLY; REFER TO THE NEVADA STORMWATER GENERAL PERMIT FOR CONSTRUCTION ACTIVITY 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 A RAIN EVENT OF 0.5 INCHES OR MORE. THE CONTRACTOR OR HIS AGENT SHALL UPDATE OR MODIFY THE STORMWATER POLLUTION PREVENTION PLAN AS NECESSARY. SOME EXCEPTIONS TO WEEKLY INSPECTIONS MAY APPLY, SUCH AS SUSPENSION OF LAND DISTURBANCE ACTIVITIES. REFER TO THE NEVADA STORMWATER GENERAL PERMIT FOR CONSTRUCTION ACTIVITY NVR100000, SECTION III.A.12.
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 DEPICTED ON FLOOD INSURANCE RATE MAP (FIRM) PANEL 2300C1750E, DATED SEPTEMBER 27, 2002. A ZONE X (UNSHADED) IS DESCRIBED AS AN AREA DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOOD PLAIN.



GRADING NOTES

1. FIELD VERIFY AND CONNECT TO EXISTING CURB, GUTTER AND/OR SIDEWALK
2. CONSTRUCT 20" ROLL CURB AND GUTTER PER CCAUSD NO. 217.S1. CURB FLOW LINES LESS THAN 0.60% GRADE SHALL BE WATER TESTED. ANY CURB THAT DOES NOT FLOW SHALL BE REMOVED AND REPLACED AT NO COST TO THE CITY.
3. CONSTRUCT "L" TYPE CURB AND GUTTER PER CCAUSD NO. 216
4. CONSTRUCT "A" TYPE ISLAND CURB PER CCAUSD NO. 219
5. CONSTRUCT 10' ROLL CURB TO L CURB TRANSITION PER DETAIL 21 ON SHEET D-2
6. CONSTRUCT 5' WIDE SIDEWALK PER CCAUSD NO. 234
7. CONSTRUCT 8' WIDE CROSS GUTTER PER DETAIL 20 ON SHEET D-2
8. INSTALL 2" ASPHALT PAVEMENT OVER 4" TYPE II AGGREGATE BASE
9. CONSTRUCT SIDEWALK RAMP USING ARMOR TILE TRUNCATED DOMES OR EQUIVALENT PER CCAUSD NO. 235, CASE I & 235.1
10. CONSTRUCT SIDEWALK DRAIN PER CCAUSD NO. 236
11. CONSTRUCT 5' X 6' (TRIPLE GRATE) NDOT TYPE II INLET PER NDOT STD. R-4.2.1 AND DETAIL ON SHEET D-3
12. RIP RAP D50=8" THICKNESS=16" W/ 6" FINE AGGREGATE BASE (PER SPEC 706.0303) COMPACTED TO 90% OVER FILTER FABRIC
13. CONSTRUCT 8' CROSS GUTTER PER CCAUSD NO. 228
14. INSTALL WROUGHT IRON FENCE W/ACCESS GATES, DESIGN BY OTHERS
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19. CONSTRUCT CONCRETE CHANNEL PER DETAIL 25 ON SHEET D-2
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SEE SHEET C-3 FOR ABBREVIATIONS, LEGEND, AND QUANTITIES

BONDABLE DRAINAGE QUANTITIES (PRIVATE)

8' WIDE CONCRETE VALLEY GUTTER W/10" TYPE I AGGREGATE BASE	SF	5,120
SIDEWALK UNDER DRAIN	EA	3
RIPRAP D50=6", THK=12"	SF	2,955
3.0' CONCRETE U-CHANNEL	LF	36
3.0' CONCRETE VALLEY GUTTER	SF	293
5' X 6' TYPE II DROP INLET	EA	1

DRAINAGE EASEMENT NOTE

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FLOOD CERTIFICATION

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

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

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

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

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

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.

CITY OF LAS VEGAS, NV

NINETY FIVE MANAGEMENT LLC

SKYE CANYON II PARCEL 2.27
GRADING PLAN IV

S 12
R 59

DATE: 6/21/17
DRAFTER: JM
DESIGNER: MAK
CHECKED: TM

PROJECT NO.
OLY1607-005

PROFESSIONAL ENGINEER — STATE OF NEVADA — TIMOTHY M. MULROONEY — Exp. 12/31/2017 — CIVIL — No. 22938
6/21/17

G-4
SHEET 7 OF 13

J:\OLY1607-005 skye canyon parcel 2.27\Dwg\Improv\OLY1607-005 grd.dwg 6/21/2017 11:35 AM Erwin Sacundo



SCALE – 1"=30' (0, 30, 60 FEET)

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SOILS REPORT BY GEOTEK RESIDENTIAL, LLC

PROJECT NO. 12208-LVR DATED March 30, 2016

UPDATED SOILS REPORT BY ADD FIELD
ADD FIELD
PROJECT NO. 12208-LVR DATED ADD FIELD

EARTHWORKS

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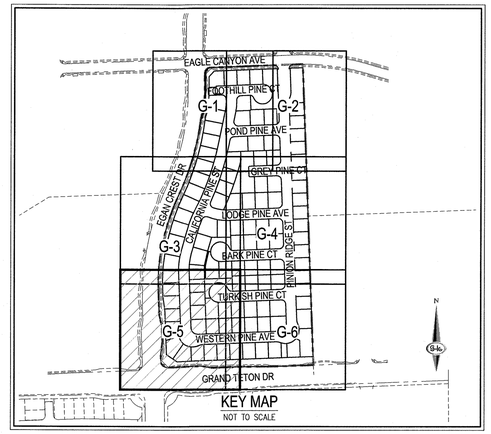
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20. CONSTRUCT 3' WIDE CONCRETE VALLEY GUTTER PER DETAIL 26 ON SHEET D-2

SEE SHEET C-3 FOR ABBREVIATIONS, LEGEND, AND QUANTITIES

BONDABLE DRAINAGE QUANTITIES (PRIVATE)

8' WIDE CONCRETE VALLEY GUTTER W/10" TYPE I AGGREGATE BASE	SF	5,120
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3.0' CONCRETE VALLEY GUTTER	SF	293
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TIMOTHY M. MULROONEY, P.E. 22938 — DATE

FAST
Call before you UnderGround
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FREEWAY & ARTERIAL SYSTEM OF TRANSPORTATION (F.A.S.T.)

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

Call before you Dig
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Call 811
OR
1-800-227-2600

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.

CITY OF LAS VEGAS, NV

NINETY FIVE MANAGEMENT LLC

SKYE CANYON II PARCEL 2.27

GRADING PLAN V

S 12
T 19
R 59

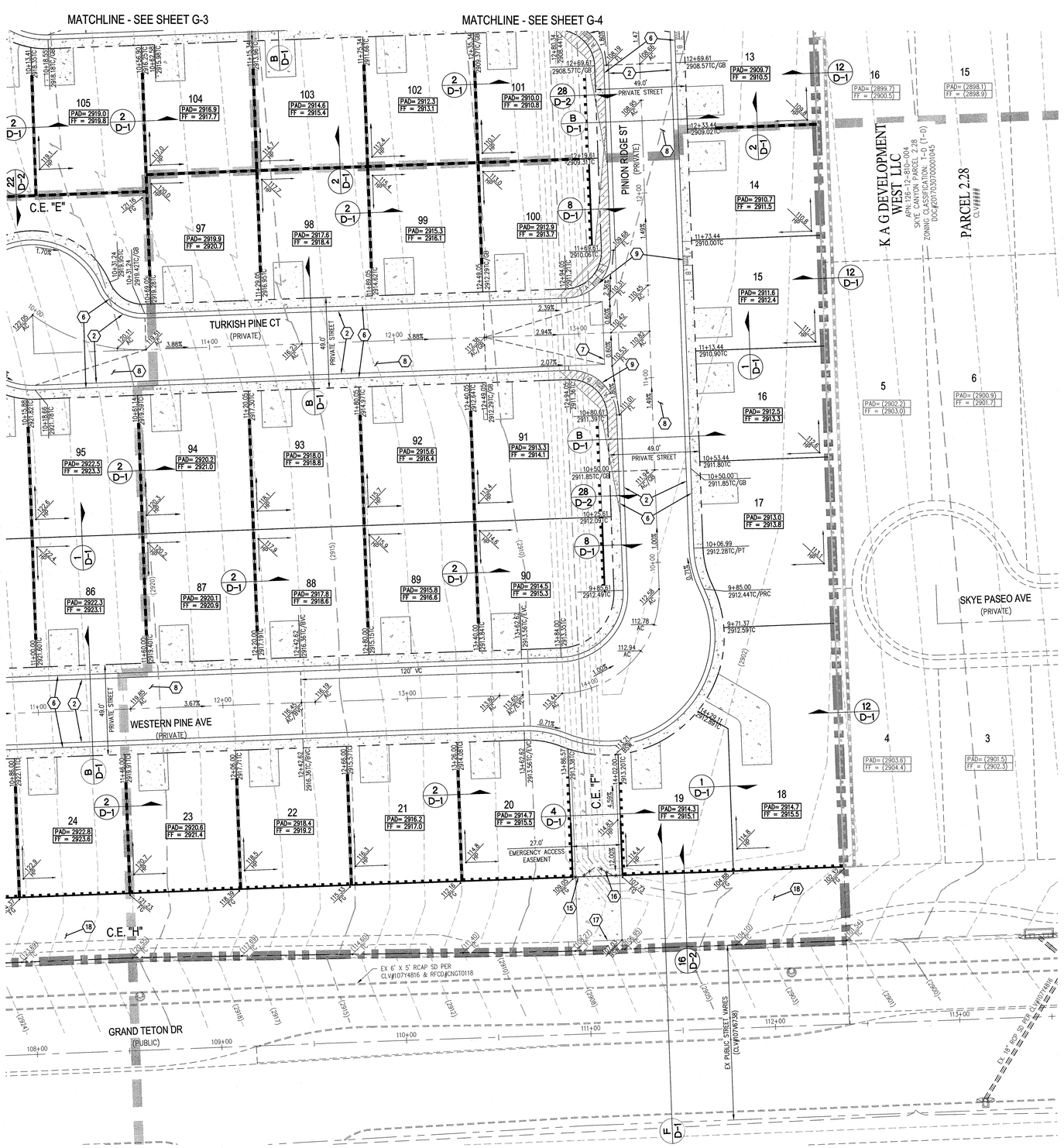
DATE: 6/21/17
DRAFTER: JM
DESIGNER: MAK
CHECKED: TM

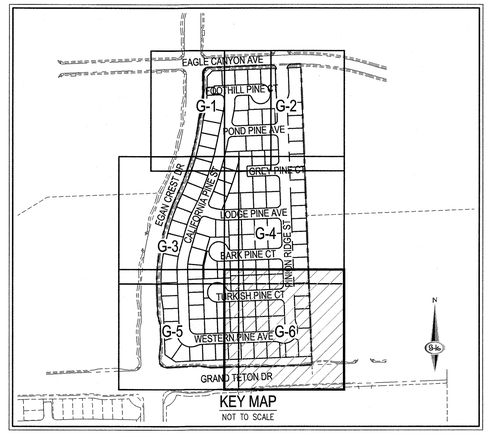
PROJECT NO.
OLY1607-005



G-5
SHEET 8 OF 13

k:\oly1607-005 skye canyon parcel 2.27\dwg\mercer\oly1607-005 grd.dwg 6/21/2017 11:35 AM Erwin Scrundo





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SOILS REPORT BY GEOTEK RESIDENTIAL, LLC

PROJECT NO. 12208-LVR DATED March 30, 2016

UPDATED SOILS REPORT BY ADD FIELD
ADD FIELD
PROJECT NO. 12208-LVR DATED ADD FIELD

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DISCLAIMER NOTE

1) EXISTING UTILITY LOCATIONS SHOWN HEREON ARE APPROXIMATE ONLY. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE EXACT VERTICAL AND HORIZONTAL LOCATION OF ALL EXISTING UNDERGROUND UTILITIES PRIOR TO COMMENCING CONSTRUCTION. NO REPRESENTATION IS MADE THAT ALL EXISTING UTILITIES ARE SHOWN HEREON. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR UTILITIES NOT SHOWN IN THEIR PROPER LOCATION.

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

GRADING NOTES

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

GRADING NOTES

1. FIELD VERIFY AND CONNECT TO EXISTING CURB, GUTTER AND/OR SIDEWALK
2. CONSTRUCT 30" ROLL CURB AND GUTTER PER CCAUSD NO. 217.S1. CURB FLOW LINES LESS THAN 0.60% GRADE SHALL BE WATER TESTED. ANY CURB THAT DOES NOT FLOW SHALL BE REMOVED AND REPLACED AT NO COST TO THE CITY.
3. CONSTRUCT "L" TYPE CURB AND GUTTER PER CCAUSD NO. 216
4. CONSTRUCT "A" TYPE ISLAND CURB PER CCAUSD NO. 219
5. CONSTRUCT 10' ROLL CURB TO L CURB TRANSITION PER DETAIL 21 ON SHEET D-2
6. CONSTRUCT 5' WIDE SIDEWALK PER CCAUSD NO. 234
7. CONSTRUCT 8' WIDE CROSS GUTTER PER DETAIL 20 ON SHEET D-2
8. INSTALL 2" ASPHALT PAVEMENT OVER 4" TYPE II AGGREGATE BASE
9. CONSTRUCT SIDEWALK RAMP USING ARMOR TILE TRUNCATED DOMES OR EQUIVALENT PER CCAUSD NO. 235, CASE I & 235.1
10. CONSTRUCT SIDEWALK DRAIN PER CCAUSD NO. 236
11. CONSTRUCT 5' X 6' (TRIPLE GRATE) NDOT TYPE II INLET PER NDOT STD. R-4.2.1 AND DETAIL ON SHEET D-3
12. RIP RAP D50=8" THICKNESS=16" W/ 6" FINE AGGREGATE BASE (PER SPEC 706.0303) COMPACTED TO 90% OVER FILTER FABRIC
13. CONSTRUCT 8' CROSS GUTTER PER CCAUSD NO. 228
14. INSTALL WROUGHT IRON FENCE W/ACCESS GATES, DESIGN BY OTHERS
15. INSTALL WROUGHT IRON FENCE, DESIGN BY OTHERS
16. INSTALL WROUGHT IRON GATES PER DETAIL 19 ON SHEET D-2
17. CONSTRUCT 24' WIDE COMMERCIAL DRIVEWAY PER CCAUSD NO. 224
18. PERIMETER LANDSCAPE TO BE CONSTRUCTED BY MASTER DEVELOPER
19. CONSTRUCT CONCRETE CHANNEL PER DETAIL 25 ON SHEET D-2
20. CONSTRUCT 3' WIDE CONCRETE VALLEY GUTTER PER DETAIL 26 ON SHEET D-2

SEE SHEET C-3 FOR ABBREVIATIONS, LEGEND, AND QUANTITIES

LAS VEGAS VALLEY CONSTRUCTION SITE BMP GUIDELINES

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

1. THE OWNER, SITE DEVELOPER, CONTRACTOR, AND/OR THEIR AUTHORIZED AGENTS SHALL EACH DAY REMOVE ALL SEDIMENT, MUD, CONSTRUCTION DEBRIS, OR OTHER POTENTIAL POLLUTANTS THAT MAY HAVE BEEN DISCHARGED TO, OR ACCUMULATED IN, THE PUBLIC RIGHTS OF WAY OF CLARK COUNTY AS A RESULT OF CONSTRUCTION ACTIVITIES ASSOCIATED WITH THIS SITE DEVELOPMENT OR CONSTRUCTION PROJECT. SUCH MATERIALS SHALL BE PREVENTED FROM ENTERING THE STORM SEWER SYSTEM.
2. ADDITIONAL CONSTRUCTION SITE DISCHARGE BEST MANAGEMENT PRACTICES MAY BE REQUIRED OF THE OWNER AND HIS OR HER AGENTS DUE TO UNFORESEEN EROSION PROBLEMS OR IF THE SUBMITTED PLAN DOES NOT MEET THE PERFORMANCE STANDARDS SPECIFIED IN CLARK COUNTY TITLE 24.40 AND IN THE LAS VEGAS VALLEY CONSTRUCTION SITE BMP GUIDANCE MANUAL.
3. TEMPORARY OR PERMANENT STABILIZATION PRACTICES WILL BE INSTALLED ON DISTURBED AREAS AS SOON AS PRACTICABLE AND NO LATER THAN 14 DAYS AFTER THE CONSTRUCTION ACTIVITY IN THAT PORTION OF THE SITE HAS TEMPORARILY OR PERMANENTLY CEASED. SOME EXCEPTIONS MAY APPLY; REFER TO THE NEVADA STORMWATER GENERAL PERMIT FOR CONSTRUCTION ACTIVITY 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 A RAIN EVENT OF 0.5 INCHES OR MORE. THE CONTRACTOR OR HIS AGENT SHALL UPDATE OR MODIFY THE STORMWATER POLLUTION PREVENTION PLAN AS NECESSARY. SOME EXCEPTIONS TO WEEKLY INSPECTIONS MAY APPLY, SUCH AS SUSPENSION OF LAND DISTURBANCE ACTIVITIES. REFER TO THE NEVADA STORMWATER GENERAL PERMIT FOR CONSTRUCTION ACTIVITY NVR100000, SECTION III.A.12.
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.

BONDABLE DRAINAGE QUANTITIES (PRIVATE)

8' WIDE CONCRETE VALLEY GUTTER W/10" TYPE I AGGREGATE BASE	SF	5,120
SIDEWALK UNDER DRAIN	EA	3
RIPRAP D50=6", THK=12"	SF	2,955
3.0' CONCRETE U-CHANNEL	LF	36
3.0' CONCRETE VALLEY GUTTER	SF	293
5' X 6' TYPE II DROP INLET	EA	1

DRAINAGE EASEMENT NOTE

ALL DRAINAGE EASEMENTS AND COMMON LOTS ARE PUBLIC DRAINAGE EASEMENTS PRIVATELY MAINTAINED BY THE H.O.A.

FLOOD ZONE

THE PROJECT SITE IS LOCATED WITHIN A FEMA DESIGNATED ZONE X (UNSHADED) AS DEPICTED ON FLOOD INSURANCE RATE MAP (FIRM) PANEL 23003C1750E, DATED SEPTEMBER 27, 2002. A ZONE X (UNSHADED) IS DESCRIBED AS AN AREA DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOOD PLAIN.

FLOOD CERTIFICATION

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

TIMOTHY M. MULROONEY, P.E. 22938 DATE

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

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

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

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.

CITY OF LAS VEGAS, NV

NINETY FIVE MANAGEMENT LLC

SKYE CANYON II PARCEL 2.27

GRADING PLAN VI

S-12 T-19 R-59

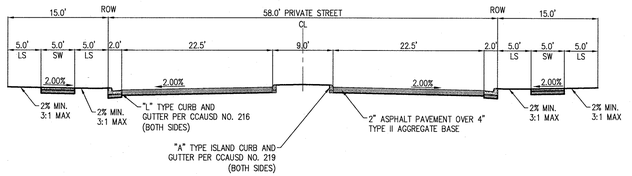
DATE: 6/21/17
DRAFTER: JM
DESIGNER: MAK
CHECKED: TM

PROJECT NO.
OLY1607-005

TIMOTHY M. MULROONEY — Exp. 12/31/2017 — CIVIL — No. 22938 — STATE OF NEVADA — PROFESSIONAL ENGINEER — 6/21/17

G-6
SHEET 9 OF 13

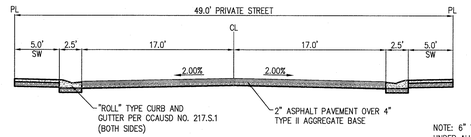
J:\oly\607-005 skye canyon parcel 2.27\dwg\mass\oly607-005 grd.dwg 6/21/2017 11:35 AM Kevin Sciscio



A. 58' ENTRY STREET SECTION

NOT TO SCALE

ONSITE PRIVATE STREET

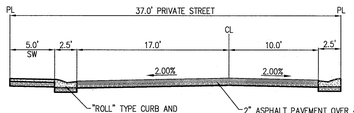


NOTE: 6" TYPE II AGGREGATE BASE UNDER ALL CURB AND SIDEWALK (TYP)

B. 49' PRIVATE STREET SECTION

NOT TO SCALE

ONSITE PRIVATE STREET

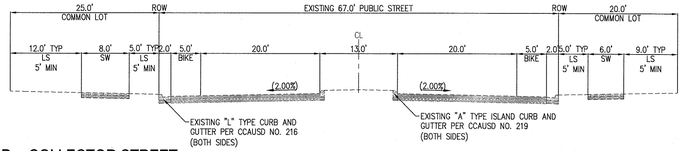


NOTE: 6" TYPE II AGGREGATE BASE UNDER ALL CURB AND SIDEWALK (TYP)

C. STUB STREET

NOT TO SCALE

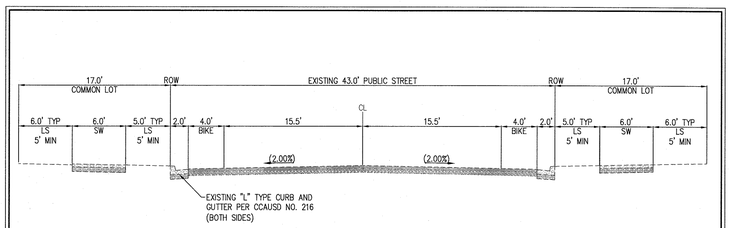
ONSITE PRIVATE STREET



D. COLLECTOR STREET

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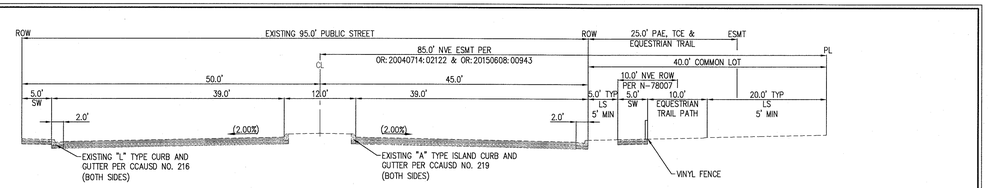
EGAN CREST DRIVE



E. MINOR COLLECTOR STREET

NOT TO SCALE

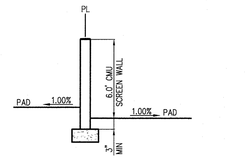
EAGLE CANYON AVENUE



F. EXISTING PUBLIC STREET

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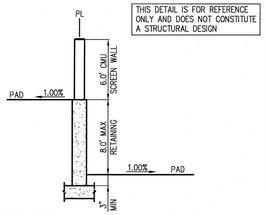
GRAND TETON DRIVE



THIS DETAIL IS FOR REFERENCE ONLY AND DOES NOT CONSTITUTE A STRUCTURAL DESIGN

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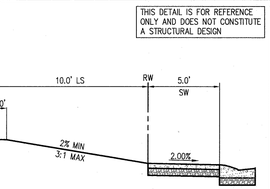
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THIS DETAIL IS FOR REFERENCE ONLY AND DOES NOT CONSTITUTE A STRUCTURAL DESIGN

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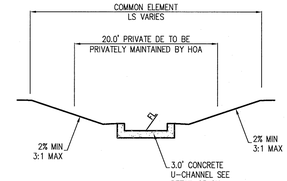
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THIS DETAIL IS FOR REFERENCE ONLY AND DOES NOT CONSTITUTE A STRUCTURAL DESIGN

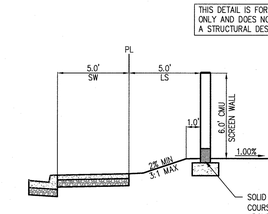
3. WALL SECTION

NOT TO SCALE



6. WALL SECTION

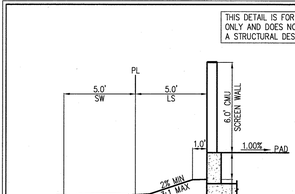
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THIS DETAIL IS FOR REFERENCE ONLY AND DOES NOT CONSTITUTE A STRUCTURAL DESIGN

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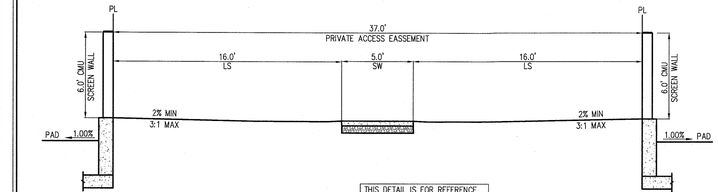
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THIS DETAIL IS FOR REFERENCE ONLY AND DOES NOT CONSTITUTE A STRUCTURAL DESIGN

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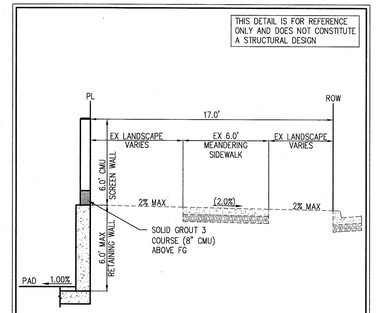
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THIS DETAIL IS FOR REFERENCE ONLY AND DOES NOT CONSTITUTE A STRUCTURAL DESIGN

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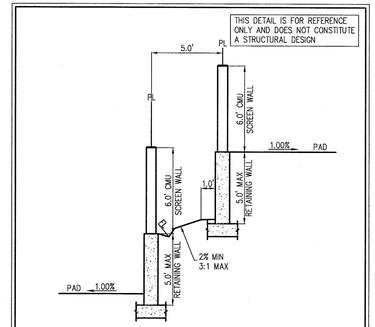
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THIS DETAIL IS FOR REFERENCE ONLY AND DOES NOT CONSTITUTE A STRUCTURAL DESIGN

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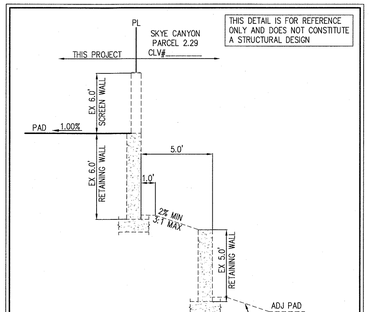
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THIS DETAIL IS FOR REFERENCE ONLY AND DOES NOT CONSTITUTE A STRUCTURAL DESIGN

11. WALL SECTION

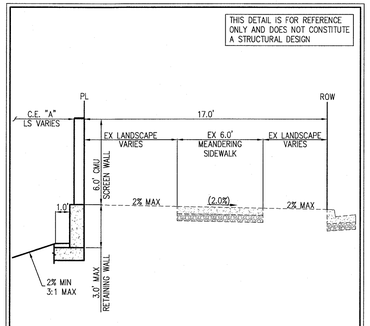
NOT TO SCALE



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12. WALL SECTION

NOT TO SCALE



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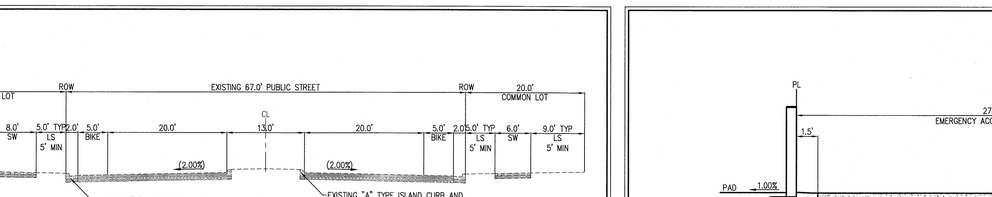
13. WALL SECTION

NOT TO SCALE

THIS DETAIL IS FOR REFERENCE ONLY AND DOES NOT CONSTITUTE A STRUCTURAL DESIGN

14. WALL SECTION

NOT TO SCALE



THIS DETAIL IS FOR REFERENCE ONLY AND DOES NOT CONSTITUTE A STRUCTURAL DESIGN

5. WALL SECTION

NOT TO SCALE

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

AVOID HITTING OVERHEAD POWER LINES. IT'S COSTLY.
CALL BEFORE YOU DO OVERHEAD
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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	APP.

CITY OF LAS VEGAS, NV

NINETY FIVE MANAGEMENT LLC

SKYE CANYON II PARCEL 2.27

STREET SECTIONS AND GRADING DETAILS I

S 12
T 19
R 59

DATE: 6/21/17
DRAFTER: JM
DESIGNER: MAK
CHECKED: TM

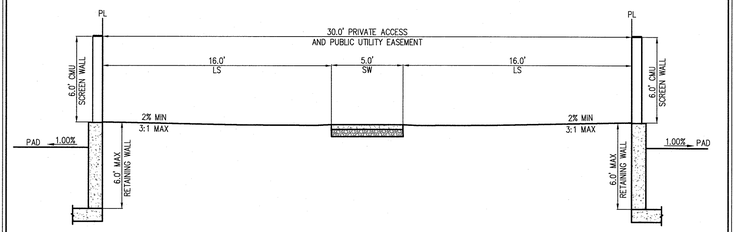
PROJECT NO.
OLY1607-005

PROFESSIONAL ENGINEER STATE OF NEVADA
TIMOTHY M. MULROONEY
Exp. 12/31/2017
CIVIL
No. 22938
6/21/17

D-1
SHEET 10 OF 13

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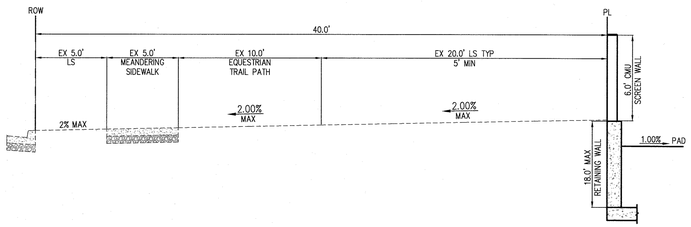
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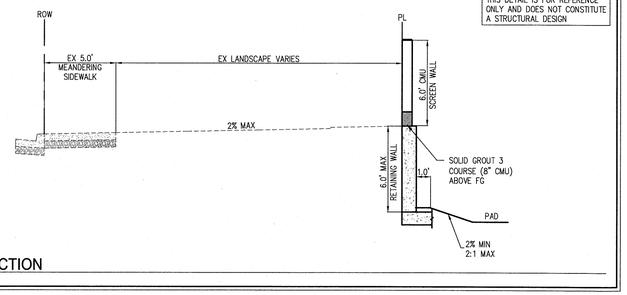
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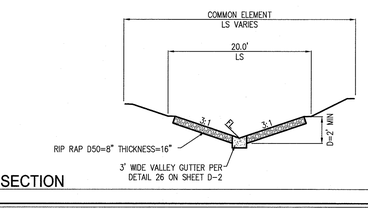
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17. WALL SECTION

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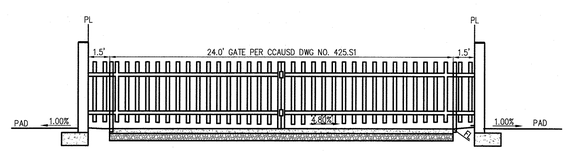
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18. GRADING SECTION

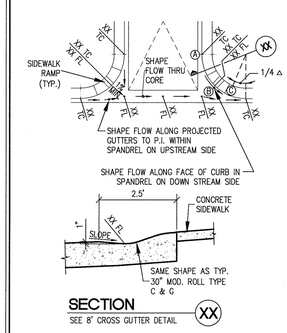
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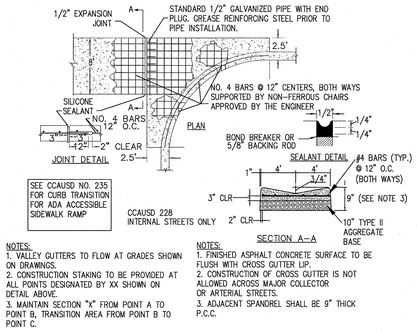
THIS DETAIL IS FOR REFERENCE ONLY AND DOES NOT CONSTITUTE A STRUCTURAL DESIGN



19. COMMON ELEMENT SECTION

NOT TO SCALE





SEE CCAUSD NO. 235 FOR CURB TRANSITION FOR ADA ACCESSIBLE SIDEWALK RAMP

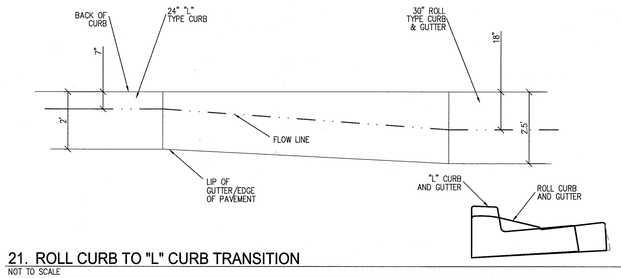
CCAUSD 228 INTERNAL STREETS ONLY

NOTES:
1. VALLEY GUTTERS TO FLOW AT GRADES SHOWN ON DRAWINGS.
2. CONSTRUCTION STAKING TO BE PROVIDED AT ALL POINTS DESIGNATED BY XX SHOWN ON DETAIL ABOVE.
3. MAINTAIN SECTION "X" FROM POINT A TO POINT B, TRANSITION AREA FROM POINT B TO POINT C.

NOTES:
1. FINISHED ASPHALT CONCRETE SURFACE TO BE FLUSH WITH CROSS GUTTER LIP.
2. CONSTRUCTION OF CROSS GUTTER IS NOT ALLOWED ACROSS MAJOR COLLECTOR OR ARTERIAL STREETS.
3. ADJACENT SPANDREL SHALL BE 9" THICK P.C.C.

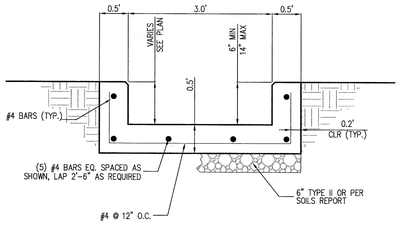
20. MODIFIED 8' WIDE CROSS GUTTER

NOT TO SCALE



21. ROLL CURB TO "L" CURB TRANSITION

NOT TO SCALE



GENERAL STRUCTURAL NOTES:

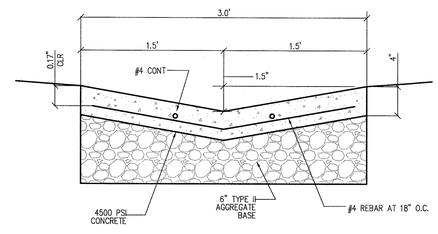
CONCRETE: ALL CONCRETE SHALL BE CLASS D WITH A MINIMUM ULTIMATE COMPRESSIVE STRENGTH f'c=4500psi AT 28 DAYS. ALL CONCRETE SHALL BE MADE USING TYPE V CEMENT. ALL EXPOSED CORNERS SHALL BE BEVELED 3/4" UNLESS OTHERWISE NOTED.

REINFORCING STEEL: ALL REINFORCING STEEL SHALL BE ASTM A615, GRADE 60. DIMENSIONS RELATING TO BAR SPACING ARE CENTER TO CENTER. BENDING DIMENSIONS ARE FROM OUT TO OUT OF BARS.

JOINTS: PROVIDE 3/4" EXPANSION JOINT AT MAXIMUM SPACING OF 180'-0" OC. PROVIDE CONTRACTION JOINTS (SAW CUT OR TOOLED 1/2" DEEP) AT MAXIMUM 30'-0" O.C.

25. 3' CONCRETE U-CHANNEL SECTION

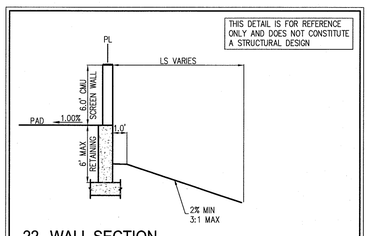
NOT TO SCALE



26. 3' WIDE CONCRETE VALLEY GUTTER

NOT TO SCALE

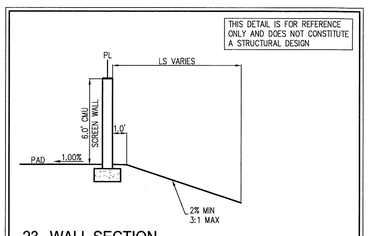
THIS DETAIL IS FOR REFERENCE ONLY AND DOES NOT CONSTITUTE A STRUCTURAL DESIGN



22. WALL SECTION

NOT TO SCALE

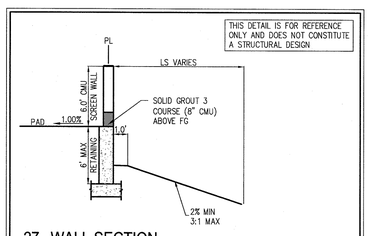
THIS DETAIL IS FOR REFERENCE ONLY AND DOES NOT CONSTITUTE A STRUCTURAL DESIGN



23. WALL SECTION

NOT TO SCALE

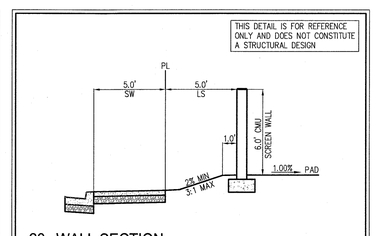
THIS DETAIL IS FOR REFERENCE ONLY AND DOES NOT CONSTITUTE A STRUCTURAL DESIGN



27. WALL SECTION

NOT TO SCALE

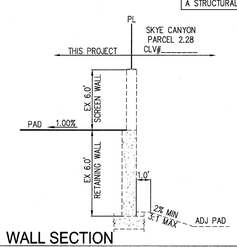
THIS DETAIL IS FOR REFERENCE ONLY AND DOES NOT CONSTITUTE A STRUCTURAL DESIGN



28. WALL SECTION

NOT TO SCALE

THIS DETAIL IS FOR REFERENCE ONLY AND DOES NOT CONSTITUTE A STRUCTURAL DESIGN



24. WALL SECTION

NOT TO SCALE

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

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

Call before you Dig
AVOID CUTTING UNDERGROUND UTILITY LINES. IT'S COSTLY.
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NO.	DESCRIPTION	DATE	BY	APP. DATE	APP.

CITY OF LAS VEGAS, NV

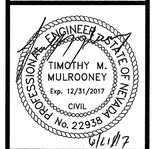
NINETY FIVE MANAGEMENT LLC

SKYE CANYON II PARCEL 2.27

GRADING DETAILS II

S 12
T 19
R 59

DATE: 6/21/17
DRAFTER: JM
DESIGNER: MAK
CHECKED: TM
PROJECT NO.
OLY1607-005



D-2
SHEET 11 OF 13

J:\oly1607-005 skye canyon parcel 2.27\dwg\mmcx\oly1607-005 dtl.dwg 6/21/2017 11:35 AM Erwin Sciortino

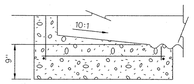
BILL OF MATERIALS (RCP HDPE CMP)

PIPE SIZE (INCH)	SINGLE (ONE GRATE)					DOUBLE (TWO GRATES)					TRIPLE (THREE GRATES)				
	* CONCRETE (CY)		* REINF. (LB.)			* CONCRETE (CY)		* REINF. (LB.)			* CONCRETE (CY)		* REINF. (LB.)		
	BASE QUAN. (H MIN.)	ADD RATE (CY/FT)	BASE QUAN. (H MIN.)	ADD RATE (LB/FT)	STR STEEL (LB)	BASE QUAN. (H MIN.)	ADD RATE (CY/FT)	BASE QUAN. (H MIN.)	ADD RATE (LB/FT)	STR STEEL (LB)	BASE QUAN. (H MIN.)	ADD RATE (CY/FT)	BASE QUAN. (H MIN.)	ADD RATE (LB/FT)	STR STEEL (LB)
≤15	0.71	0.19	36	10	211	1.06	0.26	50	13	397	1.41	0.33	70	17	583
18	0.89	0.20	40	10	306	1.31	0.28	56	13	574	1.72	0.35	77	18	842
24	1.08	0.22	58	12	349	1.56	0.30	80	15	652	2.04	0.37	105	20	956
30	1.28	0.24	63	12	390	1.83	0.31	86	16	729	2.38	0.39	113	20	1068
36	1.50	0.26	67	13	524	2.11	0.33	92	16	980	2.72	0.41	120	21	1435
42	1.71	0.28	90	15	575	2.39	0.35	120	18	1073	3.07	0.43	154	22	1571
48	1.94	0.30	95	15	707	2.68	0.37	127	18	1329	3.42	0.44	163	23	1951

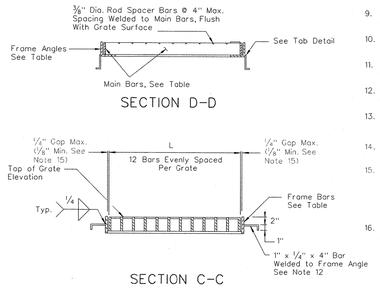
*The Concrete And Reinforcing Quantities Are Based On The H Min. Shown. Increase The Concrete And Reinforcing Base Quantity By The Corresponding Add Rate (Per Foot Of Increased H) If The H Specified Is Larger Than H Min.

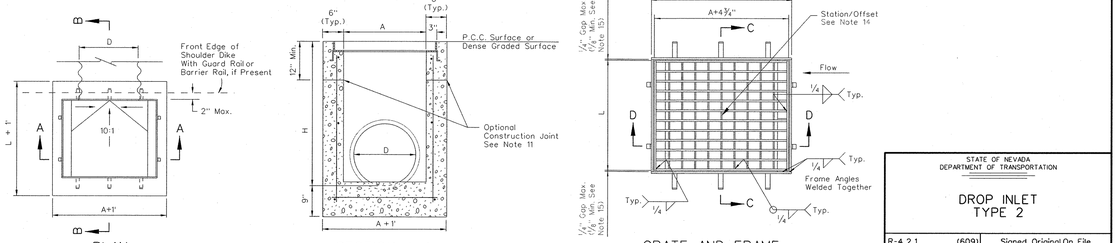
TABLE OF DIMENSIONS (RCP HDPE CMP)

PIPE SIZE (INCH)	A	H Min. (FT)	MAIN BARS (INCH)	FRAME ANGLES (INCH)	FRAME BARS (INCH)	L (FT) SINGLE GRATE	L (FT) DOUBLE GRATE	L (FT) TRIPLE GRATE
≤ 15	2'	2.50	3½ X ⅜	4 X 3 X ⅜	4 X ⅜	2'	4'	6'
18	2' 6"	3.00	4½ X ⅜	5 X 3 X ⅜	5 X ⅜	2'	4'	6'
24	3'	3.50	4½ X ⅜	5 X 3 X ⅜	5 X ⅜	2'	4'	6'
30	3' 5"	4.00	4½ X ⅜	5 X 3 X ⅜	5 X ⅜	2'	4'	6'
36	4'	4.50	5½ X ⅜	6 X 3½ X ⅜	6 X ⅜	2'	4'	6'
42	4' 6"	5.00	5½ X ⅜	6 X 3½ X ⅜	6 X ⅜	2'	4'	6'
48	5'	5.50	5½ X 7/16	6 X 3½ X ⅜	6 X ⅜	2'	4'	6'



SECTION B-B





NOTES:

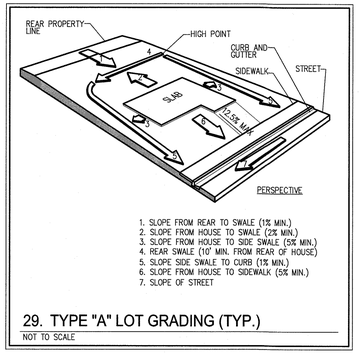
1. All concrete shall be class A or AA.
2. Reinforcing steel shall be No.4 bars with maximum spacing at 18 inch centers, wired tightly at all intersections and embedded 2 inches clear of all concrete surfaces.
3. Exposed edges of concrete shall be chamfered 1 inch.
4. Dimensions may be varied to fit local conditions if ordered by the engineer.
5. Commercial prefabricated gratings approved by the bridge division may be used in lieu of the field-welded grating shown.
6. Extreme low cover situations to be reviewed by hydraulics engineer.
7. Slope catch basin floors 10:1 from all directions toward outlet pipe. If basin is used as a junction, shape flow line(s) to outlet pipe and provide a 10:1 slope to flow line(s).
8. See sheet R-2.9.1 for details if connecting HDPE pipe.
9. A single Type 2 drop inlet shall be constructed unless a double or triple is specified.
10. Single grate configuration shown for clarity. Outside dimensions of each grate shall measure 2 feet by A+4¾".
11. Run rebar continuous thru construction joint. Joint must be a minimum of 3 inches from horizontal bars.
12. Weld one tab on ℄ of grate and remaining two tabs 6 inches from edge of frame. Six tabs per inlet, three tabs on each side
13. Weld tabs 6 inches from edge of frame. Four tabs per grate, two on each side.
14. For multiple grate installations, the station/offset is to the center of the concrete drop inlet structure.
15. Grate is to fit in the frame and be easily removed. If the gap between the grate and frame is greater than 1/4" on each side of the grate, the grate and frame shall be removed and reconstructed to the tolerances specified or, with approval of the engineer, a filler strip up to 1/4" in thickness may be welded flush to the top of the frame to reduce the gap to a maximum of 1/4".
16. Additional pipe penetrations may be placed in any wall. Pipe penetrations are to be to the center of the structure wall unless specified otherwise.

STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION

DROP INLET
TYPE 2

R-4.2.1	(609)	Signed Original On File
ADOPTED 11/70	REVISED 10/15	CHIEF HYDRAULICS ENGR.

R-4.3



1. SLOPE FROM REAR TO SWALE (1% MIN.)
2. SLOPE FROM HOUSE TO SWALE (2% MIN.)
3. SLOPE FROM HOUSE TO SIDE SWALE (5% MIN.)
4. REAR SWALE (10' MIN. FROM REAR OF HOUSE)
5. SLOPE SIDE SWALE TO CURB (1% MIN.)
6. SLOPE FROM HOUSE TO SIDEWALK (5% MIN.)
7. SLOPE OF STREET

29. TYPE "A" LOT GRADING (TYP.)

NOT TO SCALE

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NO.	DESCRIPTION	DATE	BY	APP. DATE	APP.

CITY OF LAS VEGAS, NV

NINETY FIVE MANAGEMENT LLC

SKYE CANYON II PARCEL 2.27

GRADING DETAILS III

S 12
T 19
R 59

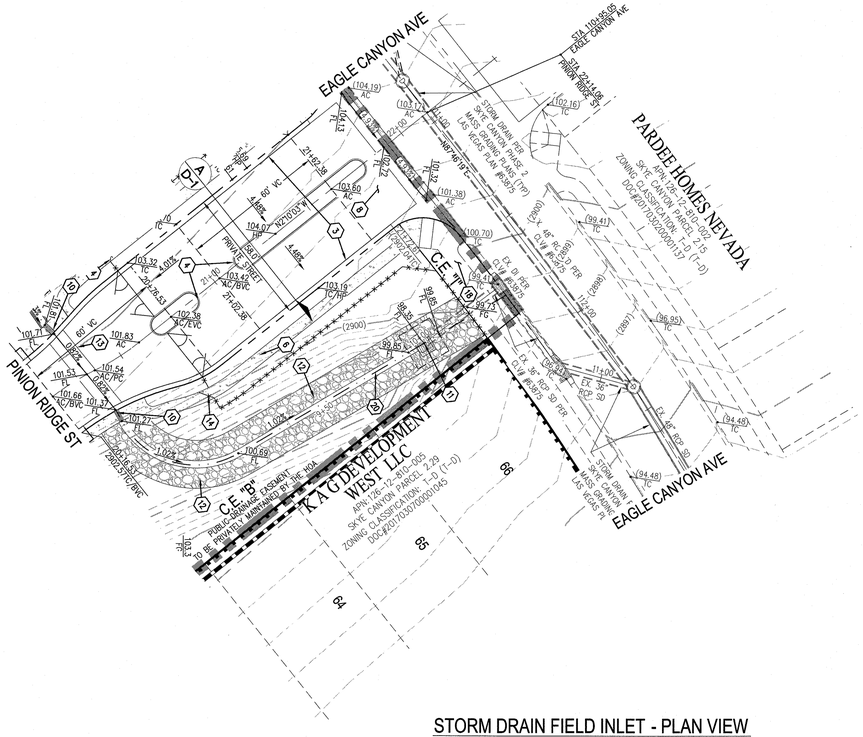
DATE: 6/21/17
DRAFTER: JM
DESIGNER: MAK
CHECKED: TM

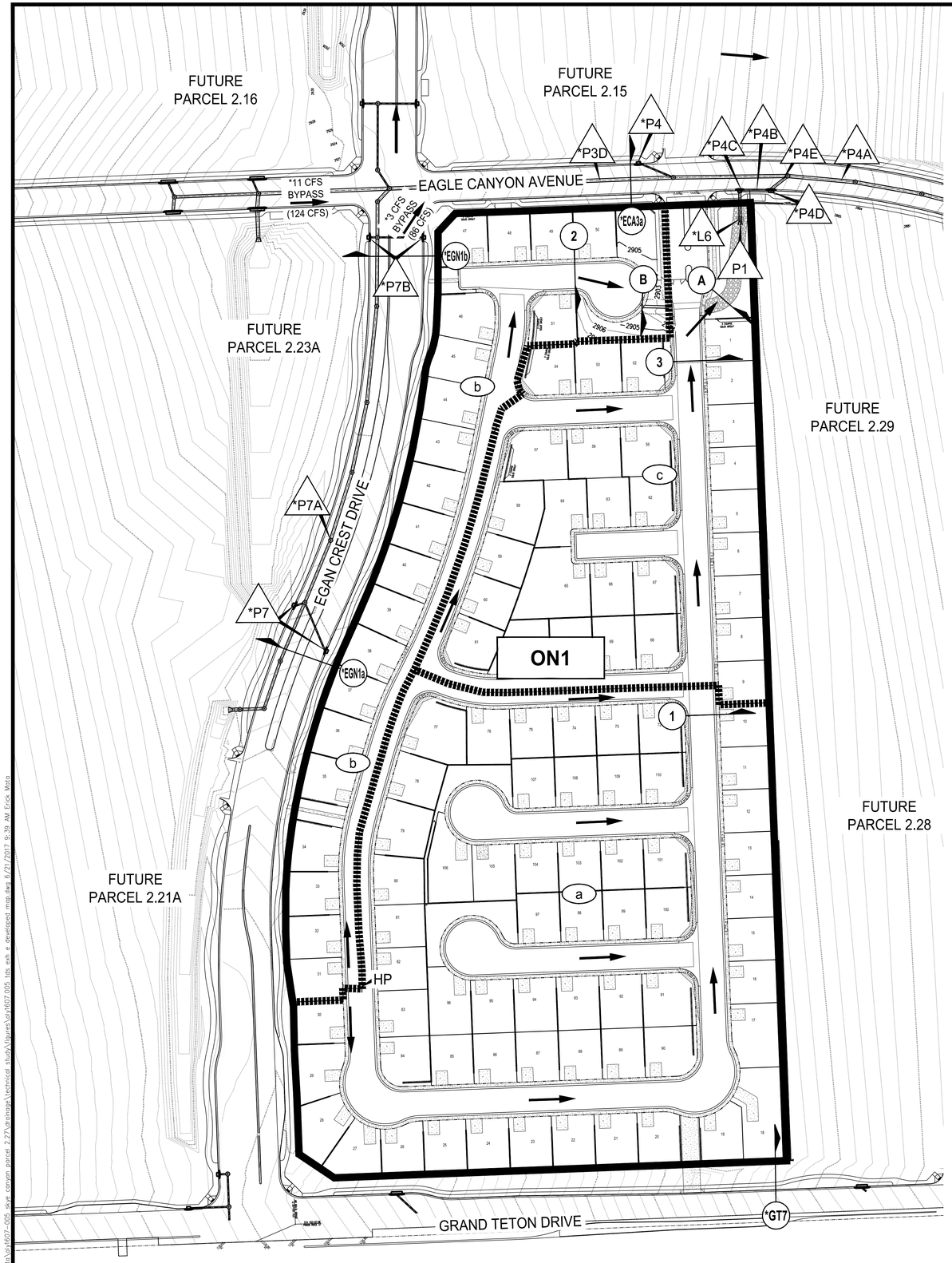
PROJECT NO.
OLY1607-005

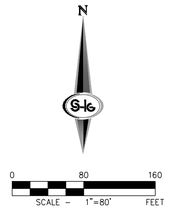
PROFESSIONAL ENGINEER STATE OF NEVADA
TIMOTHY M. MULROONEY
Exp. 12/31/2017
CIVIL
No. 22938
6/21/17

D-3
SHEET 12 OF 13

J:\oly1607-005 skye canyon parcel 2.27\dwg\improv\oly1607-005 dtl.dwg 6/21/2017 11:36 AM Erwin Sacundo


EAGLE CANYON AVE
PARDEE HOMES NEVADA
PINION RIDGE ST
K A G DEVELOPMENT WEST LLC
APN: 126-12-810-005
SKYE CANYON PARCEL 2.29
ZONING CLASSIFICATION: T-O (1-0)
DOC#20150305:00045
C.E. "A" PUBLIC DRAINAGE EASEMENT TO BE PRIVATELY MAINTAINED BY THE HOA
C.E. "B" PUBLIC DRAINAGE EASEMENT TO BE PRIVATELY MAINTAINED BY THE HOA
PRIVATE STREET
STORM DRAIN PER PHASE 2 SKYE CANYON PLANS AS-BUILTS
STA 10+66.06 EAGLE CANYON AVE
STA 9+14.08 PINION RIDGE ST
EX. 39.75 LF 36" CLASS IV RCP SD @ S=5.33% (PUBLIC) Q100=53 CFS
EX. 41.22 LF 36" CLASS IV RCP SD @ S=5.33% (PUBLIC) Q100=53 CFS
EX. 33.23 LF 36" CLASS IV RCP SD @ S=5.33% (PUBLIC) Q100=56 CFS
EX. 16" RCP SD
EX. 36" RCP SD
EX. 24" RCP SD
EX. 18" RCP SD
EX. 30" RCP SD
EX. 42" RCP SD
EX. 48" RCP SD
EX. 54" RCP SD
EX. 60" RCP SD
EX. 66" RCP SD
EX. 72" RCP SD
EX. 78" RCP SD
EX. 84" RCP SD
EX. 90" RCP SD
EX. 96" RCP SD
EX.





LEGEND	
	BASIN BOUNDARY
ID	BASIN ID
	PRO-RATED SUBBASIN BOUNDARY
ID	PRO-RATED SUBBASIN ID
	FLOW DIRECTION
ID	CONCENTRATION POINT
ID	FLOWMASTER SECTION
ID	FACILITY ID
XX CFS	SURFACE FLOW
(XX CFS)	STORM DRAIN FLOW

Developed Condition Flow Rate Summary

Basin/Concentration Point ID	Area (ac)	Q_{100} (cfs)	Q_{10} (cfs)
ON1	18.1	53	27

Developed Condition Onsite Hydraulic Section Summary

Section ID	Section Description	Q_{100} (cfs)	Slope (%)	Depth (ft)	Velocity (fps)
Section A (Q = ON1)	V-Ditch w/ 3:1 SS and 8-inch riprap	53.0	1.02	1.22	7.56
Section B (Q = ON1)	3-ft wide Concrete U-Channel	11.0	4.08	0.36	10.15

Prorated Flow Summary

Basin ID	Q_{100} (cfs)	Area (acres)	100-yr Unit Flow (cfs/acre)
ON1	53	18.1	2.9
Subbasin ID	**Q_{100} (cfs)**	**Area (acres)**	**100-yr Unit Flow (cfs/acre)**
ON1 (a)	27	9.4	2.9
ON1 (b)	11	3.7	2.9
ON1 (c)	15	5.1	2.9
TOTAL	***53***	***18.1***	

Developed Condition 100-Year Street Flow Summary

Section ID	Slope (%)	Q_{100} (cfs)	Depth (ft)	Velocity (fps)	DxV
1	3.88	27	0.40	5.4	2.2
Q = ON1a	0.66		0.49	2.6	1.3
2	4.16	11	0.29	5.1	1.5
Q = ON1b	0.64		0.40	2.2	0.9
3	3.39	42	0.46	2.4	1.1
Q = ON1(a + c)	0.66		0.57	3.3	1.9
*ECA3a	4.94	17	0.38	5.3	2.0
*EGN1a	2.46	4	0.29	2.9	0.8
*EGN1b	0.50	2.5	0.38	1.6	0.6
*GT7	3.50	2	0.27	3.5	0.9

*Referenced from the Skye Canyon Phase 2 Infrastructure Study.

Recommended Flood Control Facility Summary

Facility ID	Facility Description	Design Flow (cfs) Q_{100}	Notes
P1	Proposed 5'x6' NDOT Type II Inlet	53	
*P3D	Existing 48" RCP	210	
*P4	(2) Existing 5-ft Type CM2 DIs	6	18" RCP North, 30" RCP South Lateral (Q shown is total for both inlets)
*P4A	Existing 48" RCP	269	
*P4B	Existing 36" RCP	53	
*P4C	Existing 5-ft Type CM2 DI	Nuisance	
*P4D	Existing 36" RCP	56	
*P4E	Existing 7.5-ft Type CM2 DI	3	Inlet Grates Replaced with Solid Plates
*P7	(2) Existing 5-ft Type CM2 DIs	3	
*P7A	Existing 36' to 42" RCP Transition	84	
*P7B	(2) Existing 5-ft Type CM2 DIs	2	18" RCP laterals (West Inlet Provided as Nuisance)
*L6	Existing 36" RCP	53	Stub Utilized for Facility P1 Tie In

*Referenced from the Skye Canyon Phase 2 Infrastructure Study.

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FAX (702) 284-5399

NO.	DESCRIPTION	DATE	BY	APP DATE	APP

NINETY-FIVE MANAGEMENT, LLC.

SKYE CANYON - PARCEL 2.27

DEVELOPED CONDITION DRAINAGE MAP

DATE: JUNE 2017
DRAFTER: ETM
DESIGNER: ETM
CHECKED: SOA
PROJECT NO.
OLY1607.005

EXHIBIT E
SHEET 1 OF 1

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