DS #: 4683

APN: 125-07-301-001

PROJECT: Skye Canyon - Parcel 1.1

SUBMITTAL: 1st

SCANNED BY/DATE: _____

CHECKED BY/DATE: _____

CITY OF LAS VEGAS NEVADA

CITY OF LAS VEGAS INTER-OFFICE MEMORANDUM				DATE: August 11, 2014
TO: **Land Development Services** Department of Building & Safety				FROM: Albert Sung, P.E. Flood Control Project Engineer Department of Public Works
SUBJECT:	Drainage Study for: **Skye Canyon – Parcel 1.1**			**COPIES TO:** Slater Hanifan Group
Cross Streets:	SEC of Hualapai Way & Horse Drive			K A G Development South, LLC / Ninety-Five Management, LLC
File Number:	F:\Depot\DSMemos\DS4683A.doc			Bart Anderson, P.E., DevCo
Parcel Number:	125-07-301-001			CCRFCD
Zoning Action:	TMP-53897			
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	6/30/2014	8/11/2014	See Comments Below	$400.00	361818: $400
			TOTAL FEES (LDDRS):	**$400.00**	**----**

REMARKS:

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

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

1. The subject drainage study is based on the condition that the ***Skye Canyon Phase 1 Infrastructure*** and the perimeter streets (*Racel Street, Hualapai Way, Horse Drive* and *Conquistador Street*) are fully improved for onsite major storm events protection. The perimeter streets and all the associated storm drain facilities must be completed prior to the issuance of any permits for the subject development.

2. This drainage study for **Parcel 1.1** will not be approved prior to the final approval of the ***Skye Canyon Phase 1 Infrastructure*** study.

3. Provide a copy of the zoning/planning conditions associated with this site (**TMP-53897**) with the next submittal to verify compliance with conditions. *Flood Control* will not issue conditional approval of the drainage study without the associated zoning/planning conditions (issued by the *City Council*). Any associated conditions of approval that revise the site drainage parameters will require that the drainage study be revised and resubmitted.

4. In all grading plans, label the existing storm drain systems in the perimeter streets with *City of Las Vegas* recorded drawing numbers. It is understood that the infrastructure plans have not been approved yet and therefore no recorded drawing numbers have been issued at current time. Label with "per *City of Las Vegas Plan #* xxxxx". Once the drawing numbers are available, label the pertinent plans with the actual numbers.

5. Provide finished floor elevations of the houses adjacent to the east of *Conquistador Street* on all pertinent grading plans.

6. **Grading Plans G-3 and G-4**:

   In a worst case scenario that the 100-year flow depth of 1.77' in *Racel Street*, main entrance ***Entry 1 Street*** appears to allow flood water split and overflow into the onsite development and continue east on **Street 1I**. Provide hydraulic calculations to quantify how much flow will split into the site downstream of the intersection at ***Entry 1 Street*** and ***Street 1I*** under a worst case situation. Address whether the proposed finished floor elevations of the impacted lots are still above the worst case flood event.

7. **Grading Plan G-4**:

   It appears that a wrought iron fence is needed at the south border of common element **CE "O"** to provide an overflow path from the finger street in case the sump drop inlet is completely clogged. Provide as such in the next submittal.

   Common element **CE "O"** must also be dedicated as a public drainage easement to be privately maintained by the HOA. Show that on the grading plan and dedicate as such in the final map.

8. **Detail Sheet D-2:**

   Sections 2/D-2, 3/D-2, 4/D-2, 5/D-2, 6/D-2 and 9/D-2 all indicate that the proposed pad and finished floor elevations are below the corresponding street grade. Revise those sections to solid grout a minimum of 3-courses of 8"-CMU above the adjacent grade.

9. Any proposed wrought iron fence in the public drainage easements must utilize *City of Las Vegas* Standard Drawing 421B. Contact Raul Cruz at 229-3224 for the AutoCAD details (421 series) to be included with the improvement plans.

10. 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.

11. The engineer must provide a table on the grading plans that shows a quantity estimate of all drainage improvements within Public Drainage Easements. All drainage improvements within Public Drainage Easements must be bonded and inspected.

12. The *City Council* of the *City of Las Vegas* recently adopted an amendment to Title 20 of the Municipal Code in which Section 20.10.030 requires all public drainage easements to be concrete lined. Revise the grading plan and *Detail Section XXXX* and all pertinent plans and construction notes accordingly.

13. Note that offset crown street is a deviation from standard. If there is any, apply for a deviation meeting with *City Land Development Section* for approval prior to the final acceptance of the improvement plans.

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

END OF REMARKS
ays

T/R/S: T19S/R60E/07
AREA G-07

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

TRANSMISSION OK

JOB NO.	4321
DESTINATION ADDRESS	7022845399
PSWD/SUBADDRESS	
DESTINATION ID	
ST. TIME	08/12 09:25
USAGE T	00'40
PGS.	2
RESULT	OK

CITY OF LAS VEGAS
INTER-OFFICE MEMORANDUM

DATE: August 11, 2014

TO:
Land Development Services
Department of Building & Safety

FROM:
Albert Sung, P.E.
Flood Control Project Engineer
Department of Public Works

SUBJECT: Drainage Study for:
Skye Canyon – Parcel 1.1

Cross Streets: SEC of Hualapai Way & Horse Drive

File Number: F:\Depot\DSMemos\DS4683A.doc

Parcel Number: 125-07-301-001

Zoning Action: TMP-53897

FEMA Flood Zone	YES	NO X
Proposed Storm Drain	YES X	NO

COPIES TO:
Slater Hanifan Group
K A G Development South, LLC / Ninety-Five Management, LLC
Bart Anderson, P.E., DevCo
CCRFCD

HISTORY	DATE RECEIVED	DATE REVIEWED	COMMENTS	REVIEW FEES	FEES PAID Payment Trn #
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1. The subject drainage study is based on the condition that the ***Skye Canyon Phase 1 Infrastructure*** and the perimeter streets (*Racel Street, Hualapai Way, Horse Drive* and *Conquistador Street*) are fully improved for onsite major storm events protection. The perimeter streets and all the associated storm drain facilities must be completed prior to the issuance of any permits for the subject development.

2. This drainage study for **Parcel 1.1** will not be approved prior to the final approval of the ***Skye Canyon Phase 1 Infrastructure*** study.

3. Provide a copy of the zoning/planning conditions associated with this site (**TMP-53897**) with the next submittal to verify compliance with conditions. *Flood Control* will not issue conditional approval of the

TECHNICAL DRAINAGE STUDY

Skye Canyon

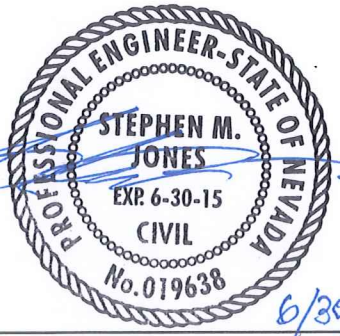
Parcel 1.1

City of Las Vegas, Nevada

Job No.: OLY1401.002
Date: June 2014

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

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



6/30/2014

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

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

HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL

DRAINAGE STUDY INFORMATION FORM

Name of Development: Skye Canyon – Parcel 1.1 Date: June 2014

Location of Development: a) Descriptive (Cross Streets): North/South: Hualapai Way

East/West: Horse Drive

b) Section: 7 Township: 19 South Range: 60 East

c) APN: 125-07-301-001

Name of Owner/Developer: K A G Development South, LLC / Ninety-Five Management, LLC

Telephone No.: 702-220-6565 Fax No.: 702-220-6566 E-mail Address: mbolduc@olympiacompanies.com

Address: 11411 Southern Highlands Parkway, Suite 300; Las Vegas, NV 89141

Contact Person – Name: Steve Jones, P.E. Telephone No.: 702-284-5300

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

Firm: Slater Hanifan Group

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

Type of Land Development/Land Disturbance Process:

☐	Rezoning	☒	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: 39.46 Acres Being Developed/Disturbed: 32.55 Acres

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

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

4. Proposed type of development (Residential, Commercial, Etc.): Single-Family Residential

5. Approximate upstream land area which drains to the subject site: 0 Acres

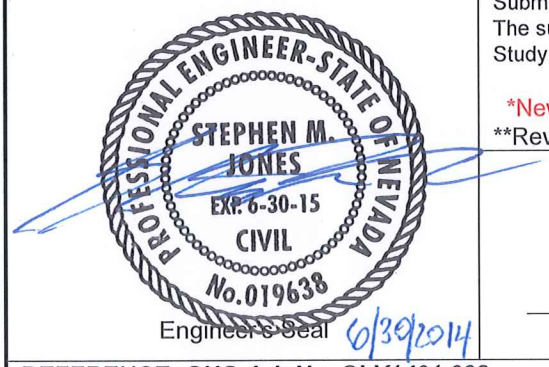
6. Has the site drainage been evaluated in the past? ☒ Yes** ☐ No If yes, please identify documentation:

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

Technical Drainage Study for Skye Canyon – Phase 1 Infrastructure (SHG, DS4661)

7. If known, please briefly identify the proposed discharge point(s) of runoff from the site: Racel Street regional facility (CNKC 0050), Horse Drive local storm drain

8. Briefly describe your proposed schedule for the subject project: 1 Phase after completion of Phase 1 Infrastructure (DS4661)



Engineer's Seal 6/30/2014

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

*Newly Required Field

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

Revision	Date

Local Entity File No.

REFERENCE: ***SHG Job No. OLY1401.002***

STANDARD FORM 1

Updated 05/01/2008

HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL

DRAINAGE SUBMITTAL CHECKLIST

Project Name: Skye Canyon – Parcel 1.1		Map ID:
Firm Name: Slater Hanifan Group (SHG)		
Address: 5740 S. Arville St., Suite 216		
City: Las Vegas	State: Nevada	Zip: 89118
Phone Number: 702-284-5300	Fax Number: 702-284-5399	
Property Owner/Developer: K A G Development South, LLC / Ninety-Five Management, LLC		
Address: 11411 Southern Highlands Parkway, Suite 300		
City: Las Vegas	State: NV	Zip: 89141
Reviewed By:	Date Received:	Date Accepted for Review:

The following checklist is intended as a guide for the engineer preparing a Technical Drainage Study to submit to the local entity and Clark County Regional Flood Control District (if necessary). The listed items are the minimum information required prior to the entity performing a review. The engineer will remain responsible to ensure the Technical Drainage Study is prepared within the guidelines as set forth in the Clark County Regional Flood Control District (CCRFCD) Hydrologic Criteria and Drainage Design Manual (MANUAL).

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

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

I. GENERAL REQUIREMENT:

Yes	No	
X		Design Manual **Standard Form 1** with the engineer's seal and signature.
X		Design Manual **Standard Form 4**.
X		2 copies of the 24" x 36" Drainage Plan.
	N/A	A notarized letter from the adjacent property owner(s) allowing off-site grading or discharge.

Reference:	**STANDARD FORM 2**

DRAINAGE SUBMITTAL CHECKLIST

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

III. DRAINAGE PLAN

Yes	No	
		Sheet size: 24" x 36" sealed by a registered engineer in the State of Nevada.
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.

REFERENCE:	STANDARD FORM 2

DRAINAGE SUBMITTAL CHECKLIST

III. DRAINAGE PLAN (Continued)

Yes	No	
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.
	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 is16"x48". 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.

REFERENCE:	STANDARD FORM 2

DRAINAGE SUBMITTAL CHECKLIST

III. DRAINAGE PLAN (Continued)

Yes	No	
X		Perimeter retaining wall locations. All existing and proposed walls (retaining screen and flood) must be shown with adjacent ground elevations. Flood Walls with 8-inch concrete masonry unit.
X		Building and/or lot numbers.
X		Alignment of all existing, proposed, or future Regional Facilities adjacent to the site.
	N/A	Limits of existing floodplain based on current FIRM or best available information; limits of proposed floodplains based on best available information.
	N/A	For areas in Zone A, AE, AH, and AO, base flood elevations (BFEs) must be shown for each lot; BFEs may be listed on each lot, or in a table. Finish floor elevations must be a minimum of 18 inches above BFE.
X		Appropriately elevated "humps" 6 inches above the 100-year water surface elevation at site accesses where the intent is to protect the site from the Q_{100} flows.
X		Street slopes for perimeter and interior streets. The minimum slope is 0.4 percent.

IV. HYDROLOGIC ANALYSIS

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

REFERENCE:	STANDARD FORM 2

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, which ever is greater.
	N/A	A complete water surface profile analysis (HEC-2, HEC-RAS, etc.) for channel flows and FEMA Zone A flood zones. • Field survey data. • Input and output information. • Plotted cross-sections based on survey with proper encroachments. • A map showing the location of the cross-sections. • Analysis of both sub- and super-critical flow segments. • A summary table and a discussion of the results in the text of the report.
X		Provide a 50 percent clogging factor in the capacity calculation for drop inlets.
X		Hydraulic calculations for culverts and storm drains. D-Load calculations must be provided for storm drain pipes in public rights-of-way, including headwater pool inundation.
X		The mitigation of nuisance water, both during construction and in the fully developed condition, must be addressed.

REFERENCE:	STANDARD FORM 2

CITY OF LAS VEGAS

MINIMUM DRAINAGE STUDY CRITERIA
STANDARD FORM 2 CHECKLIST SUPPLEMENT

(Revised 5/18/11)

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

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

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

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

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

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.
-	N/A	Ten-foot wide public drainage easements to be privately maintained are allowed for flow less than 20 cfs. The depth of flow entering the easement must be checked using the submerged weir calculation.
-	N/A	The limits of the flood zones and the base flood elevations (BFE) must be shown on all grading plans for all developments within a Special Flood Hazard Zone A, AO, AE, etc.
X	-	Minimum finish floor elevation is 6 inches above highest adjacent top of curb. Finish floor calculations must include allowances for super elevations on curves and velocity head for tee intersections.
X	-	Finished floor elevations for buildings adjacent to public drainage easements must be a minimum of 18 inches above the Q100 weir of submerged weir elevation, whichever is greater.

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

Appendix B Hydrologic Data
- Precipitation
- Curve Number
- Lag Time Computations – Standard Form 4

Appendix C Developed Condition HEC-1 Analysis

Appendix D Surface Flow Hydraulic Computations
- Onsite Street Flow
- Perimeter Street Flow
- Drop Inlets

Appendix E Storm Drain WSPGW Analyses
- Basin ON1-D Mainline Storm Drain
- Basin ON1-D Lateral Storm Drain (from 22.5-ft SDDI)
- Basin ON1-D Lateral Storm Drain (from 10-ft SDDI)
- Basin ON2-D Mainline Storm Drain

Appendix F Finished Floor Analysis
- Design Street Flows
- Supplemental Street Flow Analysis for Specific Energy Check
- Onsite Overflow Condition
- Racel Overflow Condition

Appendix G Reference Material
Technical Drainage Study for Skye Canyon – Phase 1 Infrastructure, by SHG
- Approval Letters
- Interim Condition Exhibit and HEC-1 (Parcel 1.1 Existing Condition)
- Street Hydraulic Exhibits (Offsite Flow Impacts to Parcel 1.1)
- Conquistador Storm Drain Model (Parcel 1.1 Storm Drain Design)
- Racel Storm Drain Model (Parcel 1.1 Storm Drain Design)
- Pertinent Improvement Plan Sheets

Appendix H Correspondence with City of Las Vegas
- 2/5/2014 Kick-off Meeting Summary Notes
- Justification Letter for Skye Canyon Phase 1 (submitted separately to CLV)

Appendix I Grading Plan, Storm Drain Profile and Detail Sheets

1 INTRODUCTION

1.1 Project Overview & Study Purpose

Ninety-Five Management, LLC is proposing a single-family residential development, identified as *Skye Canyon Parcel 1.1*, within the city limits of Las Vegas, Nevada. The proposed development is approximately 32.5 acres in area, and located at the southeast corner of the intersection of Horse Drive and Hualapai Way.

The proposed development is located within the master planned Skye Canyon property and specifically in the Phase 1 area supported by the *Technical Drainage Study for Skye Canyon – Phase 1 Infrastructure* (DS4661). All roadways and perimeter drainage infrastructure required for development of Parcel 1.1 has been technically addressed in the Phase 1 Infrastructure drainage study. Parcel 1.1 proposes utilization of drainage facilities provided by the Phase 1 Infrastructure. It is the objective of this study to show conformance to the drainage patterns assumed by the Phase 1 Infrastructure drainage study.

Additionally, the 1,662 acre Skye Canyon property has been master planned and a *Master Drainage Study for Kyle Canyon (DS4420)* has been conditionally approved by the City of Las Vegas. Proposed Parcel 1.1 has been proposed within the framework set forth in the Master Drainage Study.

1.2 Description of Improvements

The project is located within Township 19 South, Range 60 East and Section 7, within APN 125-07-301-001. Parcel 1.1 is bound by Horse Drive to the north, Conquistador Street to the east, Racel Street to the south, and Hualapai Way to the west. A location map identifying the site in relation to major streets in the vicinity has been prepared as Exhibit A, included in Appendix A.

The project consists of the construction of single-family residential lots with average areas of 6,000 ft^2, in addition to the construction of all associated interior roadways. The typical onsite roadway is proposed as a 49-ft wide private street. The landscaping in the adjacent common elements between the infrastructure roadways and the subdivision is to be installed by Parcel 1.1. The adjacent perimeter roadways are to be installed by separate improvements and considered existing for development of Parcel 1.1.

Drainage improvements necessary to control storm runoff and satisfy local drainage criteria onsite have been proposed by Parcel 1.1. The proposed drainage improvements are intended to connect into the existing Phase 1 Infrastructure facilities.

1.3 FEMA Flood Zone Designation

The Parcel 1.1 site boundary has been delineated on current FEMA FIRM Panel Maps 32003C1735F and 32003C1745F, dated September 27, 2002, as Exhibit B included in Appendix A. Per the FIRM Panels, the project site is located within a FEMA designated

Zone 'X', or outside the 500-year floodplain. A Zone 'X' is located outside a FEMA designated Special Flood Hazard Area (SFHA).

1.4 CCRFCD Facility Information

The project site has been delineated on the current 2013 Clark County Regional Flood Control District (CCRFCD) Las Vegas Valley Flood Control Master Plan Update (2013 MPU, Reference 1) facility figure as Exhibit C, included in Appendix A. Per the 2013 MPU, the following CCRFCD regional facility alignments are considered pertinent to Parcel 1.1:

- CNKC 0050 within Racel Street. This facility is proposed as part of the Phase 1 Infrastructure improvements as a 72-inch RCP adjacent to the site. A stub from the CNKC regional alignment in Racel has been provided to collect the south half of the Parcel 1.1 site flow.
- MOHU 0036 within Hualapai Way. This facility is proposed as part of the Phase 1 Infrastructure improvements as an 8-ft x 5-ft RCA adjacent to the site. The facility will not have any impacts to Parcel 1.1.

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

1.5 Referenced Documents

Technical Drainage Study for Skye Canyon – Phase 1 Infrastructure, prepared by Slater Hanifan Group (hereafter referred to as the Phase 1 Infrastructure Study, Reference 4), has technically designed the adjacent perimeter roadways and associated drainage infrastructure utilized by Parcel 1.1. The Phase 1 Infrastructure Study has been referenced to show Parcel 1.1 development conformance to the drainage patterns for the perimeter infrastructure in order to prove that development is in accordance with the master plan for the area. The following specific items have been referenced from the Phase 1 Infrastructure Study and included in Appendix G:

- The Phase 1 Infrastructure interim condition functions as Parcel 1.1 existing drainage condition.
- Hydraulic modeling of Racel Street and Conquistador Street storm drain for utilization in proposed Parcel 1.1 storm drain design.
- Offsite flow impacts from the adjacent perimeter roadways.

Master Drainage Study for Kyle Canyon, prepared by Slater Hanifan Group (hereafter referred to as the SHG Master Study, Reference 5), had conceptually planned drainage improvements required for the current land plan on the property. The referenced Phase 1 Infrastructure improvements were shown to be in conformance with the master drainage patterns per the SHG Master Study. Therefore, if this study shows Parcel 1.1 is in conformance with drainage patterns presented in the Phase 1 Infrastructure Study, then it is surmised that it is also in conformance with the SHG Master Study. As a result, no reference material from the SHG Master Study is necessary in preparation of this Parcel 1.1 technical study.

1.6 Correspondence with City of Las Vegas

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

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

2 METHODOLOGY

2.1 Compliance

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

2.2 Hydrologic Modeling

Modeling:

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

Precipitation:

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

Curve Number:

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

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

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

Note that one lot size is proposed by the project, in conformance with the Phase 1 Infrastructure Study:

- Basin ON1-D/ON2-D: Residential 6,000 ft^2 in average area per CCRFCD Manual Table 602A.

Lag Time:

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

2.3 Hydraulic Modeling & Criteria

Street Flow:

Street flows have been analyzed utilizing the FlowMaster Version 7.0 software by Haestad Methods. In accordance with the CCRFCD Manual, the following criteria apply:

- 10-year minor storm event: maximum flow depth of 1-ft from gutter flow line, and depth times velocity factor (DxV) not exceeding 6.
- 100-year major storm event: maximum flow depth of 2-ft from gutter flow line, 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 (WSPGW) Hydraulic Analysis System software by CIVILDESIGN. 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 of Existing Condition

The adjacent Phase 1 Infrastructure improvements are considered in place and functioning prior to development of Parcel 1.1. As a result, the existing drainage condition considers that the interim condition defined in the referenced Phase 1 Infrastructure study is valid as the existing condition of Parcel 1.1. Therefore, no additional analyses have been performed by this study to demonstrate an existing drainage condition for Parcel 1.1.

3.2 Discussion of Existing Condition

Refer to the Phase 1 Infrastructure Study's referenced Exhibit G – Interim Condition Drainage Map within Appendix G for demonstration of the existing condition drainage patterns occurring on the Parcel 1.1 site.

Parcel 1.1 is located within referenced Basins ON1-I and ON2-I. Runoff from ON1-I is conveyed to a storm drain opening provided from the Phase 1 Infrastructure Conquistador storm drain, via interim ditches. Runoff from ON2-I is conveyed south to Racel via an earthen swale to a storm drain opening provided from the Phase 1 Infrastructure. Note that in the developed condition, the site is designed to convey its runoff to the same storm drain openings from the Conquistador Street and Racel Street storm drains.

Offsite flows west of Hualapai are routed away from the project site via graded ditches to the regional storm drain in Racel Street, which were proposed in the Phase 1 Infrastructure Study.

3.3 Summary of Existing Condition Flows

A summary of the existing condition runoff produced by Parcel 1.1, as referenced from the Phase 1 Infrastructure Study's interim condition, has been summarized below in Table 1.

Table 1: Summary of Existing Condition Flow Rates (Referenced from Phase 1 Infrastructure – Interim Condition)

Basin ID	Area (acres)	Q_{100} (cfs)	Q_{10} (cfs)
ON1-I	16.8	38	14
ON2-I	15.8	36	13

4 DEVELOPED DRAINAGE CONDITION

4.1 Definition of Developed Condition

The developed condition considers the entire Parcel 1.1 area developed, inclusive of the proposed interior roadway infrastructure. Also included in this project are the proposed drainage facilities required to collect and convey storm runoff produced by Parcel 1.1.

The offsite drainage areas are assumed to remain in their current state, unchanged from the existing condition. Ditches graded as a part of the Phase 1 Infrastructure Study are present adjacent to Hualapai.

4.2 Discussion of Developed Condition

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

In the developed condition, Parcel 1.1 is divided into two basins, ON1-D and ON2-D. Basin ON1-D represents the northern 18.2 acres of the project site and ON2-D represents the southern 14.4 acres of the project site.

Basin ON1-D generally conveys storm runoff via curb and gutter in an easterly direction toward the project site's entrance at the eastern edge of the basin, where it is collected and conveyed by proposed onsite storm drain to the existing storm drain facility in Conquistador Street. Conquistador Street conveys all flow south where it is collected by existing drop inlets. The site entrance from Conquistador Street has positive grading that peaks at the Street 1A roadway centerline, which allows onsite runoff from ON1-D to flow through the entrance road where it is captured by two onsite drop inlets. Both site entrance drop inlets capture all flow, preventing any bypass from entering Conquistador Street.

Basin ON2-D generally conveys storm runoff via curb and gutter in an easterly direction toward a proposed drop inlet in the southeast corner of the basin where it is conveyed in a proposed onsite storm drain to the existing storm drain facility in Racel Street. The site entrance from Racel Street has been humped to prevent any offsite flows from entering the site. Note that the west edge of the humped site entrance from Racel Street is approximately 0.35-ft above the 100-year flow depth in Racel Street, rather than the required 0.5-ft hump height. This proposed hump height is considered acceptable because eastward flowing velocities will not have a direct impact. Also, note that due to the slope of Racel Street, the driveway has 0.5 feet of freeboard at the centerline of the driveway and at the downstream end.

As part of the Phase 1 Infrastructure design and prior to Parcel 1.1 construction, drainage ditches will be present in the undeveloped area west of Hualapai Way which will guide flow toward an inlet structure that is connected to the Racel Street storm drain system. Similarly, the surrounding parcels will also have infrastructure in place to route all flow through storm drains without impacting Parcel 1.1.

4.3 Summary of Developed Condition Flows

A summary of developed condition flow rates determined by this study has been presented below in Table 2, as demonstrated by the drainage patterns and basins depicted on Exhibit E. Refer to Appendix C for the applicable HEC-1 analysis.

Table 2: Summary of Developed Condition Flow Rates			
Basin ID	**Area (acres)**	**Q_{100} (cfs)**	**Q_{10} (cfs)**
ON1-D	18.2	48	21
ON2-D	14.4	39	17

It is the main objective of this study to show conformance with the Phase 1 Infrastructure Study and show no adverse impacts to downstream property or facilities. The flow rates and patterns evaluated in this study are consistent with and conform to those set forth in the Phase 1 Infrastructure Study. Table 3 below summarizes and compares flow rates for developed Parcel 1.1 to the flow rates determined in the developed condition of the Infrastructure Study.

Table 3: Flow Rate Comparison Parcel 1.1 Study vs. Phase 1 Infrastructure Study					
Parcel 1.1 Study			**Phase 1 Infrastructure Study**		
Contributing Source	**Receiving Facility**	**Q_{100} (cfs)**	**Contributing Source**	**Receiving Facility**	**Q_{100} (cfs)**
ON1-D	Conquistador St	48	ON1-D	Conquistador St	47
ON2-D	Racel St	39	ON3-D	Racel St	39

Review of Table 3 shows that developed condition onsite flow is equivalent to the flow determined in the Phase 1 Infrastructure Study; therefore, the Parcel 1.1 development is considered in conformance with Infrastructure Study's planned drainage patterns. It is noted that the Parcel 1.1 study shows a 1 cfs increase in 100-year flow to the Conquistador Street storm drain system but this is assumed to be a negligible impact.

4.4 Summary of Developed Condition Street Flows

Hydraulic analysis shows that street flow criteria for onsite street improvements, as outlined in Section 2.3 of this report, are satisfied. The 100-year flows conveyed in the onsite streets also satisfy 10-year street flow criteria; therefore, only 100-year hydraulic sections were performed. Table 4 below provides a summary of the street flow hydraulic computations. Refer to Exhibit E for the location of analyzed street sections and refer to Appendix D for street flow calculations.

Table 4: Summary of 100-Year Onsite Street Flow Hydraulic Characteristics						
Cross Section	**Contributing Source**	**Slope (%)**	**Q_{100} (cfs)**	**Depth, D_{100} (ft)**	**Velocity, V_{100} (fps)**	**D_{100}*V_{100}**
1-1	ON1-D(A)	2.82	33	0.45	4.8	2.1
1-2	ON1-D(B+C)	2.82	15	0.35	4.6	1.6
1-3N	ON1-D(C)	0.56	3	0.37	2.1	0.8
1-3S	½(ON1-D(A))	0.56	16.5	0.61	2.6	1.6
2-1	½(ON2-D)	3.22	19.5	0.37	5.1	1.9
2-2	½(ON2-D)	2.79	19.5	0.37	4.8	1.8

As a result of Parcel 1.1 conformance to drainage patterns established in the Phase 1 Infrastructure Study, perimeter street flow conditions for Horse Drive and Conquistador Street have been referenced. The referenced street flow characteristics have been summarized on Exhibit E, as determined by the Phase 1 Infrastructure Study. Due to the location of analyzed street sections in the Phase 1 Infrastructure Study for Hualapai Way and Racel Street, street flows were re-analyzed in the Parcel 1.1 Study to ensure the most conservative analysis. Refer to Exhibit E for the location of analyzed street sections and refer to Appendix D for street flow calculations. Table 5 below provides a summary of the perimeter street flow characteristics.

Table 5: Summary of 100-Year Perimeter Street Flow Hydraulic Characteristics

Cross Section	Slope (%)	Q_{100} (cfs)	Depth, D_{100} (ft)	Velocity, V_{100} (fps)	$D_{100}*V_{100}$
H1*	3.56	15	0.37	5.2	1.9
NC1*	0.61	6	0.36	2.1	0.8
RA1	1.00	13*	0.43	3.0	1.3
RA2	4.9	10*	.32	5.2	1.6
HU	0.50	6.5*	0.47	2.3	1.1
* Referenced from Phase 1 Infrastructure Study					

Note that all perimeter 100-year street flows have been maintained below top of curb; therefore, perimeter flows are not anticipated to have any impact on the proposed onsite improvements.

4.5 Summary of Drainage Facilities

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

Tie-In to Conquistador Storm Drain:

A low point in the ON1-D basin has been graded adjacent to Lot 26, and a 12.5-ft Type CM2 drop inlet, acting in sump, has been proposed to collect all flow contained within the west half of Street 1A. The contributing flow to the sump inlet includes half of the prorated Basin ON1-D(A) and all of the flow from the prorated Basin ON1-D(B). The proposed low point in Street 1A is only along the west curb which allows the remainder of Basin ON1-D runoff, contained in the eastern half of the street, to flow toward a 10-ft and 22.5-ft Type CM2 drop inlet along the north and south site entrance, respectfully, at Conquistador Street. Proposed 30-inch, 18-inch and 30-inch RCP storm drains connect the sump inlet, the north site entrance inlet and the south site entrance inlet, respectfully, to the existing Conquistador 36-inch RCP storm drain, in conformance with Phase 1 Infrastructure drainage patterns. A manhole has been proposed in the site entrance to make the connection between proposed and existing storm drains.

A WSPGW model has been prepared to analyze the hydraulics of each proposed storm drain. All HGLs and flow velocities meet storm drain criteria set forth in Section 2.3 of this study. The proposed storm drains are summarized below and WSPGW output files have been included for reference in Appendix E.

- The ON1-D 30-inch mainline storm drain extends from the proposed 12.5-ft sump inlet to the connection into the existing Conquistador storm drain lateral. Since the flow contribution to the existing storm drain is in conformance, the starting water surface elevation (2795.23-ft) utilized for this study's model has been referenced directly from the Phase 1 Infrastructure Study WSPG Station "CS"74+48.74.
- A 30-inch storm drain lateral extends from the proposed mainline storm drain in the Conquistador site entrance to the proposed 10-ft drop inlet.
- An 18-inch storm drain lateral extends from the proposed mainline storm drain in the Conquistador site entrance to the proposed 22.5-ft drop inlet.

Tie-In to Racel Storm Drain:

A low point in Basin ON2-D has been graded adjacent to Lot 93, and a 17.5-ft Type CM2 drop inlet, acting in sump, has been proposed to collect the entire 39 cfs generated by Basin ON2-D. Note that the stub street adjacent to Lot 93 has been graded to direct runoff to the low point with no bypass into Racel Street. A proposed 36-inch RCP connects the drop inlet to the existing 36-inch storm drain lateral stub from Racel Street, in conformance with Phase 1 Infrastructure drainage patterns.

A WSPGW model has been prepared to analyze the hydraulics of the proposed storm drain. The model extends from the connection into the existing Racel trunk storm drain lateral to the proposed 17.5-ft sump drop inlet. Since the flow contribution to the existing storm drain is in conformance, the starting water surface elevation (2793.19-ft) utilized for this study's model has been referenced directly from the Phase 1 Infrastructure Study WSPG Station "RS"80+80.87. All HGLs and flow velocities meet storm drain criteria set forth in Section 2.3 of this study.

5 ULTIMATE DRAINAGE CONDITION

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

As a result of this study establishing that Parcel 1.1 drainage patterns are in accordance with the Phase 1 Infrastructure Study, the ultimate condition produced by the referenced study remains valid for use by this study. It is anticipated that future offsite development will be in conformance with the Phase 1 Infrastructure drainage patterns, or else be required to provide technical analysis to validate otherwise. Therefore, a specific Parcel 1.1 ultimate condition drainage analysis is not necessary.

6 PROPOSED FINISHED FLOORS

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

Additionally, an emergency overflow path is provided at the low point proposed in the Basin ON2-D stub street to allow for storm flows to exit into Racel Street in the case that the onsite drop inlets become clogged or considered inefficient. After inspection of weir computations included in Appendix F, the adjacent affected lots have been determined to be above the overflow water surface elevation at the exit point; therefore, considered adequately flood protected. Because the low point in the west side of Street 1A is isolated to only one side of the street, the roadway crown is considered to be the emergency overflow path with the east side of the street conveying flow toward secondary storm drain systems.

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

7 CONCLUSIONS & RECOMMENDATIONS

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

2. The project is adjacent to existing regional alignment CNKC0050 and proposes flow contribution to the regional facility in conformance with the Phase 1 Infrastructure Study that proposes to construct the storm drain.

3. The project is adjacent to existing regional alignment MOHU0036 and does not propose any contributions to the storm drain system.

4. The proposed drainage patterns are in conformance with the Phase 1 Infrastructure Study. It is anticipated that the Phase 1 Infrastructure improvements are in place and functioning prior to start of Parcel 1.1 development.

5. Proposed street flow and storm drain facilities satisfy local 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, 1990.

3. *Soil Survey of Las Vegas Valley Area, Nevada.* U.S. Department of Agriculture, Soil Conservation Service, July 1985.

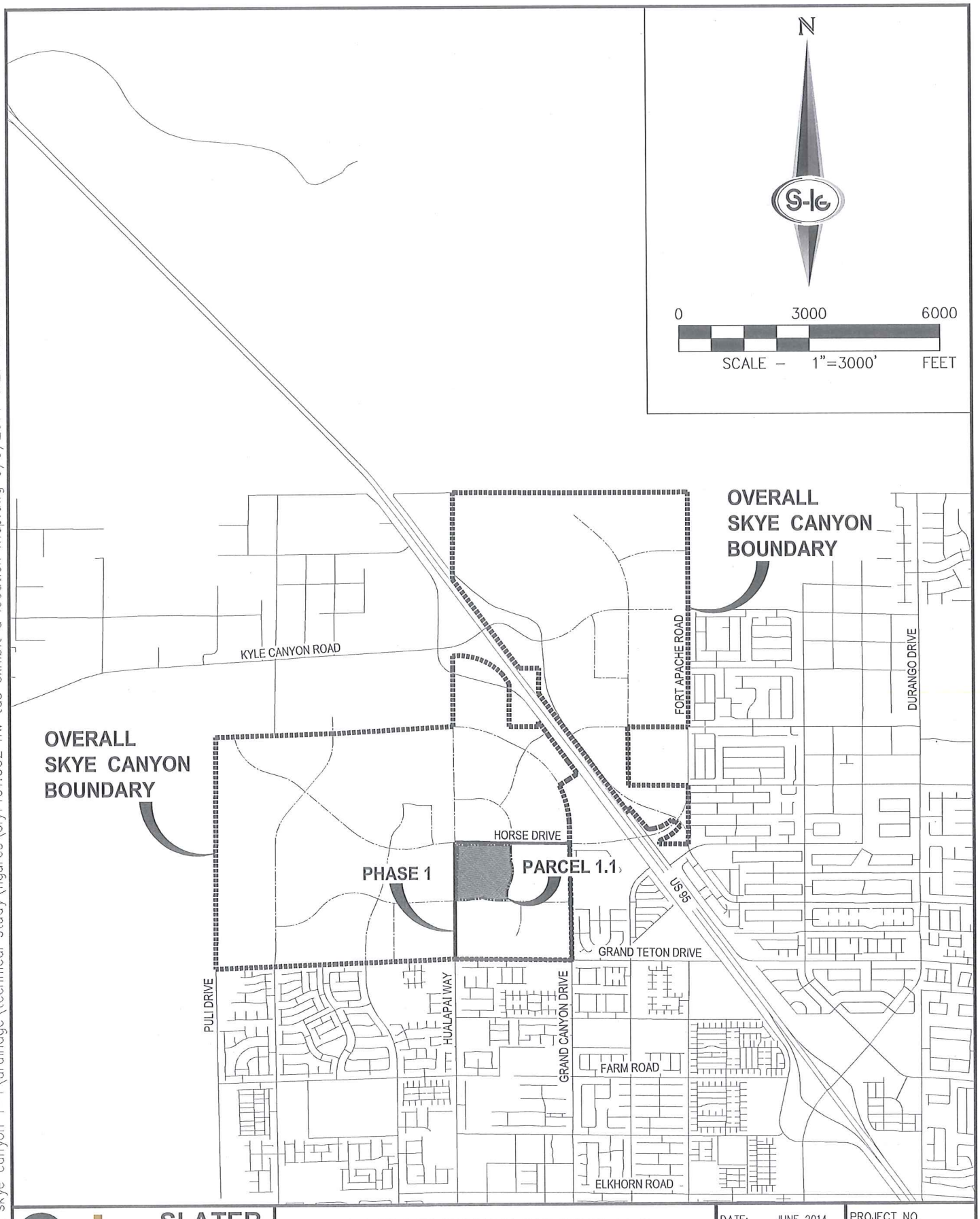
4. *Technical Drainage Study for Skye Canyon – Phase 1 Infrastructure*; Slater Hanifan Group, 2014.

5. *Master Drainage Study for Kyle Canyon;* Slater Hanifan Group, 2012.

APPENDIX A

Drainage Exhibits

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



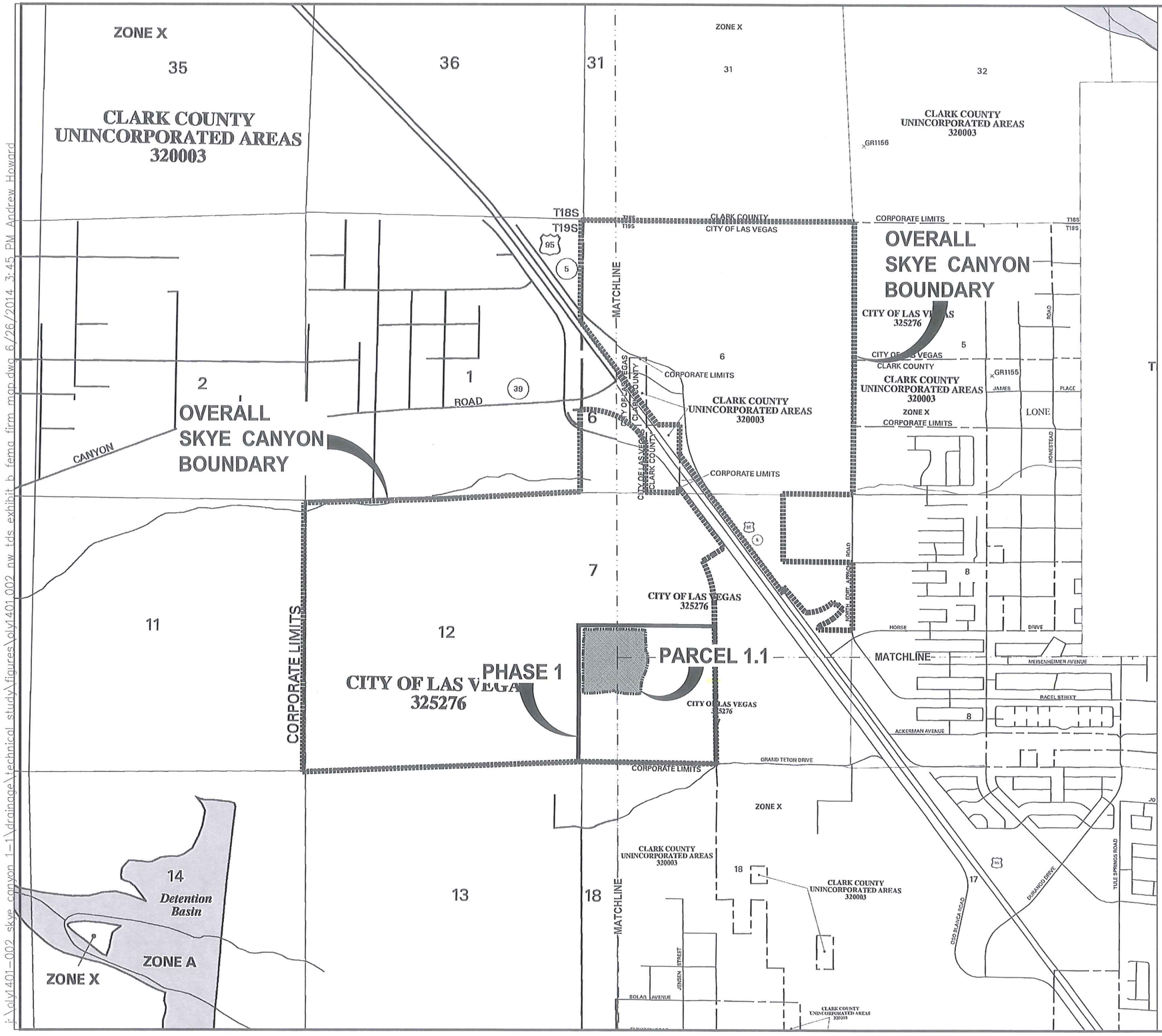
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CONSULTING ENGINEERS & PLANNERS
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PHONE (702) 284-5300 FAX (702) 284-5399

NINETY-FIVE MANAGEMENT, LLC.

SKYE CANYON - PARCEL 1.1
LOCATION MAP

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

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ZONE X
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36
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CLARK COUNTY
UNINCORPORATED AREAS
320003
T18S
T19S
95
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MATCHLINE
CLARK COUNTY
CITY OF LAS VEGAS
2
1
39
ROAD
CANYON
OVERALL
SKYE CANYON
BOUNDARY
6
CORPORATE LIMITS
CITY OF LAS VEGAS
CLARK COUNTY
CLARK COUNTY
UNINCORPORATED AREAS
320003
CORPORATE LIMITS
7
CITY OF LAS VEGAS
325276
11
12
CORPORATE LIMITS
PHASE 1
PARCEL 1.1
CITY OF LAS VEGAS
325276
CITY OF LAS VEGAS
325276
GRAND TETON DRIVE
CORPORATE LIMITS
ZONE X
14
Detention
Basin
ZONE A
ZONE X
13
18
MATCHLINE
CLARK COUNTY
UNINCORPORATED AREAS
320003
JENSEN STREET
SOLAR AVENUE
CLARK COUNTY
UNINCORPORATED AREAS
320003
ZONE X
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32
CLARK COUNTY
UNINCORPORATED AREAS
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GR1156
CORPORATE LIMITS
T18S
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CLARK COUNTY
CITY OF LAS VEGAS
OVERALL
SKYE CANYON
BOUNDARY
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CITY OF LAS VEGAS
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CORPORATE LIMITS
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HOMESTEAD
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HORSE
DRIVE
MATCHLINE
MERSENHEIMER AVENUE
RACEL STREET
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ACKERMAN AVENUE
JO
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CLARK COUNTY
UNINCORPORATED AREAS
320003
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DURANGO DRIVE
DIGO BLANCA ROAD
TULE SPRINGS ROAD
CLARK COUNTY
UNINCORPORATED AREAS
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RANCHO DRIVE
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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 (%) **
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
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

OVERALL SKYE CANYON BOUNDARY

PARCEL 1.1

PHASE 1

KYLE CANYON RD

FORT APACHE RD

GRAND TETON DR

GILCREASE AV

95

N

0 1000 2000

SCALE – 1"=1000' FEET

REGIONAL FLOOD CONTROL DISTRICT

2013
LAS VEGAS VALLEY
FLOOD CONTROL
MASTER PLAN UPDATE

FIGURE F- 13
FLOOD CONTROL FACILITIES

LEGEND

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

Remove & Replace/Parallel Facilities

Category A	Category B
Channel	Channel
Stormdrain	Stormdrain

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

NO.	DESCRIPTION	DATE	BY	APP. DATE	APP.

NINETY-FIVE MANAGEMENT, LLC.

SKYE CANYON - PARCEL 1.1
CCRFCD 2013 MPU FACILITIES MAP

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

EXHIBIT C
SHEET 1 OF 1

"400"

PARCEL 1.1

"155"

HORSE DRIVE

US 95

HUALAPAI WAY

GRAND CANYON DRIVE

PHASE 1

"155"

GRAND TETON DRIVE

"400"

N

0 500 1000

SCALE – 1"=500' FEET

SLATER HANIFAN GROUP

CONSULTING ENGINEERS & PLANNERS

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

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

NO.	DESCRIPTION	DATE	BY	APP. DATE	APP.

NINETY-FIVE MANAGEMENT, LLC.

SKYE CANYON - PARCEL 1.1

SOILS MAP

DATE: JUNE 2014

DRAFTER: AJH

DESIGNER: AJH

CHECKED: SMJ

PROJECT NO.

OLY1401.002

EXHIBIT D

SHEET 1 OF 1

j:\oly1401-002 skye canyon 1-1\drainage\technical study\figures\oly1401.002 nw tds exhibit d soils map.dwg 6/12/2014 6:08 PM Andrew Howard

APPENDIX B

Hydrologic Data

Precipitation

SLATER HANIFAN GROUP
CONSULTING ENGINEERS & PLANNERS

Rainfall and Precipitation Computation

Project Name: Skye Canyon Parcel 1.1
Date: 06/10/14
File Name: OLY1401-002 NW TDS Precipitatio
By: AJH

Data:

Reference:

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

Site is NOT located in the McCarran Airport Rainfall Area — Figure 513*

Rainfall Depth-Duration-Frequency 10-Year, 6-Hour: 1.30 inches — Figure 503*

Rainfall Depth-Duration-Frequency 100-Year, 6-Hour: 2.05 inches — Figure 506*

Precipitation Adjustment Ratios:

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

Six Hour Depth Area Reduction Factors (DARF):
Area (gross acres): 32.5 = 0.0508 square miles — Table 502*
DARF = 1.00

Calculations:

P_{10} = 1.61 10-Year Precipitation (in)
P_{100} = 2.93 100-Year Precipitation (in)

P10/P100= 0.55 HEC-1 Multiple Ratio Value

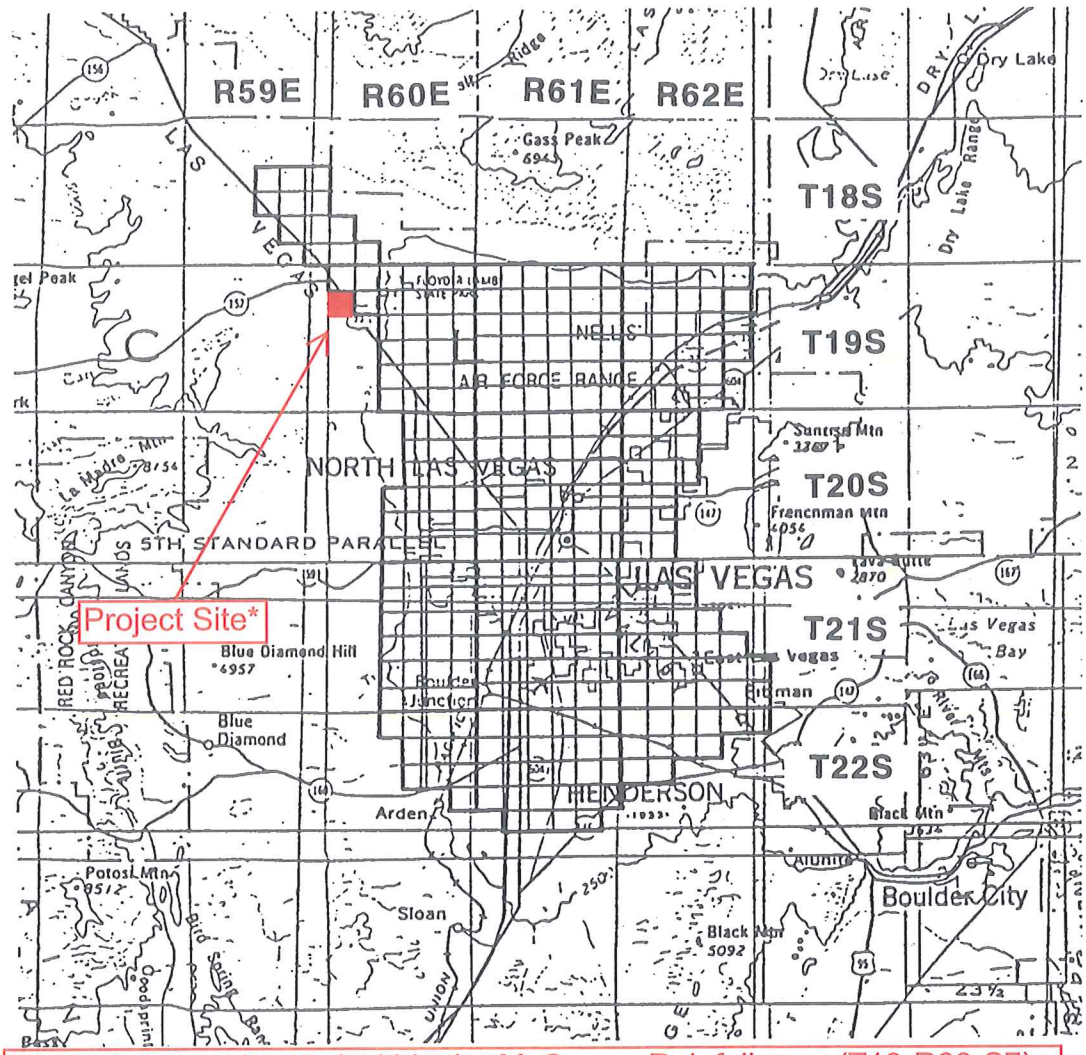
Equations:

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

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

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McCARRAN AIRPORT RAINFALL AREA



*Project site not located within the McCarran Rainfall area (T19-R60-S7)

TOWNSHIP	RANGE	SECTIONS	TOWNSHIP	RANGE	SECTIONS
18 South	59 East	13-15,22-26,36	20 South	62 East	4-9,16-20,29-32
18 South	60 East	30-32	21 South	60 East	1-4,9-16,21-28,33-36
19 South	60 East	1-6,8-16,21-28,33-36	21 South	61 East	ALL SECTIONS
19 South	61 East	ALL SECTIONS	21 South	62 East	4-9,15-23, 25-36
19 South	62 East	2-11,14-23,27-34	22 South	60 East	1-4,10-15,24
20 South	60 East	1-3,10-15,21-28,33-36	22 South	61 East	1-24,26-29
20 South	61 East	ALL SECTIONS	22 South	62 East	1-10,17-18

Notes:
1. Refer to Table 505 and Figure 516 Depth-Duration- Frequency values in the McCarran Airport Rainfall Area.
2. Refer to Table 506 and Figure 517 for Time-Intensity-Frequency values on the McCarran Airport Rainfall Area.

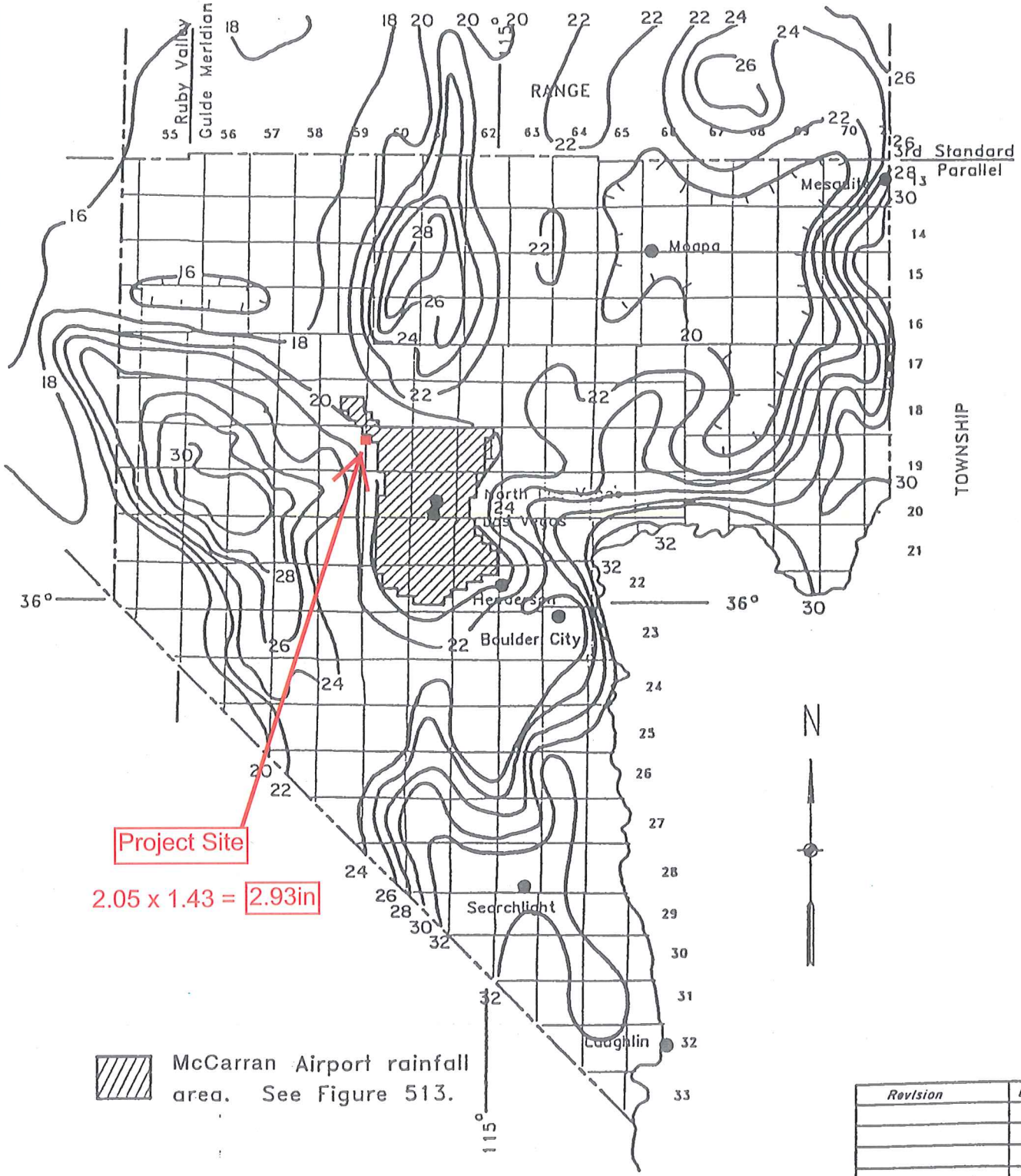
Revision	Date

WRC ENGINEERING

REFERENCE:
USACE, Los Angeles District, 1988

FIGURE 513

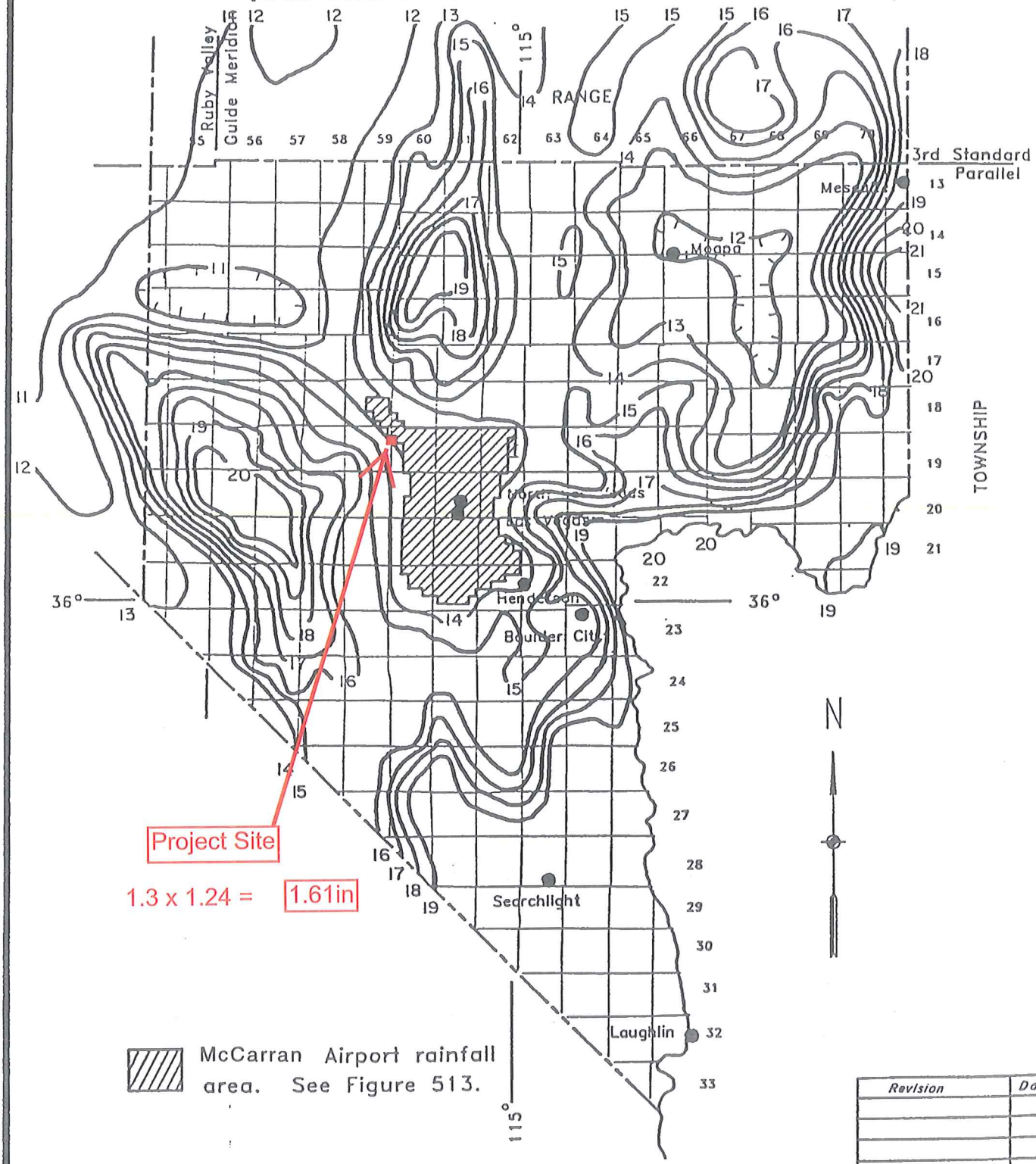
RAINFALL DEPTH-DURATION-FREQUENCY
100-YEAR, 6-HOUR
(DEPTHS IN TENTHS OF INCHES)



Revision	Date

WRC ENGINEERING	REFERENCE: NOAA ATLAS 2, VOLUME VII NEVADA, 1973	FIGURE 506

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



Revision	Date

WRC ENGINEERING	REFERENCE: NOAA ATLAS 2, VOLUME VII NEVADA, 1973	FIGURE 503

PRECIPITATION ADJUSTMENT RATIOS

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

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

Revision	Date

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

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

Revision	Date

REFERENCE:

TABLE 503

Curve Number

SLATER HANIFAN GROUP
CONSULTING ENGINEERS & PLANNERS

Soil & Curve Number Computation

Project Name: SKYE CANYON PARCEL 1.2
Date: 6/12/2014
File Name: OLY1401-002 NW TDS CN Calc.xlsx
By: AJH

Data:

Reference: Exhibit D SCS Soil Data

Soil Type & Description		A	B	C	D
155	Cave gravelly fine sandy loam, 4 to 15 percent slopes	5%	5%	0%	90%

Land Use	A	B	C	D
Residential (6,000 sf)	80	87	90	92

BASIN ID	SOIL TYPE	SUBAREA PERCENT	LAND USE	HYDROLOGIC SOIL GROUP A	B	C	D	LAND USE CN A	B	C	D	SUBAREA ACRES	CALCULATED CN
ON1-D	155	100.0%	Residential (6,000 sf)	5%	5%	0%	90%	80	87	90	92	18.2	91.2
TOTAL PERCENT		100.0%									TOTAL AREA	18.2	**91.2**

BASIN ID	SOIL TYPE	SUBAREA PERCENT	LAND USE	HYDROLOGIC SOIL GROUP A	B	C	D	LAND USE CN A	B	C	D	SUBAREA ACRES	CALCULATED CN
ON2-D	155	100.0%	Residential (6,000 sf)	5%	5%	0%	90%	80	87	90	92	14.4	91.2
TOTAL PERCENT		100.0%									TOTAL AREA	14.4	**91.2**

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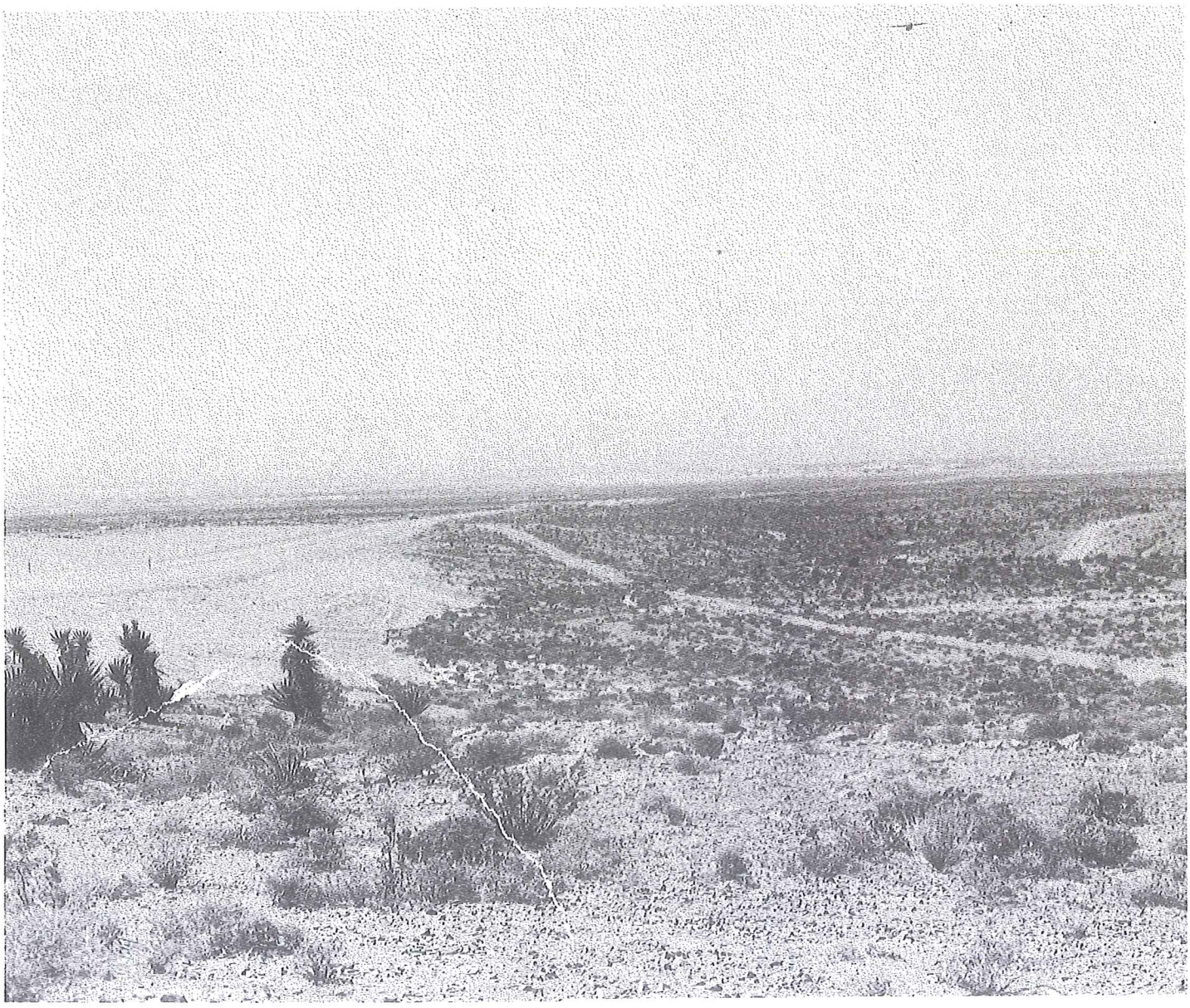
United States Department of Agriculture

Soil Conservation Service

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

Soil Survey of Las Vegas Valley Area Nevada

Part of Clark County



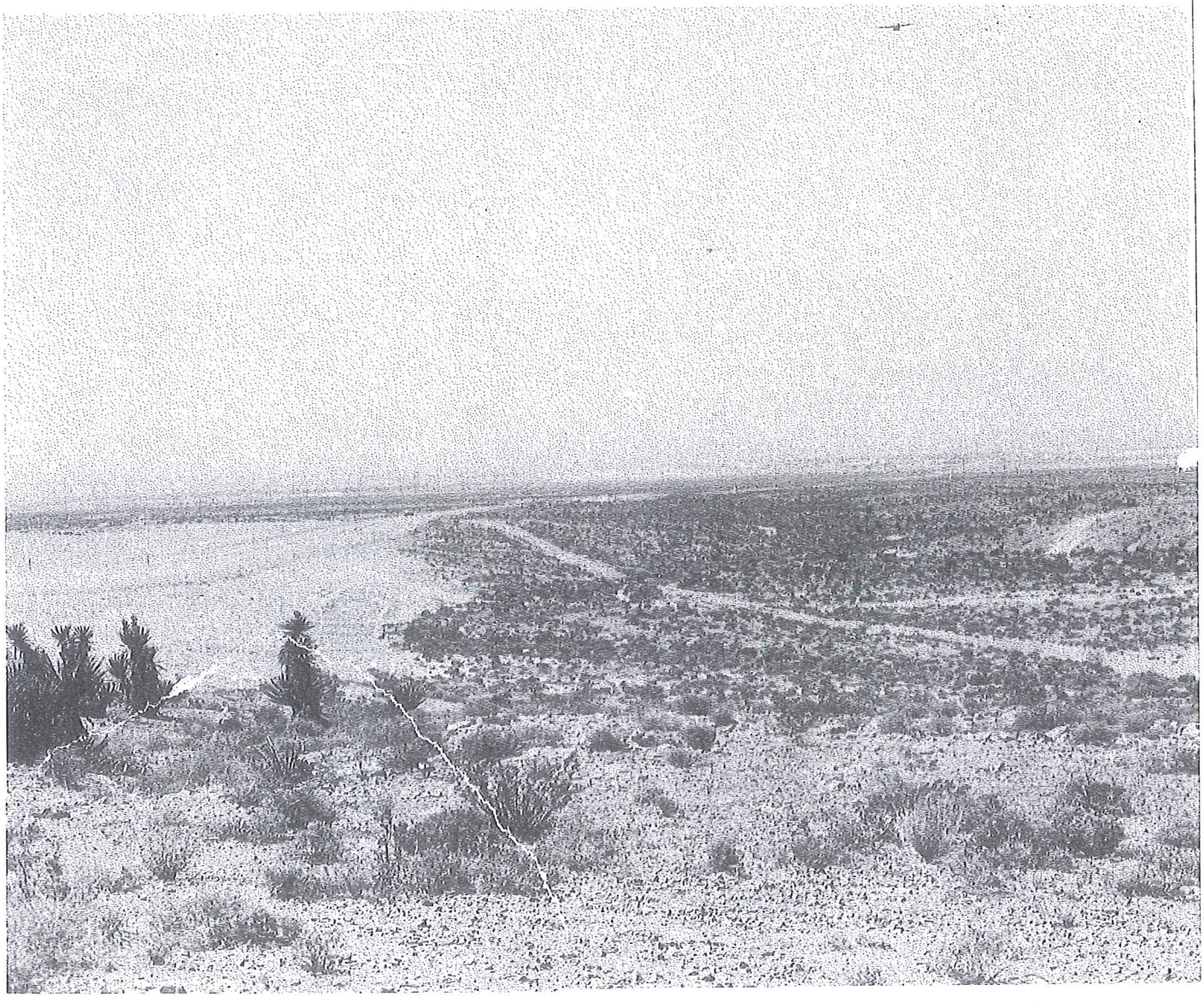
United States Department of Agriculture

Soil Conservation Service

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

Soil Survey of Las Vegas Valley Area Nevada

Part of Clark County



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

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

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

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

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

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

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

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

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

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

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

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

155—Cave gravelly fine sandy loam, 4 to 15 percent slopes. This shallow, well drained soil is on erosional fan remnants. It formed in alluvium derived from various kinds of rock.

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

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

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

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

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

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

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

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

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

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

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

This unit is well suited to the construction of dwellings.

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

TABLE 15.--SOIL AND WATER FEATURES

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

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

See footnote at end of table.

RUNOFF CURVE NUMBERS
(URBAN AREAS[1])

Cover description		Curve numbers for hydrologic soil group—			
Cover type and hydrologic condition	Average percent impervious area[2]	A	B	C	D
Fully developed urban areas (vegetation established)					
Open space (lawns, parks, golf courses, cemeteries, etc.)[3]:					
Poor condition (grass cover < 50%)		68	79	86	89
Fair condition (grass cover 50% to 75%)		49	69	79	84
Good condition (grass cover > 75%)		39	61	74	80
Impervious areas:					
Paved parking lots, roofs, driveways, etc. (excluding right-of-way)		98	98	98	98
Streets and roads:					
Paved; curbs and storm sewers (excluding right-of-way)		98	98	98	98
Paved; open ditches (including right-of-way)		83	89	92	93
Gravel (including right-of-way)		76	85	89	91
Dirt (including right-of-way)		72	82	87	89
Western desert urban areas:					
Natural desert landscaping (pervious areas only)[4]		63	77	85	88
Artificial desert landscaping (impervious weed barrier, desert shrub with 1- to 2-inch sand or gravel mulch and basin borders)		96	96	96	96
Urban districts:					
Commercial and business	85	89	92	94	95
Industrial	72	81	88	91	93
Residential districts by average lot size: **See Table 602A**					
Developing urban areas					
Newly graded areas (pervious areas only, no vegetation)[5]		77	86	91	94

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

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

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

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

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

Revision	Date

RUNOFF CURVE NUMBERS - RESIDENTIAL DISTRICTS

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

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

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

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

Revision	Date

REFERENCE:

TABLE 602A

Lag Time - Standard Form 4 Computations

SLATER HANIFAN GROUP
CONSULTING ENGINEERS & PLANNERS

HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL
TIME OF CONCENTRATION

Project Name: SKYE CANYON PARCEL 1.1
Description: Hydrologic Data
File Name: OLY1401-002 NW TDS SF4.xls
By: AJH
Date: 6/12/2014

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]
ON1-D	D	91.2	0.814	18.2	0.0284	115	1.0	5.52	1640	2.6	3.23	4.90	6.46	11.98	1755	19.750	0.120
ON2-D	D	91.2	0.814	14.4	0.0225	115	1.0	5.52	1310	2.6	3.27	4.96	5.27	10.79	1425	17.917	0.108

[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

```
1*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*             JUN  1998                 *
*          VERSION 4.1                  *
*                                       *
*  RUN DATE   10JUN14  TIME  14:16:18   *
*                                       *
*****************************************
```

```
*****************************************
*                                       *
*    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 1.1
    3         ID     TECHNICAL DRAINAGE STUDY
    4         ID     DEVELOPED DRAINAGE CONDITION
    5         ID
    6         ID     RETURN PERIOD ------- 100 & 10-YEAR
    7         ID     DISTRIBUTION -------- 6-HOUR SDN3
    8         ID     PROJECT NO. --------- OLY1401.002
    9         ID     FILENAME ------------ DEV.H1
   10         ID     DATE ---------------- 06/10/14
   11         ID     MODELED BY ---------- AJH
   12         ID
   13         ID        PRECIPITATION STORM EVENT RATIOS
   14         ID        STORM EVENT              RATIO
   15         ID        100-YR                   1.00
   16         ID        10-YR                    0.55
   17         ID
   18         IT       5       0       0     300
   19         IO       5       0       0
   20         IN       5       0       0
   21         JR    PREC    1.00    0.55
              *

   22         KK   ON1-D
   23         KM   DEVELOPED ONSITE BASIN (NORTH HALF)
   24         BA   .0284
   25         PB    2.93
   26         PC       0   0.020   0.057   0.070   0.087   0.108   0.124   0.130   0.130   0.130
   27         PC   0.130   0.130   0.130   0.133   0.140   0.142   0.148   0.158   0.172   0.181
   28         PC   0.190   0.197   0.199   0.200   0.201   0.204   0.214   0.229   0.241   0.249
   29         PC   0.251   0.256   0.270   0.278   0.281   0.283   0.295   0.322   0.352   0.409
   30         PC   0.499   0.590   0.710   0.744   0.781   0.812   0.819   0.835   0.851   0.856
   31         PC   0.860   0.868   0.876   0.888   0.910   0.926   0.937   0.950   0.970   0.976
   32         PC   0.982   0.985   0.987   0.989   0.990   0.993   0.993   0.994   0.995   0.998
   33         PC   0.998   0.999       1
   34         LS       0    91.2
   35         UD   0.120
              *

   36         KK   ON2-D
   37         KM   DEVELOPED ONSITE BASIN (SOUTH HALF)
   38         BA   .0225
   39         LS       0    91.2
   40         UD   0.108
              *

   41         ZZ
```

1 SCHEMATIC DIAGRAM OF STREAM NETWORK

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

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

    22       ON1-D
              .
              .
    36        .       ON2-D

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


```
1*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*             JUN  1998                 *
*          VERSION 4.1                  *
*                                       *
*  RUN DATE   10JUN14  TIME  14:16:18   *
*                                       *
```

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

****

****

SLATER HANIFAN GROUP
SKYE CANYON PARCEL 1.1
TECHNICAL DRAINAGE STUDY
DEVELOPED DRAINAGE CONDITION

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

PRECIPITATION STORM EVENT RATIOS

STORM EVENT	RATIO
100-YR	1.00
10-YR	0.55

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

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

                   COMPUTATION INTERVAL     .08 HOURS
                        TOTAL TIME BASE   24.92 HOURS

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

     JP          MULTI-PLAN OPTION
                       NPLAN           1  NUMBER OF PLANS

     JR          MULTI-RATIO OPTION
                     RATIOS OF PRECIPITATION
                    1.00       .55
1
```

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

					RATIOS APPLIED TO PRECIPITATION	
OPERATION	STATION	AREA	PLAN		RATIO 1 1.00	RATIO 2 .55
HYDROGRAPH AT						
+	ON1-D	.03	1	FLOW	48.	21.
				TIME	3.58	3.58
HYDROGRAPH AT						
+	ON2-D	.02	1	FLOW	39.	17.
				TIME	3.50	3.58

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

APPENDIX D

Surface Flow Hydraulic Computations

Onsite Street Flows

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

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

Input Data		
Channel Slope	2.82	%
Discharge	33.00	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	0.45	ft
Elevation Range	0.00 to 0.48	
Flow Area	6.9	ft²
Wetted Perimeter	44.85	ft
Top Width	44.61	ft
Actual Depth	0.45	ft
Critical Elevation	0.55	ft
Critical Slope	0.54	%
Velocity	4.75	ft/s
Velocity Head	0.35	ft
Specific Energy	0.80	ft
Froude Number	2.12	
Flow Type	Supercritical	

Calculation Messages:
Flow is divided.

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

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

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

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

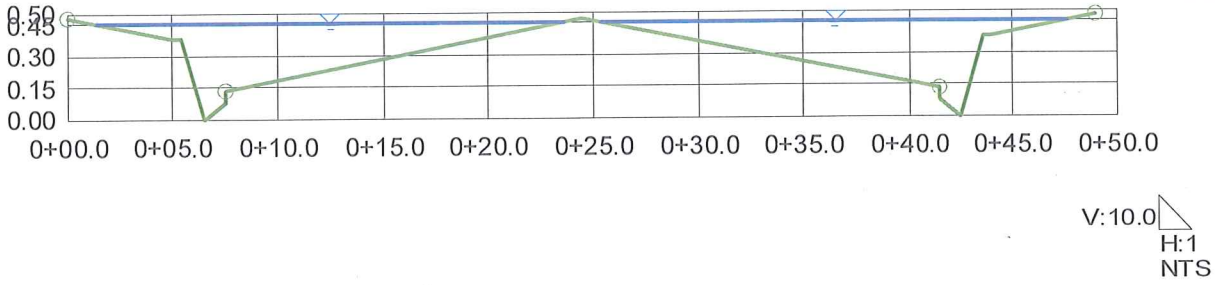
Notes:
Q = ON1-D(A)

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

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

Section Data	
Mannings Coefficient	0.015
Channel Slope	2.82 %
Water Surface Elevation	0.45 ft
Elevation Range	0.00 to 0.48
Discharge	33.00 cfs



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Section 1-2 (100-Year) - Basin ON1-D
Worksheet for Irregular Channel

Project Description	
Worksheet	Section 1-2 (100-Year) - Basin ON1-D
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Channel Slope	2.82	%
Discharge	15.00	cfs

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

Results		
Mannings Coefficient	0.014	
Water Surface Elevation	0.35	ft
Elevation Range	0.00 to 0.48	
Flow Area	3.3	ft²
Wetted Perimeter	25.76	ft
Top Width	25.53	ft
Actual Depth	0.35	ft
Critical Elevation	0.45	ft
Critical Slope	0.52	%
Velocity	4.58	ft/s
Velocity Head	0.33	ft
Specific Energy	0.67	ft
Froude Number	2.26	
Flow Type	Supercritical	

Calculation Messages:
Flow is divided.

Roughness Segments

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

Natural Channel Points

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

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Section 1-2 (100-Year) - Basin ON1-D
Worksheet for Irregular Channel

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

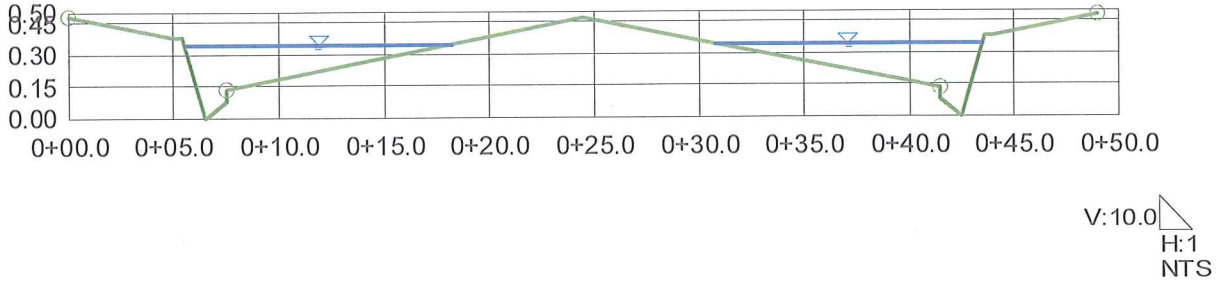
Notes:
Q = ON1-D(B+C)

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Section 1-2 (100-Year) - Basin ON1-D
Cross Section for Irregular Channel

Project Description	
Worksheet	Section 1-2 (100-Year) - Basin ON1-D
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

Section Data		
Mannings Coefficient	0.014	
Channel Slope	2.82	%
Water Surface Elevation	0.35	ft
Elevation Range	0.00 to 0.48	
Discharge	15.00	cfs



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Section 1-3N (100-Year) - Basin ON1-D
Worksheet for Irregular Channel

Project Description	
Worksheet	Section 1-3N (100-Year) - Basin ON1-D
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Channel Slope	0.56	%
Discharge	3.00	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	0.37	ft
Elevation Range	0.00 to 1.19	
Flow Area	1.4	ft²
Wetted Perimeter	11.88	ft
Top Width	11.46	ft
Actual Depth	0.37	ft
Critical Elevation	0.37	ft
Critical Slope	0.53	%
Velocity	2.07	ft/s
Velocity Head	0.07	ft
Specific Energy	0.44	ft
Froude Number	1.03	
Flow Type	Supercritical	

Roughness Segments

Start Station	End Station	Mannings Coefficient
0+00.0	0+02.0	0.013
0+02.0	0+25.0	0.016
0+25.0	0+26.0	0.013
0+26.0	0+29.0	0.025

Natural Channel Points

Station (ft)	Elevation (ft)
0+00.0	0.50
0+00.5	0.48
0+00.5	0.00
0+02.0	0.13
0+02.0	0.17
0+25.0	0.63
0+25.0	1.13
0+26.0	1.13
0+29.0	1.19

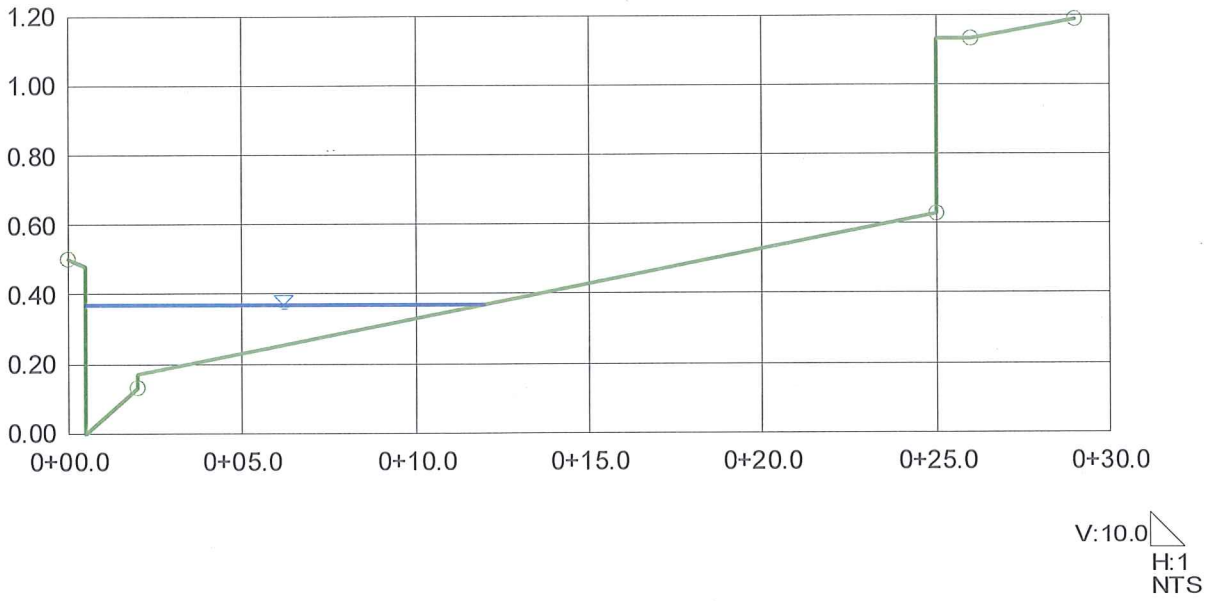
Notes:
Q = ON1-D(C) = 3cfs

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Section 1-3N (100-Year) - Basin ON1-D
Cross Section for Irregular Channel

Project Description	
Worksheet	Section 1-3N (100-Year) - Basin ON1-D
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

Section Data	
Mannings Coefficient	0.013
Channel Slope	0.56 %
Water Surface Elevation	0.37 ft
Elevation Range	0.00 to 1.19
Discharge	3.00 cfs



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Section 1-3S (100-Year) - Basin ON1-D
Worksheet for Irregular Channel

Project Description	
Worksheet	Section 1-3S (100-Year) - Basin ON1-D
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Channel Slope	0.56	%
Discharge	16.50	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	0.62	ft
Elevation Range	0.00 to 1.19	
Flow Area	5.9	ft²
Wetted Perimeter	25.01	ft
Top Width	24.36	ft
Actual Depth	0.62	ft
Critical Elevation	0.62	ft
Critical Slope	0.55	%
Velocity	2.80	ft/s
Velocity Head	0.12	ft
Specific Energy	0.74	ft
Froude Number	1.00	
Flow Type	Supercritical	

Calculation Messages:
Water elevation exceeds lowest end station by 0.11724059 ft.

Roughness Segments

Start Station	End Station	Mannings Coefficient
0+29.0	0+32.0	0.025
0+32.0	0+33.0	0.013
0+33.0	0+56.0	0.016
0+56.0	0+58.0	0.013

Natural Channel Points

Station (ft)	Elevation (ft)
0+29.0	1.19
0+32.0	1.13
0+33.0	1.13
0+33.0	0.63
0+56.0	0.17
0+56.0	0.13
0+57.5	0.00
0+57.5	0.48

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Section 1-3S (100-Year) - Basin ON1-D
Worksheet for Irregular Channel

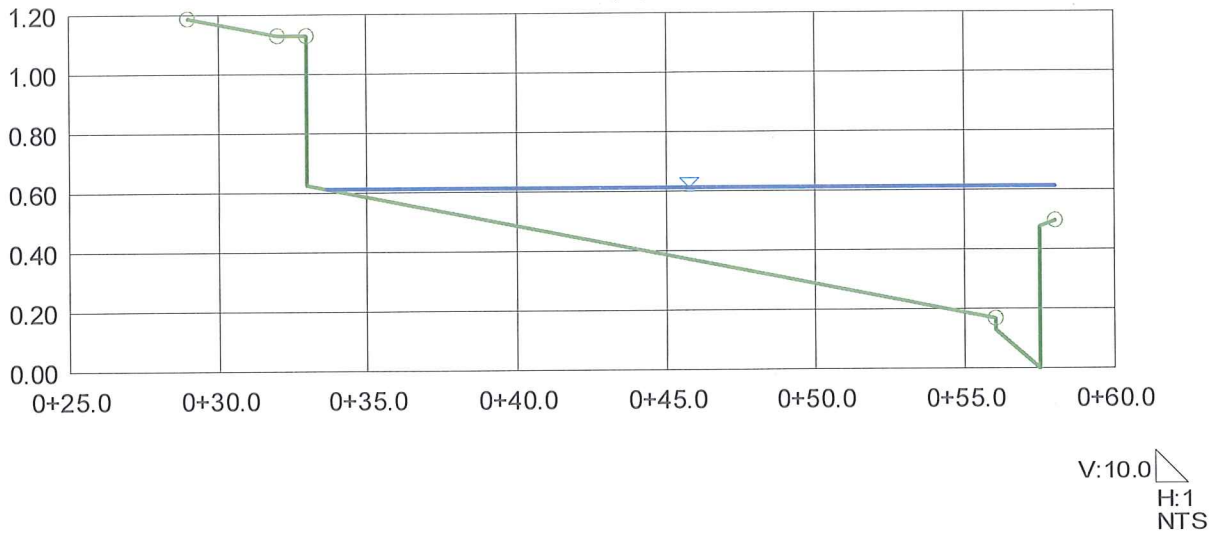
Natural Channel Points	
Station (ft)	Elevation (ft)
0+58.0	0.50

Notes:
Q = 1/2 ON1-D(A) = 16.5cfs

Section 1-3S (100-Year) - Basin ON1-D
Cross Section for Irregular Channel

Project Description	
Worksheet	Section 1-3S (100-Year) - Basin ON1-D
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

Section Data	
Mannings Coefficient	0.015
Channel Slope	0.56 %
Water Surface Elevation	0.62 ft
Elevation Range	0.00 to 1.19
Discharge	16.50 cfs



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Section 2-1 (100-Year) - Basin ON2-D
Worksheet for Irregular Channel

Project Description	
Worksheet	Section 2-1 (100-Year) - Basin ON2-D
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Channel Slope	3.22	%
Discharge	19.50	cfs

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

Results		
Mannings Coefficient	0.014	
Water Surface Elevation	0.37	ft
Elevation Range	0.00 to 0.48	
Flow Area	3.8	ft²
Wetted Perimeter	28.03	ft
Top Width	27.79	ft
Actual Depth	0.37	ft
Critical Elevation	0.48	ft
Critical Slope	0.52	%
Velocity	5.07	ft/s
Velocity Head	0.40	ft
Specific Energy	0.77	ft
Froude Number	2.40	
Flow Type	Supercritical	

Calculation Messages:
Flow is divided.

Specific energy used to evaluate raised elevation of stub street adjacent to Lot #99 in order to fully drain all runoff toward proposed drop inlet.

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

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

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Section 2-1 (100-Year) - Basin ON2-D
Worksheet for Irregular Channel

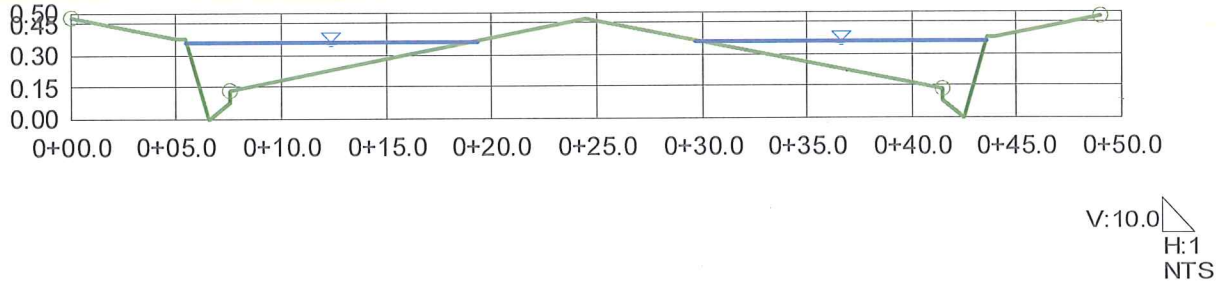
Natural Channel Points	
Station (ft)	Elevation (ft)
0+42.5	0.00
0+43.6	0.38
0+44.0	0.38
0+49.0	0.48

Notes:
Q = 1/2 ON2-D Basin flow
= 19.5cfs

Section 2-1 (100-Year) - Basin ON2-D
Cross Section for Irregular Channel

Project Description	
Worksheet	Section 2-1 (100-Year) - Basin ON2-D
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

Section Data		
Mannings Coefficient	0.014	
Channel Slope	3.22	%
Water Surface Elevation	0.37	ft
Elevation Range	0.00 to 0.48	
Discharge	19.50	cfs



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Section 2-2 (100-Year) - Basin ON2-D
Worksheet for Irregular Channel

Project Description	
Worksheet	Section 2-2 (100-Year) - Basin ON2-D
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Channel Slope	2.79	%
Discharge	19.50	cfs

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

Results		
Mannings Coefficient	0.014	
Water Surface Elevation	0.37	ft
Elevation Range	0.00 to 0.48	
Flow Area	4.1	ft²
Wetted Perimeter	28.89	ft
Top Width	28.66	ft
Actual Depth	0.37	ft
Critical Elevation	0.48	ft
Critical Slope	0.52	%
Velocity	4.79	ft/s
Velocity Head	0.36	ft
Specific Energy	0.73	ft
Froude Number	2.24	
Flow Type	Supercritical	

Calculation Messages:
Flow is divided.

Roughness Segments

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

Natural Channel Points

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

Section 2-2 (100-Year) - Basin ON2-D
Worksheet for Irregular Channel

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

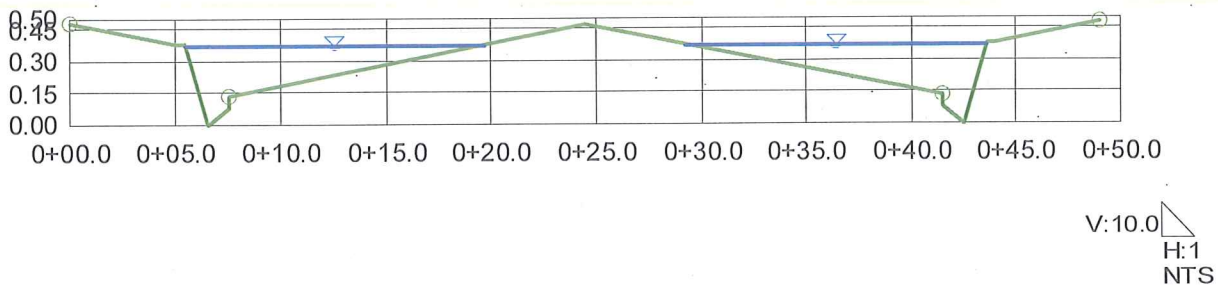
Notes:
Q = 1/2 ON2-D Basin flow
= 19.5cfs

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Section 2-2 (100-Year) - Basin ON2-D
Cross Section for Irregular Channel

Project Description	
Worksheet	Section 2-2 (100-Year) - Basin ON2-D
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

Section Data	
Mannings Coefficient	0.014
Channel Slope	2.79 %
Water Surface Elevation	0.37 ft
Elevation Range	0.00 to 0.48
Discharge	19.50 cfs



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Perimeter Street Flows

HU Hualapai Half Street Section
Worksheet for Irregular Channel

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

Input Data		
Channel Slope	0.50	%
Discharge	6.50	cfs

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

Results		
Mannings Coefficient	0.014	
Water Surface Elevation	0.47	ft
Elevation Range	0.00 to 1.44	
Flow Area	2.9	ft²
Wetted Perimeter	17.13	ft
Top Width	16.61	ft
Actual Depth	0.47	ft
Critical Elevation	0.46	ft
Critical Slope	0.56	%
Velocity	2.25	ft/s
Velocity Head	0.08	ft
Specific Energy	0.55	ft
Froude Number	0.95	
Flow Type	Subcritical	

Roughness Segments

Start Station	End Station	Mannings Coefficient
0+00.00	0+02.00	0.013
0+02.00	0+39.00	0.016
0+39.00	0+45.50	0.013

Natural Channel Points

Station (ft)	Elevation (ft)
0+00.00	0.50
0+00.50	0.48
0+00.50	0.00
0+02.00	0.13
0+02.00	0.17
0+39.00	0.91
0+39.01	0.99
0+39.25	1.30
0+39.42	1.32
0+45.50	1.44

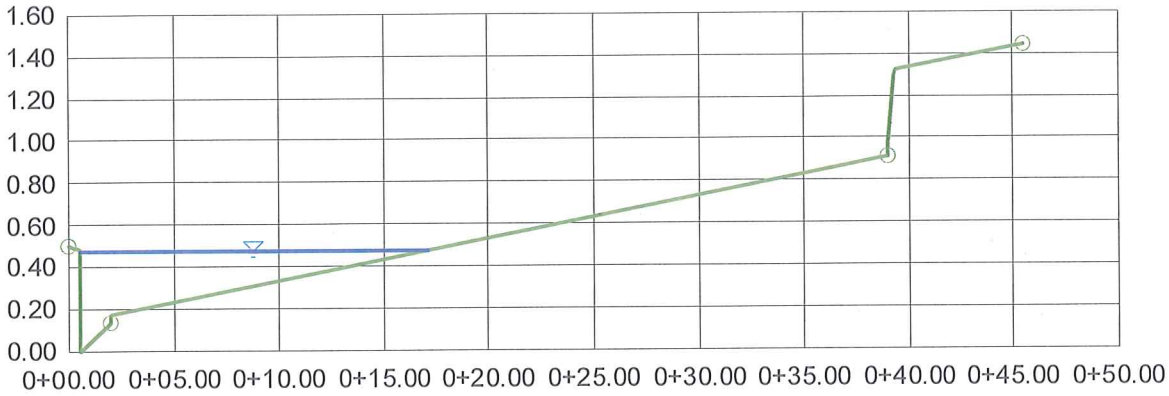
Notes: Q = 6.5cfs*
*Referenced from Phase 1 Infrastructure Study

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HU Hualapai Half Street Section
Cross Section for Irregular Channel

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

Section Data	
Mannings Coefficient	0.014
Channel Slope	0.50 %
Water Surface Elevation	0.47 ft
Elevation Range	0.00 to 1.44
Discharge	6.50 cfs



V:10.0
H:1
NTS

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RA1 Racel Street Section
Worksheet for Irregular Channel

Project Description	
Worksheet	RA1 Racel Street Section
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Channel Slope	1.00	%
Discharge	13.00	cfs

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

Results		
Mannings Coefficient	0.014	
Water Surface Elevation	0.43	ft
Elevation Range	0.00 to 0.56	
Flow Area	4.4	ft²
Wetted Perimeter	29.56	ft
Top Width	28.61	ft
Actual Depth	0.43	ft
Critical Elevation	0.46	ft
Critical Slope	0.53	%
Velocity	2.98	ft/s
Velocity Head	0.14	ft
Specific Energy	0.56	ft
Froude Number	1.34	
Flow Type	Supercritical	

Calculation Messages:
Flow is divided.

Roughness Segments

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

Natural Channel Points

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

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RA1 Racel Street Section
Worksheet for Irregular Channel

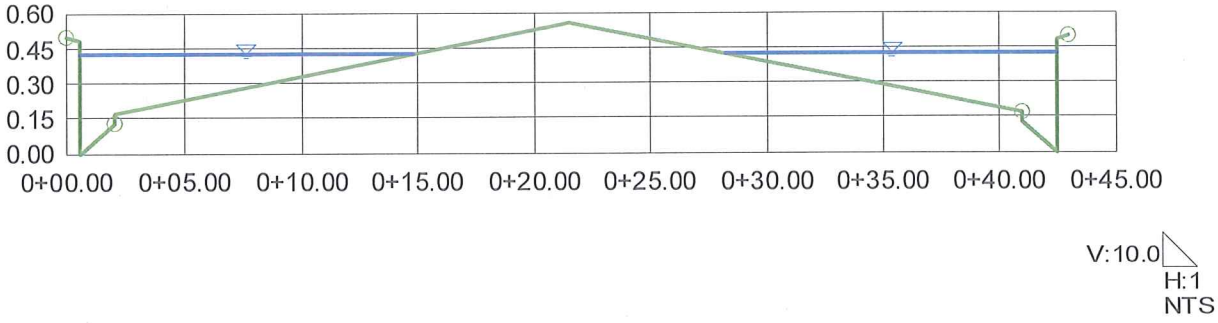
Natural Channel Points	
Station (ft)	Elevation (ft)
0+42.50	0.48
0+43.00	0.50

Notes:
Q = 13cfs*
*Referenced from Phase 1 Infrastructure Study

RA1 Racel Street Section
Cross Section for Irregular Channel

Project Description	
Worksheet	RA1 Racel Street Section
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

Section Data	
Mannings Coefficient	0.014
Channel Slope	1.00 %
Water Surface Elevation	0.43 ft
Elevation Range	0.00 to 0.56
Discharge	13.00 cfs



RA2 Racel Street Section at Site Entrance
Worksheet for Irregular Channel

Project Description	
Worksheet	RA2 Racel Street Section at Site Entrance
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Channel Slope	4.90	%
Discharge	10.00	cfs

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

Results		
Mannings Coefficient	0.014	
Water Surface Elevation	0.32	ft
Elevation Range	0.00 to 0.56	
Flow Area	1.9	ft²
Wetted Perimeter	19.03	ft
Top Width	18.29	ft
Actual Depth	0.32	ft
Critical Elevation	0.43	ft
Critical Slope	0.55	%
Velocity	5.15	ft/s
Velocity Head	0.41	ft
Specific Energy	0.74	ft
Froude Number	2.79	
Flow Type	Supercritical	

Calculation Messages:
Flow is divided.

Roughness Segments

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

Natural Channel Points

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

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RA2 Racel Street Section at Site Entrance
Worksheet for Irregular Channel

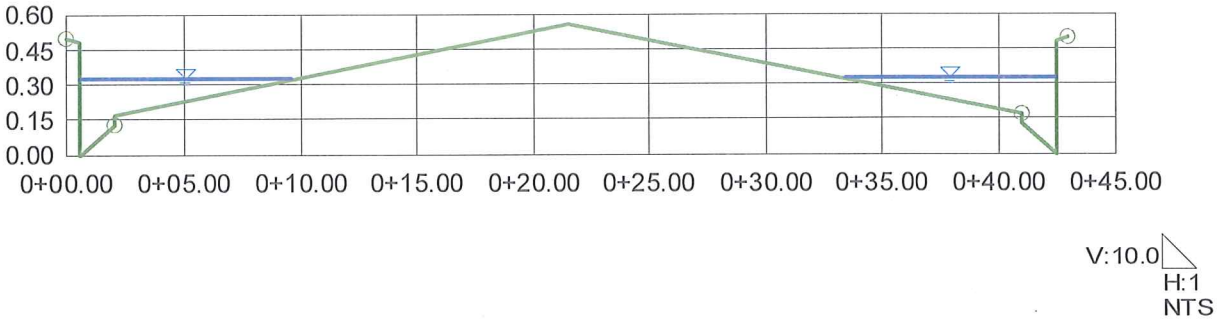
Natural Channel Points	
Station (ft)	Elevation (ft)
0+42.50	0.48
0+43.00	0.50

Notes:
Q = Bypass from storm drains west of site entrance
= 10cfs

RA2 Racel Street Section at Site Entrance
Cross Section for Irregular Channel

Project Description	
Worksheet	RA2 Racel Street Section at Site Entrance
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

Section Data		
Mannings Coefficient	0.014	
Channel Slope	4.90	%
Water Surface Elevation	0.32	ft
Elevation Range	0.00 to 0.56	
Discharge	10.00	cfs



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Drop Inlets

Project:	**Skye Canyon Parcel 1.1**
Title:	**Type CM2 Drop Inlet (SUMP)**
Subtitle:	**12.5-ft Drop Inlet @ ON1-D (Facility 1-1)**
By:	**AH**
Date:	**6/11/2014**

Input:	**Variable:**	**Input:**
Depth at Inlet (ft)	D	0.83
Grate Width (ft)	W	1.50
Length of Grate (ft)	L_g	10.00
Length of Curb Opening (ft)	L_c	12.50
Height of Curb Opening (ft)	H	0.500
Weir Coef. - Curb Opening	W_c	2.3
Weir Coef. - Grate	W_g	3.0
Orifice Coef.	O_c	0.67
Grate Coef.	G_c	0.60
Clogging Factor - Grate (%)	CF_g	50
Clogging Factor - Curb (%)	CF_c	50
Output (Grate):	**Equation:**	**Output (Grate):**
Effective Weir Length (ft)	$2*W+L_g$	13.00
Adjusted Effective Weir Length (ft)	$2*(1-CF_g/100)*W+(1-CF_g/100)*L_g$	6.50
Grate Open Area (sf)	$W*L_g$	15.00
Adjusted Grate Open Area (sf)	Grate Open Area * $G_c*(1-CF_g/100)$	4.50
Controlling Flow Type (weir/orifice)	If D<1.792*(Adj. Grate Open Area/Adj. Eff. Length) use weir, else orifice	weir
Intercepted Flow (cfs)	weir: W_g*(Adj. Eff. Weir Length)$*D^{1.5}$	14.7
	orifice: O_c*(Adj. Grate Open Area)$*(64.4*D)^{0.5}$	
Output (Curb):	**Equation:**	**Output (Curb):**
Effective Weir Length (ft)	L+1.8*W	15.20
Adjusted Effective Weir Length (ft)	$L+1.8(1-CF_c/100)*W$	13.91
Curb Open Area (sf)	L*H	6.25
Adjusted Curb Open Area (sf)	Curb Open Area * $(1-CF_c/100)$	3.13
Controlling Flow Type (weir/orifice)	If D<H, weir, else orifice	orifice
Intercepted Flow (cfs)	weir: W_c*(Adj. Eff. Weir Length)$*D^{1.5}$	15.27
	orifice: O_c*(Adj. Curb Open Area)$*(64.4*(D-H/2))^{0.5}$	
Output (Combination):		**Output (Combination):**
Total Intercepted Flow Capacity (cfs)	Intercepted (Grate) + Intercepted (Curb)	**30.0**
Total Designed Intercepted Flow (cfs):	Intercepted (Grate) + Intercepted (Curb)	**28.5**

Project:	**Skye Canyon Parcel 1.1**	
Title:	**Type CM2 Drop Inlet**	
Subtitle:	**22.5-ft Drop Inlet @ ON1-D (Facility 1-3)**	
By:	**AH**	
Date:	**6/11/2014**	
Input:	**Variable:**	**Input:**
Street Flow (cfs)	Q	16.5
Longitudinal Slope (ft/ft)	S_o	0.0056
Manning's Coefficient	n	0.016
Street Flow Velocity (fps)	V	2.64
Street Flow Depth (ft)	D	0.61
Street Cross Slope (ft/ft)	S_x	0.02
Grate Width (ft)	W	1.5
Grate Depression (in)	D_g	2.0
Length of Grate (ft)	L_g	20.0
Length of Curb Opening (ft)	L_c	22.5
Clogging Factor - Grate (%)	CF_g	50%
Clogging Factor - Curb (%)	CF_c	50%
Effective Grate Length (ft)	L_{ge}	10.0
Effective Curb Opening Length (ft)	L_{ce}	11.25
Output (Grate):	**Equation:**	**Output (Grate):**
[1] R_f - Frontal Flow Factor	1-0.09*(V-V_x) if V>V_x; else Frontal Flow Factor=1	1.00
[2] V_o - Splash Over Velocity (fps)	V_x=p+q*Lg-r*L_{ge}^2+sy*L_{ge}^3 ; where p=0.30,q=4.85,r=1.31,sy=0.15 (for Vane Grate)	67.80
[1] E - Grate Flow Ratio	Frontal Flow/Side Flow	0.17
[2] Q_w - Frontal Flow (cfs)	$Q_w = Q[1-(1-(W/T))^{2.67}]$	2.82
[1] Q_s - Side Flow (cfs)	Q_s = Q-Qw	13.7
T - Side Flow Spread (ft)	$(D-D_g)/S_x$	22.17
[1] R_s - Side Flow Factor	$1/(1+(0.15*V^{1.8})/(S_x*L_{ge}^{2.3}))$	0.82
[1] Q_{gi} - Intercepted Flow (cfs)	$(R_f*E+R_s*(1-E))*Q$	14.1
Output (Curb):	**Equation:**	**Output (Curb):**
[1] S_e - Equivalent Cross Slope (ft/ft)	S_x+S_g*E	0.039
Q_{sx} - Remaining Flow After Grate Interception (cfs)	$Q-Q_{gi}$	2.429
S_g - Gutter Cross Slope (ft/ft)	D_g/W	0.111
[1] L_t - Effective Interception Length (ft)	$0.60*Q_{sx}^{0.42}*S_o^{0.30}*(1/n*S_e)^{0.6}$	15.40
[1] Q_{ci} - Intercepted Flow (cfs)	$(1-(1-L_{ce}/L_t)^{1.8})*Q_{sx}$	2.2
	or Q_{sx} if L_t is less than L_{ce}	
Output (Combination):		**Output (Combination):**
Total Intercepted Flow (cfs)	Intercepted (Grate) + Intercepted (Curb)	**16.3**

[1] Formula referenced from the CCRFCD Manual

[2] Formula referenced from FHWA Urban Drainage Design Manual (HEC-22)

	Project:	**Skye Canyon Parcel 1.1**	
	Title:	**Type CM2 Drop Inlet**	
	Subtitle:	**10-ft Drop Inlet @ ON1-D (Facility 1-5)**	
	By:	**AH**	
	Date:	**6/12/2014**	
	Input:	**Variable:**	**Input:**
	Street Flow (cfs)	Q	3.0
	Longitudinal Slope (ft/ft)	S_o	0.0056
	Manning's Coefficient	n	0.016
	Street Flow Velocity (fps)	V	2.07
	Street Flow Depth (ft)	D	0.37
	Street Cross Slope (ft/ft)	S_x	0.02
	Grate Width (ft)	W	1.5
	Grate Depression (in)	D_g	2.0
	Length of Grate (ft)	L_g	7.5
	Length of Curb Opening (ft)	L_c	10.0
	Clogging Factor - Grate (%)	CF_g	50%
	Clogging Factor - Curb (%)	CF_c	50%
	Effective Grate Length (ft)	L_{ge}	3.8
	Effective Curb Opening Length (ft)	L_{ce}	5.00
	Output (Grate):	**Equation:**	**Output (Grate):**
[1]	R_f - Frontal Flow Factor	1-0.09*(V-V_x) if V>V_x; else Frontal Flow Factor=1	1.00
[2]	V_o - Splash Over Velocity (fps)	V_x=p+q*Lg-r*L_{ge}^2+sy*L_{ge}^3 ; where p=0.30,q=4.85,r=1.31,sy=0.15 (for Vane Grate)	7.98
[1]	E - Grate Flow Ratio	Frontal Flow/Side Flow	0.35
[2]	Q_w - Frontal Flow (cfs)	$Q_w = Q[1-(1-(W/T))^{2.67}]$	1.04
[1]	Q_s - Side Flow (cfs)	Q_s = Q-Qw	2.0
	T - Side Flow Spread (ft)	$(D-D_g)/S_x$	10.17
[1]	R_s - Side Flow Factor	$1/(1+(0.15*V^{1.8})/(S_x*L_{ge}^{2.3}))$	0.43
[1]	Q_{gi} - Intercepted Flow (cfs)	$(R_f*E+R_s*(1-E))*Q$	1.9
	Output (Curb):	**Equation:**	**Output (Curb):**
[1]	S_e - Equivalent Cross Slope (ft/ft)	S_x+S_g*E	0.059
	Q_{sx} - Remaining Flow After Grate Interception (cfs)	$Q-Q_{gi}$	1.118
	S_g - Gutter Cross Slope (ft/ft)	D_g/W	0.111
[1]	L_t - Effective Interception Length (ft)	$0.60*Q_{sx}^{0.42}*S_o^{0.30}*(1/n*S_e)^{0.6}$	8.71
[1]	Q_{ci} - Intercepted Flow (cfs)	$(1-(1-L_{ce}/L_t)^{1.8})*Q_{sx}$	0.9
		or Q_{sx} if L_t is less than L_{ce}	
	Output (Combination):		**Output (Combination):**
	Total Intercepted Flow (cfs)	Intercepted (Grate) + Intercepted (Curb)	**2.8**

[1] Formula referenced from the CCRFCD Manual

[2] Formula referenced from FHWA Urban Drainage Design Manual (HEC-22)

Project:	**Skye Canyon Parcel 1.1**
Title:	**Type CM2 Drop Inlet (SUMP)**
Subtitle:	**17.5-ft Drop Inlet @ ON2-D (Facility 2-1)**
By:	**AH**
Date:	**6/23/2014**

Input:	**Variable:**	**Input:**
Depth at Inlet (ft)	D	0.83
Grate Width (ft)	W	1.50
Length of Grate (ft)	L_g	15.00
Length of Curb Opening (ft)	L_c	17.50
Height of Curb Opening (ft)	H	0.500
Weir Coef. - Curb Opening	W_c	2.3
Weir Coef. - Grate	W_g	3.0
Orifice Coef.	O_c	0.67
Grate Coef.	G_c	0.60
Clogging Factor - Grate (%)	CF_g	50
Clogging Factor - Curb (%)	CF_c	50
Output (Grate):	**Equation:**	**Output (Grate):**
Effective Weir Length (ft)	$2*W+L_g$	18.00
Adjusted Effective Weir Length (ft)	$2*(1-CF_g/100)*W+(1-CF_g/100)*L_g$	9.00
Grate Open Area (sf)	$W*L_g$	22.50
Adjusted Grate Open Area (sf)	Grate Open Area * $G_c*(1-CF_g/100)$	6.75
Controlling Flow Type (weir/orifice)	If D<1.792*(Adj. Grate Open Area/Adj. Eff. Length) use weir, else orifice	weir
Intercepted Flow (cfs)	weir: W_g*(Adj. Eff. Weir Length)$*D^{1.5}$	20.4
	orifice: O_c*(Adj. Grate Open Area)$*(64.4*D)^{0.5}$	
Output (Curb):	**Equation:**	**Output (Curb):**
Effective Weir Length (ft)	L+1.8*W	20.20
Adjusted Effective Weir Length (ft)	$L+1.8(1-CF_c/100)*W$	18.91
Curb Open Area (sf)	L*H	8.75
Adjusted Curb Open Area (sf)	Curb Open Area * $(1-CF_c/100)$	4.38
Controlling Flow Type (weir/orifice)	If D<H, weir, else orifice	orifice
Intercepted Flow (cfs)	weir: W_c*(Adj. Eff. Weir Length)$*D^{1.5}$	21.38
	orifice: O_c*(Adj. Curb Open Area)$*(64.4*(D-H/2))^{0.5}$	
Output (Combination):		**Output (Combination):**
Total Intercepted Flow Capacity (cfs)	Intercepted (Grate) + Intercepted (Curb)	**41.8**
Total Designed Intercepted Flow (cfs):	Intercepted (Grate) + Intercepted (Curb)	**39.0**

APPENDIX E

Storm Drain WSPGW Analyses

Basin ON1-D Mainline Storm Drain

Tie-In to Existing Conquistador Lateral from Proposed Sump Inlet

```
T1 SKYE CANYON PARCEL 1.1
T2 BASIN ON1-D STORM DRAIN
T3 RCP FROM SUMP INLET TO EXISTING TRUNK LINE IN CONQUISTADOR - DEVELOPED CONDITION
SO    1000.0002791.750 36       .013                  2795.23
R     1080.0702792.550 36       .013                                .000  21.000 1
JX    1080.0702793.050 30 18 30.013     3.000   16.5002794.0502793.050 90.0 60.5
R     1204.9102794.300 30       .013                                .000
SH    1204.9102794.300 30       .013
CD  18  4   1    .000   1.500     .000  .000  .000   .00
CD  30  4   1    .000   2.500     .000  .000  .000   .00
CD  36  4   1    .000   3.000     .000  .000  .000   .00
Q            28.500   .0
```

ON1-D.EDT

FILE: ON1-D.WSW W S P G W - EDIT LISTING - Version 14.07 Date: 6-24-2014 Time: 2:46:47

WATER SURFACE PROFILE - CHANNEL DEFINITION LISTING PAGE 1

CARD CODE	SECT NO	CHN TYPE	NO OF PIER/PIP	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		1.500														
CD	30	4	1		2.500														
CD	36	4	1		3.000														

W S P G W PAGE NO 1

WATER SURFACE PROFILE - TITLE CARD LISTING

HEADING LINE NO 1 IS -
SKYE CANYON PARCEL 1.1

HEADING LINE NO 2 IS -
BASIN ON1-D STORM DRAIN

HEADING LINE NO 3 IS -
RCP FROM SUMP INLET TO EXISTING TRUNK LINE IN CONQUISTADOR - DEVELOPED CON

W S P G W PAGE NO 2

WATER SURFACE PROFILE - ELEMENT CARD LISTING

ELEMENT NO 1 IS A SYSTEM OUTLET

	STATION	INVERT	SECT	W S ELEV
U/S DATA	1000.000	2791.750	36	2795.230

ELEMENT NO 2 IS A REACH

	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
U/S DATA	1080.070	2792.550	36	.013	.000	.000	21.000	1

ELEMENT NO 3 IS A JUNCTION

	STATION	INVERT	SECT	LAT-1	LAT-2	N	Q3	Q4	INVERT-3	INVERT-4	PHI 3	PHI 4	RADIUS	ANGLE
U/S DATA	1080.070	2793.050	30	18	30	.013	3.000	16.500	2794.050	2793.050	90.000	60.500	.000	.000

ELEMENT NO 4 IS A REACH

	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
U/S DATA	1204.910	2794.300	30	.013	.000	.000	.000	0

ELEMENT NO 5 IS A SYSTEM HEADWORKS

	STATION	INVERT	SECT	W S ELEV
U/S DATA	1204.910	2794.300	30	.000

SKYE CANYON PARCEL 1.1
BASIN ON1-D STORM DRAIN
RCP FROM SUMP INLET TO EXISTING TRUNK LINE IN CONQUISTADOR - DEVELOPED

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head / SF Ave	Energy Grd.El. / HF	Super Elev / SE Dpth	Critical Depth / Froude N	Flow Top Width / Norm Dp	Height/ Dia.-FT / "N"	Base Wt or I.D. / X-Fall	ZL / ZR	No Wth Prs/Pip / Type Ch
1000.000	2791.750	3.480	2795.230	48.00	6.79	.72	2795.95	.00	2.26	.00	3.000	.000	.00	1 .0
80.070	.0100					.0052	.41	3.48	.00	1.88	.013	.00	.00	PIPE
1080.070	2792.550	3.180	2795.730	48.00	6.79	.72	2796.45	.00	2.26	.00	3.000	.000	.00	1 .0
JUNCT STR	.0000					.0050	.00	3.18	.00		.013	.00	.00	PIPE
1080.070	2793.050	3.371	2796.421	28.50	5.81	.52	2796.94	.00	1.82	.00	2.500	.000	.00	1 .0
124.840	.0100					.0048	.60	3.37	.00	1.53	.013	.00	.00	PIPE
1204.910	2794.300	2.723	2797.023	28.50	5.81	.52	2797.55	.00	1.82	.00	2.500	.000	.00	1 .0

♀♀

SKYE CANYON PARCEL 1.1

BASIN ON1-D STORM DRAIN

RCP FROM SUMP INLET TO EXISTING TRUNK LINE IN CONQUISTADOR - DEVELOPED

Inlet control depth controls. Use 2797.17-ft for HGL

1000.00 .I C H W E . R

1004.18 .

1008.36 .

1012.55 .

1016.73 .

1020.91 .

1025.09 .

```
1029.27    .                                                                .
1033.45    .                                                                .
1037.64    .                                                                .
1041.82    .                                                                .
1046.00    .                                                                .
1050.18    .                                                                .
1054.36    .                                                                .
1058.55    .                                                                .
1062.73    .                                                                .
1066.91    .                                                                .
1071.09    .                                                                .
1075.27    .                                                                .
1079.45    .                                                                .
1083.64    .          I                    C          H  W          E       .   JX
1087.82    .                    I          C          H            W     E    .   R
1092.00    .                                                                .
1096.18    .                                                                .
1100.36    .                                                                .
1104.55    .                                                                .
1108.73    .                                                                .
```

1112.91 .

1117.09 .

1121.27 .

1125.46 .

1129.64 .

1133.82 .

1138.00 .

1142.18 .

1146.36 .

1150.55 .

1154.73 .

1158.91 .

1163.09 .

1167.27 .

1171.46 .

1175.64 .

1179.82 .

1184.00 .

1188.18 .

1192.36 .

```
   1196.55    .                                                                                                .

   1200.73    .                                                                                                .

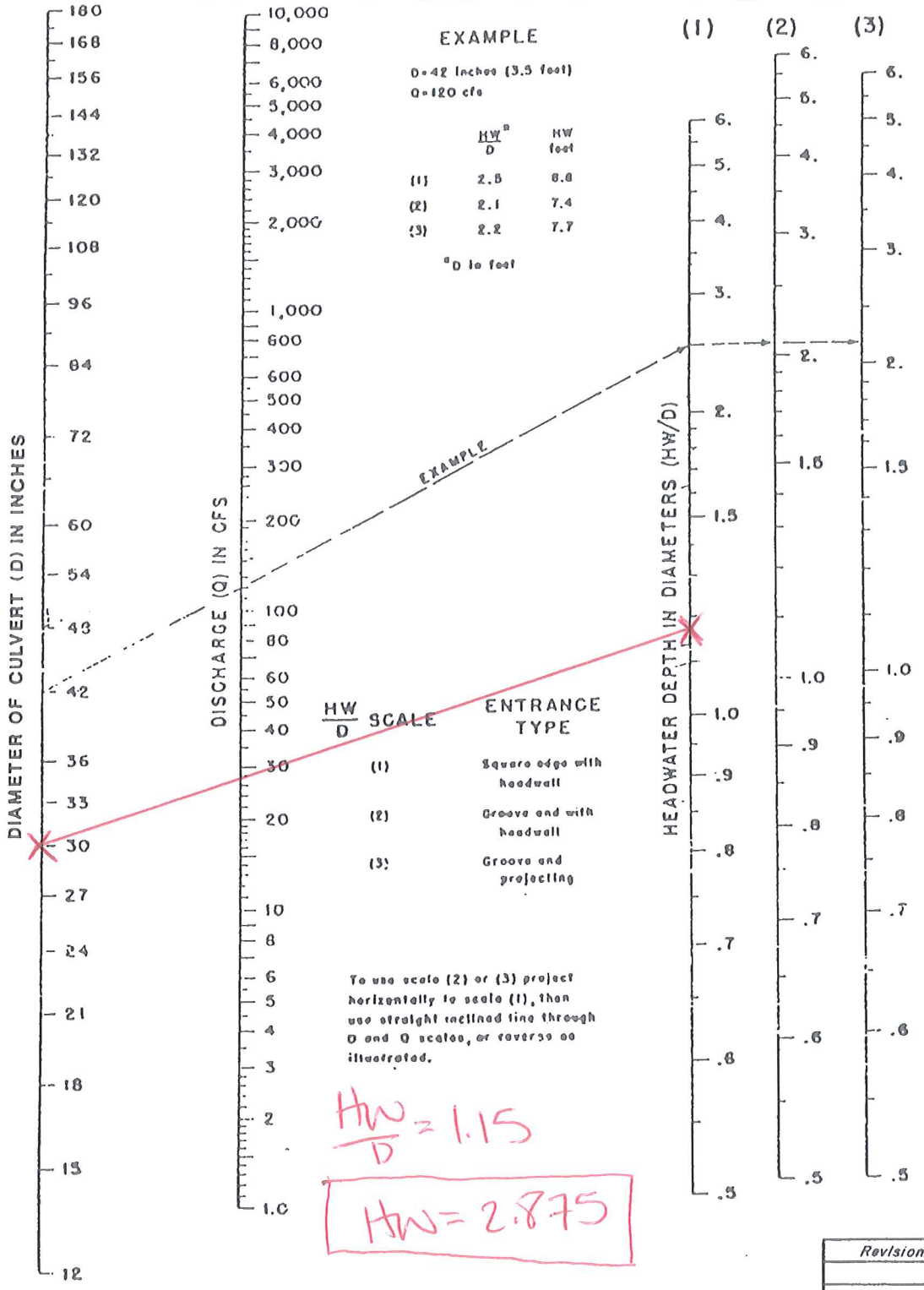
   1204.91    .                                          I                                C           H  W         E.     R

            2791.750  2792.330  2792.909  2793.489  2794.068  2794.648  2795.228  2795.807  2796.387  2796.966  2797.547
```

N O T E S
1. GLOSSARY
   I = INVERT ELEVATION
   C = CRITICAL DEPTH
   W = WATER SURFACE ELEVATION
   S = SUPER-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

NOMOGRAPH – INLET CONTROL RCP

ON-D Sump DI = 28.5 cfs



$\frac{HW}{D} = 1.15$

$HW = 2.875$

Revision	Date

WRC ENGINEERING

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

FIGURE 1005

Basin ON1-D Lateral Storm Drain

Tie-In to Proposed Mainline Storm Drain from Proposed 22.5-ft Inlet

```
T1 SKYE CANYON PARCEL 1.1
T2 BASIN ON1-D STORM DRAIN
T3 RCP LATERAL FROM 22.5' SDDI TO SDMH#1  - DEVELOPED CONDITION
SO   1000.0002793.050 30      .013                2796.421
R    1019.0002796.400 30      .013                                  .000
SH   1019.0002796.400 30      .013
CD  30  4   1    .000   2.500     .000  .000  .000   .00
Q            16.500   .0
```

LAT30.EDT

FILE: LAT30.WSW W S P G W - EDIT LISTING - Version 14.07 Date: 6-24-2014 Time: 3:37:37

WATER SURFACE PROFILE - CHANNEL DEFINITION LISTING PAGE 1

CARD CODE	SECT NO	CHN TYPE	NO OF PIER/PIP	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	30	4	1		2.500														

W S P G W PAGE NO 1

WATER SURFACE PROFILE - TITLE CARD LISTING

HEADING LINE NO 1 IS -
SKYE CANYON PARCEL 1.1

HEADING LINE NO 2 IS -
BASIN ON1-D STORM DRAIN

HEADING LINE NO 3 IS -
RCP LATERAL FROM 22.5' SDDI TO SDMH#1 - DEVELOPED CONDITION

W S P G W PAGE NO 2

WATER SURFACE PROFILE - ELEMENT CARD LISTING

ELEMENT NO 1 IS A SYSTEM OUTLET * * *

	STATION	INVERT	SECT	W S ELEV
U/S DATA	1000.000	2793.050	30	2796.421

ELEMENT NO 2 IS A REACH * * *

	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
U/S DATA	1019.000	2796.400	30	.013	.000	.000	.000	0

ELEMENT NO 3 IS A SYSTEM HEADWORKS *

	STATION	INVERT	SECT	W S ELEV
U/S DATA	1019.000	2796.400	30	.000

SKYE CANYON PARCEL 1.1
BASIN ON1-D STORM DRAIN
RCP LATERAL FROM 22.5' SDDI TO SDMH#1 - DEVELOPED CONDITION

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head / SF Ave	Energy Grd.El. / HF	Super Elev / SE Dpth	Critical Depth / Froude N	Flow Top Width / Norm Dp	Height/ Dia.-FT / "N"	Base Wt or I.D. / X-Fall	ZL / ZR	No Wth Prs/Pip / Type Ch
1000.000	2793.050	3.371	2796.421	16.50	3.36	.18	2796.60	.00	1.37	.00	2.500	.000	.00	1 .0
4.985	.1763					.0016	.01	3.37	.00	.52	.013	.00	.00	PIPE
1004.985	2793.929	2.500	2796.429	16.50	3.36	.18	2796.60	.00	1.37	.00	2.500	.000	.00	1 .0
.150	.1763					.0015	.00	2.50	.00	.52	.013	.00	.00	PIPE
1005.135	2793.955	2.472	2796.428	16.50	3.37	.18	2796.60	.00	1.37	.52	2.500	.000	.00	1 .0
HYDRAULIC JUMP														
1005.135	2793.955	.708	2794.663	16.50	14.44	3.24	2797.90	.00	1.37	2.25	2.500	.000	.00	1 .0
1.107	.1763					.0512	.06	.71	3.57	.52	.013	.00	.00	PIPE
1006.242	2794.151	.720	2794.871	16.50	14.11	3.09	2797.96	.00	1.37	2.26	2.500	.000	.00	1 .0
1.969	.1763					.0464	.09	.72	3.46	.52	.013	.00	.00	PIPE
1008.212	2794.498	.745	2795.243	16.50	13.45	2.81	2798.05	.00	1.37	2.29	2.500	.000	.00	1 .0
1.690	.1763					.0406	.07	.74	3.24	.52	.013	.00	.00	PIPE
1009.901	2794.796	.771	2795.567	16.50	12.82	2.55	2798.12	.00	1.37	2.31	2.500	.000	.00	1 .0
1.457	.1763					.0356	.05	.77	3.03	.52	.013	.00	.00	PIPE
1011.358	2795.053	.798	2795.851	16.50	12.23	2.32	2798.17	.00	1.37	2.33	2.500	.000	.00	1 .0
1.260	.1763					.0312	.04	.80	2.83	.52	.013	.00	.00	PIPE
1012.618	2795.275	.826	2796.101	16.50	11.66	2.11	2798.21	.00	1.37	2.35	2.500	.000	.00	1 .0
1.091	.1763					.0273	.03	.83	2.65	.52	.013	.00	.00	PIPE

SKYE CANYON PARCEL 1.1
BASIN ON1-D STORM DRAIN
RCP LATERAL FROM 22.5' SDDI TO SDMH#1 - DEVELOPED CONDITION

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head / SF Ave	Energy Grd.El. / HF	Super Elev / SE Dpth	Critical Depth / Froude N	Flow Top Width / Norm Dp	Height/ Dia.-FT / "N"	Base Wt or I.D. / X-Fall	ZL / ZR	No Wth Prs/Pip / Type Ch

1013.710	2795.468	.855	2796.323	16.50	11.12	1.92	2798.24	.00	1.37	2.37	2.500	.000	.00	1	.0		
.945	.1763					.0239	.02	.86	2.48	.52	.013	.00	.00	PIPE			
1014.655	2795.634	.886	2796.520	16.50	10.60	1.74	2798.26	.00	1.37	2.39	2.500	.000	.00	1	.0		
.817	.1763					.0210	.02	.89	2.31	.52	.013	.00	.00	PIPE			
1015.471	2795.778	.917	2796.696	16.50	10.10	1.59	2798.28	.00	1.37	2.41	2.500	.000	.00	1	.0		
.704	.1763					.0184	.01	.92	2.16	.52	.013	.00	.00	PIPE			
1016.175	2795.902	.950	2796.853	16.50	9.63	1.44	2798.29	.00	1.37	2.43	2.500	.000	.00	1	.0		
.604	.1763					.0161	.01	.95	2.02	.52	.013	.00	.00	PIPE			
1016.779	2796.009	.985	2796.993	16.50	9.19	1.31	2798.30	.00	1.37	2.44	2.500	.000	.00	1	.0		
.514	.1763					.0142	.01	.98	1.89	.52	.013	.00	.00	PIPE			
1017.293	2796.099	1.021	2797.120	16.50	8.76	1.19	2798.31	.00	1.37	2.46	2.500	.000	.00	1	.0		
.433	.1763					.0124	.01	1.02	1.76	.52	.013	.00	.00	PIPE			
1017.726	2796.176	1.058	2797.233	16.50	8.35	1.08	2798.32	.00	1.37	2.47	2.500	.000	.00	1	.0		
.360	.1763					.0109	.00	1.06	1.65	.52	.013	.00	.00	PIPE			
1018.086	2796.239	1.097	2797.336	16.50	7.96	.98	2798.32	.00	1.37	2.48	2.500	.000	.00	1	.0		
.293	.1763					.0096	.00	1.10	1.54	.52	.013	.00	.00	PIPE			
1018.379	2796.291	1.137	2797.428	16.50	7.59	.89	2798.32	.00	1.37	2.49	2.500	.000	.00	1	.0		
.231	.1763					.0084	.00	1.14	1.43	.52	.013	.00	.00	PIPE			

Program Package Serial Number: 1704

WATER SURFACE PROFILE LISTING

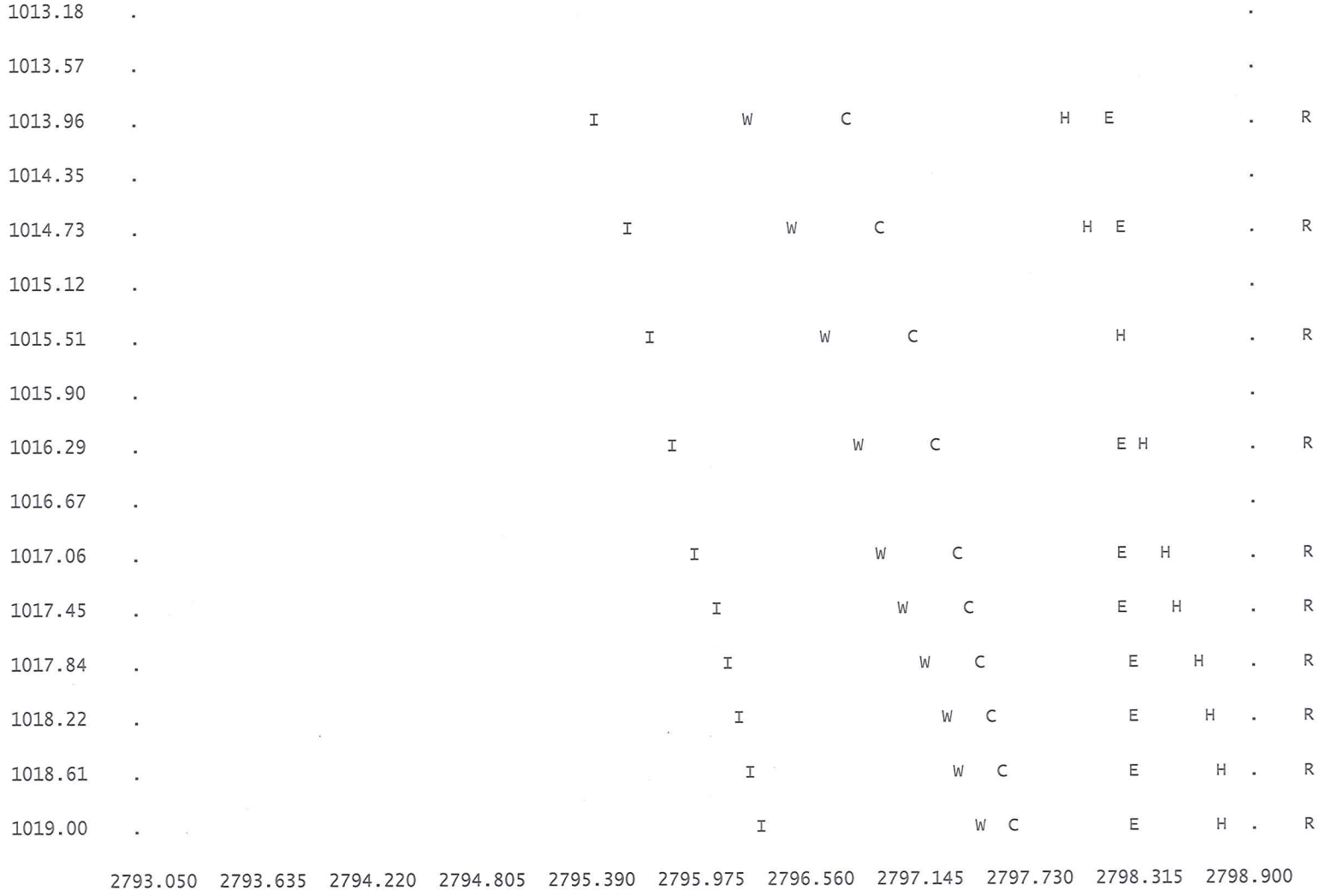
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SKYE CANYON PARCEL 1.1
BASIN ON1-D STORM DRAIN
RCP LATERAL FROM 22.5' SDDI TO SDMH#1 - DEVELOPED CONDITION

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
1018.610	2796.331	1.180	2797.511	16.50	7.24	.81	2798.32	.00	1.37	2.50	2.500	.000	.00	1 .0
.174	.1763					.0074	.00	1.18	1.33	.52	.013	.00	.00	PIPE
1018.784	2796.362	1.225	2797.587	16.50	6.90	.74	2798.33	.00	1.37	2.50	2.500	.000	.00	1 .0
.121	.1763					.0065	.00	1.22	1.24	.52	.013	.00	.00	PIPE
1018.905	2796.383	1.271	2797.655	16.50	6.58	.67	2798.33	.00	1.37	2.50	2.500	.000	.00	1 .0
.071	.1763					.0058	.00	1.27	1.16	.52	.013	.00	.00	PIPE
1018.976	2796.396	1.320	2797.716	16.50	6.27	.61	2798.33	.00	1.37	2.50	2.500	.000	.00	1 .0

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-|-      -|-      -|-      -
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```
1005.43   .          I                C              WH E                .   R
1005.82   .          I        W       C              H                E   .   R
1006.20   .                                                                .
1006.59   .            I        W       C              H                E   .   R
1006.98   .                                                                .
1007.37   .                                                                .
1007.76   .                                                                .
1008.14   .                                                                .
1008.53   .                  I        W       C              H            E   .   R
1008.92   .                                                                .
1009.31   .                                                                .
1009.69   .                                                                .
1010.08   .                     I        W       C              H        E   .   R
1010.47   .                                                                .
1010.86   .                                                                .
1011.24   .                                                                .
1011.63   .                        I        W       C              H     E   .   R
1012.02   .                                                                .
1012.41   .                                                                .
1012.80   .                           I        W       C              H  E   .   R
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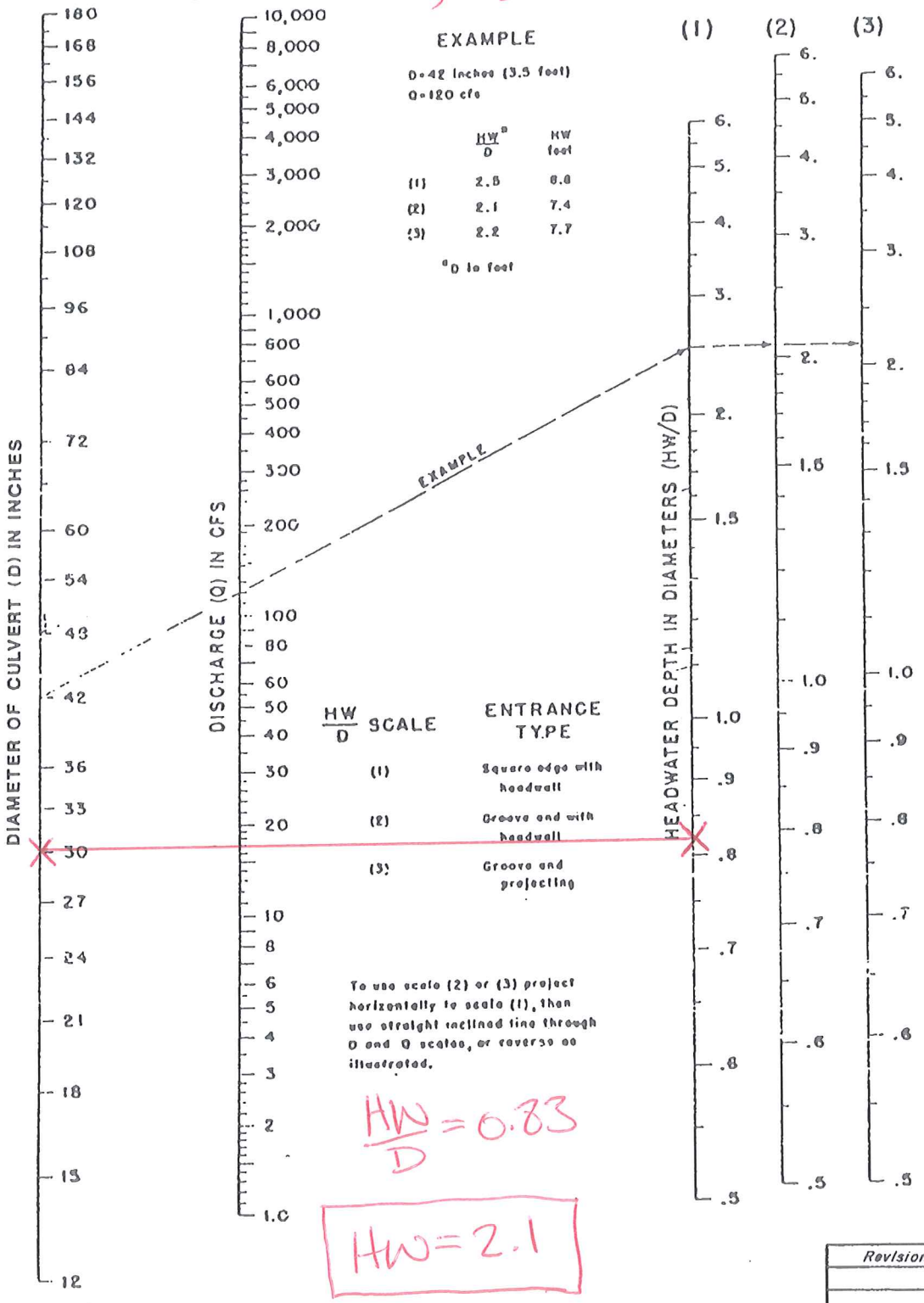
N O T E S
1. GLOSSARY
   I = INVERT ELEVATION
   C = CRITICAL DEPTH
   W = WATER SURFACE ELEVATION
   S = SUPER-ELEVATION
   H = HEIGHT OF CHANNEL
   E = ENERGY GRADE LINE

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

NOMOGRAPH – INLET CONTROL RCP

½ ON I-D(A) · DI = 16.5 cfs



Revision	Date

WRC ENGINEERING	REFERENCE: USDOT, FHWA, HDS, No. 5, 1985	FIGURE 1005

Basin ON1-D Lateral Storm Drain

Tie-In to Proposed Mainline Storm Drain from Proposed 10-ft Inlet

```
T1 SKYE CANYON PARCEL 1.1
T2 BASIN ON1-D STORM DRAIN
T3 RCP LATERAL FROM 10' SDDI TO SDMH  - DEVELOPED CONDITION
SO   1000.0002794.050 18      .013                2796.421
R    1044.8202797.400 18      .013                                  .000
SH   1044.8202797.400 18      .013
CD  18  4   1    .000   1.500     .000  .000  .000   .00
Q            3.000   .0
```

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WATER SURFACE PROFILE - CHANNEL DEFINITION LISTING PAGE 1

CARD CODE	SECT NO	CHN TYPE	NO OF PIER/PIP	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		1.500														

W S P G W PAGE NO 1

WATER SURFACE PROFILE - TITLE CARD LISTING

HEADING LINE NO 1 IS -
SKYE CANYON PARCEL 1.1

HEADING LINE NO 2 IS -
BASIN ON1-D STORM DRAIN

HEADING LINE NO 3 IS -
RCP LATERAL FROM 10' SDDI TO SDMH - DEVELOPED CONDITION

W S P G W 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
	1000.000	2794.050	18	2796.421

ELEMENT NO 2 IS A REACH * * *

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	1044.820	2797.400	18	.013	.000	.000	.000	0

ELEMENT NO 3 IS A SYSTEM HEADWORKS * *

U/S DATA	STATION	INVERT	SECT	W S ELEV
	1044.820	2797.400	18	.000

SKYE CANYON PARCEL 1.1
BASIN ON1-D STORM DRAIN
RCP LATERAL FROM 10' SDDI TO SDMH - DEVELOPED CONDITION

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head / SF Ave	Energy Grd.El. / HF	Super Elev / SE Dpth	Critical Depth / Froude N	Flow Top Width / Norm Dp	Height/ Dia.-FT / "N"	Base Wt or I.D. / X-Fall	ZL / ZR	No Wth Prs/Pip / Type Ch
1000.000	2794.050	2.371	2796.421	3.00	1.70	.04	2796.47	.00	.66	.00	1.500	.000	.00	1 .0
11.780	.0747					.0008	.01	2.37	.00	.33	.013	.00	.00	PIPE
1011.780	2794.930	1.500	2796.430	3.00	1.70	.04	2796.48	.00	.66	.00	1.500	.000	.00	1 .0
1.806	.0747					.0008	.00	1.50	.00	.33	.013	.00	.00	PIPE
1013.586	2795.065	1.361	2796.426	3.00	1.78	.05	2796.48	.00	.66	.87	1.500	.000	.00	1 .0
1.025	.0747					.0007	.00	1.36	.23	.33	.013	.00	.00	PIPE
1014.612	2795.142	1.280	2796.422	3.00	1.87	.05	2796.48	.00	.66	1.06	1.500	.000	.00	1 .0
.827	.0747					.0008	.00	1.28	.27	.33	.013	.00	.00	PIPE
1015.439	2795.204	1.214	2796.417	3.00	1.96	.06	2796.48	.00	.66	1.18	1.500	.000	.00	1 .0
.608	.0747					.0009	.00	1.21	.30	.33	.013	.00	.00	PIPE
1016.047	2795.249	1.155	2796.405	3.00	2.05	.07	2796.47	.00	.66	1.26	1.500	.000	.00	1 .0
HYDRAULIC JUMP														
1016.047	2795.249	.340	2795.590	3.00	9.96	1.54	2797.13	.00	.66	1.26	1.500	.000	.00	1 .0
6.945	.0747					.0599	.42	.34	3.58	.33	.013	.00	.00	PIPE
1022.991	2795.769	.352	2796.121	3.00	9.49	1.40	2797.52	.00	.66	1.27	1.500	.000	.00	1 .0
5.150	.0747					.0524	.27	.35	3.36	.33	.013	.00	.00	PIPE
1028.141	2796.153	.364	2796.517	3.00	9.05	1.27	2797.79	.00	.66	1.29	1.500	.000	.00	1 .0
3.566	.0747					.0458	.16	.36	3.14	.33	.013	.00	.00	PIPE

SKYE CANYON PARCEL 1.1
BASIN ON1-D STORM DRAIN
RCP LATERAL FROM 10' SDDI TO SDMH - DEVELOPED CONDITION

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head / SF Ave	Energy Grd.El. / HF	Super Elev / SE Dpth	Critical Depth / Froude N	Flow Top Width / Norm Dp	Height/ Dia.-FT / "N"	Base Wt or I.D. / X-Fall	ZL / ZR	No Wth Prs/Pip / Type Ch

1031.707	2796.420	.377	2796.797	3.00	8.63	1.16	2797.95	.00	.66	1.30	1.500	.000	.00	1	.0
2.660	.0747					.0401	.11	.38	2.94	.33	.013	.00	.00	PIPE	
1034.367	2796.619	.390	2797.008	3.00	8.23	1.05	2798.06	.00	.66	1.32	1.500	.000	.00	1	.0
2.068	.0747					.0350	.07	.39	2.75	.33	.013	.00	.00	PIPE	
1036.435	2796.773	.403	2797.176	3.00	7.85	.96	2798.13	.00	.66	1.33	1.500	.000	.00	1	.0
1.656	.0747					.0307	.05	.40	2.58	.33	.013	.00	.00	PIPE	
1038.092	2796.897	.417	2797.314	3.00	7.48	.87	2798.18	.00	.66	1.34	1.500	.000	.00	1	.0
1.346	.0747					.0268	.04	.42	2.41	.33	.013	.00	.00	PIPE	
1039.438	2796.998	.431	2797.429	3.00	7.13	.79	2798.22	.00	.66	1.36	1.500	.000	.00	1	.0
1.107	.0747					.0235	.03	.43	2.26	.33	.013	.00	.00	PIPE	
1040.545	2797.080	.447	2797.527	3.00	6.80	.72	2798.25	.00	.66	1.37	1.500	.000	.00	1	.0
.917	.0747					.0206	.02	.45	2.11	.33	.013	.00	.00	PIPE	
1041.462	2797.149	.462	2797.611	3.00	6.48	.65	2798.26	.00	.66	1.39	1.500	.000	.00	1	.0
.761	.0747					.0180	.01	.46	1.98	.33	.013	.00	.00	PIPE	
1042.223	2797.206	.478	2797.684	3.00	6.18	.59	2798.28	.00	.66	1.40	1.500	.000	.00	1	.0
.629	.0747					.0158	.01	.48	1.85	.33	.013	.00	.00	PIPE	
1042.851	2797.253	.495	2797.748	3.00	5.90	.54	2798.29	.00	.66	1.41	1.500	.000	.00	1	.0
.518	.0747					.0138	.01	.50	1.73	.33	.013	.00	.00	PIPE	

Program Package Serial Number: 1704

WATER SURFACE PROFILE LISTING

Date: 6-24-2014 Time: 2:49:20

SKYE CANYON PARCEL 1.1
BASIN ON1-D STORM DRAIN
RCP LATERAL FROM 10' SDDI TO SDMH - DEVELOPED CONDITION

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
1043.369	2797.292	.513	2797.804	3.00	5.62	.49	2798.29	.00	.66	1.42	1.500	.000	.00	1 .0
.422	.0747					.0121	.01	.51	1.62	.33	.013	.00	.00	PIPE
1043.791	2797.323	.531	2797.854	3.00	5.36	.45	2798.30	.00	.66	1.43	1.500	.000	.00	1 .0
.336	.0747					.0106	.00	.53	1.51	.33	.013	.00	.00	PIPE
1044.127	2797.348	.550	2797.898	3.00	5.11	.41	2798.30	.00	.66	1.45	1.500	.000	.00	1 .0
.262	.0747					.0093	.00	.55	1.41	.33	.013	.00	.00	PIPE
1044.389	2797.368	.570	2797.937	3.00	4.87	.37	2798.31	.00	.66	1.46	1.500	.000	.00	1 .0

.194	.0747					.0082	.00	.57	1.32	.33	.013	.00	.00	PIPE			
1044.583	2797.382	.590	2797.972	3.00	4.65	.34	2798.31	.00	.66	1.47	1.500	.000	.00	1	.0		
.133	.0747					.0072	.00	.59	1.23	.33	.013	.00	.00	PIPE			
1044.715	2797.392	.612	2798.004	3.00	4.43	.30	2798.31	.00	.66	1.47	1.500	.000	.00	1	.0		
.079	.0747					.0063	.00	.61	1.15	.33	.013	.00	.00	PIPE			
1044.794	2797.398	.634	2798.032	3.00	4.22	.28	2798.31	.00	.66	1.48	1.500	.000	.00	1	.0		
.026	.0747					.0055	.00	.63	1.07	.33	.013	.00	.00	PIPE			
1044.820	2797.400	.658	2798.058	3.00	4.02	.25	2798.31	.00	.66	1.49	1.500	.000	.00	1	.0		

SKYE CANYON PARCEL 1.1

BASIN ON1-D STORM DRAIN

RCP LATERAL FROM 10' SDDI TO SDMH - DEVELOPED CONDITION

1000.00	.I	C	H	WE	. R
1000.88	.				.
1001.76	.				.
1002.64	.				.
1003.52	.				.
1004.39	.				.
1005.27	.				.
1006.15	.				.
1007.03	.				.
1007.91	.				.

WSPGD Value controls.
Use 2798.06 for HGL

```
1008.79    .                                                                .
1009.67    .                                                                .
1010.55    .                                                                .
1011.42    .                                                                .
1012.30    .              I          C             HE                       .   R
1013.18    .                                                                .
1014.06    .               I          C           W EH                       .   R
1014.94    .                I         C           W E  H                     .   R
1015.82    .                 I        C           W E   H                    .   R
1016.70    .                  I       C           WE     H                   .   R
1017.58    .                  I   W   C                  H      E            .   R
1018.46    .                                                                .
1019.33    .                                                                .
1020.21    .                                                                .
1021.09    .                                                                .
1021.97    .                                                                .
1022.85    .                                                                .
1023.73    .                      I   W   C                  H   E          .   R
1024.61    .                                                                .
1025.49    .                                                                .
```

```
1026.36    .                                                                .
1027.24    .                                                                .
1028.12    .                                                                .
1029.00    .                I      W     C               H  E               .    R
1029.88    .                                                                .
1030.76    .                                                                .
1031.64    .                                                                .
1032.52    .                   I       W     C               HE             .    R
1033.40    .                                                                .
1034.27    .                                                                .
1035.15    .                      I       W     C              EH            .    R
1036.03    .                                                                .
1036.91    .                         I       W    C             E  H         .    R
1037.79    .                                                                .
1038.67    .                            I       W    C           E   H       .    R
1039.55    .                               I       W    C         E     H     .    R
1040.43    .                                                                .
1041.30    .                                  I       W    C        E     H   .    R
1042.18    .                                     I       W   C        E      H  .    R
1043.06    .                                        I       W  C        E       H .    R
1043.94    .                                           I       W C       E       H.    R
```

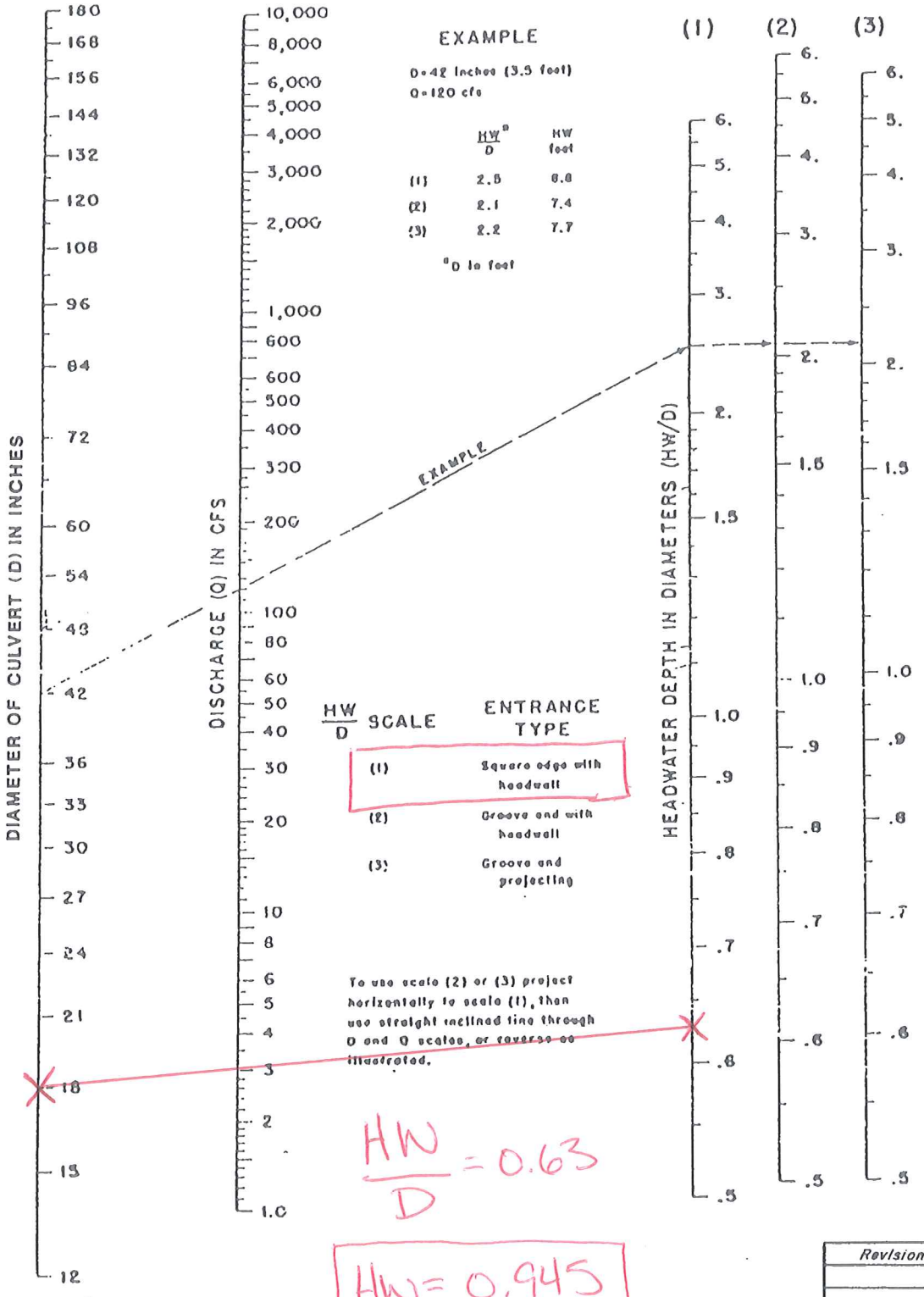
1044.82 . I W C E H . R

2794.050 2794.535 2795.020 2795.505 2795.990 2796.474 2796.959 2797.444 2797.929 2798.414 2798.900

N O T E S
1. GLOSSARY
   I = INVERT ELEVATION
   C = CRITICAL DEPTH
   W = WATER SURFACE ELEVATION
   S = SUPER-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

NOMOGRAPH – INLET CONTROL RCP

ON1-D(C) DI = 3.0cfs



$\frac{HW}{D} = 0.63$

HW = 0.945

Revision	Date

WRC ENGINEERING

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

FIGURE 1005

Basin ON2-D Storm Drain

Tie-In to Existing Racel Trunk Line Lateral from Proposed Sump Inlet

```
T1 SKYE CANYON PARCEL 1.1
T2 BASIN ON2-D STORM DRAIN
T3 RCP FROM SUMP INLET TO EXISTING TRUNK LINE IN RACEL - DEVELOPED CONDITION
SO   1000.0002792.220 36      .013                  2793.194
R    1028.4702795.280 36      .013                                .000  44.000
JX   1028.4702795.280 36 36   .013    5.000         2795.280       90.0         .000
R    1052.1202795.520 36      .013                                .000  49.000 1
R    1088.3302795.880 36      .013                                .000
SH   1088.3302795.880 36      .013
CD  36  4   1    .000   3.000     .000  .000  .000   .00
Q            39.000   .0
```

CARD CODE	SECT NO	CHN TYPE	NO OF PIER/PIP	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	36	4	1		3.000														

WATER SURFACE PROFILE - TITLE CARD LISTING

HEADING LINE NO 1 IS -
SKYE CANYON PARCEL 1.1

HEADING LINE NO 2 IS -
BASIN ON2-D STORM DRAIN

HEADING LINE NO 3 IS -
RCP FROM SUMP INLET TO EXISTING TRUNK LINE IN RACEL - DEVELOPED CONDITION

WATER SURFACE PROFILE - ELEMENT CARD LISTING

ELEMENT NO 1 IS A SYSTEM OUTLET * * *

U/S DATA	STATION	INVERT	SECT	W S ELEV
	1000.000	2792.220	36	2793.194

ELEMENT NO 2 IS A REACH * * *

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	1028.470	2795.280	36	.013	.000	.000	44.000	0

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
	1028.470	2795.280	36	36	0	.013	5.000	.000	2795.280	.000	90.000	.000

RADIUS	ANGLE
.000	.000

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
	1052.120	2795.520	36	.013	.000	.000	49.000	1

ELEMENT NO 5 IS A REACH * * *

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	1088.330	2795.880	36	.013	.000	.000	.000	0

ELEMENT NO 6 IS A SYSTEM HEADWORKS * *

U/S DATA	STATION	INVERT	SECT	W S ELEV
	1088.330	2795.880	36	.000

SKYE CANYON PARCEL 1.1
BASIN ON2-D STORM DRAIN
RCP FROM SUMP INLET TO EXISTING TRUNK LINE IN RACEL - DEVELOPED CONDIT

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head / SF Ave	Energy Grd.El. / HF	Super Elev / SE Dpth	Critical Depth / Froude N	Flow Top Width / Norm Dp	Height/ Dia.-FT / "N"	Base Wt or I.D. / X-Fall	ZL / ZR	No Wth Prs/Pip / Type Ch
1000.000	2792.220	1.196	2793.416	44.00	16.74	4.35	2797.77	.00	2.16	2.94	3.000	.000	.00	1 .0
1.535	.1075					.0381	.06	1.20	3.12	.91	.013	.00	.00	PIPE
1001.535	2792.385	1.209	2793.593	44.00	16.51	4.23	2797.82	.00	2.16	2.94	3.000	.000	.00	1 .0
4.702	.1075					.0351	.16	1.21	3.06	.91	.013	.00	.00	PIPE
1006.237	2792.890	1.253	2794.143	44.00	15.74	3.85	2797.99	.00	2.16	2.96	3.000	.000	.00	1 .0
3.959	.1075					.0308	.12	1.25	2.85	.91	.013	.00	.00	PIPE
1010.196	2793.316	1.299	2794.614	44.00	15.01	3.50	2798.11	.00	2.16	2.97	3.000	.000	.00	1 .0
3.354	.1075					.0270	.09	1.30	2.66	.91	.013	.00	.00	PIPE
1013.550	2793.676	1.347	2795.023	44.00	14.31	3.18	2798.20	.00	2.16	2.98	3.000	.000	.00	1 .0
2.853	.1075					.0238	.07	1.35	2.48	.91	.013	.00	.00	PIPE
1016.403	2793.983	1.397	2795.380	44.00	13.64	2.89	2798.27	.00	2.16	2.99	3.000	.000	.00	1 .0
2.428	.1075					.0209	.05	1.40	2.32	.91	.013	.00	.00	PIPE
1018.831	2794.244	1.449	2795.693	44.00	13.01	2.63	2798.32	.00	2.16	3.00	3.000	.000	.00	1 .0
2.063	.1075					.0184	.04	1.45	2.16	.91	.013	.00	.00	PIPE
1020.893	2794.466	1.505	2795.970	44.00	12.40	2.39	2798.36	.00	2.16	3.00	3.000	.000	.00	1 .0
1.747	.1075					.0162	.03	1.50	2.01	.91	.013	.00	.00	PIPE
1022.640	2794.653	1.562	2796.216	44.00	11.82	2.17	2798.39	.00	2.16	3.00	3.000	.000	.00	1 .0
1.467	.1075					.0143	.02	1.56	1.87	.91	.013	.00	.00	PIPE

SKYE CANYON PARCEL 1.1
BASIN ON2-D STORM DRAIN
RCP FROM SUMP INLET TO EXISTING TRUNK LINE IN RACEL - DEVELOPED CONDIT

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head / SF Ave	Energy Grd.El. / HF	Super Elev / SE Dpth	Critical Depth / Froude N	Flow Top Width / Norm Dp	Height/ Dia.-FT / "N"	Base Wt or I.D. / X-Fall	ZL / ZR	No Wth Prs/Pip / Type Ch

1024.107	2794.811	1.623	2796.434	44.00	11.27	1.97	2798.41	.00	2.16	2.99	3.000	.000	.00	1 .0
1.219	.1075					.0126	.02	1.62	1.74	.91	.013	.00	.00	PIPE
1025.325	2794.942	1.687	2796.629	44.00	10.75	1.79	2798.42	.00	2.16	2.98	3.000	.000	.00	1 .0
.995	.1075					.0111	.01	1.69	1.62	.91	.013	.00	.00	PIPE
1026.320	2795.049	1.754	2796.803	44.00	10.25	1.63	2798.43	.00	2.16	2.96	3.000	.000	.00	1 .0
.790	.1075					.0098	.01	1.75	1.50	.91	.013	.00	.00	PIPE
1027.109	2795.134	1.825	2796.959	44.00	9.77	1.48	2798.44	.00	2.16	2.93	3.000	.000	.00	1 .0
.601	.1075					.0087	.01	1.83	1.39	.91	.013	.00	.00	PIPE
1027.710	2795.198	1.901	2797.099	44.00	9.32	1.35	2798.45	.00	2.16	2.89	3.000	.000	.00	1 .0
.423	.1075					.0077	.00	1.90	1.28	.91	.013	.00	.00	PIPE
1028.133	2795.244	1.981	2797.225	44.00	8.88	1.23	2798.45	.00	2.16	2.84	3.000	.000	.00	1 .0
.253	.1075					.0069	.00	1.98	1.19	.91	.013	.00	.00	PIPE
1028.385	2795.271	2.067	2797.338	44.00	8.47	1.11	2798.45	.00	2.16	2.78	3.000	.000	.00	1 .0
.085	.1075					.0061	.00	2.07	1.09	.91	.013	.00	.00	PIPE
1028.470	2795.280	2.161	2797.441	44.00	8.07	1.01	2798.45	.00	2.16	2.69	3.000	.000	.00	1 .0
JUNCT STR	.0000					.0044	.00	2.16	1.00		.013	.00	.00	PIPE
1028.470	2795.280	2.840	2798.120	39.00	5.63	.49	2798.61	.00	2.03	1.35	3.000	.000	.00	1 .0
20.225	.0101					.0030	.06	2.84	.44	1.64	.013	.00	.00	PIPE

Program Package Serial Number: 1704

WATER SURFACE PROFILE LISTING Date: 6-24-2014 Time: 1:43:51

SKYE CANYON PARCEL 1.1
BASIN ON2-D STORM DRAIN
RCP FROM SUMP INLET TO EXISTING TRUNK LINE IN RACEL - DEVELOPED CONDIT

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
1048.695	2795.485	2.647	2798.132	39.00	5.91	.54	2798.67	.00	2.03	1.93	3.000	.000	.00	1 .0
3.425	.0101					.0031	.01	2.65	.56	1.64	.013	.00	.00	PIPE
1052.120	2795.520	2.611	2798.131	39.00	5.97	.55	2798.68	.00	2.03	2.02	3.000	.000	.00	1 .0
12.792	.0099					.0033	.04	2.61	.58	1.65	.013	.00	.00	PIPE
1064.911	2795.647	2.470	2798.117	39.00	6.26	.61	2798.73	.00	2.03	2.29	3.000	.000	.00	1 .0
9.523	.0099					.0036	.03	2.47	.67	1.65	.013	.00	.00	PIPE
1074.434	2795.742	2.349	2798.091	39.00	6.57	.67	2798.76	.00	2.03	2.47	3.000	.000	.00	1 .0

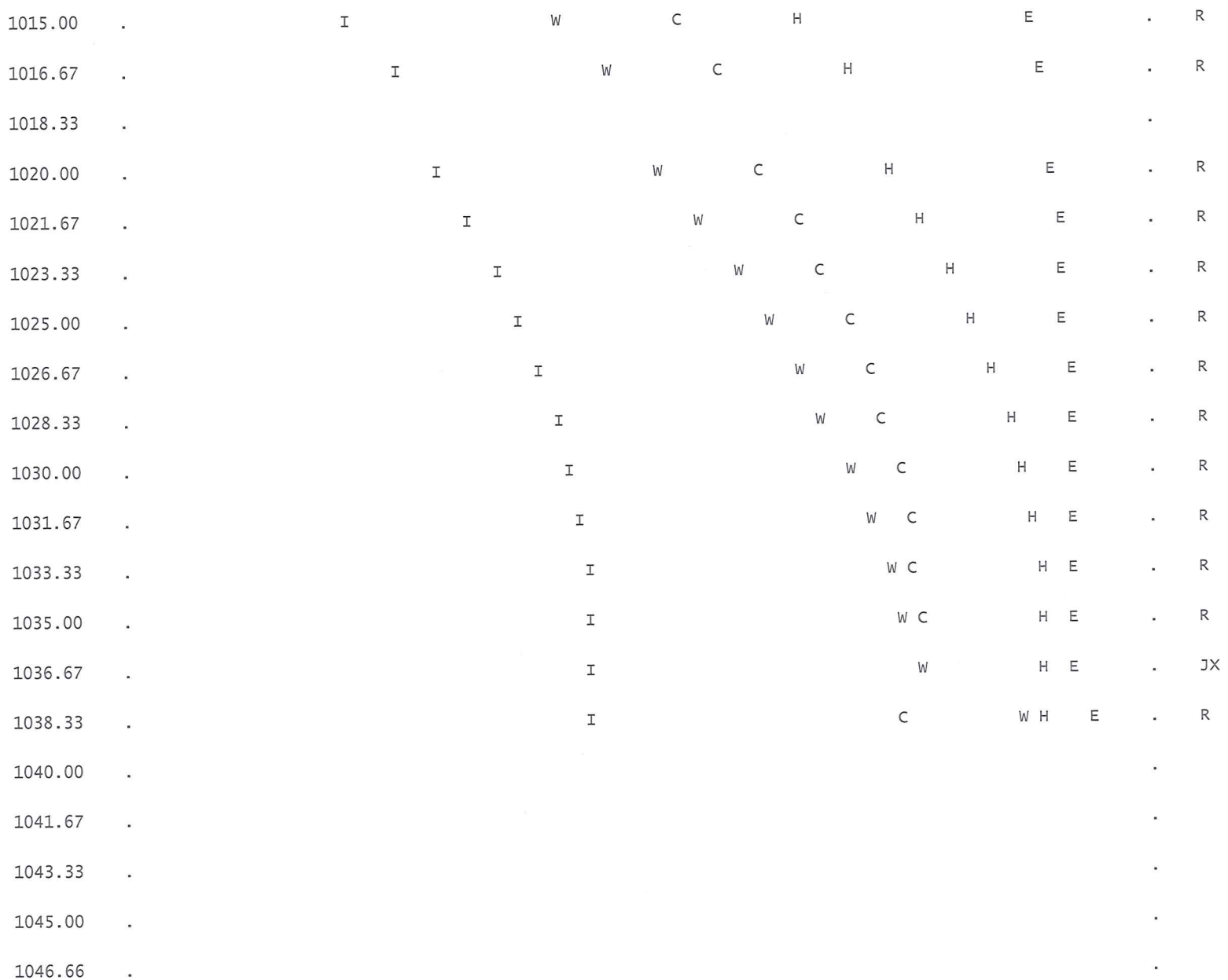
6.943	.0099					.0039	.03	2.35	.75	1.65	.013	.00	.00	PIPE	
1081.377	2795.811	2.240	2798.051	39.00	6.89	.74	2798.79	.00	2.03	2.61	3.000	.000	.00	1	.0
4.566	.0099					.0044	.02	2.24	.82	1.65	.013	.00	.00	PIPE	
1085.943	2795.856	2.141	2797.998	39.00	7.23	.81	2798.81	.00	2.03	2.71	3.000	.000	.00	1	.0
.824	.0099					.0049	.00	2.14	.90	1.65	.013	.00	.00	PIPE	
1086.767	2795.865	2.050	2797.915	39.00	7.58	.89	2798.81	.00	2.03	2.79	3.000	.000	.00	1	.0
HYDRAULIC JUMP															
1086.767	2795.865	1.948	2797.813	39.00	8.03	1.00	2798.81	.00	2.03	2.86	3.000	.000	.00	1	.0
1.563	.0099					.0057	.01	1.95	1.09	1.65	.013	.00	.00	PIPE	
1088.330	2795.880	2.033	2797.913	39.00	7.65	.91	2798.82	.00	2.03	2.80	3.000	.000	.00	1	.0

SKYE CANYON PARCEL 1.1

BASIN ON2-D STORM DRAIN

RCP FROM SUMP INLET TO EXISTING TRUNK LINE IN RACEL - DEVELOPED CONDIT

| | | | | | | | | | | | | | | |


1015.00 . I W C H E . R
1016.67 . I W C H E . R
1018.33 .
1020.00 . I W C H E . R
1021.67 . I W C H E . R
1023.33 . I W C H E . R
1025.00 . I W C H E . R
1026.67 . I W C H E . R
1028.33 . I W C H E . R
1030.00 . I W C H E . R
1031.67 . I W C H E . R
1033.33 . I W C H E . R
1035.00 . I W C H E . R
1036.67 . I W H E . JX
1038.33 . I C W H E . R
1040.00 .
1041.67 .
1043.33 .
1045.00 .
1046.66 .

```
1048.33    .                                                          .
1050.00    .                I                C        W     H E    .    R
1051.66    .                                                          .
1053.33    .                I                C        W     H  E   .    R
1055.00    .                                                          .
1056.66    .                                                          .
1058.33    .                                                          .
1060.00    .                                                          .
1061.66    .                                                          .
1063.33    .                                                          .
1065.00    .                  I              C        W       HE   .    R
1066.66    .                                                          .
1068.33    .                                                          .
1070.00    .                                                          .
1071.66    .                                                          .
1073.33    .                                                          .
1075.00    .                  I              C    W         HE   .    R
1076.66    .                                                          .
1078.33    .                                                          .
1080.00    .                                                          .
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```
1081.66    .                                                  I                                  C  W            H  .     R

1083.33    .                                                                                                        .

1085.00    .                                                                                                        .

1086.66    .                                                  I                                  CW             EH .     R

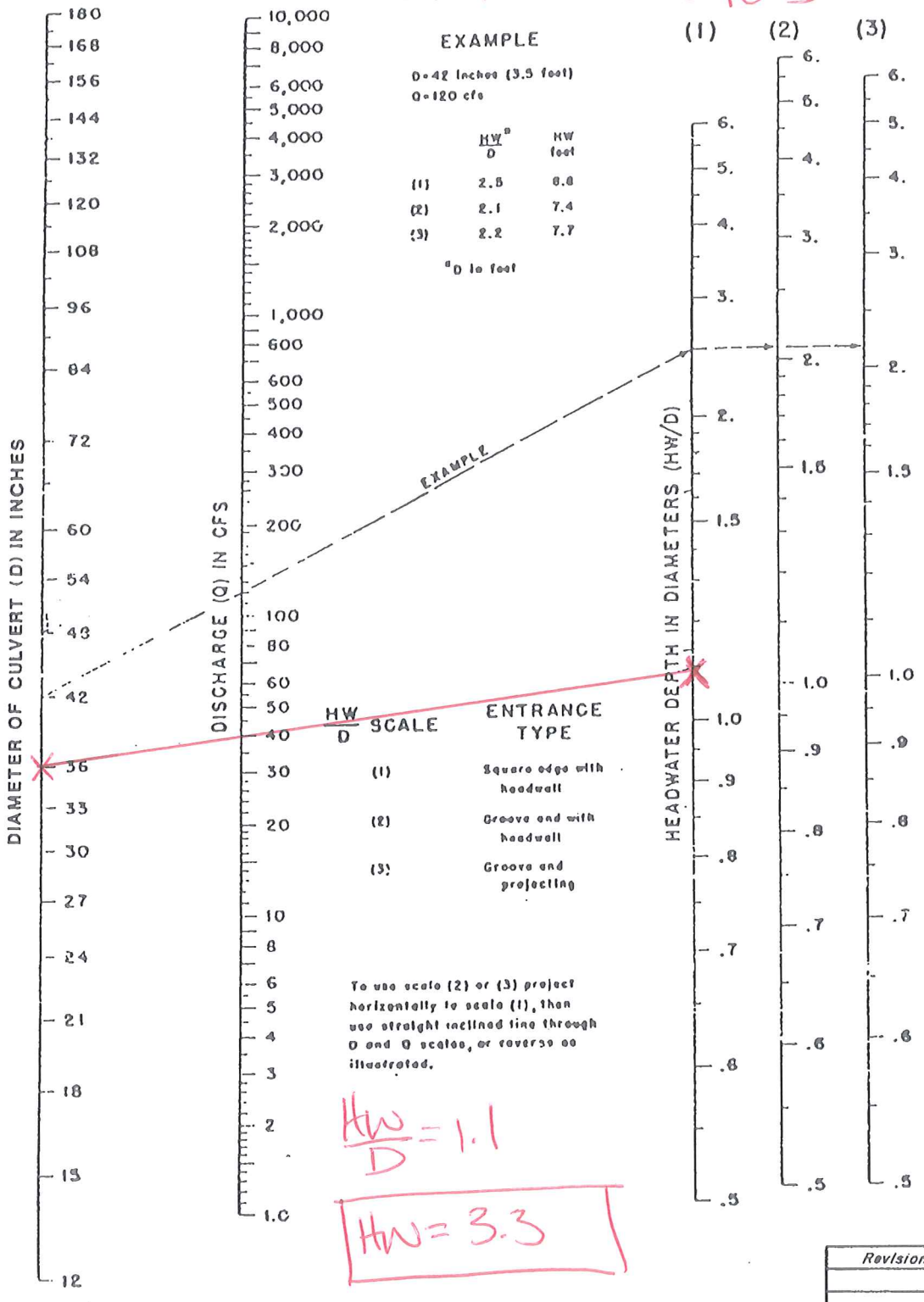
1088.33    .                                                  I                                  W              EH .     R

          2792.220  2792.886  2793.552  2794.218  2794.884  2795.550  2796.216  2796.882  2797.548  2798.214  2798.880
```

N O T E S
1. GLOSSARY
   I = INVERT ELEVATION
   C = CRITICAL DEPTH
   W = WATER SURFACE ELEVATION
   S = SUPER-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

NOMOGRAPH – INLET CONTROL RCP

ON2-D Sump DI = 39cfs



Revision	Date

WRC ENGINEERING	REFERENCE: USDOT, FHWA, HDS, No. 5, 1985	FIGURE 1005

APPENDIX F

Finished Floor Analysis

Design Street Flows

SKYE CANYON - PARCEL 1.1
FINISH FLOOR - CITY OF LAS VEGAS JURISDICTION

INPUT INFORMATION					FINISHED FLOORS					NOTES
Lot Number	Hydraulic Section Utilized	T/C[1] (ft)	F/L[2] (ft)	D_{100} (ft)	Flowline F.F.$_{min}$[3] (ft)	T/C + 6" F.F.$_{min}$[4] (ft)	F.F.$_{Design}$ (ft)	Flowline Check	T/C + 6" Check	See References on Last Sheet
1	1-2	2808.53	2808.15	0.35	2808.85	2809.03	2810.5	OK	OK	
2	1-2	2810.26	2809.88	0.35	2810.58	2810.76	2812.2	OK	OK	
3	1-2	2812.05	2811.67	0.35	2812.37	2812.55	2814.0	OK	OK	
4	1-2	2813.58	2813.20	0.35	2813.90	2814.08	2815.5	OK	OK	
5	1-2	2814.58	2814.20	0.35	2814.90	2815.08	2816.5	OK	OK	
6	1-2	2815.55	2815.17	0.35	2815.87	2816.05	2817.4	OK	OK	
7	1-2	2815.55	2815.17	0.35	2815.87	2816.05	2817.9	OK	OK	
8	1-2	2815.11	2814.73	0.35	2815.43	2815.61	2817.1	OK	OK	
9	1-2	2812.93	2812.55	0.35	2813.25	2813.43	2814.9	OK	OK	
10	1-2	2811.41	2811.03	0.35	2811.73	2811.91	2813.4	OK	OK	
11	1-2	2824.21	2823.83	0.35	2824.53	2824.71	2826.2	OK	OK	
12	1-2	2824.94	2824.56	0.35	2825.26	2825.44	2826.9	OK	OK	
13	1-2	2825.99	2825.61	0.35	2826.31	2826.49	2827.9	OK	OK	
14	1-2	2826.62	2826.24	0.35	2826.94	2827.12	2828.6	OK	OK	
15	1-2	2826.78	2826.40	0.35	2827.10	2827.28	2828.7	OK	OK	
16	1-2	2826.10	2825.72	0.35	2826.42	2826.60	2828.1	OK	OK	
17	1-2	2824.84	2824.46	0.35	2825.16	2825.34	2826.8	OK	OK	
18	1-2	2824.11	2823.73	0.35	2824.43	2824.61	2826.1	OK	OK	
19	1-2	2822.94	2822.56	0.35	2823.26	2823.44	2825.3	OK	OK	
20	1-2	2822.80	2822.42	0.35	2823.12	2823.30	2825.2	OK	OK	
21	1-2	2822.09	2821.71	0.35	2822.41	2822.59	2823.2	OK	OK	
22	1-2	2819.01	2818.63	0.35	2819.33	2819.51	2821.0	OK	OK	
23	1-2	2816.41	2816.03	0.35	2816.73	2816.91	2818.3	OK	OK	
24	1-2	2814.02	2813.64	0.35	2814.34	2814.52	2816.0	OK	OK	
25	1-2	2811.61	2811.23	0.35	2811.93	2812.11	2813.5	OK	OK	
26	1-1	2811.40	2811.02	0.45	2811.92	2811.90	2813.4	OK	OK	
27	1-1	2813.34	2812.96	0.45	2813.86	2813.84	2815.3	OK	OK	
28	1-1	2816.11	2815.73	0.45	2816.63	2816.61	2818.1	OK	OK	
29	1-1	2818.01	2817.63	0.45	2818.53	2818.51	2820.0	OK	OK	
30	1-1	2819.91	2819.53	0.45	2820.43	2820.41	2821.9	OK	OK	
31	1-1	2821.82	2821.44	0.45	2822.34	2822.32	2823.8	OK	OK	
32	1-1	2823.72	2823.34	0.45	2824.24	2824.22	2825.7	OK	OK	
33	1-1	2825.62	2825.24	0.45	2826.14	2826.12	2827.6	OK	OK	

SKYE CANYON - PARCEL 1.1 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
34	1-1	2827.52	2827.14	0.45	2828.04	2828.02	2829.5	OK	OK	
35	1-1	2828.95	2828.57	0.45	2829.47	2829.45	2830.7	OK	OK	
36	1-1	2832.40	2832.02	0.45	2832.92	2832.90	2834.5	OK	OK	
37	1-1	2832.82	2832.44	0.45	2833.34	2833.32	2834.9	OK	OK	
38	1-1	2833.74	2833.36	0.45	2834.26	2834.24	2835.5	OK	OK	
39	1-1	2834.89	2834.51	0.45	2835.41	2835.39	2836.8	OK	OK	
40	1-1	2835.45	2835.07	0.45	2835.97	2835.95	2837.4	OK	OK	
41	1-1	2835.89	2835.51	0.45	2836.41	2836.39	2837.8	OK	OK	
42	1-1	2836.56	2836.18	0.45	2837.08	2837.06	2838.5	OK	OK	
43	1-1	2839.61	2839.23	0.45	2840.13	2840.11	2841.3	OK	OK	
44	1-1	2842.84	2842.46	0.45	2843.36	2843.34	2844.5	OK	OK	
45	1-1	2844.96	2844.58	0.45	2845.48	2845.46	2846.9	OK	OK	
46	1-1	2846.14	2845.76	0.45	2846.66	2846.64	2848.1	OK	OK	
47	1-1	2847.70	2847.32	0.45	2848.22	2848.20	2849.7	OK	OK	
48	1-1	2848.79	2848.41	0.45	2849.31	2849.29	2850.5	OK	OK	
49	1-1	2847.32	2846.94	0.45	2847.84	2847.82	2848.5	OK	OK	
50	1-1	2846.12	2845.74	0.45	2846.64	2846.62	2848.1	OK	OK	
51	1-1	2844.87	2844.49	0.45	2845.39	2845.37	2846.8	OK	OK	
52	1-1	2843.61	2843.23	0.45	2844.13	2844.11	2845.6	OK	OK	
53	1-1	2842.33	2841.95	0.45	2842.85	2842.83	2844.3	OK	OK	
54	1-1	2841.06	2840.68	0.45	2841.58	2841.56	2843.1	OK	OK	
55	1-1	2841.68	2841.30	0.45	2842.20	2842.18	2843.6	OK	OK	
56	1-1	2842.96	2842.58	0.45	2843.48	2843.46	2844.9	OK	OK	
57	1-1	2844.23	2843.85	0.45	2844.75	2844.73	2846.2	OK	OK	
58	1-1	2845.74	2845.36	0.45	2846.26	2846.24	2847.7	OK	OK	
59	1-1	2846.53	2846.15	0.45	2847.05	2847.03	2848.5	OK	OK	
60	1-1	2833.07	2832.69	0.45	2833.59	2833.57	2835.2	OK	OK	
61	1-1	2832.74	2832.36	0.45	2833.26	2833.24	2834.9	OK	OK	
62	1-1	2832.43	2832.05	0.45	2832.95	2832.93	2834.6	OK	OK	
63	1-1	2832.10	2831.72	0.45	2832.62	2832.60	2834.2	OK	OK	
64	1-1	2831.75	2831.37	0.45	2832.27	2832.25	2833.9	OK	OK	
65	1-1	2842.30	2841.92	0.45	2842.82	2842.80	2844.3	OK	OK	
66	1-1	2841.06	2840.68	0.45	2841.58	2841.56	2843.0	OK	OK	

SKYE CANYON - PARCEL 1.1
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
67	1-1	2839.51	2839.13	0.45	2840.03	2840.01	2841.3	OK	OK	
68	1-1	2838.58	2838.20	0.45	2839.10	2839.08	2840.4	OK	OK	
69	1-1	2837.46	2837.08	0.45	2837.98	2837.96	2839.4	OK	OK	
70	1-1	2835.52	2835.14	0.45	2836.04	2836.02	2837.5	OK	OK	
71	1-1	2833.58	2833.20	0.45	2834.10	2834.08	2835.5	OK	OK	
72	1-1	2829.06	2828.68	0.45	2829.58	2829.56	2830.8	OK	OK	
73	1-1	2827.59	2827.21	0.45	2828.11	2828.09	2829.5	OK	OK	
74	1-1	2825.50	2825.12	0.45	2826.02	2826.00	2827.5	OK	OK	
75	1-1	2823.41	2823.03	0.45	2823.93	2823.91	2825.4	OK	OK	
76	1-1	2821.31	2820.93	0.45	2821.83	2821.81	2823.3	OK	OK	
77	1-1	2819.22	2818.84	0.45	2819.74	2819.72	2821.2	OK	OK	
78	1-1	2817.12	2816.74	0.45	2817.64	2817.62	2819.1	OK	OK	
79	1-1	2815.22	2814.84	0.45	2815.74	2815.72	2817.2	OK	OK	
80	1-1	2813.44	2813.06	0.45	2813.96	2813.94	2815.4	OK	OK	
81	1-1	2811.49	2811.11	0.45	2812.01	2811.99	2813.4	OK	OK	
82	1-1	2809.58	2809.20	0.45	2810.10	2810.08	2811.5	OK	OK	
83	1-1	2809.09	2808.71	0.45	2809.61	2809.59	2811.0	OK	OK	
84	1-1	2808.71	2808.33	0.45	2809.23	2809.21	2810.7	OK	OK	
85	1-1	2807.98	2807.60	0.45	2808.50	2808.48	2809.9	OK	OK	
86	1-1	2807.14	2806.76	0.45	2807.66	2807.64	2808.9	OK	OK	
87	2-2	2824.65	2824.27	0.36	2824.99	2825.15	2825.5	OK	OK	
88	2-2	2821.15	2820.77	0.36	2821.49	2821.65	2822.6	OK	OK	
89	2-2	2817.80	2817.42	0.36	2818.14	2818.30	2819.4	OK	OK	
90	2-2	2814.95	2814.57	0.36	2815.29	2815.45	2816.7	OK	OK	
91	2-2	2812.49	2812.11	0.36	2812.83	2812.99	2814.5	OK	OK	
92	2-2	2810.39	2810.01	0.36	2810.73	2810.89	2812.4	OK	OK	
93	2-2	2808.32	2807.94	0.36	2808.66	2808.82	2810.6	OK	OK	
94	2-2	2808.66	2808.28	0.36	2809.00	2809.16	2810.8	OK	OK	
95	2-2	2808.98	2808.60	0.36	2809.32	2809.48	2811.2	OK	OK	
96	2-2	2809.35	2808.97	0.36	2809.69	2809.85	2811.5	OK	OK	
97	2-2	2809.69	2809.31	0.36	2810.03	2810.19	2811.9	OK	OK	
98	2-2	2810.12	2809.74	0.36	2810.46	2810.62	2812.2	OK	OK	
99	2-2	2810.59	2810.21	0.36	2810.93	2811.09	2812.6	OK	OK	

SKYE CANYON - PARCEL 1.1
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
100	2-1	2812.12	2811.74	0.36	2812.46	2812.62	2814.4	OK	OK	
101	2-1	2812.02	2811.64	0.36	2812.36	2812.52	2814.1	OK	OK	
102	2-1	2811.44	2811.06	0.36	2811.78	2811.94	2813.6	OK	OK	
103	2-1	2811.68	2811.30	0.36	2812.02	2812.18	2813.5	OK	OK	
104	2-1	2812.42	2812.04	0.36	2812.76	2812.92	2814.4	OK	OK	
105	2-1	2814.28	2813.90	0.36	2814.62	2814.78	2816.2	OK	OK	
106	2-1	2816.34	2815.96	0.36	2816.68	2816.84	2818.3	OK	OK	
107	2-1	2817.93	2817.55	0.36	2818.27	2818.43	2819.9	OK	OK	
108	2-1	2819.50	2819.12	0.36	2819.84	2820.00	2821.5	OK	OK	
109	2-1	2821.07	2820.69	0.36	2821.41	2821.57	2823.0	OK	OK	
110	2-1	2822.65	2822.27	0.36	2822.99	2823.15	2824.6	OK	OK	
111	2-1	2824.22	2823.84	0.36	2824.56	2824.72	2826.2	OK	OK	
112	2-1	2825.80	2825.42	0.36	2826.14	2826.30	2827.8	OK	OK	
113	2-1	2826.92	2826.54	0.36	2827.26	2827.42	2828.9	OK	OK	
114	2-1	2830.92	2830.54	0.36	2831.26	2831.42	2832.9	OK	OK	
115	2-1	2832.53	2832.15	0.36	2832.87	2833.03	2834.5	OK	OK	
116	2-1	2834.14	2833.76	0.36	2834.48	2834.64	2836.1	OK	OK	
117	2-1	2835.75	2835.37	0.36	2836.09	2836.25	2837.7	OK	OK	
118	2-1	2837.36	2836.98	0.36	2837.70	2837.86	2839.3	OK	OK	
119	2-1	2839.44	2839.06	0.36	2839.78	2839.94	2841.2	OK	OK	
120	2-1	2840.28	2839.90	0.36	2840.62	2840.78	2842.2	OK	OK	
121	2-1	2840.23	2839.85	0.36	2840.57	2840.73	2842.2	OK	OK	
122	2-1	2839.42	2839.04	0.36	2839.76	2839.92	2841.2	OK	OK	
123	2-1	2838.22	2837.84	0.36	2838.56	2838.72	2839.6	OK	OK	
124	2-1	2836.53	2836.15	0.36	2836.87	2837.03	2838.5	OK	OK	
125	2-1	2834.91	2834.53	0.36	2835.25	2835.41	2836.9	OK	OK	
126	2-1	2833.30	2832.92	0.36	2833.64	2833.80	2836.3	OK	OK	
127	2-1	2831.69	2831.31	0.36	2832.03	2832.19	2833.6	OK	OK	
128	2-1	2830.08	2829.70	0.36	2830.42	2830.58	2832.0	OK	OK	
129	2-1	2828.47	2828.09	0.36	2828.81	2828.97	2830.4	OK	OK	
130	2-1	2826.86	2826.48	0.36	2827.20	2827.36	2828.8	OK	OK	
131	2-1	2825.19	2824.81	0.36	2825.53	2825.69	2827.1	OK	OK	
132	2-1	2822.65	2822.27	0.36	2822.99	2823.15	2824.6	OK	OK	
133	2-1	2820.88	2820.50	0.36	2821.22	2821.38	2822.8	OK	OK	

SKYE CANYON - PARCEL 1.1
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
134	2-1	2819.12	2818.74	0.36	2819.46	2819.62	2821.1	OK	OK	
135	2-1	2817.35	2816.97	0.36	2817.69	2817.85	2819.3	OK	OK	
136	2-1	2815.77	2815.39	0.36	2816.11	2816.27	2817.7	OK	OK	
137	2-1	2814.25	2813.87	0.36	2814.59	2814.75	2816.2	OK	OK	
138	2-1	2812.71	2812.33	0.36	2813.05	2813.21	2814.7	OK	OK	
139	2-2	2810.82	2810.44	0.36	2811.16	2811.32	2812.9	OK	OK	
140	2-2	2813.49	2813.11	0.36	2813.83	2813.99	2815.5	OK	OK	
141	2-2	2816.75	2816.37	0.36	2817.09	2817.25	2818.5	OK	OK	
142	2-2	2820.38	2820.00	0.36	2820.72	2820.88	2821.7	OK	OK	
143	2-2	2822.86	2822.48	0.36	2823.20	2823.36	2824.7	OK	OK	
144	2-2	2824.78	2824.40	0.36	2825.12	2825.28	2826.7	OK	OK	
145	2-2	2828.32	2827.94	0.36	2828.66	2828.82	2830.3	OK	OK	
146	2-2	2829.69	2829.31	0.36	2830.03	2830.19	2831.6	OK	OK	
147	2-2	2831.00	2830.62	0.36	2831.34	2831.50	2833.0	OK	OK	
148	2-2	2832.37	2831.99	0.36	2832.71	2832.87	2834.3	OK	OK	
149	2-2	2833.74	2833.36	0.36	2834.08	2834.24	2835.7	OK	OK	
150	2-2	2835.16	2834.78	0.36	2835.50	2835.66	2837.1	OK	OK	
151	2-2	2836.61	2836.23	0.36	2836.95	2837.11	2838.6	OK	OK	
152	2-2	2838.04	2837.66	0.36	2838.38	2838.54	2840.0	OK	OK	
153	2-2	2840.04	2839.66	0.36	2840.38	2840.54	2841.8	OK	OK	
154	2-2	2841.35	2840.97	0.36	2841.69	2841.85	2843.2	OK	OK	
155	2-2	2842.06	2841.68	0.36	2842.40	2842.56	2844.5	OK	OK	
156	2-2	2842.06	2841.68	0.36	2842.40	2842.56	2844.5	OK	OK	
157	2-2	2841.77	2841.39	0.36	2842.11	2842.27	2843.7	OK	OK	
158	2-2	2840.13	2839.75	0.36	2840.47	2840.63	2842.1	OK	OK	
159	2-2	2838.36	2837.98	0.36	2838.70	2838.86	2840.3	OK	OK	
160	2-2	2837.02	2836.64	0.36	2837.36	2837.52	2839.0	OK	OK	
161	2-2	2835.68	2835.30	0.36	2836.02	2836.18	2837.6	OK	OK	
162	2-2	2834.32	2833.94	0.36	2834.66	2834.82	2836.3	OK	OK	
163	2-2	2832.76	2832.38	0.36	2833.10	2833.26	2834.7	OK	OK	
164	2-2	2831.20	2830.82	0.36	2831.54	2831.70	2833.2	OK	OK	
165	2-2	2829.64	2829.26	0.36	2829.98	2830.14	2831.6	OK	OK	

Where:

SKYE CANYON - PARCEL 1.1
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: 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.

Supplemental Street Flow Analysis for Specific Energy Check

Other Finish Floor Checks

Specific Energy Check					
Lot Number	High FL[1]	Specific Energy[2]	Min FF[3]	Design FF	Check
2	2809.88	0.76	2810.64	2812.20	OK
67	2839.13	0.76	2839.89	2841.30	OK
84	2808.71	0.86	2809.57	2810.70	OK
85	2807.98	0.86	2808.84	2809.90	OK
94	2808.66	0.80	2809.46	2810.80	OK
95	2808.98	0.80	2809.78	2811.20	OK
99	2810.59	0.77	2811.36	2812.60	OK

Basin ON1-D(B) @ 4.67% (SE Check at Lot 2)
Worksheet for Irregular Channel

Project Description	
Worksheet	Basin ON1-D(B) @ 4.67% (SE Check at Lot 2)
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data	
Channel Slope	4.67 %
Discharge	12.00 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	0.30 ft
Elevation Range	0.00 to 0.48
Flow Area	2.2 ft²
Wetted Perimeter	20.83 ft
Top Width	20.62 ft
Actual Depth	0.30 ft
Critical Elevation	0.42 ft
Critical Slope	0.48 %
Velocity	5.45 ft/s
Velocity Head	0.46 ft
Specific Energy	0.76 ft
Froude Number	2.94
Flow Type	Supercritical

Calculation Messages:
Flow is divided.

Roughness Segments

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

Natural Channel Points

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

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Basin ON1-D(B) @ 4.67% (SE Check at Lot 2)
Worksheet for Irregular Channel

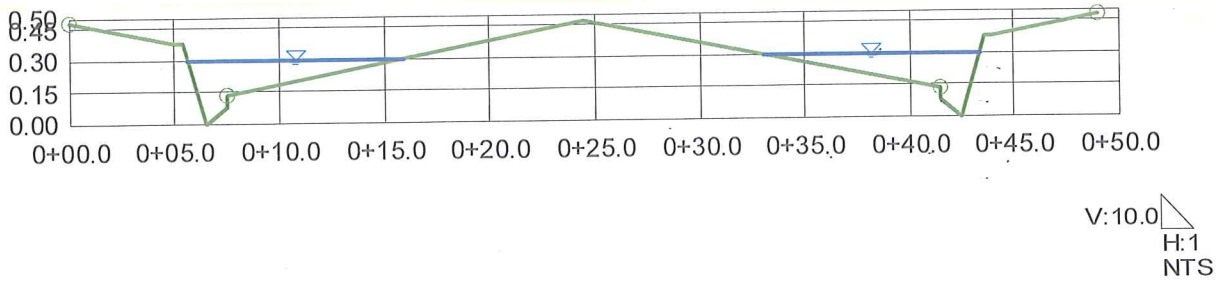
Natural Channel Points	
Station (ft)	Elevation (ft)
0+42.5	0.00
0+43.6	0.38
0+44.0	0.38
0+49.0	0.48

Notes:
Q = ON1-D(B)

Basin ON1-D(B) @ 4.67% (SE Check at Lot 2)
Cross Section for Irregular Channel

Project Description	
Worksheet	Basin ON1-D(B) @ 4.67% (SE Check at Lot 2)
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

Section Data	
Mannings Coefficient	0.013
Channel Slope	4.67 %
Water Surface Elevation	0.30 ft
Elevation Range	0.00 to 0.48
Discharge	12.00 cfs



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Basin ON1-D(A) @ 2.32% (SE Check at Lot 67)
Worksheet for Irregular Channel

Project Description	
Worksheet	Basin ON1-D(A) @ 2.32% (SE Check at Lot 67)
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Channel Slope	2.32	%
Discharge	33.00	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	0.47	ft
Elevation Range	0.00 to 0.48	
Flow Area	7.5	ft²
Wetted Perimeter	47.37	ft
Top Width	47.13	ft
Actual Depth	0.47	ft
Critical Elevation	0.55	ft
Critical Slope	0.54	%
Velocity	4.39	ft/s
Velocity Head	0.30	ft
Specific Energy	0.76	ft
Froude Number	1.93	
Flow Type	Supercritical	

Calculation Messages:
Flow is divided.

Roughness Segments

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

Natural Channel Points

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

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Basin ON1-D(A) @ 2.32% (SE Check at Lot 67)
Worksheet for Irregular Channel

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

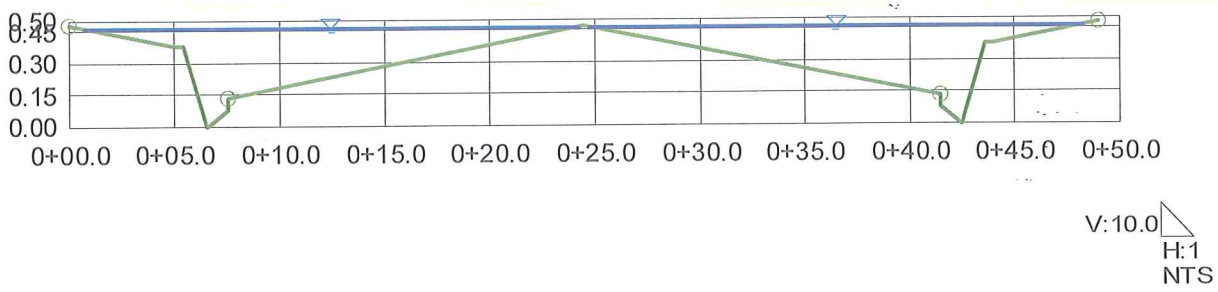
Notes:
Q = ON1-D(A)

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Basin ON1-D(A) @ 2.32% (SE Check at Lot 67)
Cross Section for Irregular Channel

Project Description	
Worksheet	Basin ON1-D(A) @ 2.32% (SE Check at Lot 67)
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

Section Data	
Mannings Coefficient	0.015
Channel Slope	2.32 %
Water Surface Elevation	0.47 ft
Elevation Range	0.00 to 0.48
Discharge	33.00 cfs



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Basin ON1-D(A) @ 3.53% (SE Check at Lots 84-85)
Worksheet for Irregular Channel

Project Description	
Worksheet	Basin ON1-D(A) @ 3.53% (SE Check at Lots 84-85)
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Channel Slope	3.53	%
Discharge	33.00	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	0.44	ft
Elevation Range	0.00 to 0.48	
Flow Area	6.3	ft²
Wetted Perimeter	41.97	ft
Top Width	41.73	ft
Actual Depth	0.44	ft
Critical Elevation	0.55	ft
Critical Slope	0.54	%
Velocity	5.22	ft/s
Velocity Head	0.42	ft
Specific Energy	0.86	ft
Froude Number	2.36	
Flow Type	Supercritical	

Calculation Messages:
Flow is divided.

Roughness Segments

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

Natural Channel Points

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

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Basin ON1-D(A) @ 3.53% (SE Check at Lots 84-85)
Worksheet for Irregular Channel

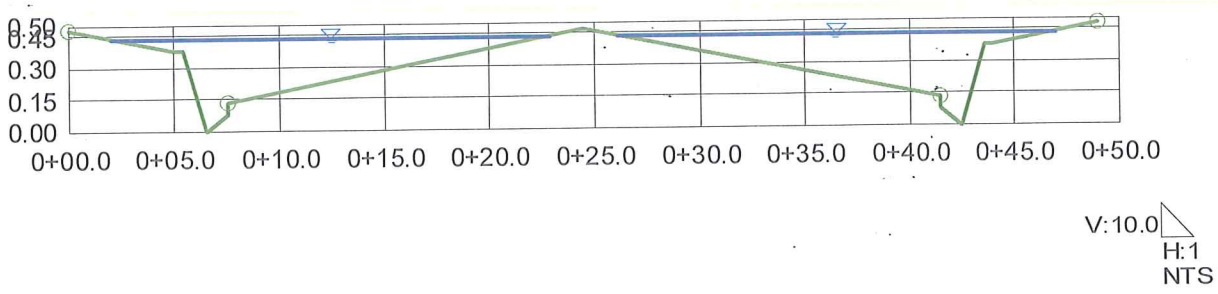
Natural Channel Points	
Station (ft)	Elevation (ft)
0+42.5	0.00
0+43.6	0.38
0+44.0	0.38
0+49.0	0.48

Notes:
Q = ON1-D(A)

Basin ON1-D(A) @ 3.53% (SE Check at Lots 84-85)
Cross Section for Irregular Channel

Project Description	
Worksheet	Basin ON1-D(A) @ 3.53% (SE Check at Lots 84-85)
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

Section Data	
Mannings Coefficient	0.015
Channel Slope	3.53 %
Water Surface Elevation	0.44 ft
Elevation Range	0.00 to 0.48
Discharge	33.00 cfs



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Basin ON2-D @ 3.65% (SE Check at Lots 94-95)
Worksheet for Irregular Channel

Project Description	
Worksheet	Basin ON2-D @ 3.65% (SE Check at Lots 94-95)
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Channel Slope	3.65	%
Discharge	19.50	cfs

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

Results		
Mannings Coefficient	0.014	
Water Surface Elevation	0.36	ft
Elevation Range	0.00 to 0.48	
Flow Area	3.7	ft²
Wetted Perimeter	27.29	ft
Top Width	27.05	ft
Actual Depth	0.36	ft
Critical Elevation	0.48	ft
Critical Slope	0.51	%
Velocity	5.34	ft/s
Velocity Head	0.44	ft
Specific Energy	0.80	ft
Froude Number	2.56	
Flow Type	Supercritical	

Calculation Messages:
Flow is divided.

Roughness Segments

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

Natural Channel Points

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

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Basin ON2-D @ 3.65% (SE Check at Lots 94-95)
Worksheet for Irregular Channel

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

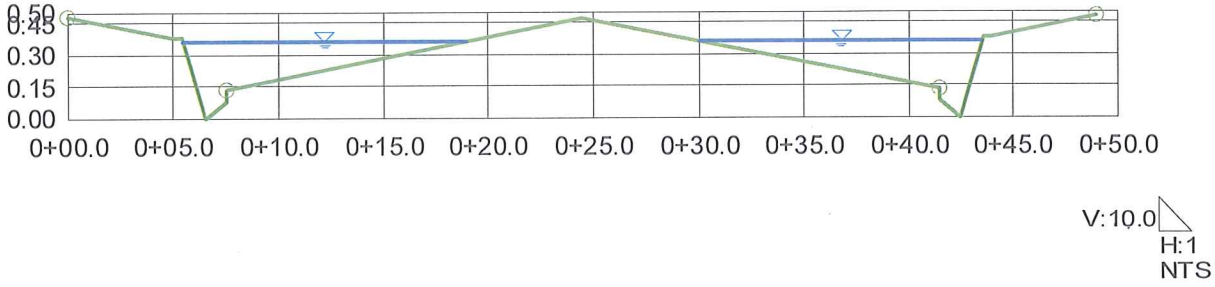
Notes:
Q = 1/2 (ON2-D)

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Basin ON2-D @ 3.65% (SE Check at Lots 94-95)
Cross Section for Irregular Channel

Project Description	
Worksheet	Basin ON2-D @ 3.65% (SE Check at Lots 94-95)
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

Section Data		
Mannings Coefficient	0.014	
Channel Slope	3.65	%
Water Surface Elevation	0.36	ft
Elevation Range	0.00 to 0.48	
Discharge	19.50	cfs



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Basin ON2-D @ 3.22% (SE Check at Lot 99)
Worksheet for Irregular Channel

Project Description	
Worksheet	Basin ON2-D @ 3.22% (SE Check at Lot 99)
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Channel Slope	3.22	%
Discharge	19.50	cfs

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

Results		
Mannings Coefficient	0.014	
Water Surface Elevation	0.37	ft
Elevation Range	0.00 to 0.48	
Flow Area	3.8	ft²
Wetted Perimeter	28.03	ft
Top Width	27.79	ft
Actual Depth	0.37	ft
Critical Elevation	0.48	ft
Critical Slope	0.52	%
Velocity	5.07	ft/s
Velocity Head	0.40	ft
Specific Energy	0.77	ft
Froude Number	2.40	
Flow Type	Supercritical	

Calculation Messages:
Flow is divided.

Roughness Segments

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

Natural Channel Points

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

Basin ON2-D @ 3.22% (SE Check at Lot 99)
Worksheet for Irregular Channel

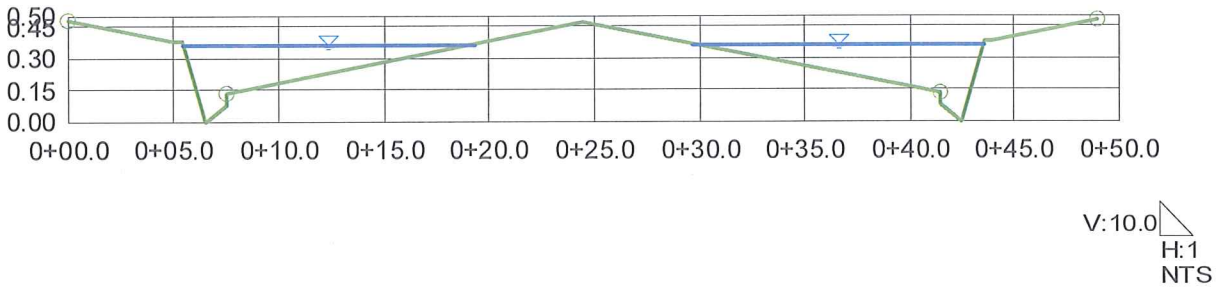
Natural Channel Points	
Station (ft)	Elevation (ft)
0+42.5	0.00
0+43.6	0.38
0+44.0	0.38
0+49.0	0.48

Notes:
Q = 1/2 (ON2-D)

Basin ON2-D @ 3.22% (SE Check at Lot 99)
Cross Section for Irregular Channel

Project Description	
Worksheet	Basin ON2-D @ 3.22% (SE Check at Lot 99)
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

Section Data	
Mannings Coefficient	0.014
Channel Slope	3.22 %
Water Surface Elevation	0.37 ft
Elevation Range	0.00 to 0.48
Discharge	19.50 cfs



Onsite Overflow Condition

Emergency Overflow - ON2-D
Worksheet for Generic Weir

Project Description	
Worksheet	Weir at ON2-D
Type	Generic Weir
Solve For	Headwater Elevation

Input Data		
Discharge	78.00	cfs
Crest Elevation	0.00	ft
Discharge Coefficient	3.00	US
Crest Length	42.00	ft

Results		
Headwater Elevation	0.73	ft
Headwater Height Above Crest	0.73	ft
Flow Area	30.5	ft²
Velocity	2.56	ft/s
Wetted Perimeter	43.45	ft
Top Width	42.00	ft

Notes:
Emergency Overflow = FG + Weir Depth*
= 2809.7 + .78
= 2810.48 Emergency Overflow Elevation

Min. Adjacent FF = 2810.6

OK!

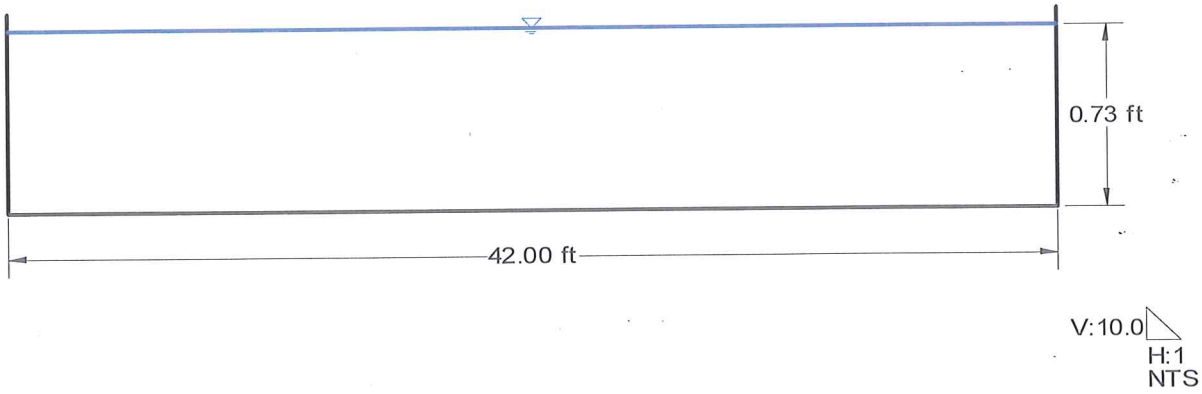
* 2X flow used for weir depth due to triangular overflow path (conservative)

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Emergency Overflow - ON2-D
Cross Section for Generic Weir

Project Description	
Worksheet	Weir at ON2-D
Type	Generic Weir
Solve For	Headwater Elevation

Section Data		
Discharge	78.00	cfs
Headwater Elevation	0.73	ft
Crest Elevation	0.00	ft
Discharge Coefficient	3.00	US
Crest Length	42.00	ft



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Racel Overflow Condition

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

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

Input Data		
Channel Slope	4.90	%
Discharge	704.00	cfs

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

Results		
Mannings Coefficient	0.016	
Water Surface Elevation	1.23	ft
Elevation Range	0.00 to 0.56	
Flow Area	37.8	ft²
Wetted Perimeter	45.51	ft
Top Width	43.00	ft
Actual Depth	1.23	ft
Critical Elevation	2.37	ft
Critical Slope	0.32	%
Velocity	18.63	ft/s
Velocity Head	5.40	ft
Specific Energy	6.62	ft
Froude Number	3.50	
Flow Type	Supercritical	

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

In steep portion of Racel (unconservative), flow depth is higher than finished floor elev.

∴ use min. slope analysis for perimeter wall solid grating (conservative)

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

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

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

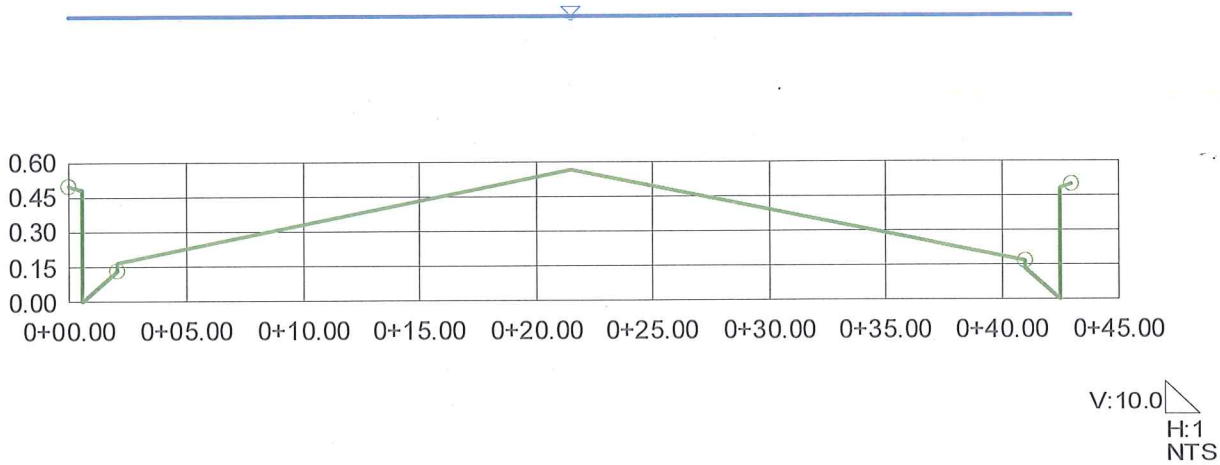
Natural Channel Points	
Station (ft)	Elevation (ft)
0+42.50	0.48
0+43.00	0.50

Notes:
Q = developed condition RAHU

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

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

Section Data		
Mannings Coefficient	0.016	
Channel Slope	4.90	%
Water Surface Elevation	1.23	ft
Elevation Range	0.00 to 0.56	
Discharge	704.00	cfs



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

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

Input Data		
Channel Slope	1.00	%
Discharge	704.00	cfs

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

Results		
Mannings Coefficient	0.016	
Water Surface Elevation	1.77	ft
Elevation Range	0.00 to 0.56	
Flow Area	61.2	ft²
Wetted Perimeter	46.60	ft
Top Width	43.00	ft
Actual Depth	1.77	ft
Critical Elevation	2.37	ft
Critical Slope	0.32	%
Velocity	11.50	ft/s
Velocity Head	2.05	ft
Specific Energy	3.83	ft
Froude Number	1.70	
Flow Type	Supercritical	

All finished floor elevations are below flow depth.

∴ solid grout perimeter walls along Racel St. two (2) courses for emergency overflow

Calculation Messages:
Water elevation exceeds lowest end station by 1.27089931 ft.

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

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

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

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

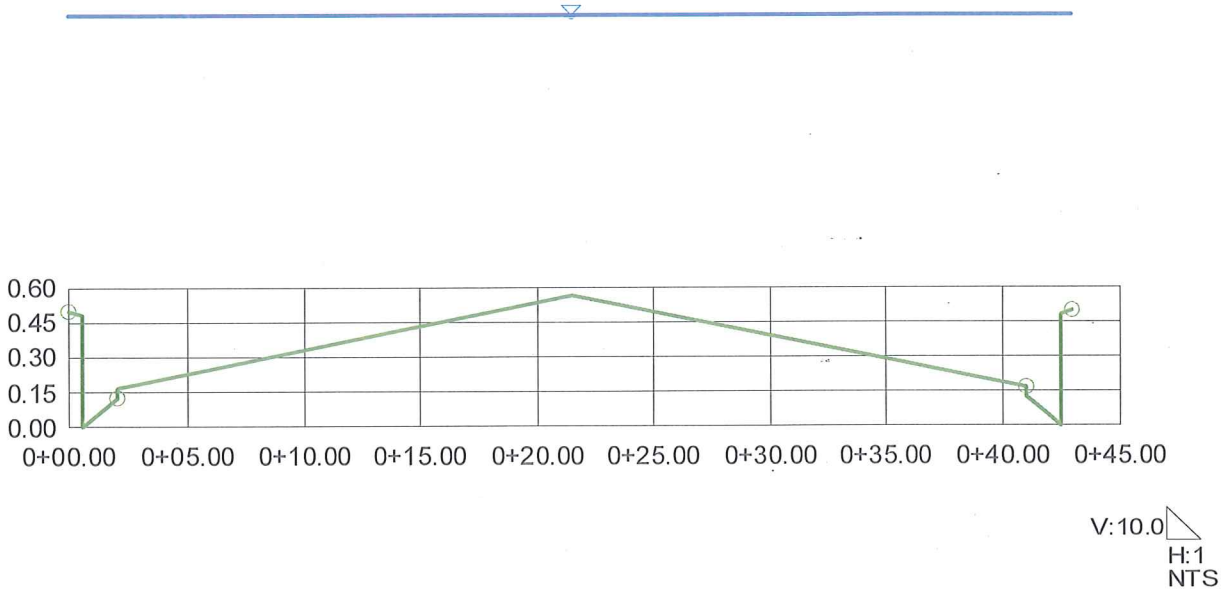
Notes:
Q = developed condition RAHU

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

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

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



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APPENDIX G

Reference Material

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

Approval Letters

CITY OF LAS VEGAS INTER-OFFICE MEMORANDUM				DATE: June 16, 2014
TO: Land Development Services Department of Building & Safety				FROM: Albert Sung, P.E. Flood Control Project Engineer Department of Public Works
SUBJECT:	Drainage Study for: Skye Canyon – Phase 1 Infrastructure			COPIES TO: Slater Hanifan Group
Cross Streets:	NEC of Grand Teton Blvd. & Hualapai Way			K A G Development South, LLC / Ninety-Five Management, LLC
File Number:	F:\Depot\DSMemos\DS4661B.doc			Bart Anderson, P.E., DevCo
Parcel Number:	125-07-301-001 & 125-07-301-002; 125-07-401-001 & 125-07-401-002			CCRFCD
Zoning Action:	TMP-53058			
FEMA Flood Zone	YES	NO X		
Proposed Storm Drain	YES X	NO		

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

REMARKS:

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

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

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

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

4. All drainage facilities proposed in this *Phase 1 Infrastructure Study* are considered interim facilities and must be maintained by the master developer until the facilities are formally accepted by the *City of Las Vegas.*

5. The proposed improvement plans show drainage facilities of a size that must be reviewed for Maintenance and Access concerns. The engineer must coordinate with *City Streets & Sanitation Department* for their review and approval prior to the subject drainage study approval.

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

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

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

8. **Sheet SD-09**: Review and revise an appeared low point "61.95TC" in *Grand Canyon Drive* at the intersection with *Grand Teton Drive*.

9. Technical drainage studies are required for each of the POD's. The technical drainage studies for the POD's may not be conditional approved until the final approval of the pertinent infrastructure drainage study is obtained.

10. Building permits for the homes within the individual POD's will not be issued until construction of the street and flood control infrastructure around the POD is substantially complete or interim protection is provided per the approved technical drainage study.

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

END OF REMARKS
ays

T/R/S: T19S/R60E/07
AREA G-07

Interim Condition Exhibit & HEC-1

(Parcel 1.1 Existing Condition)

Interim Condition (100-Yr)

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

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*****************************************
*                                       *
*    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     OLYMPIA COMPANIES
    3         ID     SKYE CANYON - PHASE 1 INFRASTRUCTURE
    4         ID     INTERIM CONDITION (100-YR STORM)
    5         ID
    6         ID     RETURN PERIOD ------- 100-YEAR
    7         ID     DISTRIBUTION -------- 6-HOUR SDN3
    8         ID     PROJECT NO. --------- OLY1401.001
    9         ID     FILENAME ------------ INT-100.H1
   10         ID     DATE ---------------- 03/10/14
   11         ID     MODELED BY ---------- AJH/SMJ
   12         ID
   13         ID        SIX HOUR DEPTH-AREA REDUCTION FACTORS
   14         ID        DRAINAGE AREA (MI^2)    DARF
   15         ID        0.0-0.49                1.00
   16         ID        0.5-0.99                0.98
   17         ID        1.0-1.99                0.97
   18         ID
   19         IT       5       0       0     300
   20         IO       5       0       0
   21         IN       5       0       0
   22         JR    PREC    1.00    0.98    0.97
              *
   23         KK    HUAL
   24         KM   OFFSITE STREET BASIN FOR HUALAPAI WAY
   25         PB    2.93
   26         PC       0   0.020   0.057   0.070   0.087   0.108   0.124   0.130   0.130   0.130
   27         PC   0.130   0.130   0.130   0.133   0.140   0.142   0.148   0.158   0.172   0.181
   28         PC   0.190   0.197   0.199   0.200   0.201   0.204   0.214   0.229   0.241   0.249
   29         PC   0.251   0.256   0.270   0.278   0.281   0.283   0.295   0.322   0.352   0.409
   30         PC   0.499   0.590   0.710   0.744   0.781   0.812   0.819   0.835   0.851   0.856
   31         PC   0.860   0.868   0.876   0.888   0.910   0.926   0.937   0.950   0.970   0.976
   32         PC   0.982   0.985   0.987   0.989   0.990   0.993   0.993   0.994   0.995   0.998
   33         PC   0.998   0.999       1
   34         BA   .0144
   35         LS       0    93.2
   36         UD   0.136
              *
   37         KK   OFF20
   38         KM   REFERENCED FROM GCW MASTER DRAINAGE STUDY
   39         BA   .0656
   40         PB    3.01
   41         LS       0    86.2
   42         UD   0.190
              *
   43         KK  ROFF20
   44         KM   ROUTE OFF20 TO PT2
   45         RD    6020   0.034   0.035       0    TRAP      15       1
              *
```

1 HEC-1 INPUT PAGE 2

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

   46         KK  OFF2-E
   47         KM   LOCAL OFFSITE BASIN
   48         BA   .1355
   49         PB    3.00
   50         LS       0    86.2
   51         UD   0.243
              *
   52         KK     PT2
   53         KM   COMBINES OFF20 AND OFF2-E
```

```
54          HC       2
            *

55          KK   OFF21
56          KM   REFERENCED FROM GCW MASTER DRAINAGE STUDY
57          BA   .5280
58          PB    3.10
59          LS       0     85.7
60          UD   0.446
            *

61          KK  ROFF21
62          KM   ROUTE OFF21 TO PT3
63          RD    5655   0.037   0.035       0    TRAP       0     100
            *

64          KK  OFF3-E
65          KM   LOCAL OFFSITE BASIN
66          BA   .1581
67          PB    3.00
68          LS       0     82.8
69          UD   0.302
            *

70          KK     PT3
71          KM   COMBINES OFF21 AND OFF3-E
72          HC       2
            *

73          KK     CP0
74          HC       2
            *

75          KK  OFF1-E
76          KM   LOCAL OFFSITE BASIN
77          PB    3.00
78          BA   .0917
79          LS       0     86.2
80          UD   0.202
            *
```



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

81          KK   RA-HU
82          KM   COMBINES OFF20, OFF21, OFF1-E, OFF2-E, OFF3-E, HUAL
83          HC       3
            *

84          KK  RRA-HU
85          KM   ROUTE RA-HU TO CP26
86          RK    2700   0.040   0.013       0    CIRC       6
            *

87          KK   ON2-I
88          KM   ONSITE BASIN SOUTH OF ON1-I AND NORTH OF RACEL ST
89          PB    2.93
90          BA   .0247
91          LS       0     86.2
92          UD   0.101
            *

93          KK   ON4-I
94          KM   SOUTHWEST QUAD ONSITE BASIN
95          PB    2.93
96          BA   .0611
97          LS       0     86.4
98          UD   0.100
            *

99          KK     RAC
100         KM   STREET BASIN FOR RACEL ST
101         PB    2.93
102         BA   .0071
103         LS       0     92.5
104         UD   0.097
            *

105         KK    CONQ
106         KM   STREET BASIN FOR CONQUISTADOR ST
107         PB    2.93
108         BA   .0035
109         LS       0     92.5
110         UD   0.133
            *

111         KK     CP1
112         KM   COMBINES RA-HU, ON2-I, ON4-I, RAC AND CONQ
113         HC       5
            *

114         KK   ON3-I
115         KM   NORTHEAST QUAD ONSITE BASIN
116         PB    2.93
117         BA   .0553
118         LS       0     86.3
119         UD   0.127
            *
```



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

120         KK   ON5-I
121         KM   SOUTHEAST QUAD ONSITE BASIN
```

Parcel 1.1

```
122           PB    2.93
123           BA   .0505
124           LS      0     86.4
125           UD   0.129
              *

126           KK     GCD
127           KM   OFFSITE (HALF) STREET BASIN FOR GRAD CANYON DR
128           PB    2.93
129           BA   .0053
130           LS      0     93.8
131           UD   0.137
              *

132           KK    CP26
133           KM   COMBINES CP1, ON3-I, ON5-I AND GCD
134           HC       4
              *

135           KK   ON1-I
136           KM   NORTHWEST QUAD ONSITE BASIN, NORTH OF ON2-I
137           PB    2.93
138           BA   .0262
139           LS      0     86.2
140           UD   0.100
              *

141           KK     HOR
142           KM   OFFSITE STREET BASIN FOR HORSE DR
143           PB    2.93
144           BA   .0163
145           LS      0     93.3
146           UD   0.108
              *

147           KK     CP2
148           KM   COMBINES ON1-D AND HOR
149           HC       2
              *

150           KK   OFF18
151           KM   REFERENCED FROM GCW MASTER DRAINAGE STUDY
152           BA   .5491
153           PB    3.05
154           LS      0     86.3
155           UD   0.445
              *
```

Parcel 1.1


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

156           KK  ROFF18
157           KM   ROUTE OFF18 THRU EX-W5
158           RM       2   0.171    0.15
              *

159           KK   EX-W5
160           KM   REFERENCED FROM GCW MASTER DRAINAGE STUDY
161           BA   .4460
162           PB    2.86
163           LS      0     86.3
164           UD    .308
              *

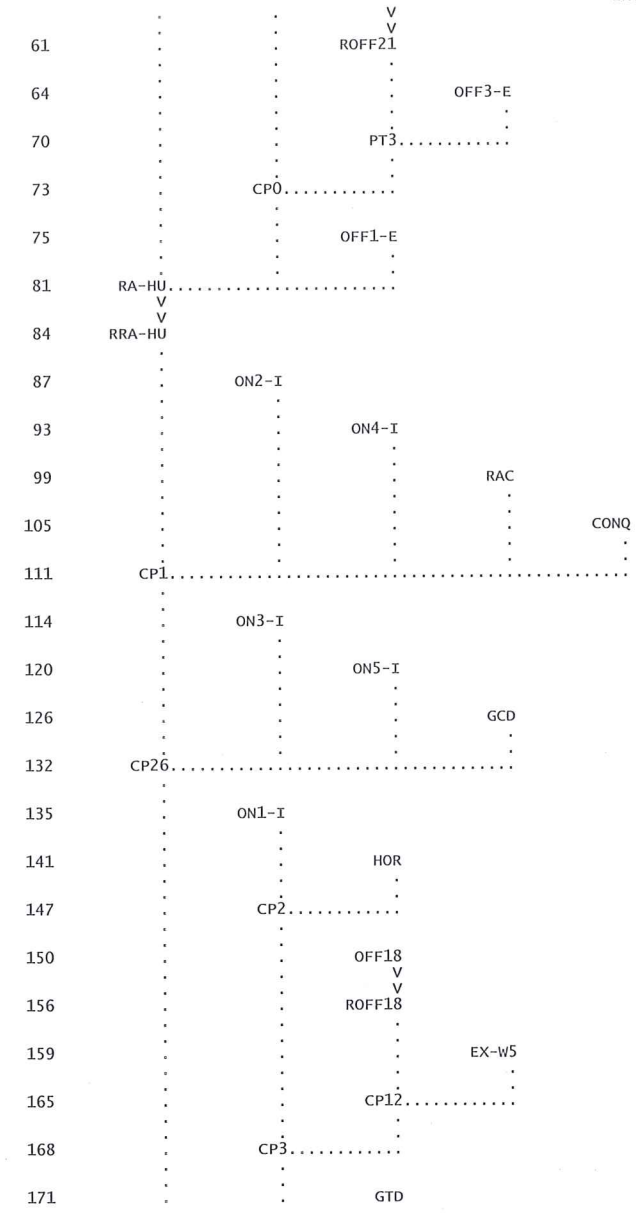
165           KK    CP12
166           KM   COMBINES OFF18 AND EX-W5
167           HC       2
              *

168           KK     CP3
169           KM   COMBINES CP2 AND CP12
170           HC       2
              *

171           KK     GTD
172           KM   OFFSITE (HALF) STREET BASIN FOR GRAD TETON DR
173           PB    2.93
174           BA   .0073
175           LS      0     93.9
176           UD   0.105
              *
177           ZZ
```

1

SCHEMATIC DIAGRAM OF STREAM NETWORK



(***) RUNOFF ALSO COMPUTED AT THIS LOCATION

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

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

SLATER HANIFAN GROUP
OLYMPIA COMPANIES
SKYE CANYON - PHASE 1 INFRASTRUCTURE
INTERIM CONDITION (100-YR STORM)

RETURN PERIOD ------- 100-YEAR
DISTRIBUTION -------- 6-HOUR SDN3
PROJECT NO. --------- OLY1401.001
FILENAME ------------ INT-100.H1
DATE ---------------- 03/10/14
MODELED BY ---------- AJH/SMJ

SIX HOUR DEPTH-AREA REDUCTION FACTORS

DRAINAGE AREA (MI^2)	DARF
0.0-0.49	1.00

0.5-0.99	0.98
1.0-1.99	0.97

20 IO OUTPUT CONTROL VARIABLES

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

IT HYDROGRAPH TIME DATA

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

COMPUTATION INTERVAL .08 HOURS
TOTAL TIME BASE 24.92 HOURS

ENGLISH UNITS

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

JP MULTI-PLAN OPTION
NPLAN 1 NUMBER OF PLANS

JR MULTI-RATIO OPTION
RATIOS OF PRECIPITATION
1.00 .98 .97

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

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

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

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

1

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

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

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

INT-100.OUT

+	CP12	1.00	1	FLOW	792.	768.	756.
				TIME	3.92	3.92	3.92
2 COMBINED AT							
+	CP3	1.04	1	FLOW	807.	783.	771.
				TIME	3.92	3.92	3.92
HYDROGRAPH AT							
+	GTD	.01	1	FLOW	14.	13.	13.
				TIME	3.50	3.50	3.50

1

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Interim Condition (10-Yr)

```
1*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*              JUN  1998                *
*            VERSION 4.1                *
*                                       *
*  RUN DATE   13MAR14  TIME  11:09:40   *
*                                       *
*****************************************
```

```
*****************************************
*                                       *
*    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     OLYMPIA COMPANIES
    3         ID     SKYE CANYON - PHASE 1 INFRASTRUCTURE
    4         ID     INTERIM CONDITION (10-YR STORM)
    5         ID
    6         ID     RETURN PERIOD ------- 10-YEAR
    7         ID     DISTRIBUTION -------- 6-HOUR SDN3
    8         ID     PROJECT NO. --------- OLY1401.001
    9         ID     FILENAME ------------ INT-10.H1
   10         ID     DATE ---------------- 03/10/14
   11         ID     MODELED BY ---------- AJH/SMJ
   12         ID
   13         ID        SIX HOUR DEPTH-AREA REDUCTION FACTORS
   14         ID        DRAINAGE AREA (MI^2)    DARF
   15         ID        0.0-0.49                1.00
   16         ID        0.5-0.99                0.98
   17         ID        1.0-1.99                0.97
   18         ID
   19         IT       5       0       0     300
   20         IO       5       0       0
   21         IN       5       0       0
   22         JR    PREC    1.00    0.98    0.97
              *
   23         KK    HUAL
   24         KM    OFFSITE STREET BASIN FOR HUALAPAI WAY
   25         PB    1.61
   26         PC       0   0.020   0.057   0.070   0.087   0.108   0.124   0.130   0.130   0.130
   27         PC   0.130   0.130   0.130   0.133   0.140   0.142   0.148   0.158   0.172   0.181
   28         PC   0.190   0.197   0.199   0.200   0.201   0.204   0.214   0.229   0.241   0.249
   29         PC   0.251   0.256   0.270   0.278   0.281   0.283   0.295   0.322   0.352   0.409
   30         PC   0.499   0.590   0.710   0.744   0.781   0.812   0.819   0.835   0.851   0.856
   31         PC   0.860   0.868   0.876   0.888   0.910   0.926   0.937   0.950   0.970   0.976
   32         PC   0.982   0.985   0.987   0.989   0.990   0.993   0.993   0.994   0.995   0.998
   33         PC   0.998   0.999       1
   34         BA   .0144
   35         LS       0    91.2
   36         UD   0.138
              *
   37         KK    OFF20
   38         KM    REFERENCED FROM GCW MASTER DRAINAGE STUDY
   39         BA    .0656
   40         PB    1.72
   41         LS       0    86.2
   42         UD   0.190
              *
   43         KK   ROFF20
   44         KM    ROUTE OFF20 TO PT2
   45         RD     6020   0.034   0.035       0    TRAP      15       1
              *
```

1 HEC-1 INPUT PAGE 2

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

   46         KK   OFF2-E
   47         KM    LOCAL OFFSITE BASIN
   48         BA    .1355
   49         PB    1.67
   50         LS       0    86.2
   51         UD   0.243
              *
   52         KK     PT2
   53         KM    COMBINES OFF20 AND OFF2-E
```

```
 54          HC       2
             *

 55          KK   OFF21
 56          KM   REFERENCED FROM GCW MASTER DRAINAGE STUDY
 57          BA   .5280
 58          PB    1.77
 59          LS       0    85.7
 60          UD   0.446
             *

 61          KK  ROFF21
 62          KM   ROUTE OFF21 TO PT3
 63          RD    5655   0.037   0.035       0    TRAP       0     100
             *

 64          KK  OFF3-E
 65          KM   LOCAL OFFSITE BASIN
 66          BA   .1581
 67          PB    1.67
 68          LS       0    82.8
 69          UD   0.302
             *

 70          KK     PT3
 71          KM   COMBINES OFF21 AND OFF3-E
 72          HC       2
             *

 73          KK     CP0
 74          HC       2
             *

 75          KK  OFF1-E
 76          KM   LOCAL OFFSITE BASIN
 77          PB    1.67
 78          BA   .0917
 79          LS       0    86.2
 80          UD   0.202
             *
```



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

 81          KK   RA-HU
 82          KM   COMBINES OFF20, OFF21, OFF2-E, OFF3-E, OFF1-E AND HUAL
 83          HC       3
             *

 84          KK  RRA-HU
 85          KM   ROUTE RA-HU TO CP26
 86          RK    2700   0.040   0.013       0    CIRC       6
             *

 87          KK   ON2-I
 88          KM   ONSITE BASIN SOUTH OF ON1-I AND NORTH OF RACEL ST
 89          PB    1.61
 90          BA   .0247
 91          LS       0    86.2
 92          UD   0.101
             *

 93          KK   ON4-I
 94          KM   SOUTHWEST QUAD ONSITE BASIN
 95          PB    1.61
 96          BA   .0611
 97          LS       0    86.4
 98          UD   0.100
             *

 99          KK     RAC
100          KM   STREET BASIN FOR RACEL ST
101          PB    1.61
102          BA   .0071
103          LS       0    92.5
104          UD   0.097
             *

105          KK    CONQ
106          KM   STREET BASIN FOR CONQUISTADOR ST
107          PB    1.61
108          BA   .0035
109          LS       0    92.5
110          UD   0.133
             *

111          KK     CP1
112          KM   COMBINES RA-HU, ON2-I, ON4-I, RAC AND CONQ
113          HC       5
             *

114          KK   ON3-I
115          KM   NORTHEAST QUAD ONSITE BASIN
116          PB    1.61
117          BA   .0553
118          LS       0    86.3
119          UD   0.127
             *
```

Parcel 1.1


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

120          KK   ON5-I
121          KM   SOUTHEAST QUAD ONSITE BASIN
```

```
122          PB    1.61
123          BA   .0505
124          LS      0     86.4
125          UD   0.129
             *

126          KK     GCD
127          KM   OFFSITE (HALF) STREET BASIN FOR GRAD CANYON DR
128          PB    1.61
129          BA   .0053
130          LS      0     93.8
131          UD   0.137
             *

132          KK    CP26
133          KM   COMBINES CP1, ON3-I, ON5-I AND GCD
134          HC       4
             *

135          KK   ON1-I
136          KM   NORTHWEST QUAD ONSITE BASIN, NORTH OF ON2-I
137          PB    1.61
138          BA   .0262
139          LS      0     86.2
140          UD   0.100
             *

141          KK     HOR
142          KM   OFFSITE STREET BASIN FOR HORSE DR
143          PB    1.61
144          BA   .0163
145          LS      0     93.3
146          UD   0.108
             *

147          KK     CP2
148          KM   COMBINES ON1-D AND HOR
149          HC       2
             *

150          KK   OFF18
151          KM   REFERENCED FROM GCW MASTER DRAINAGE STUDY
152          BA   .5491
153          PB   1.708
154          LS      0     86.3
155          UD   0.445
             *
```

Parcel 1.1


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

156          KK  ROFF18
157          KM   ROUTE OFF18 THRU EX-W5
158          RM       2   0.171    0.15
             *

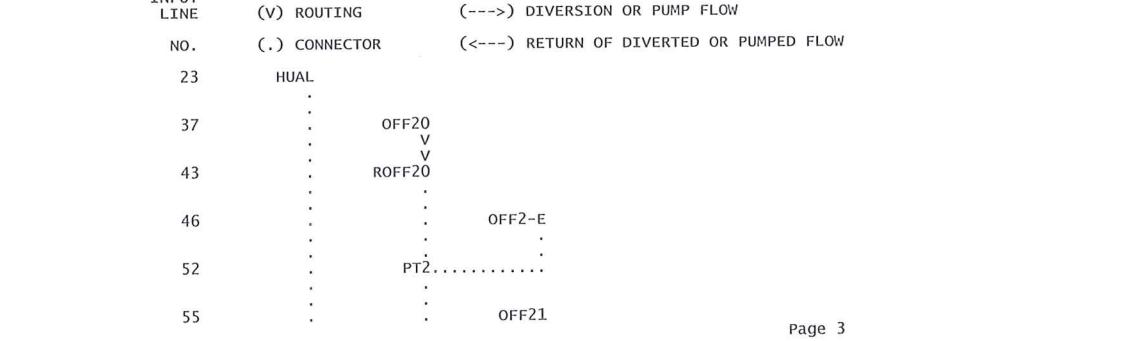
159          KK   EX-W5
160          KM   REFERENCED FROM GCW MASTER DRAINAGE STUDY
161          BA   .4460
162          PB   1.606
163          LS      0     86.3
164          UD    .308
             *

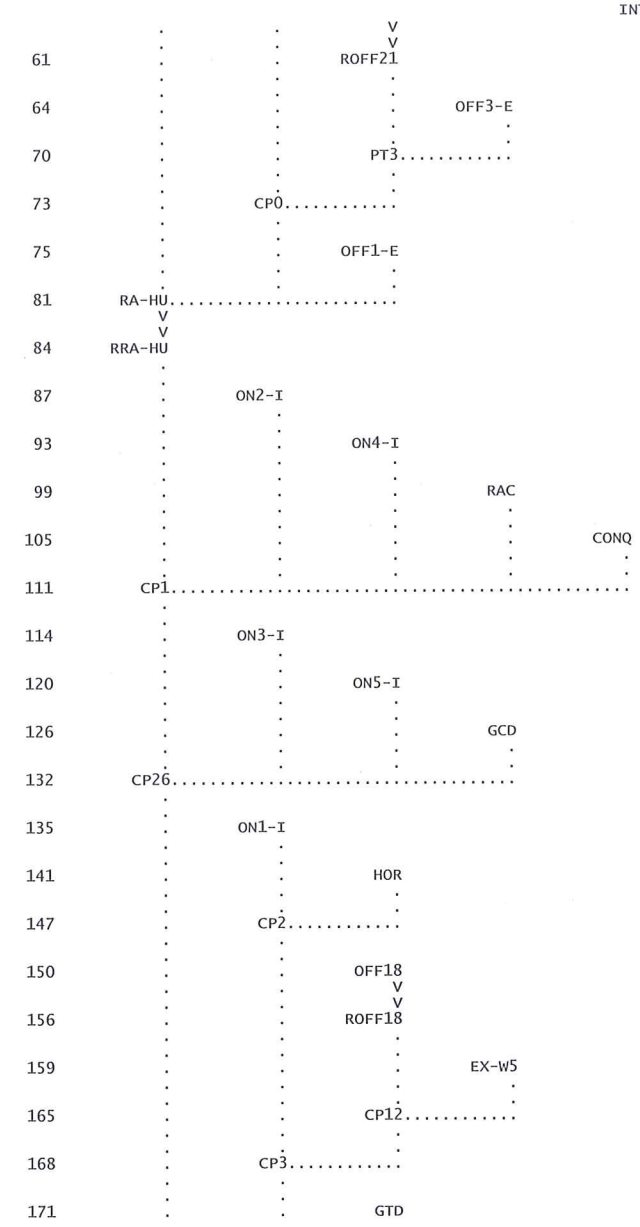
165          KK    CP12
166          KM   COMBINES OFF18 AND EX-W5
167          HC       2
             *

168          KK     CP3
169          KM   COMBINES CP2 AND CP12
170          HC       2
             *

171          KK     GTD
172          KM   OFFSITE (HALF) STREET BASIN FOR GRAD TETON DR
173          PB    1.61
174          BA   .0073
175          LS      0     93.9
176          UD   0.105
             *
177          ZZ
```


SCHEMATIC DIAGRAM OF STREAM NETWORK





(***) RUNOFF ALSO COMPUTED AT THIS LOCATION

```
1*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*              JUN  1998                *
*            VERSION 4.1                *
*                                       *
*  RUN DATE   13MAR14  TIME  11:09:40   *
*                                       *
*****************************************
```

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

SLATER HANIFAN GROUP
OLYMPIA COMPANIES
SKYE CANYON - PHASE 1 INFRASTRUCTURE
INTERIM CONDITION (10-YR STORM)

RETURN PERIOD ------- 10-YEAR
DISTRIBUTION -------- 6-HOUR SDN3
PROJECT NO. --------- OLY1401.001
FILENAME ------------ INT-10.H1
DATE ---------------- 03/10/14
MODELED BY ---------- AJH/SMJ

SIX HOUR DEPTH-AREA REDUCTION FACTORS

DRAINAGE AREA (MI^2)	DARF
0.0-0.49	1.00

0.5-0.99	0.98
1.0-1.99	0.97

20 IO OUTPUT CONTROL VARIABLES

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

IT HYDROGRAPH TIME DATA

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

COMPUTATION INTERVAL .08 HOURS
TOTAL TIME BASE 24.92 HOURS

ENGLISH UNITS

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

JP MULTI-PLAN OPTION
NPLAN 1 NUMBER OF PLANS

JR MULTI-RATIO OPTION
RATIOS OF PRECIPITATION
1.00 .98 .97

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

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

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

1

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

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

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

1

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

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

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

FOR PLAN = 1 RATIO= .00

ROFF20	MANE	5.00	33.65	230.00	.63	5.00	33.65	230.00	.63	

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

FOR PLAN = 1 RATIO= .00

ROFF20	MANE	5.00	32.93	230.00	.62	5.00	32.93	230.00	.62	

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

FOR PLAN = 1 RATIO= .00

ROFF21	MANE	5.00	185.81	250.00	.67	5.00	185.81	250.00	.67	

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

FOR PLAN = 1 RATIO= .00

ROFF21	MANE	5.00	178.88	255.00	.64	5.00	178.88	255.00	.64	

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

FOR PLAN = 1 RATIO= .00

ROFF21	MANE	5.00	175.51	255.00	.63	5.00	175.51	255.00	.63	

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

FOR PLAN = 1 RATIO= 1.00

RRA-HU	MANE	.50	266.47	246.15	.63	5.00	264.46	250.00	.63	

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

FOR PLAN = 1 RATIO= .98

RRA-HU	MANE	.58	255.20	246.28	.60	5.00	254.02	250.00	.60	

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

FOR PLAN = 1 RATIO= .97

RRA-HU	MANE	.50	249.85	246.14	.59	5.00	248.96	250.00	.59	

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

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

100-Year Ditch Flow Hydraulic Summary

Cross Section ID	Slope (%)	Q_{100} (cfs)	Normal Depth (ft)	Description
HU1	1.5	38	1.08	Riprap (D50 = 6-inch) Lined Trap. Channel; 5-ft Bottom, 3:1 SS, Min. 2.0-ft Depth
HU2	0.5	232	2.19	Riprap (D50 = 6-inch) Lined Trap. Channel; 12-ft Bottom, 3:1 SS, Min. 3.5-ft Depth. Berm utilized to contain flow.
HU3	0.5	540	4.00	Riprap (D50 = 6-inch) Lined Trap. Channel; 12-ft Bottom, 3:1 SS, Min. 5.0-ft Depth
HU3A	0.5	540	3.32	Riprap (D50 = 6-inch) Lined Trap. Channel; 20-ft Bottom, 3:1 SS, Min. 3.5-ft Depth. Ditch HU3 flares to 20-ft Bottom in order to cut thru HU3 Berm without flow spilling over top of berm.
2I	0.5	36	0.70	Earthen Lined Trap. Channel; 15-ft Bottom, 3:1 SS, Min. 2.0-ft Depth
3IA	0.5	5	0.22	Earthen Lined Trap. Channel; 15-ft Bottom, 3:1 SS, Min. 2.0-ft Depth
3IC	0.5	78	1.09	Earthen Lined Trap. Channel; 15-ft Bottom, 3:1 SS, Min. 2.0-ft Depth
4IA	0.5	7	0.27	Earthen Lined Trap. Channel; 15-ft Bottom, 3:1 SS, Min. 2.0-ft Depth
4IC	0.5	44	0.78	Earthen Lined Trap. Channel; 15-ft Bottom, 3:1 SS, Min. 2.0-ft Depth
5IA	1.1	35	0.54	Earthen Lined Trap. Channel; 15-ft Bottom, 3:1 SS, Min. 2.0-ft Depth
5IB	2.0	37	0.47	Earthen Lined Trap. Channel; 15-ft Bottom, 3:1 SS, Min. 2.0-ft Depth

OFFSITE FLOW CAPTURED BY PR.1 INFRASTRUCTURE FACILITIES

PARCEL 1.1

REFER TO EXHIBIT E FOR REMAINDER DELINEATION OF OFFSITE BASINS

N

0 180 360
SCALE – 1"=180' FEET

S-I-G

LEGEND

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

Basin Flow Rate Summary (Interim Condition)

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

*REFERENCED FROM GC WALLACE KYLE CANYON MASTER DRAINAGE STUDY

Concentration Points Summary (Interim Condition)

Basin/Concentration Point ID	Area (sq-mi)	Q_{100} (cfs)	Q_{10} (cfs)
PT2 (OFF20 + OFF2-E)	0.20	232	83
PT3 (OFF21 + OFF3-E)	0.69	540	202
RA-HU (CP0 + OFF1-E)	0.99	704	255
CP0 (PT2 + PT3)	0.89	655	241
CP1 (RA-HU + ON2-I + ON4-I + RAC + CONQ)	1.09	721	257
CP2 (ON1-I + HOR)	0.04	68	28
CP3 (CP12 + CP2)	1.04	771	288
CP12 (OFFF18 + EX-W5)	1.00	756	281
CP26 (CP1 + ON3-I + ON5-I + GCD)	1.20	757	270

Prorated Flow Summary

Interim Condition

Basin	Q_{100} (cfs)	Area (acres)	Unit Flow (cfs/acre)
ON1-I	38	16.8	2.3
Subbasin	**Q_{100} (cfs)**	**Area (acres)**	**Unit Flow (cfs/acre)**
ON1-I A	22	9.8	2.3
ON1-I B	16	7.0	2.3
TOTAL	***38***	***16.8***	
Basin	**Q_{100} (cfs)**	**Area (acres)**	**Unit Flow (cfs/acre)**
ON3-I	78	35.4	2.2
Subbasin	**Q_{100} (cfs)**	**Area (acres)**	**Unit Flow (cfs/acre)**
ON3-I A	5	2.2	2.2
ON3-I B	38	17.1	2.2
ON3-I C	35	16.1	2.2
TOTAL	***78***	***35.4***	
Basin	**Q_{100} (cfs)**	**Area (acres)**	**Unit Flow (cfs/acre)**
ON4-I	90	39.1	2.3
Subbasin	**Q_{100} (cfs)**	**Area (acres)**	**Unit Flow (cfs/acre)**
ON4-I A	7	3.0	2.3
ON4-I B	39	17.1	2.3
ON4-I C	44	19.1	2.3
TOTAL	***90***	***39.1***	
Basin	**Q_{100} (cfs)**	**Area (acres)**	**Unit Flow (cfs/acre)**
ON5-I	72	32.3	2.2
Subbasin	**Q_{100} (cfs)**	**Area (acres)**	**Unit Flow (cfs/acre)**
ON5-I A	36	16.3	2.2
ON5-I B	36	16.0	2.2
TOTAL	***72***	***32.3***	

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

NO.	DESCRIPTION	DATE	BY	APP.

NINETY-FIVE MANAGEMENT, LLC.

SKYE CANYON - PHASE 1 INFRASTRUCTURE

INTERIM CONDITION DRAINAGE MAP

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

EXHIBIT G
SHEET 1 OF 1

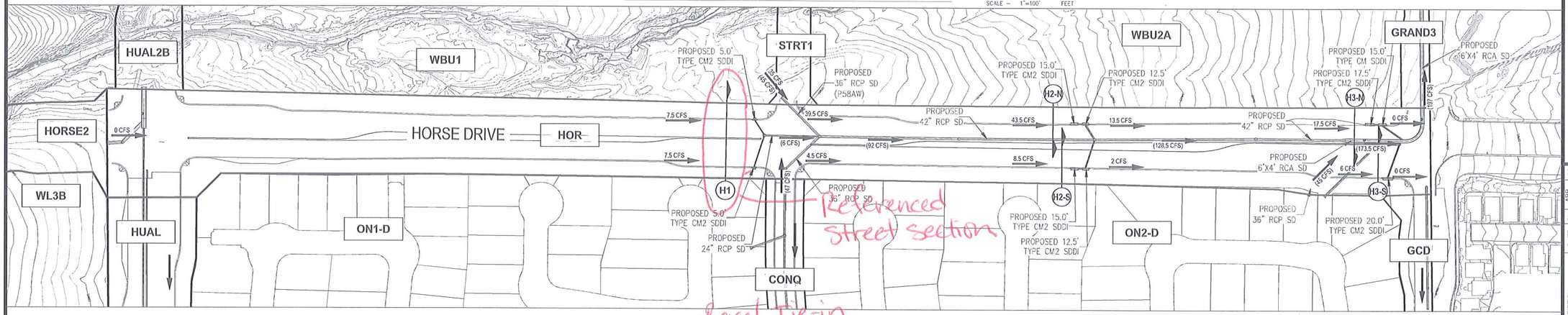
J:\oly1401.001 skye canyon\drainage\technical study\addendum\figures\oly1401.001 tds exhibit g interim condition drainage mod.dwg 5/12/2014 3:16 PM Andrew Howard

Street Hydraulic Exhibits

(Offsite Flow Impacts to Parcel 1.1)

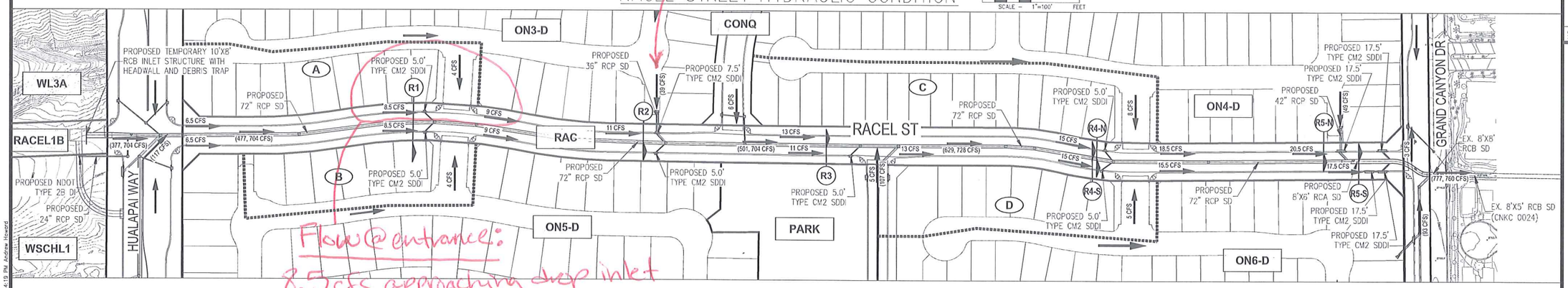
HORSE DRIVE HYDRAULIC CONDITION

SCALE – 1"=100' (0, 100, 200 FEET)



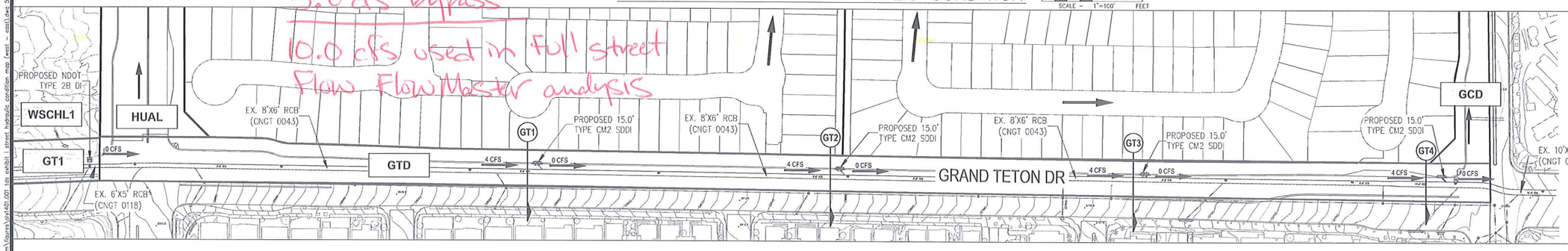
RACEL STREET HYDRAULIC CONDITION

SCALE – 1"=100' (0, 100, 200 FEET)



GRAND TETON DRIVE HYDRAULIC CONDITION

SCALE – 1"=100' (0, 100, 200 FEET)



100-Year Street Flow Summary
Horse Drive

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

*MODELED AS HALF STREET

100-Year Street Flow Summary
Racel Street

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

*MODELED AS HALF STREET

100-Year Street Flow Summary
Grand Teton Drive

Cross Section	Slope (%)	Q_{100} (cfs)	Depth (ft)	Velocity (fps)	DxV
*GT1	3.60	4	0.33	4.0	1.3
*GT2	3.60	4	0.33	4.0	1.3
*GT3	3.60	4	0.33	4.0	1.3
*GT4	2.30	4	0.35	3.4	1.2

*MODELED AS HALF STREET

LEGEND

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

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

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NO. | DESCRIPTION | DATE | BY | APP. DATE | APP.

NINETY-FIVE MANAGEMENT, LLC.

SKYE CANYON - PHASE 1 INFRASTRUCTURE
STREET HYDRAULIC CONDITION MAP
(EAST/WEST STREETS)

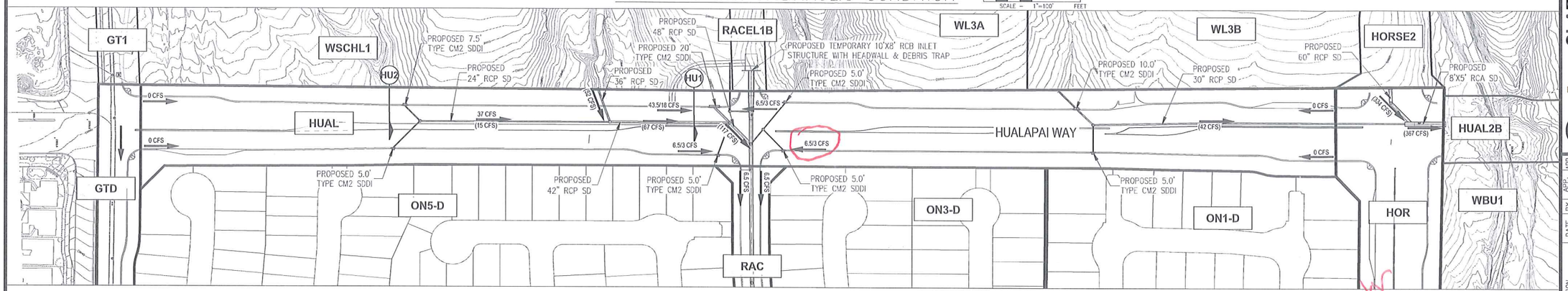
DATE: MAY 2014
DRAFTER: AJH
DESIGNER: AJH
CHECKED: SMJ

PROJECT NO.
OLY1401.001

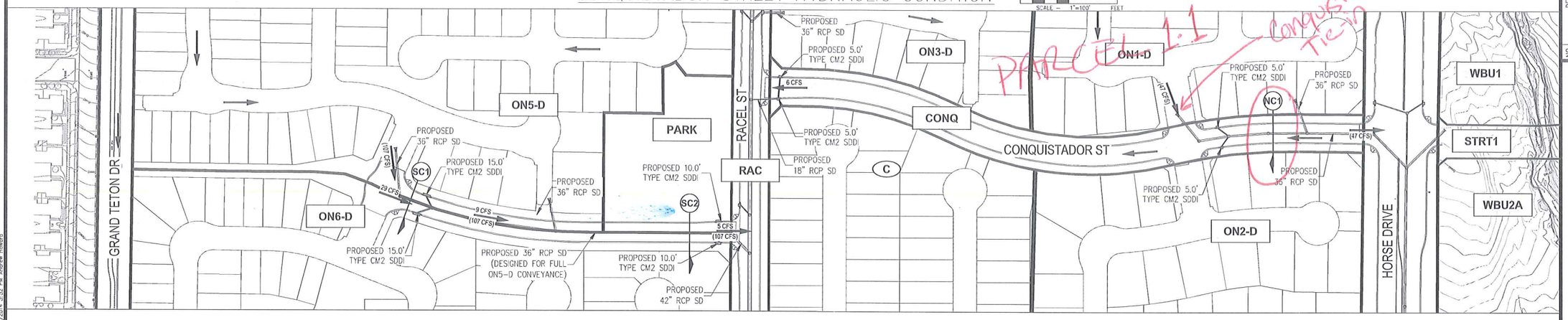
EXHIBIT I
SHEET 1 OF 2

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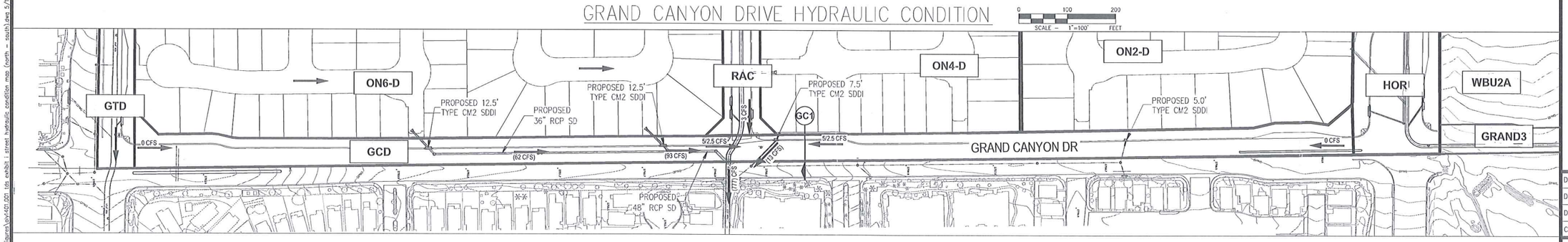
HUALAPAI WAY HYDRAULIC CONDITION



CONQUISTADOR STREET HYDRAULIC CONDITION



GRAND CANYON DRIVE HYDRAULIC CONDITION



10-Year & 100-Year Street Flow Summary
Hualapai Way

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

*MODELED AS HALF STREET

100-Year Street Flow Summary
Conquistador Street

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

10-Year & 100-Year Street Flow Summary
Grand Canyon Drive

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

*MODELED AS HALF STREET

LEGEND

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

N

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

NO.	DESCRIPTION	DATE	BY	APP.	APP. DATE

NINETY-FIVE MANAGEMENT, LLC.

SKYE CANYON - PHASE 1 INFRASTRUCTURE
STREET HYDRAULIC CONDITION MAP
(NORTH/SOUTH STREETS)

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

PROJECT NO.
OLY1401.001

EXHIBIT I
SHEET 2 OF 2

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H1 Horse Street Section
Worksheet for Irregular Channel

Project Description	
Worksheet	H1 Horse Street Section
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Channel Slope	3.56	%
Discharge	15.00	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	0.37	ft
Elevation Range	0.00 to 1.44	
Flow Area	2.9	ft²
Wetted Perimeter	23.70	ft
Top Width	22.86	ft
Actual Depth	0.37	ft
Critical Elevation	0.49	ft
Critical Slope	0.47	%
Velocity	5.20	ft/s
Velocity Head	0.42	ft
Specific Energy	0.79	ft
Froude Number	2.58	
Flow Type	Supercritical	

Calculation Messages:
Flow is divided.

Roughness Segments

Start Station	End Station	Mannings Coefficient
0+00.00	0+02.00	0.013
0+02.00	0+39.00	0.016
0+39.00	0+52.00	0.013
0+52.00	0+89.00	0.016
0+89.00	0+91.00	0.013

Natural Channel Points

Station (ft)	Elevation (ft)
0+00.00	0.50
0+00.50	0.48
0+00.50	0.00
0+02.00	0.13
0+02.00	0.17
0+39.00	0.91
0+39.01	0.99

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H1 Horse Street Section
Worksheet for Irregular Channel

Natural Channel Points	
Station (ft)	Elevation (ft)
0+39.25	1.30
0+39.42	1.32
0+45.50	1.44
0+51.58	1.32
0+51.74	1.30
0+51.99	0.99
0+52.00	0.91
0+89.00	0.17
0+89.00	0.13
0+90.50	0.00
0+90.50	0.48
0+91.00	0.50

Notes:
Q = 1/2 (HOR)

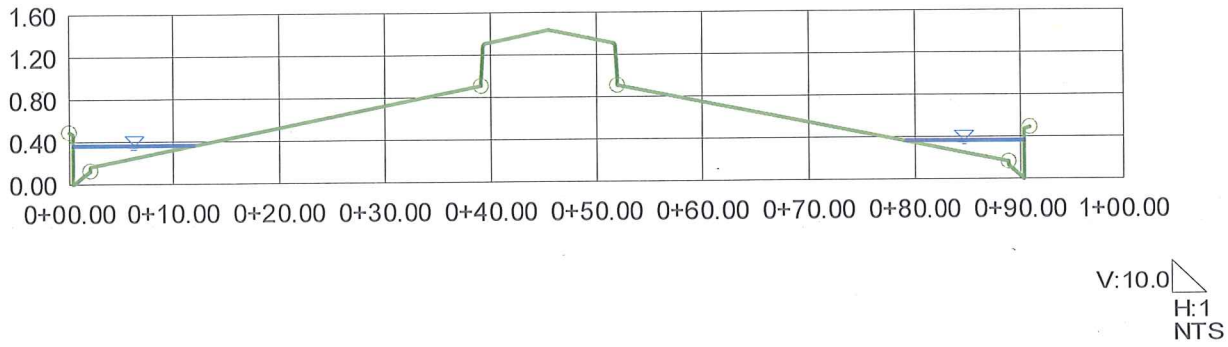
*Model referenced from Phase I Infrastructure Study

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H1 Horse Street Section
Cross Section for Irregular Channel

Project Description	
Worksheet	H1 Horse Street Section
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

Section Data	
Mannings Coefficient	0.013
Channel Slope	3.56 %
Water Surface Elevation	0.37 ft
Elevation Range	0.00 to 1.44
Discharge	15.00 cfs



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NC1 North Conquistador Street Section
Worksheet for Irregular Channel

Project Description	
Worksheet	NC1 North Conquistador Street Section
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Channel Slope	0.61	%
Discharge	6.00	cfs

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

Results		
Mannings Coefficient	0.013	
Water Surface Elevation	0.36	ft
Elevation Range	0.00 to 0.56	
Flow Area	2.8	ft²
Wetted Perimeter	23.32	ft
Top Width	22.49	ft
Actual Depth	0.36	ft
Critical Elevation	0.37	ft
Critical Slope	0.53	%
Velocity	2.14	ft/s
Velocity Head	0.07	ft
Specific Energy	0.44	ft
Froude Number	1.07	
Flow Type	Supercritical	

Calculation Messages:
Flow is divided.

Roughness Segments

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

Natural Channel Points

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

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NC1 North Conquistador Street Section
Worksheet for Irregular Channel

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

Notes:
Q = CONQ

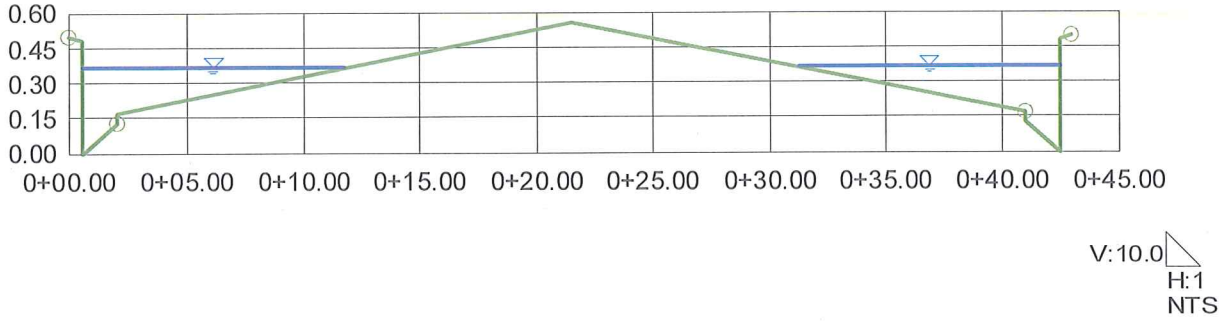
* Model referenced from Phase 1. Infrastructure study

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NC1 North Conquistador Street Section
Cross Section for Irregular Channel

Project Description	
Worksheet	NC1 North Conquistador Street Section
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

Section Data		
Mannings Coefficient	0.013	
Channel Slope	0.61	%
Water Surface Elevation	0.36	ft
Elevation Range	0.00 to 0.56	
Discharge	6.00	cfs



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Conquistador Storm Drain Model

(Parcel 1.1 Storm Drain Design)

Revised WSPG Model
"H-Main.WSP"

H-MAIN	
WSPG Station	Corresponding Roadway Station
1000	GCD 44+50.00
1706	GCD 37+45.66
1762	HD 95+80.84
1775	HD 95+67.04
1812	HD 95+28.28
1887	HD 94+56.38
1897	HD 94+46.38
2073	HD 92+71.29
2405	HD 89+39.10
2685	HD 87+59.57
2973	HD 83+71.85
3070	CS (N) 78+10.64
3208	CS (N) 76+72.68
3289	CS (N) 75+91.82
3370	CS (N) 75+10.94
3432	CS (N) 74+48.74

← Junction w/ 36" RCP lateral (Existing)

```
0
T1 SKYE CANYON INFRASTRUCTURE - PHASE 1
T2 BY OLYMPIA COMPANIES
T3 HORSE DRIVE - TRUNK STORM DRAIN
SO   1000.002749.58  1                          2753.58
R    1706.002753.10  1      .013                                    90.
R    1762.002753.38  1      .013                                    90.
JX   1775.002753.45  1 24 24.013     6.     17.52753.442753.45 70.   35.
R    1812.002753.64  1      .013
JX   1812.002753.64  1 36   .013    45.          2753.64        45.
R    1887.002754.00  1      .013
TS   1897.002754.31 42      .013                                          1
R    2073.002759.63 42      .013                                          1
R    2405.002769.72 42      .013                                    5.    1
JX   2405.002769.72 42 24 30.013     6.5    30. 2771.222770.72 75.   60.
R    2685.002778.21 42      .013                                          1
R    2973.002786.95 42      .013                                    45.   1
JX   2973.002787.45 36 36   .013    45.          2787.45        90.
R    3070.002788.14 36      .013                                    45.   1
R    3208.002789.52 36      .013                                          1
R    3289.002790.32 36      .013                                    5.    1
R    3370.002791.63 36      .013                                    5.    1
R    3432.002791.75 36      .013                                    60.   1
SH   3432.002791.75 36
CD   1  6   0      0.0      0.0     0.0     0.0      0.0     0.0
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.
PTS  121  0.00  0.00  6.00  0.00  6.00  0.01  6.00  0.56  6.00  1.11
PTS       6.00  1.67  5.93  2.23  5.72  2.76  5.32  3.29  5.00  3.66
PTS       4.13  3.90  3.00  4.00  1.87  3.90  1.00  3.66  0.68  3.29
PTS       0.28  2.76  0.07  2.23  0.00  1.67  0.00  1.11  0.00  0.56
PTS       0.00  0.01
```

47.

DATE: 5/13/2014
TIME: 16:48

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	1	6	0	0.00															
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														

DATE: 5/13/2014
TIME: 16:48

F0515P
WATER SURFACE PROFILE - CROSS SECTION POINT LISTING

CARD CODE	SECT NO	NO OF POINTS	X(1) , Y(1) X(8) , Y(8)		X(2) , Y(2) X(9) , Y(9)		X(3) , Y(3) X(10) ,Y(10)		X(4) , Y(4) X(11) ,Y(11)		X(5) , Y(5) X(N) , Y(N)		X(6) , Y(6) X(N+1),Y(N+1)		X(7) , Y(7) X(99) ,Y(99)	
PTS	1	21	0.00	0.00	6.00	0.00	6.00	0.01	6.00	0.56	6.00	1.11	6.00	1.67	5.93	2.23
PTS			5.72	2.76	5.32	3.29	5.00	3.66	4.13	3.90	3.00	4.00	1.87	3.90	1.00	3.66
PTS			0.68	3.29	0.28	2.76	0.07	2.23	0.00	1.67	0.00	1.11	0.00	0.56	0.00	0.01

F 0 5 1 5 P

WATER SURFACE PROFILE - TITLE CARD LISTING

HEADING LINE NO 1 IS -

SKYE CANYON INFRASTRUCTURE - PHASE 1

HEADING LINE NO 2 IS -

BY OLYMPIA COMPANIES

HEADING LINE NO 3 IS -

HORSE DRIVE - TRUNK STORM DRAIN

F 0 5 1 5 P

WATER SURFACE PROFILE - ELEMENT CARD LISTING

ELEMENT NO 1 IS A SYSTEM OUTLET

	STATION	INVERT	SECT	W S ELEV
U/S DATA	1000.00	2749.58	1	2753.58

ELEMENT NO 2 IS A REACH

	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
U/S DATA	1706.00	2753.10	1	0.013	0.00	0.00	0.00	0

ELEMENT NO 3 IS A REACH

	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
U/S DATA	1762.00	2753.38	1	0.013	0.00	90.00	0.00	0

ELEMENT NO 4 IS A JUNCTION

	STATION	INVERT	SECT	LAT-1	LAT-2	N	Q3	Q4	INVERT-3	INVERT-4	PHI 3	PHI 4
U/S DATA												

1775.00	2753.45	1	24	24	0.013	6.0	17.5	2753.44	2753.45	70.00	35.00	

ELEMENT NO 5 IS A REACH

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	1812.00	2753.64	1	0.013	0.00	0.00	0.00	0

ELEMENT NO 6 IS A JUNCTION

U/S DATA	STATION	INVERT	SECT	LAT-1	LAT-2	N	Q3	Q4	INVERT-3	INVERT-4	PHI 3	PHI 4
	1812.00	2753.64	1	36	0	0.013	45.0	0.0	2753.64	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 7 IS A REACH

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	1887.00	2754.00	1	0.013	0.00	0.00	0.00	0

ELEMENT NO 8 IS A TRANSITION

U/S DATA	STATION	INVERT	SECT	N
	1897.00	2754.31	42	0.013

ELEMENT NO 9 IS A REACH

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	2073.00	2759.63	42	0.013	0.00	0.00	0.00	1

ELEMENT NO 10 IS A REACH

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	2405.00	2769.72	42	0.013	0.00	0.00	5.00	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
	2405.00	2769.72	42	24	30	0.013	6.5	30.0	2771.22	2770.72	75.00	60.00

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

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
	2685.00	2778.21	42	0.013	0.00	0.00	0.00	1

ELEMENT NO 13 IS A REACH

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	2973.00	2786.95	42	0.013	0.00	0.00	45.00	1

ELEMENT NO 14 IS A JUNCTION

U/S DATA	STATION	INVERT	SECT	LAT-1	LAT-2	N	Q3	Q4	INVERT-3	INVERT-4	PHI 3	PHI 4
	2973.00	2787.45	36	36	0	0.013	45.0	0.0	2787.45	0.00	90.00	0.00

ELEMENT NO 15 IS A REACH

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	3070.00	2788.14	36	0.013	0.00	0.00	45.00	1

ELEMENT NO 16 IS A REACH

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	3208.00	2789.52	36	0.013	0.00	0.00	0.00	1

ELEMENT NO 17 IS A REACH

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	3289.00	2790.32	36	0.013	0.00	0.00	5.00	1

ELEMENT NO 18 IS A REACH		* STATION	* INVERT	* SECT	N			RADIUS	ANGLE	ANG PT	MAN H
	U/S DATA	3370.00	2791.63	36	0.013			0.00	0.00	5.00	1
ELEMENT NO 19 IS A REACH		* STATION	* INVERT	* SECT	N			RADIUS	ANGLE	ANG PT	MAN H
	U/S DATA	3432.00	2791.75	36	0.013			0.00	0.00	60.00	1
ELEMENT NO 20 IS A SYSTEM HEADWORKS		*		*			W S ELEV				
	U/S DATA	STATION 3432.00	INVERT 2791.75	SECT 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 INFRASTRUCTURE - PHASE 1
BY OLYMPIA COMPANIES
HORSE DRIVE - 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		
1000.00	2749.58	4.000	2753.580	197.0	9.18	1.307	2754.887		3.102			1		0	0.00
706.00	0.00499					.005090	3.59			3.267					
1706.00	2753.10	4.074	2757.174	197.0	9.18	1.307	2758.481		3.102			1		0	0.00
56.00	0.00500					.005090	0.29			3.262					
1762.00	2753.38	4.340	2757.720	197.0	9.18	1.307	2759.027		3.102			1		0	0.00
JUNCT STR	0.00539					.004519	0.06								
1775.00	2753.45	4.795	2758.245	173.5	8.08	1.014	2759.259		2.884			1		0	0.00
37.00	0.00513					.003948	0.15			2.840					
1812.00	2753.64	4.751	2758.391	173.5	8.08	1.014	2759.405		2.884			1		0	0.00
JUNCT STR	0.00000					.003057	0.00								
1812.00	2753.64	5.373	2759.013	128.5	5.99	0.556	2759.569		2.400			1		0	0.00
75.00	0.00480					.002166	0.16			2.288					
1887.00	2754.00	5.176	2759.176	128.5	5.99	0.556	2759.732		2.400			1		0	0.00
TRANS STR	0.03100														
1897.00	2754.31	2.236	2756.546	128.5	19.80	6.089	2762.635	0.00	3.301		3.50	0.00	0.00	0	0.00
176.00	0.03023					.029524	5.20			2.230			0.00		
2073.00	2759.63	2.259	2761.889	128.5	19.56	5.944	2767.833	0.00	3.301		3.50	0.00	0.00	0	0.00
110.97	0.03039					.028195	3.13			2.225			0.00		

2183.97	2763.00	2.309	2765.311	128.5	19.08	5.653	2770.964	0.00	3.301		3.50	0.00	0.00	0	0.00
90.33	0.03039					.025811	2.33			2.225			0.00		
2274.30	2765.75	2.409	2768.157	128.5	18.19	5.138	2773.295	0.00	3.301		3.50	0.00	0.00	0	0.00
48.60	0.03039					.023002	1.12			2.225			0.00		

WATER SURFACE PROFILE LISTING

SKYE CANYON INFRASTRUCTURE - PHASE 1
BY OLYMPIA COMPANIES
HORSE DRIVE - 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		
2322.90	2767.22	2.517	2769.742	128.5	17.34	4.671	2774.413	0.00	3.301		3.50	0.00	0.00	0	0.00
31.33	0.03039					.020569	0.64			2.225			0.00		
2354.23	2768.18	2.634	2770.811	128.5	16.54	4.247	2775.058	0.00	3.301		3.50	0.00	0.00	0	0.00
21.57	0.03039					.018479	0.40			2.225			0.00		
2375.80	2768.83	2.763	2771.596	128.5	15.77	3.861	2775.457	0.00	3.301		3.50	0.00	0.00	0	0.00
15.00	0.03039					.016719	0.25			2.225			0.00		
2390.80	2769.29	2.909	2772.197	128.5	15.03	3.510	2775.707	0.00	3.301		3.50	0.00	0.00	0	0.00
9.94	0.03039					.015301	0.15			2.225			0.00		
2400.74	2769.59	3.078	2772.669	128.5	14.34	3.191	2775.860	0.00	3.301		3.50	0.00	0.00	0	0.00
4.26	0.03039					.014392	0.06			2.225			0.00		
2405.00	2769.72	3.301	2773.021	128.5	13.66	2.899	2775.920	0.00	3.301		3.50	0.00	0.00	0	0.00
JUNCT STR	0.00000					.011232	0.00						0.00		
2405.00	2769.72	5.851	2775.571	92.0	9.56	1.420	2776.991	0.00	2.971		3.50	0.00	0.00	0	0.00
49.31	0.03032					.008362	0.41			1.801			0.00		
2454.31	2771.22	4.781	2775.996	92.0	9.56	1.420	2777.416	0.00	2.971		3.50	0.00	0.00	0	0.00
HYDRAULIC JUMP													0.00		
2454.31	2771.22	1.801	2773.016	92.0	18.44	5.280	2778.296	0.00	2.971		3.50	0.00	0.00	0	0.00
230.69	0.03032					.029568	6.82			1.801			0.00		
2685.00	2778.21	1.830	2780.040	92.0	18.07	5.071	2785.111	0.00	2.971		3.50	0.00	0.00	0	0.00
50.82	0.03035					.028319	1.44			1.801			0.00		
2735.82	2779.75	1.847	2781.599	92.0	17.85	4.950	2786.549	0.00	2.971		3.50	0.00	0.00	0	0.00

91.55 0.03035 .026218 2.40 1.801 0.00

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WATER SURFACE PROFILE LISTING

SKYE CANYON INFRASTRUCTURE - PHASE 1
BY OLYMPIA COMPANIES
HORSE DRIVE - 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		
2827.37	2782.53	1.919	2784.450	92.0	17.02	4.500	2788.950	0.00	2.971		3.50	0.00	0.00	0	0.00
46.21	0.03035					.023140	1.07			1.801			0.00		
2873.58	2783.93	1.995	2785.928	92.0	16.23	4.091	2790.019	0.00	2.971		3.50	0.00	0.00	0	0.00
29.48	0.03035					.020445	0.60			1.801			0.00		
2903.06	2784.83	2.075	2786.903	92.0	15.48	3.719	2790.622	0.00	2.971		3.50	0.00	0.00	0	0.00
20.64	0.03035					.018087	0.37			1.801			0.00		
2923.70	2785.45	2.160	2787.614	92.0	14.76	3.381	2790.995	0.00	2.971		3.50	0.00	0.00	0	0.00
15.18	0.03035					.016026	0.24			1.801			0.00		
2938.88	2785.91	2.250	2788.165	92.0	14.07	3.074	2791.239	0.00	2.971		3.50	0.00	0.00	0	0.00
11.38	0.03035					.014226	0.16			1.801			0.00		
2950.26	2786.26	2.346	2788.606	92.0	13.41	2.794	2791.400	0.00	2.971		3.50	0.00	0.00	0	0.00
8.54	0.03035					.012657	0.11			1.801			0.00		
2958.80	2786.52	2.449	2788.968	92.0	12.79	2.540	2791.508	0.00	2.971		3.50	0.00	0.00	0	0.00
6.24	0.03035					.011295	0.07			1.801			0.00		
2965.04	2786.71	2.561	2789.269	92.0	12.20	2.309	2791.578	0.00	2.971		3.50	0.00	0.00	0	0.00
4.40	0.03035					.010118	0.04			1.801			0.00		
2969.44	2786.84	2.682	2789.524	92.0	11.63	2.100	2791.624	0.00	2.971		3.50	0.00	0.00	0	0.00
2.67	0.03035					.009109	0.02			1.801			0.00		
2972.11	2786.92	2.816	2789.739	92.0	11.09	1.908	2791.647	0.00	2.971		3.50	0.00	0.00	0	0.00
0.89	0.03035					.008268	0.01			1.801			0.00		
2973.00	2786.95	2.971	2789.921	92.0	10.57	1.734	2791.655	0.00	2.971		3.50	0.00	0.00	0	0.00
JUNCT STR	0.00000					.006429	0.00						0.00		

LICENSEE: SLATER HANIFAN GROUP

F0515P

WATER SURFACE PROFILE LISTING

SKYE CANYON INFRASTRUCTURE - PHASE 1
BY OLYMPIA COMPANIES
HORSE DRIVE - TRUNK STORM DRAIN

STATION	INVERT ELEV	DEPTH OF FLOW	W.S. ELEV	Q	VEL	VEL HEAD	ENERGY GRD.EL.	SUPER ELEV	CRITICAL DEPTH	NORM DEPTH	HGT/ DIA	BASE/ ID NO.	ZL	NO PIER	AVBPR
L/ELEM	SO					SF AVE	HF						ZR		
2973.00	2787.45	5.068	2792.518	47.0	6.65	0.686	2793.204	0.00	2.233		3.00	0.00	0.00	0	0.00
97.00	0.00711					.004966	0.48			2.096			0.00		
3070.00	2788.14	4.996	2793.136	47.0	6.65	0.686	2793.822	0.00	2.233		3.00	0.00	0.00	0	0.00
138.00	0.01000					.004966	0.69			1.857			0.00		
3208.00	2789.52	4.336	2793.856	47.0	6.65	0.686	2794.542	0.00	2.233		3.00	0.00	0.00	0	0.00
81.00	0.00988					.004966	0.40			1.864			0.00		
3289.00	2790.32	3.984	2794.304	47.0	6.65	0.686	2794.990	0.00	2.233		3.00	0.00	0.00	0	0.00
81.00	0.01617					.004966	0.40			1.594			0.00		
3370.00	2791.63	3.122	2794.752	47.0	6.65	0.686	2795.438	0.00	2.233		3.00	0.00	0.00	0	0.00
62.00	0.00194					.004966	0.31			3.000			0.00		
3432.00	2791.75	3.480	2795.230	47.0	6.65	0.686	2795.916	0.00	2.233		3.00	0.00	0.00	0	0.00

SKYE CANYON INFRASTRUCTURE - PHASE 1
BY OLYMPIA COMPANIES
HORSE DRIVE - TRUNK STORM DRAIN

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                .         .         .         .         .         .         .         .         .         .         .
1000.00        .I    C X  E                                                                                    .    R
1031.58         .                                                                                             .
1063.17         .                                                                                             .
1094.75         .                                                                                             .
1126.34         .                                                                                             .
1157.92         .                                                                                             .
1189.51         .                                                                                             .
1221.09         .                                                                                             .
1252.68         .                                                                                             .
1284.26         .                                                                                             .
1315.84         .                                                                                             .
1347.43         .                                                                                             .
1379.01         .                                                                                             .
1410.60         .                                                                                             .
1442.18         .                                                                                             .
1473.77         .                                                                                             .
1505.35         .                                                                                             .
1536.94         .                                                                                             .
1568.52         .                                                                                             .
1600.10         .                                                                                             .
1631.69         .                                                                                             .
1663.27         .                                                                                             .
1694.86         .                                                                                             .    R
1726.44         .         I       C X  E                                                                      .
1758.03         .                                                                                             .    JX
1789.61         .          I      C HW  E
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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♀

Racel Storm Drain Model

(Parcel 1.1 Storm Drain Design)

Interim Condition WSPG Model
"R-MainD.WSP"

R-MAIN	
WSPG Station	Corresponding Roadway Station
1000	VTN 19+98.25
1310	VTN 23+08.25
1330	VTN 23+28.25
1380	96+67.59
1390	96+57.57
1411	96+38.46
1426	96+26.38
1472	95+83.79
1556	95+00.00
1576	94+80.00
1862	92+03.97
2059	90+07.82
2225	88+41.95
2285	87+82.51
2507	85+60.57
2586	84+81.56
2825	82+43.05
2988	80+80.87
3193	78+75.97
3382	76+87.14
3469	76+00.47
3570	74+99.79
3751	73+18.77
4038	70+31.85
4088	69+81.87
4138	69+31.91
4190	68+79.60



PARCEL 1.1 TIE-IN TO PARCEL TRUNK LINE

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T1 SKYE CANYON INFRASTRUCTURE - PHASE 1
T2 BY OLYMPIA COMPANIES
T3 RACEL STREET - TRUNK STORM DRAIN (DEVELOPED CONDITION MODEL)
SO   1000.002725.86  1                                          2730.5
R    1310.002736.19  1       .013
TS   1330.002736.86  3       .013
JX   1380.002738.46  3 24 24.013    22.       1. 2740.3 2740.3  45.   45.
JX   1390.002738.56  5 48    .013    21.          2739.42         45.
R    1411.002738.75  5       .013                                 35.
R    1426.002738.87  5       .013                                 35.
R    1472.002739.30  5       .013
R    1556.002740.10  5       .013                                 45.
JX   1576.002740.50 72 42    .013    11.          2740.24                  1
R    1862.002750.10 72       .013                                      10.  1
R    2059.002761.05 72       .013                                       5.  1
R    2225.002766.02 72       .013                                       5.  1
R    2285.002767.81 72       .013                                           1
R    2507.002769.29 72       .013
JX   2507.002769.29 72 42    .013    24.          2771.79         45.       1
R    2586.002775.00 72       .013                                           1
R    2825.002782.00 72       .013                                           1
R    2988.002789.22 72       .013                                       5.  1
R    3193.002799.54 72       .013                                       5.  1
R    3382.002809.06 72       .013                                       5.  1
R    3469.002813.43 72       .013                                       5.  1
R    3570.002818.50 72       .013                                       5.  1
R    3751.002821.89 72       .013                                           1
R    4038.002830.52 72       .013
R    4088.002831.58 72       .013
TS   4138.002835.60  6       .013
R    4190.002840.31  6       .013
SH   4190.002840.31  6
CD   1  3                 5.      8.
CD   2  3                 6.      8.
CD   3  3                 8.      8.
CD   4  6   0      0.0          0.0      0.0      0.0      0.0    0.0
CD   5  6   0      0.0          0.0      0.0      0.0      0.0    0.0
CD   6  3                 8.     10.
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.
PTS  421  0.00   0.00 12.00   0.00 12.00   4.99 11.79   6.00 11.48  6.53
PTS      11.00   7.00 10.48   7.30 10.00   7.46  9.00   7.70  8.00  7.87
PTS       7.00   7.97  6.00   8.00  5.00   7.97  4.00   7.87  3.00  7.70
PTS       2.00   7.46  1.52   7.30  1.00   7.00  0.52   6.53  0.21  6.00
PTS       0.00   5.01
PTS  521  0.00   0.00  8.00   0.00  8.00   3.28  8.00   3.29  7.90  3.99
PTS       7.70   4.48  7.50   4.79  7.25   5.08  7.00   5.29  6.00  5.74
PTS       5.00   5.94  4.00   6.00  3.00   5.94  2.00   5.74  1.00  5.29
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```
PTS       0.75  5.08  0.50  4.79  0.30  4.48  0.10  3.99  0.00  3.29
PTS       0.00  3.30
-
```

Q 1

704.

DATE: 5/10/2014
TIME: 20:40

F0515P

PAGE 1

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	1	3	0	0.00	5.00	8.00	0.00	0.00	0.00										
CD	2	3	0	0.00	6.00	8.00	0.00	0.00	0.00										
CD	3	3	0	0.00	8.00	8.00	0.00	0.00	0.00										
CD	4	6	0	0.00															
CD	5	6	0	0.00															
CD	6	3	0	0.00	8.00	10.00	0.00	0.00	0.00										
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														

DATE: 5/10/2014
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WATER SURFACE PROFILE - CROSS SECTION POINT LISTING

CARD CODE	SECT NO	NO OF POINTS	X(1) , Y(1) X(8) , Y(8)		X(2) , Y(2) X(9) , Y(9)		X(3) , Y(3) X(10) , Y(10)		X(4) , Y(4) X(11) , Y(11)		X(5) , Y(5) X(N) , Y(N)		X(6) , Y(6) X(N+1) , Y(N+1)		X(7) , Y(7) X(99) , Y(99)	
PTS	4	21	0.00	0.00	12.00	0.00	12.00	4.99	11.79	6.00	11.48	6.53	11.00	7.00	10.48	7.30
PTS			10.00	7.46	9.00	7.70	8.00	7.87	7.00	7.97	6.00	8.00	5.00	7.97	4.00	7.87
PTS			3.00	7.70	2.00	7.46	1.52	7.30	1.00	7.00	0.52	6.53	0.21	6.00	0.00	5.01
PTS	5	21	0.00	0.00	8.00	0.00	8.00	3.28	8.00	3.29	7.90	3.99	7.70	4.48	7.50	4.79
PTS			7.25	5.08	7.00	5.29	6.00	5.74	5.00	5.94	4.00	6.00	3.00	5.94	2.00	5.74
PTS			1.00	5.29	0.75	5.08	0.50	4.79	0.30	4.48	0.10	3.99	0.00	3.29	0.00	3.30

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PAGE NO 3

WATER SURFACE PROFILE - TITLE CARD LISTING

HEADING LINE NO 1 IS -

SKYE CANYON INFRASTRUCTURE - PHASE 1

HEADING LINE NO 2 IS -

BY OLYMPIA COMPANIES

HEADING LINE NO 3 IS -

RACEL STREET - TRUNK STORM DRAIN (DEVELOPED CONDITION MODEL)

PAGE NO 2

WATER SURFACE PROFILE - ELEMENT CARD LISTING

ELEMENT NO	1 IS A SYSTEM OUTLET											W S ELEV				
	U/S DATA	STATION	INVERT	SECT								2730.50				
		1000.00	2725.86	1												
ELEMENT NO	2 IS A REACH						N					RADIUS	ANGLE	ANG PT	MAN H	
	U/S DATA	STATION	INVERT	SECT			0.013					0.00	0.00	0.00	0	
		1310.00	2736.19	1												
ELEMENT NO	3 IS A TRANSITION						N									
	U/S DATA	STATION	INVERT	SECT			0.013									
		1330.00	2736.86	3												
ELEMENT NO	4 IS A JUNCTION							Q3	Q4							
	U/S DATA	STATION	INVERT	SECT	LAT-1	LAT-2	N			INVERT-3	INVERT-4	PHI 3	PHI 4			
		1380.00	2738.46	3	24	24	0.013	22.0	1.0	2740.30	2740.30	45.00	45.00			
ELEMENT NO	5 IS A JUNCTION							Q3	Q4							
	U/S DATA	STATION	INVERT	SECT	LAT-1	LAT-2	N			INVERT-3	INVERT-4	PHI 3	PHI 4			
		1390.00	2738.56	5	48	0	0.013	21.0	0.0	2739.42	0.00	45.00	0.00			
ELEMENT NO	6 IS A REACH						N					RADIUS	ANGLE	ANG PT	MAN H	
	U/S DATA	STATION	INVERT	SECT			0.013					0.00	35.00	0.00	0	
		1411.00	2738.75	5												
ELEMENT NO	7 IS A REACH						N					RADIUS	ANGLE	ANG PT	MAN H	
	U/S DATA	STATION	INVERT	SECT			0.013					0.00	0.00	0.00	0	
		1426.00	2738.87	5												
ELEMENT NO	8 IS A REACH						N					RADIUS	ANGLE	ANG PT	MAN H	
	U/S DATA	STATION	INVERT	SECT			0.013					0.00	35.00	0.00	0	
		1472.00	2739.30	5												
ELEMENT NO	9 IS A REACH						N					RADIUS	ANGLE	ANG PT	MAN H	
	U/S DATA	STATION	INVERT	SECT			0.013					0.00	0.00	0.00	0	
		1556.00	2740.10	5												
ELEMENT NO	10 IS A JUNCTION							Q3	Q4							
	U/S DATA	STATION	INVERT	SECT	LAT-1	LAT-2	N			INVERT-3	INVERT-4	PHI 3	PHI 4			
		1576.00	2740.50	72	42	0	0.013	11.0	0.0	2740.24	0.00	45.00	0.00			
					F 0 5 1 5 P									PAGE NO	3	

WATER SURFACE PROFILE - ELEMENT CARD LISTING

ELEMENT NO	11 IS A REACH						N					RADIUS	ANGLE	ANG PT	MAN H	
	U/S DATA	STATION	INVERT	SECT			0.013					0.00	0.00	0.00	1	
		1862.00	2750.10	72												
ELEMENT NO	12 IS A REACH						N					RADIUS	ANGLE	ANG PT	MAN H	
	U/S DATA	STATION	INVERT	SECT			0.013					0.00	0.00	10.00	1	
		2059.00	2761.05	72												
ELEMENT NO	13 IS A REACH						N					RADIUS	ANGLE	ANG PT	MAN H	
	U/S DATA	STATION	INVERT	SECT			0.013					0.00	0.00	5.00	1	
		2225.00	2766.02	72												

ELEMENT NO 14 IS A REACH		*	*	*							RADIUS	ANGLE	ANG PT	MAN H
U/S DATA	STATION	INVERT	SECT			N					0.00	0.00	5.00	1
	2285.00	2767.81	72			0.013								
ELEMENT NO 15 IS A REACH		*	*	*							RADIUS	ANGLE	ANG PT	MAN H
U/S DATA	STATION	INVERT	SECT			N					0.00	0.00	0.00	1
	2507.00	2769.29	72			0.013								
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		
	2507.00	2769.29	72	42	0	0.013	24.0	0.0	2771.79		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 17 IS A REACH		*	*	*							RADIUS	ANGLE	ANG PT	MAN H
U/S DATA	STATION	INVERT	SECT			N					0.00	0.00	0.00	1
	2586.00	2775.00	72			0.013								
ELEMENT NO 18 IS A REACH		*	*	*							RADIUS	ANGLE	ANG PT	MAN H
U/S DATA	STATION	INVERT	SECT			N					0.00	0.00	0.00	1
	2825.00	2782.00	72			0.013								
ELEMENT NO 19 IS A REACH		*	*	*							RADIUS	ANGLE	ANG PT	MAN H
U/S DATA	STATION	INVERT	SECT			N					0.00	0.00	0.00	1
	2988.00	2789.22	72			0.013								
ELEMENT NO 20 IS A REACH		*	*	*							RADIUS	ANGLE	ANG PT	MAN H
U/S DATA	STATION	INVERT	SECT			N					0.00	0.00	5.00	1
	3193.00	2799.54	72			0.013								
ELEMENT NO 21 IS A REACH		*	*	*							RADIUS	ANGLE	ANG PT	MAN H
U/S DATA	STATION	INVERT	SECT			N					0.00	0.00	5.00	1
	3382.00	2809.06	72			0.013								
ELEMENT NO 22 IS A REACH		*	*	*							RADIUS	ANGLE	ANG PT	MAN H
U/S DATA	STATION	INVERT	SECT			N					0.00	0.00	5.00	1
	3469.00	2813.43	72			0.013							PAGE NO	4

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WATER SURFACE PROFILE - ELEMENT CARD LISTING

ELEMENT NO 23 IS A REACH		*	*	. *							RADIUS	ANGLE	ANG PT	MAN H
U/S DATA	STATION	INVERT	SECT			N					0.00	0.00	5.00	1
	3570.00	2818.50	72			0.013								
ELEMENT NO 24 IS A REACH		*	*	. *							RADIUS	ANGLE	ANG PT	MAN H
U/S DATA	STATION	INVERT	SECT			N					0.00	0.00	5.00	1
	3751.00	2821.89	72			0.013								
ELEMENT NO 25 IS A REACH		*	*	*							RADIUS	ANGLE	ANG PT	MAN H
U/S DATA	STATION	INVERT	SECT			N					0.00	0.00	0.00	1
	4038.00	2830.52	72			0.013								
ELEMENT NO 26 IS A REACH		*	*	*							RADIUS	ANGLE	ANG PT	MAN H
U/S DATA	STATION	INVERT	SECT			N					0.00	0.00	0.00	0
	4088.00	2831.58	72			0.013								

ELEMENT NO 27 IS A TRANSITION
U/S DATA STATION 4138.00 INVERT 2835.60 SECT 6 N 0.013

ELEMENT NO 28 IS A REACH
U/S DATA STATION 4190.00 INVERT 2840.31 SECT 6 N 0.013 RADIUS 0.00 ANGLE 0.00 ANG PT 0.00 MAN H 0

ELEMENT NO 29 IS A SYSTEM HEADWORKS
U/S DATA STATION 4190.00 INVERT 2840.31 SECT 6 W S ELEV 0.00

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

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F0515P
WATER SURFACE PROFILE LISTING

SKYE CANYON INFRASTRUCTURE - PHASE 1
BY OLYMPIA COMPANIES
RACEL STREET - TRUNK STORM DRAIN (DEVELOPED CONDITION MODEL)

STATION	INVERT ELEV	DEPTH OF FLOW	W.S. ELEV	Q	VEL	VEL HEAD	ENERGY GRD.EL.	SUPER ELEV	CRITICAL DEPTH	NORM DEPTH	HGT/ DIA	BASE/ ID	NO.	ZL	NO PIER	AVBPR
L/ELEM	SO					SF AVE	HF							ZR		
1000.00	2725.86	3.320	2729.180	783.0	29.48	13.496	2742.676	0.00	5.000		5.00	8.00	0.00	0	0.00
190.62	0.03332					.028478	5.43			3.197			0.00		
1190.62	2732.21	3.459	2735.671	783.0	28.30	12.435	2748.106	0.00	5.000		5.00	8.00	0.00	0	0.00
119.38	0.03332					.025267	3.02			3.197			0.00		
1310.00	2736.19	3.627	2739.817	783.0	26.98	11.305	2751.122	0.00	5.000		5.00	8.00	0.00	0	0.00
TRANS STR	0.03350					.023341	0.47						0.00		
1330.00	2736.86	3.662	2740.522	783.0	26.73	11.093	2751.615	0.00	6.677		8.00	8.00	0.00	0	0.00
JUNCT STR	0.03200					.023446	1.17						0.00		
1380.00	2738.46	3.537	2741.997	760.0	26.86	11.203	2753.200	0.00	6.546		8.00	8.00	0.00	0	0.00
JUNCT STR	0.01000					.025609	0.26						0.00		
1390.00	2738.56	3.294	2741.854	739.0	28.05	12.215	2754.069		5.605			5		0	0.00
21.00	0.00905					.028079	0.59			5.272					
1411.00	2738.75	3.233	2741.983	739.0	28.57	12.676	2754.659		5.605			5		0	0.00
15.00	0.00800					.029365	0.44			6.000					
1426.00	2738.87	3.187	2742.057	739.0	28.98	13.043	2755.100		5.605			5		0	0.00
46.00	0.00935					.031811	1.46			5.159					

1472.00	2739.30	3.054	2742.354	739.0	30.25	14.211	2756.565		5.605			5	0	0.00
38.20	0.00952					.035511	1.36			5.099				
1510.20	2739.66	2.941	2742.605	739.0	31.40	15.313	2757.918		5.605			5	0	0.00
45.80	0.00952					.039982	1.83			5.099				
1556.00	2740.10	2.805	2742.905	739.0	32.94	16.844	2759.749		5.605			5	0	0.00
JUNCT STR	0.02000					.039235	0.78							

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WATER SURFACE PROFILE LISTING

SKYE CANYON INFRASTRUCTURE - PHASE 1
BY OLYMPIA COMPANIES
RACEL STREET - TRUNK STORM DRAIN (DEVELOPED CONDITION MODEL)

STATION	INVERT ELEV	DEPTH OF FLOW	W.S. ELEV	Q	VEL	VEL HEAD	ENERGY GRD.EL.	SUPER ELEV	CRITICAL DEPTH	NORM DEPTH	HGT/ DIA	BASE/ ID NO.	ZL	NO PIER	AVBPR
L/ELEM	SO					SF AVE	HF						ZR		
1576.00	2740.50	4.483	2744.983	728.0	32.13	16.027	2761.010	0.00	5.922		6.00	0.00	0.00	0	0.00
286.00	0.03357					.037533	10.73			4.615			0.00		
1862.00	2750.10	4.320	2754.420	728.0	33.41	17.328	2771.748	0.00	5.922		6.00	0.00	0.00	0	0.00
61.50	0.05558					.037578	2.31			3.802			0.00		
1923.50	2753.52	4.478	2757.996	728.0	32.16	16.064	2774.060	0.00	5.922		6.00	0.00	0.00	0	0.00
57.97	0.05558					.034135	1.98			3.802			0.00		
1981.47	2756.74	4.695	2761.435	728.0	30.67	14.603	2776.038	0.00	5.922		6.00	0.00	0.00	0	0.00
43.81	0.05558					.030833	1.35			3.802			0.00		
2025.28	2759.18	4.938	2764.114	728.0	29.24	13.275	2777.389	0.00	5.922		6.00	0.00	0.00	0	0.00
33.72	0.05558					.028141	0.95			3.802			0.00		
2059.00	2761.05	5.220	2766.270	728.0	27.88	12.069	2778.339	0.00	5.922		6.00	0.00	0.00	0	0.00
166.00	0.02994					.026343	4.37			4.882			0.00		
2225.00	2766.02	5.485	2771.505	728.0	26.86	11.207	2782.712	0.00	5.922		6.00	0.00	0.00	0	0.00
60.00	0.02983					.025638	1.54			4.892			0.00		
2285.00	2767.81	5.654	2773.464	728.0	26.36	10.786	2784.250	0.00	5.922		6.00	0.00	0.00	0	0.00
5.85	0.00667					.025554	0.15			6.000			0.00		
2290.85	2767.85	5.571	2773.420	728.0	26.59	10.978	2784.398	0.00	5.922		6.00	0.00	0.00	0	0.00

37.96	0.00667					.026265	1.00			6.000			0.00		
2328.81	2768.10	5.217	2773.319	728.0	27.89	12.077	2785.396	0.00	5.922		6.00	0.00	0.00	0	0.00
43.12	0.00667					.028155	1.21			6.000			0.00		
2371.93	2768.39	4.936	2773.325	728.0	29.25	13.284	2786.609	0.00	5.922		6.00	0.00	0.00	0	0.00
44.88	0.00667					.030852	1.38			6.000			0.00		

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WATER SURFACE PROFILE LISTING

SKYE CANYON INFRASTRUCTURE - PHASE 1
BY OLYMPIA COMPANIES
RACEL STREET - TRUNK STORM DRAIN (DEVELOPED CONDITION MODEL)

STATION	INVERT ELEV	DEPTH OF FLOW	W.S. ELEV	Q	VEL	VEL HEAD	ENERGY GRD.EL.	SUPER ELEV	CRITICAL DEPTH	NORM DEPTH	HGT/ DIA	BASE/ ID NO.	ZL	NO PIER	AVBPR
L/ELEM	SO					SF AVE	HF						ZR		
2416.81	2768.69	4.693	2773.382	728.0	30.68	14.613	2787.995	0.00	5.922		6.00	0.00	0.00	0	0.00
45.29	0.00667					.034161	1.55			6.000			0.00		
2462.10	2768.99	4.477	2773.468	728.0	32.17	16.074	2789.542	0.00	5.922		6.00	0.00	0.00	0	0.00
44.90	0.00667					.038066	1.71			6.000			0.00		
2507.00	2769.29	4.279	2773.569	728.0	33.74	17.681	2791.250	0.00	5.922		6.00	0.00	0.00	0	0.00
JUNCT STR	0.00000					.042343	0.00						0.00		
2507.00	2769.29	4.015	2773.305	704.0	35.01	19.037	2792.342	0.00	5.911		6.00	0.00	0.00	0	0.00
35.71	0.07228					.042873	1.53			3.413			0.00		
2542.71	2771.87	4.129	2776.000	704.0	33.93	17.874	2793.874	0.00	5.911		6.00	0.00	0.00	0	0.00
43.29	0.07228					.039014	1.69			3.413			0.00		
2586.00	2775.00	4.314	2779.314	704.0	32.35	16.250	2795.564	0.00	5.911		6.00	0.00	0.00	0	0.00
121.32	0.02929					.038509	4.67			4.770			0.00		
2707.32	2778.55	4.167	2782.720	704.0	33.58	17.513	2800.233	0.00	5.911		6.00	0.00	0.00	0	0.00
117.68	0.02929					.042695	5.02			4.770			0.00		
2825.00	2782.00	3.994	2785.994	704.0	35.22	19.265	2805.259	0.00	5.911		6.00	0.00	0.00	0	0.00
163.00	0.04429					.045489	7.41			4.022			0.00		
2988.00	2789.22	3.974	2793.194	704.0	35.42	19.483	2812.677	0.00	5.911		6.00	0.00	0.00	0	0.00
205.00	0.05034					.043642	8.95			3.844			0.00		

3193.00	2799.54	4.120	2803.660	704.0	34.01	17.964	2821.624	0.00	5.911		6.00	0.00	0.00	0	0.00
92.25	0.05037					.040006	3.69			3.843			0.00		
3285.25	2804.19	4.237	2808.424	704.0	32.99	16.895	2825.319	0.00	5.911		6.00	0.00	0.00	0	0.00
96.75	0.05037					.036499	3.53			3.843			0.00		

LICENSEE: SLATER HANIFAN GROUP

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WATER SURFACE PROFILE LISTING

SKYE CANYON INFRASTRUCTURE - PHASE 1
BY OLYMPIA COMPANIES
RACEL STREET - TRUNK STORM DRAIN (DEVELOPED CONDITION MODEL)

STATION	INVERT ELEV	DEPTH OF FLOW	W.S. ELEV	Q	VEL	VEL HEAD	ENERGY GRD.EL.	SUPER ELEV	CRITICAL DEPTH	NORM DEPTH	HGT/ DIA	BASE/ ID NO.	ZL	NO PIER	AVBPR
						SF AVE	HF						ZR		
L/ELEM	SO														
3382.00	2809.06	4.431	2813.491	704.0	31.45	15.358	2828.849	0.00	5.911		6.00	0.00	0.00	0	0.00
26.61	0.05023					.033817	0.90			3.847			0.00		
3408.61	2810.40	4.503	2814.900	704.0	30.92	14.850	2829.750	0.00	5.911		6.00	0.00	0.00	0	0.00
60.39	0.05023					.031521	1.90			3.847			0.00		
3469.00	2813.43	4.723	2818.153	704.0	29.49	13.500	2831.653	0.00	5.911		6.00	0.00	0.00	0	0.00
38.46	0.05020					.028710	1.10			3.848			0.00		
3507.46	2815.36	4.926	2820.287	704.0	28.34	12.470	2832.757	0.00	5.911		6.00	0.00	0.00	0	0.00
35.94	0.05020					.026419	0.95			3.848			0.00		
3543.40	2817.16	5.205	2822.370	704.0	27.02	11.336	2833.706	0.00	5.911		6.00	0.00	0.00	0	0.00
26.60	0.05020					.024612	0.65			3.848			0.00		
3570.00	2818.50	5.555	2824.055	704.0	25.76	10.306	2834.361	0.00	5.911		6.00	0.00	0.00	0	0.00
65.29	0.01873					.024236	1.58			6.000			0.00		
3635.29	2819.72	5.345	2825.068	704.0	26.46	10.873	2835.941	0.00	5.911		6.00	0.00	0.00	0	0.00
115.71	0.01873					.025512	2.95			6.000			0.00		
3751.00	2821.89	5.043	2826.933	704.0	27.75	11.961	2838.894	0.00	5.911		6.00	0.00	0.00	0	0.00
47.29	0.03007					.026245	1.24			4.708			0.00		
3798.29	2823.31	5.102	2828.414	704.0	27.47	11.721	2840.135	0.00	5.911		6.00	0.00	0.00	0	0.00
151.35	0.03007					.025131	3.80			4.708			0.00		
3949.64	2827.86	5.420	2833.283	704.0	26.20	10.655	2843.938	0.00	5.911		6.00	0.00	0.00	0	0.00

						.024657	2.18			4.708			0.00		
88.36	0.03007										6.00	0.00	0.00	0	0.00
4038.00	2830.52	5.911	2836.431	704.0	24.98	9.686	2846.117	0.00	5.911						
						.026195	0.16			6.000			0.00		
6.00	0.02120													PAGE	5

LICENSEE: SLATER HANIFAN GROUP

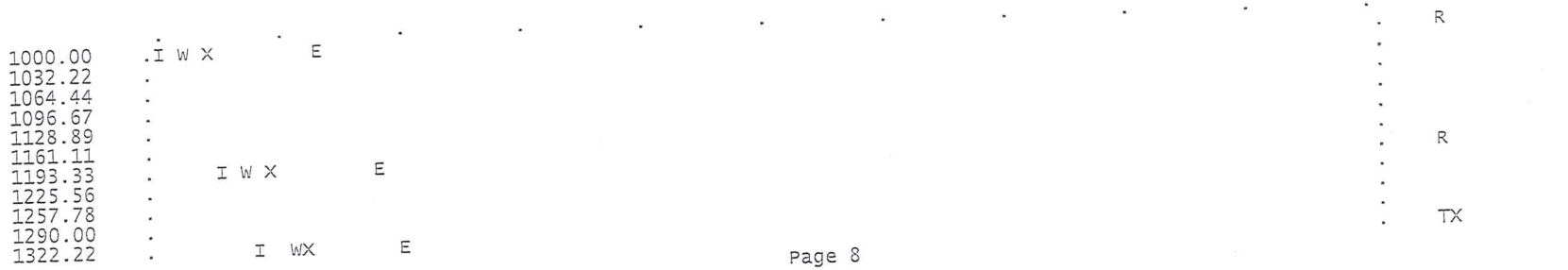
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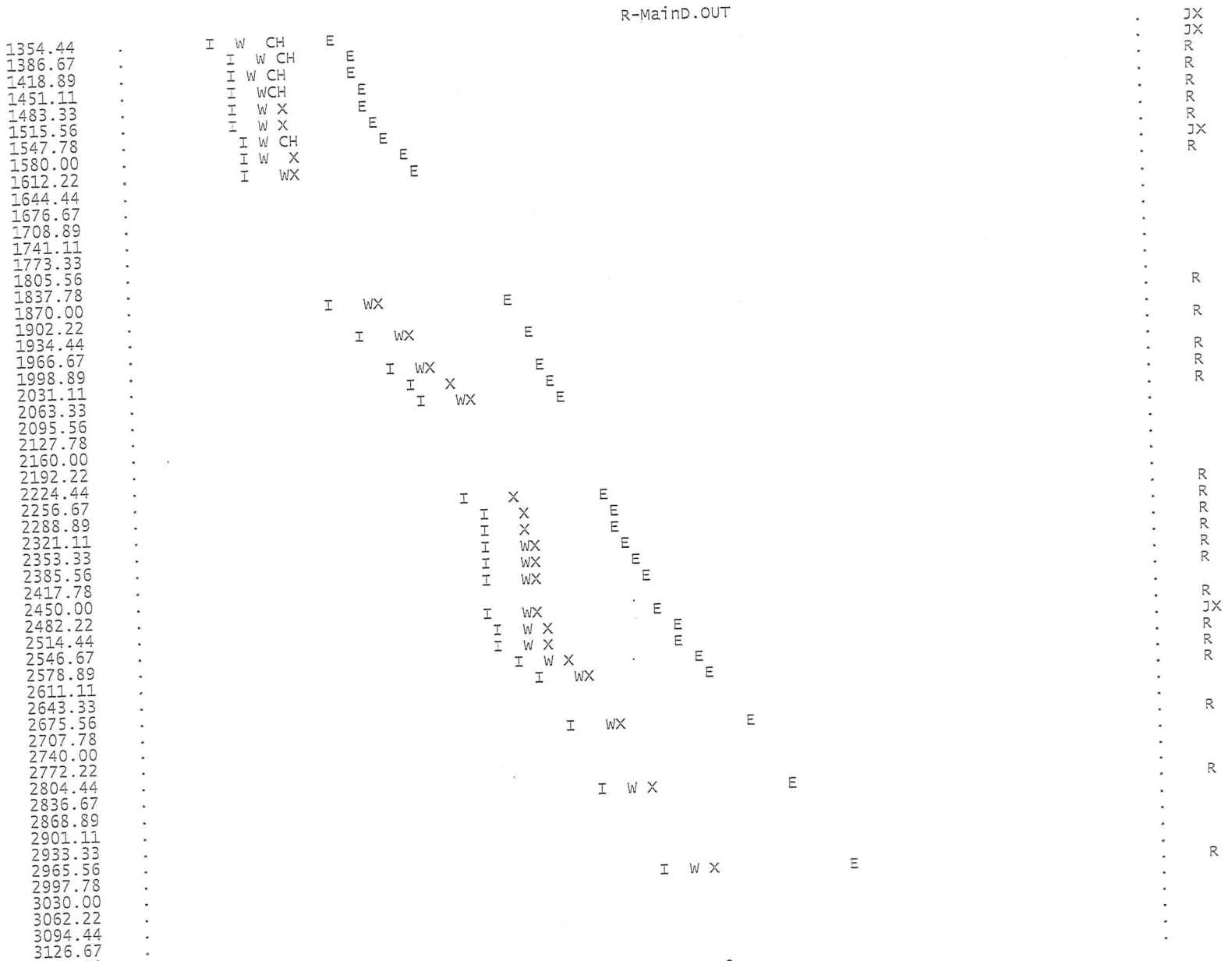
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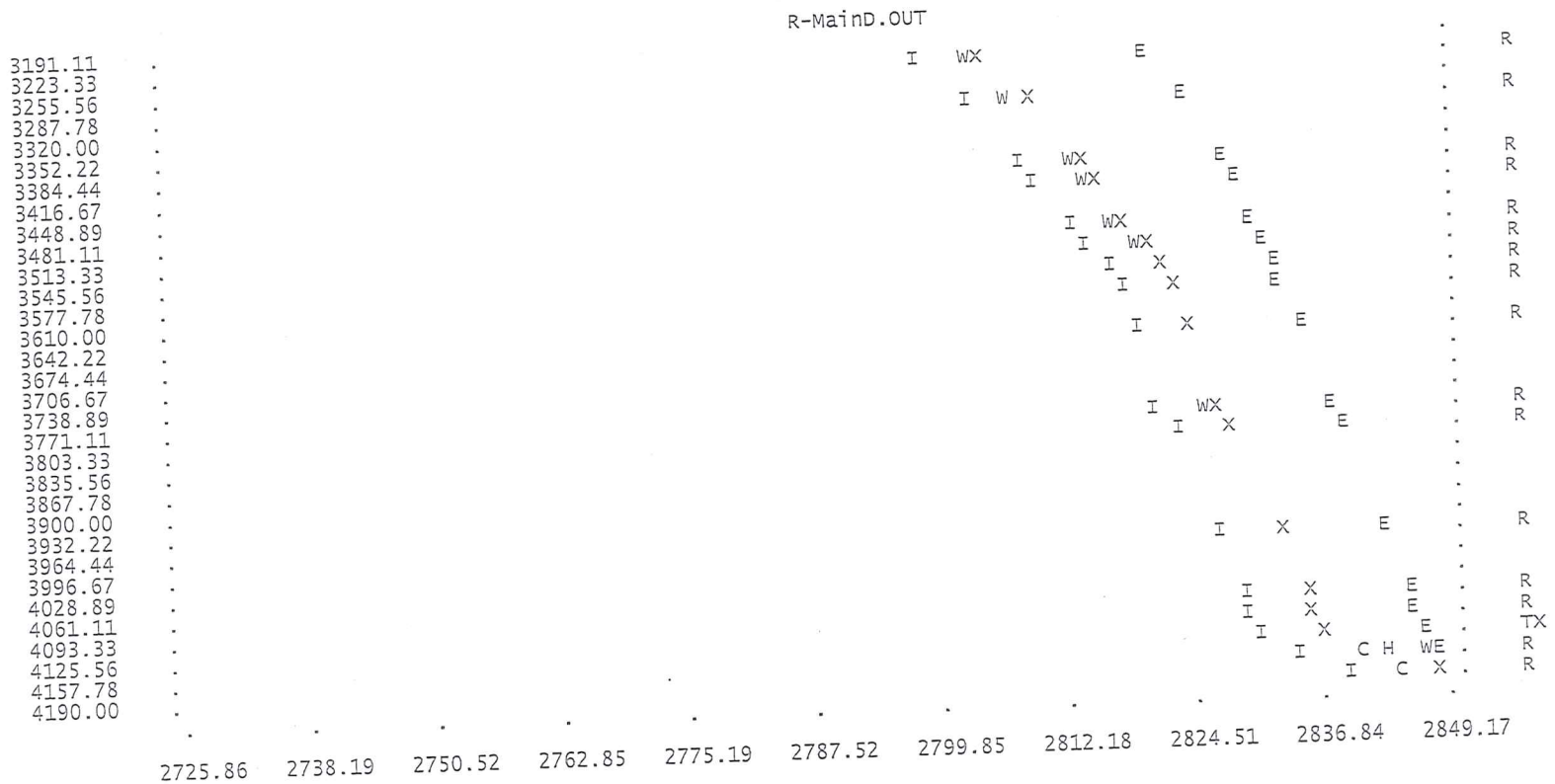
SKYE CANYON INFRASTRUCTURE - PHASE 1
BY OLYMPIA COMPANIES
RACEL STREET - TRUNK STORM DRAIN (DEVELOPED CONDITION MODEL)

STATION	INVERT ELEV	DEPTH OF FLOW	W.S. ELEV	Q	VEL	VEL HEAD	ENERGY GRD.EL.	SUPER ELEV	CRITICAL DEPTH	NORM DEPTH	HGT/ DIA	BASE/ ID NO.	ZL	NO PIER	AVBPR
L/ELEM	SO					SF AVE	HF						ZR		
4044.00	2830.65	6.000	2836.647	704.0	24.90	9.627	2846.274	0.00	5.911		6.00	0.00	0.00	0	0.00
44.00	0.02120					.027481	1.21			6.000			0.00		
4088.00	2831.58	6.283	2837.863	704.0	24.90	9.627	2847.490	0.00	5.911		6.00	0.00	0.00	0	0.00
TRANS STR	0.08040					.014849	0.74						0.00		
4138.00	2835.60	12.264	2847.864	704.0	8.83	1.210	2849.074	0.00	5.361		8.00	10.00	0.00	0	0.00
48.17	0.09058					.002065	0.10			1.731			0.00		
4186.17	2839.96	8.000	2847.963	704.0	8.83	1.210	2849.173	0.00	5.361		8.00	10.00	0.00	0	0.00
2.83	0.09058					.001416	0.00			1.731			0.00		
4189.00	2840.22	7.627	2847.846	704.0	9.23	1.323	2849.169	0.00	5.361		8.00	10.00	0.00	0	0.00
1.00	0.09058					.001530	0.00			1.731			0.00		
4190.00	2840.31	7.488	2847.798	704.0	9.40	1.373	2849.171	0.00	5.361		8.00	10.00	0.00	0	0.00

SKYE CANYON INFRASTRUCTURE - PHASE 1
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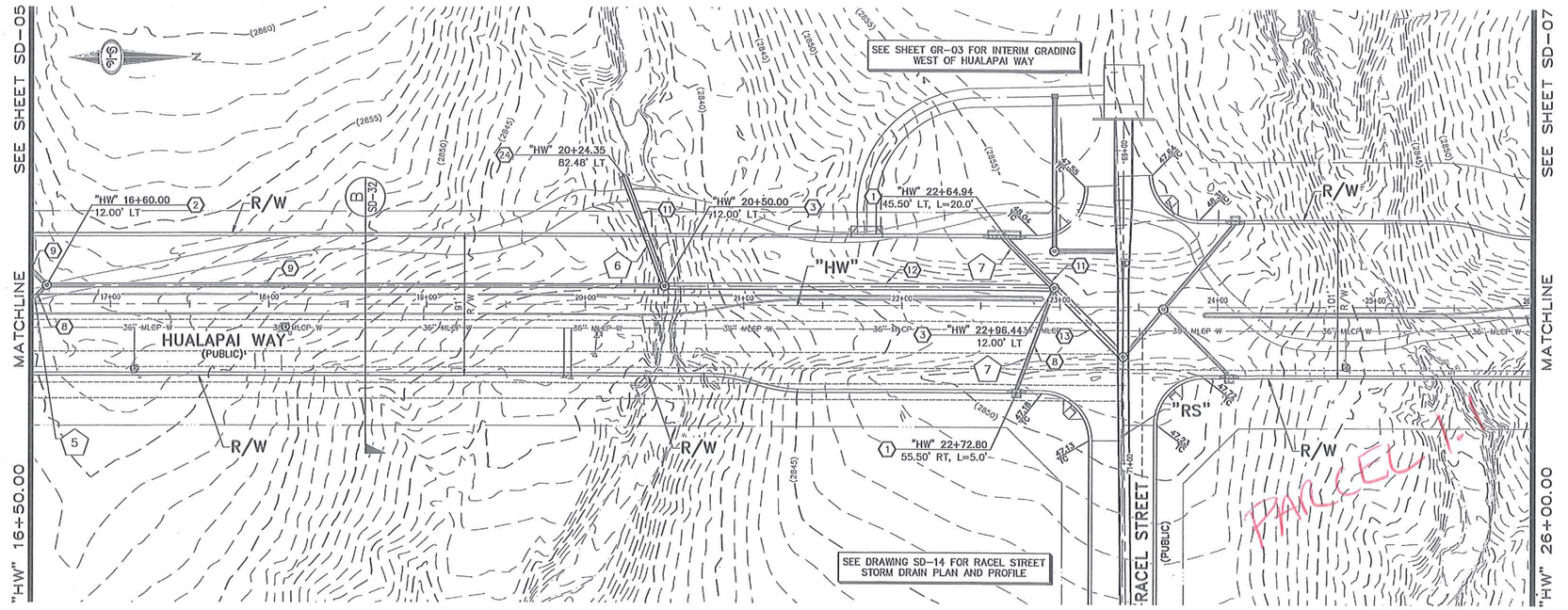


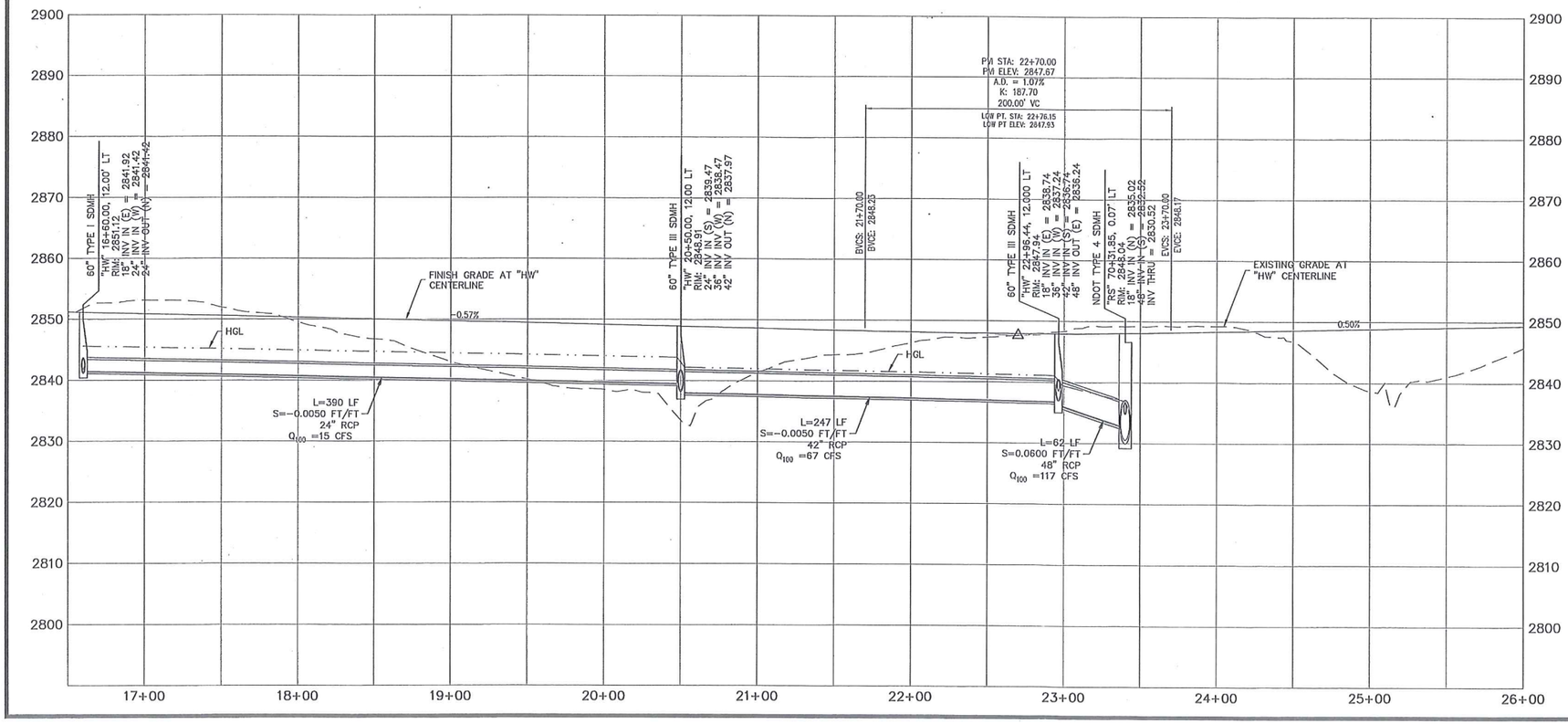

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1451.11
1483.33
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1644.44
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1708.89
1741.11
1773.33
1805.56
1837.78
1870.00
1902.22
1934.44
1966.67
1998.89
2031.11
2063.33
2095.56
2127.78
2160.00
2192.22
2224.44
2256.67
2288.89
2321.11
2353.33
2385.56
2417.78
2450.00
2482.22
2514.44
2546.67
2578.89
2611.11
2643.33
2675.56
2707.78
2740.00
2772.22
2804.44
2836.67
2868.89
2901.11
2933.33
2965.56
2997.78
3030.00
3062.22
3094.44
3126.67
3158.89



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

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5. ALL PIPES ARE PUBLICLY MAINTAINED.

LEGEND

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

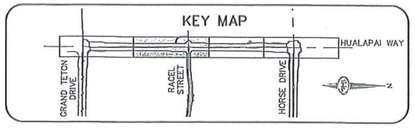
I CERTIFY THAT THIS GRADING PLAN IS IN CONFORMANCE WITH THE APPROVED TECHNICAL DRAINAGE STUDY DS-4661 ON FILE AT THE CITY OF LAS VEGAS FOR THE SUBJECT PROJECT

STEPHEN JONES, P.E. 019638 — 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) PANELS: 32003C1735E, 32003C1745E, 32003C1750E, ALL DATED SEPTEMBER 27, 2002

KEY MAP



AVOID HITTING BURIED PIPES! LOCATE ITS DEPTH
CALL BEFORE YOU DIG UTAH
1-702-227-2929

FAST
Call before you UnderGround.
1-702-432-5300
PROTECT OUR NATIONAL SYSTEM OF COMMUNICATION

Call before you Dig
Avoid injury and expensive utility cuts. It's easy.
Call 811
or
1-800-227-2600

SLATER HANFAN 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

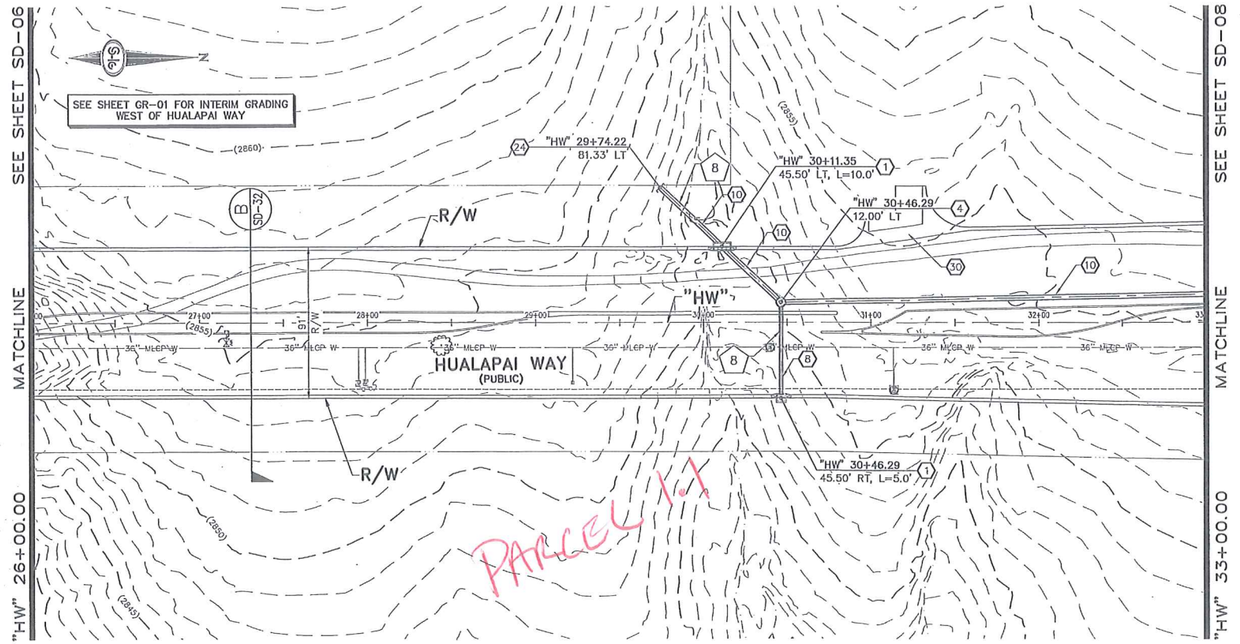
SKYE CANYON PHASE 1
HUALAPAI WAY STORM DRAIN PLAN AND PROFILE
"HW" 16+50.00 TO "HW" 26+00.00

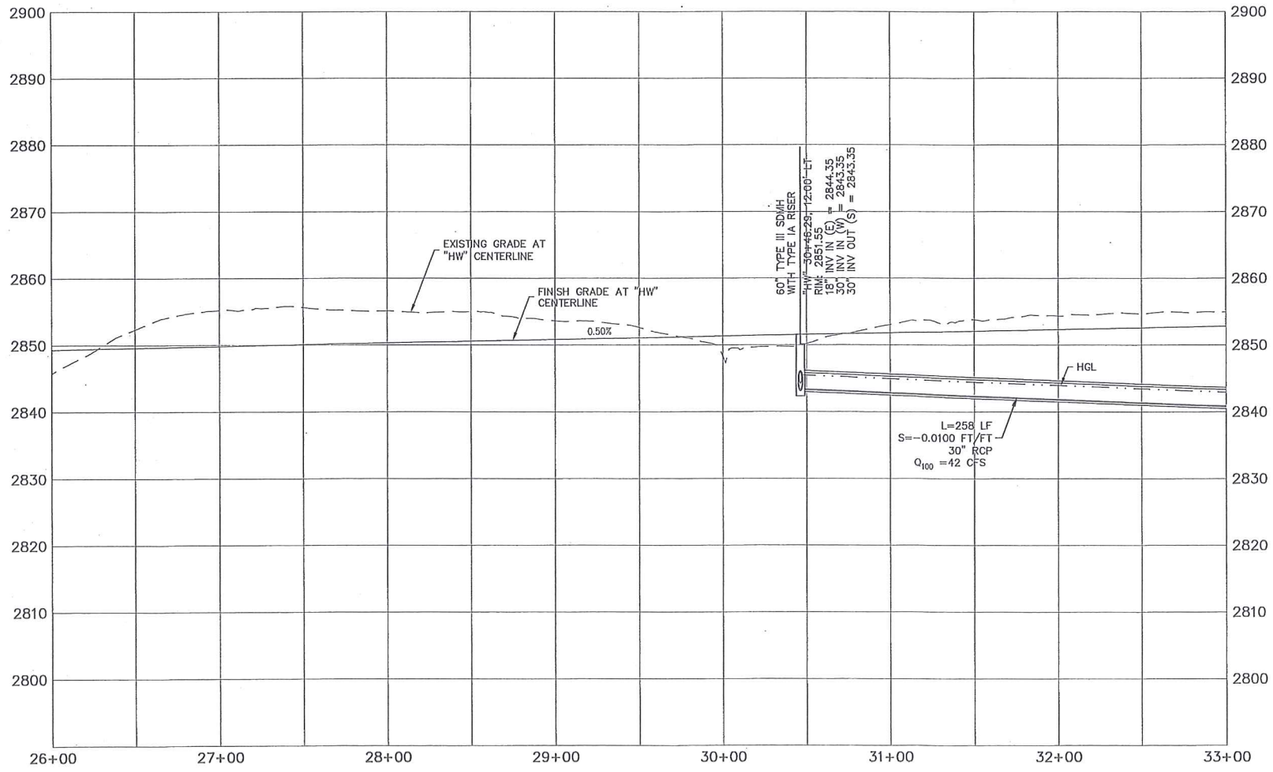
DATE: 5/13/14
DRAFTER: DAM
DESIGNER: DAM
CHECKED: JJS
PROJECT NO.
OLY1401-001

PROFESSIONAL ENGINEER — STATE OF NEVADA — STEPHEN M. JONES — Exp. 6/30/15 — CIVIL — No. 019638 — 5/13/2014

SD-06
SHEET 9 OF 42

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STORM DRAIN NOTES

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LEGEND

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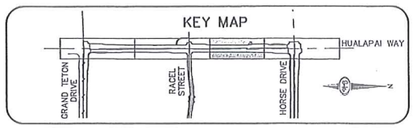
I CERTIFY THAT THIS GRADING PLAN IS IN CONFORMANCE WITH THE APPROVED TECHNICAL DRAINAGE STUDY DS-4651 ON FILE AT THE CITY OF LAS VEGAS FOR THE SUBJECT PROJECT

STEPHEN JONES, P.E. 019638 DATE

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KEY MAP



SCALE 40 0 40 80 FEET

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

FAST Call before you UnderGround. 1-702-432-5300 PROUDLY AND ACTIVELY SUPPORTS 811 PROTECTION

Call before you Dig Avoid hitting underground utility lines. It's easy. 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.

NINETY-FIVE MANAGEMENT LLC

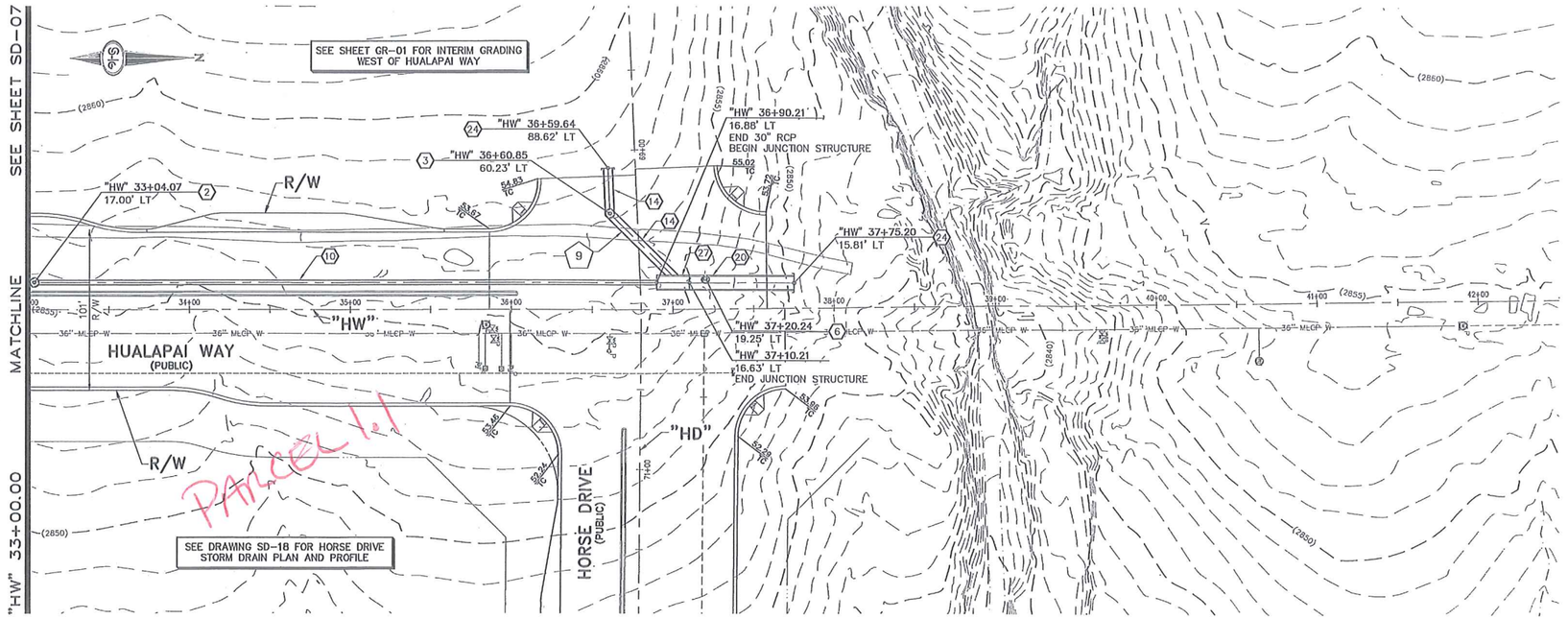
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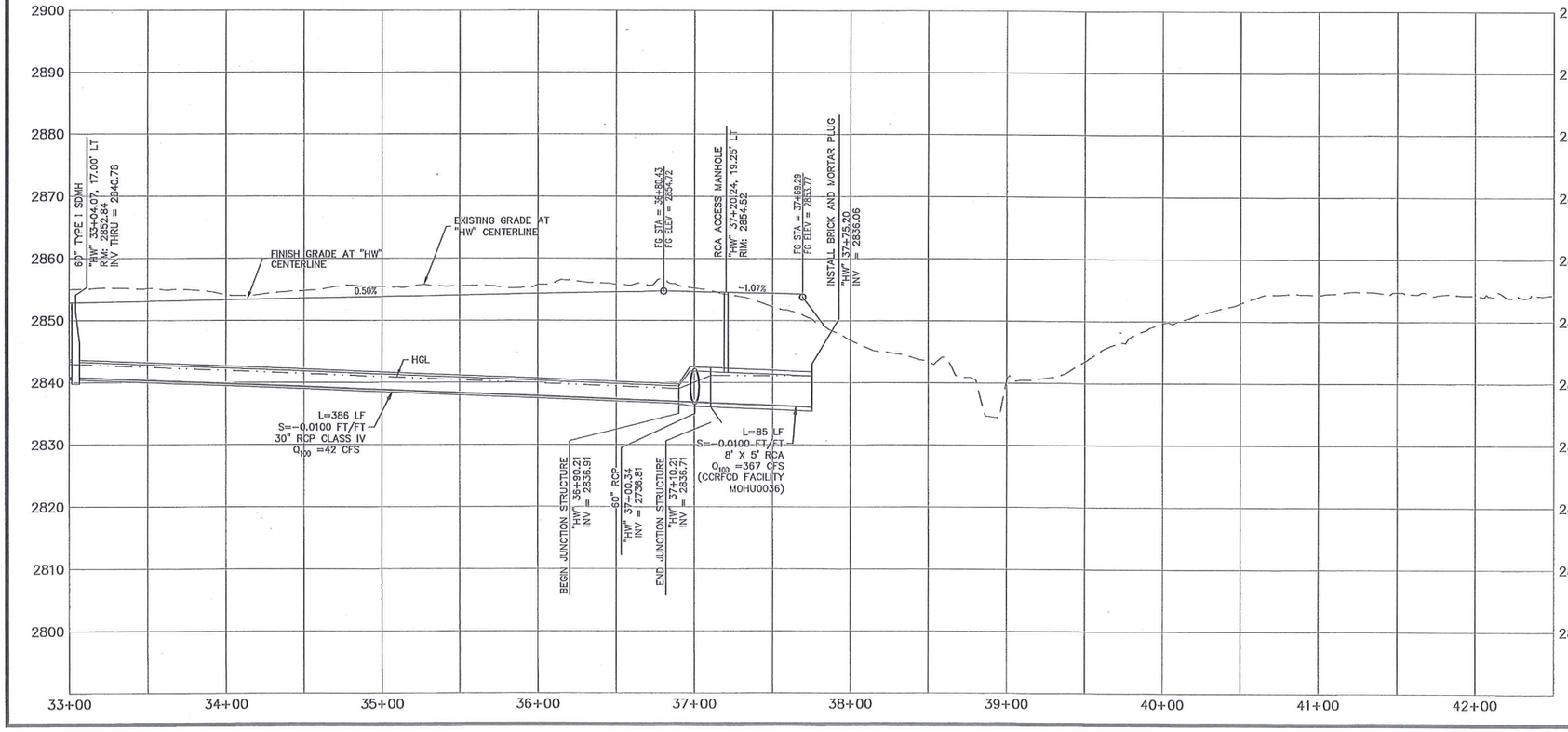
DATE: 5/13/14
DRAFTER: DAM
DESIGNER: DAM
CHECKED: JJS
PROJECT NO. OLY1401-001

PROFESSIONAL ENGINEER STATE OF NEVADA STEPHEN M. JONES Exp. 6/30/15 No. 019638 5/13/2014

SD-07
SHEET 10 OF 42

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STORM DRAIN NOTES

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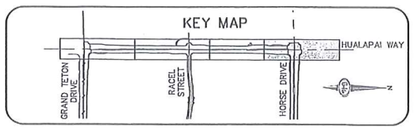
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40 0 40 80
SCALE FEET

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

Call before you Dig 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.

NINETY-FIVE MANAGEMENT LLC

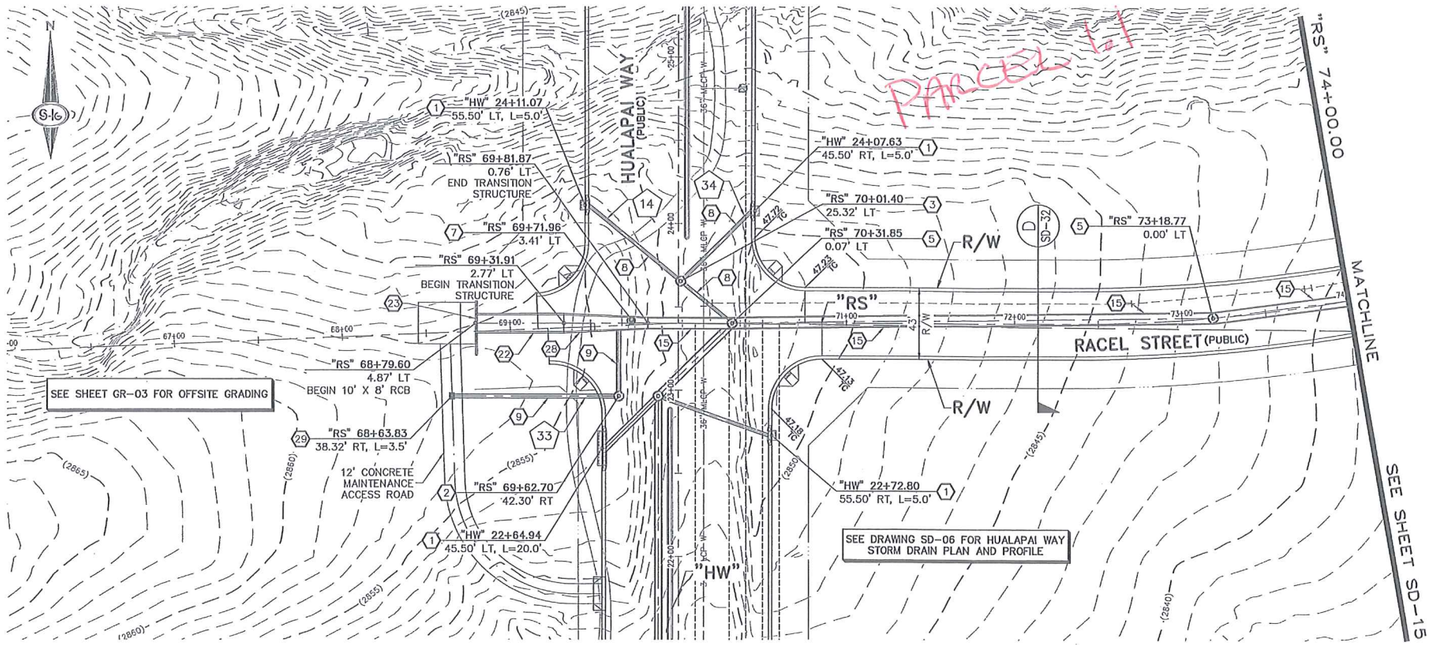
SKYE CANYON PHASE 1
HUALAPAI WAY STORM DRAIN PLAN AND PROFILE
"HW" 33+00.00 TO "HW" 42+50.00

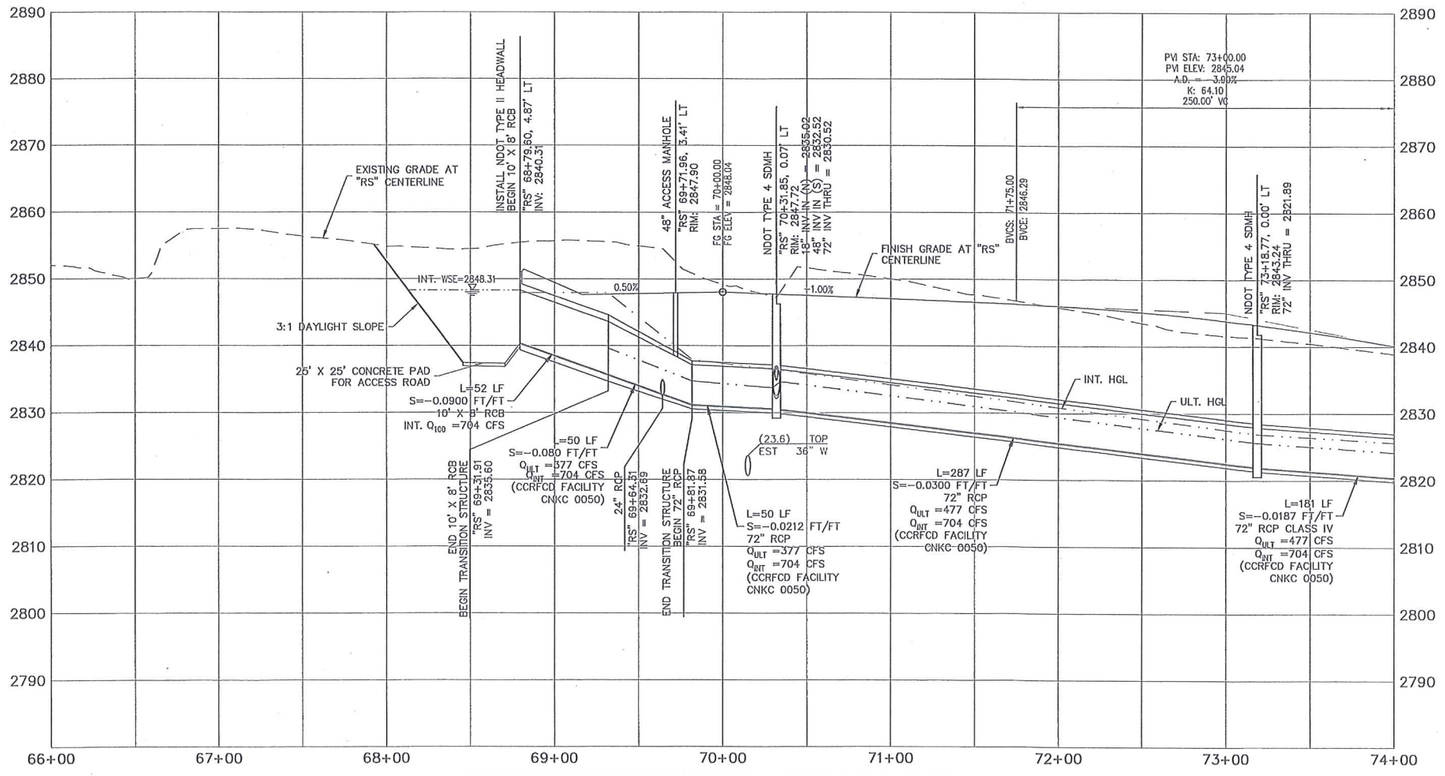
DATE: 5/13/14
DRAFTER: DAM
DESIGNER: DAM
CHECKED: JJS
PROJECT NO.
OLY1401-001

PROFESSIONAL ENGINEER — STATE OF NEVADA — STEPHEN M. JONES — Exp. 6/30/15 — CIVIL — No. 019638 — 5/13/2014

SD-08
SHEET 11 OF 42

J:\OLY\1401\SD\Skye Canyon Dwg\Plans\14SD07 Drainage Study\SD-08.dwg, 5/13/2014 10:49:59 AM, asmr





STORM DRAIN NOTES

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

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.

LEGEND

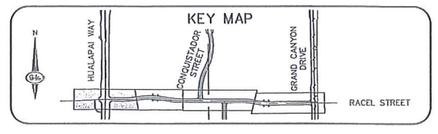
(1) STORM DRAIN LATERAL # (SEE SHEETS SD-25 THRU SD-31)

I CERTIFY THAT THIS GRADING PLAN IS IN CONFORMANCE WITH THE APPROVED TECHNICAL DRAINAGE STUDY DS-4681 ON FILE AT THE CITY OF LAS VEGAS FOR THE SUBJECT PROJECT

STEPHEN JONES, P.E. 019638 — 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) PANELS: 32003C1735E, 32003C1745E, 32003C1750E, ALL DATED SEPTEMBER 27, 2002



SCALE: 40 0 40 80 FEET

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

FAST Call before you UnderGround. 1-702-432-5500 PREPAID AND BUTTON BUTTON OF EXCAVATION

Call before you Dig MAKE A FREE CALL BEFORE YOU START ANY EXCAVATION. Call 811
1-800-227-2600

SLATER HANIFAN GROUP
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PHONE (702) 284-5300
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NO.	DESCRIPTION	DATE	BY	APP. DATE	APP.

NINETY-FIVE MANAGEMENT LLC

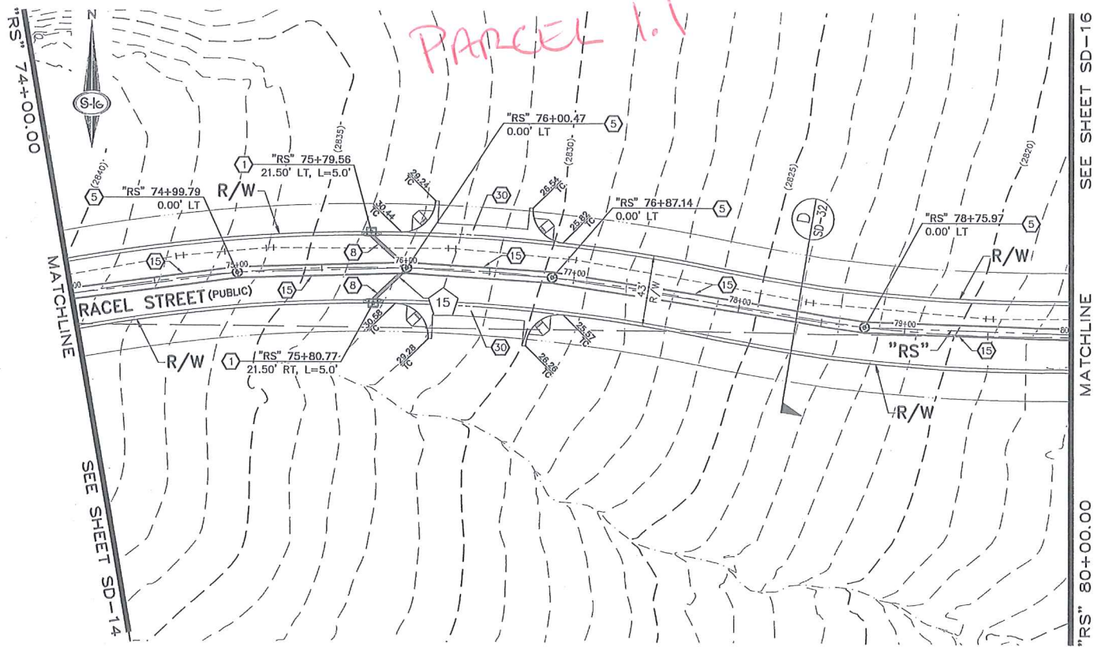
SKYE CANYON PHASE 1
RACEL STREET STORM DRAIN PLAN AND PROFILE
"RS" 66+00.00 TO "RS" 74+00.00

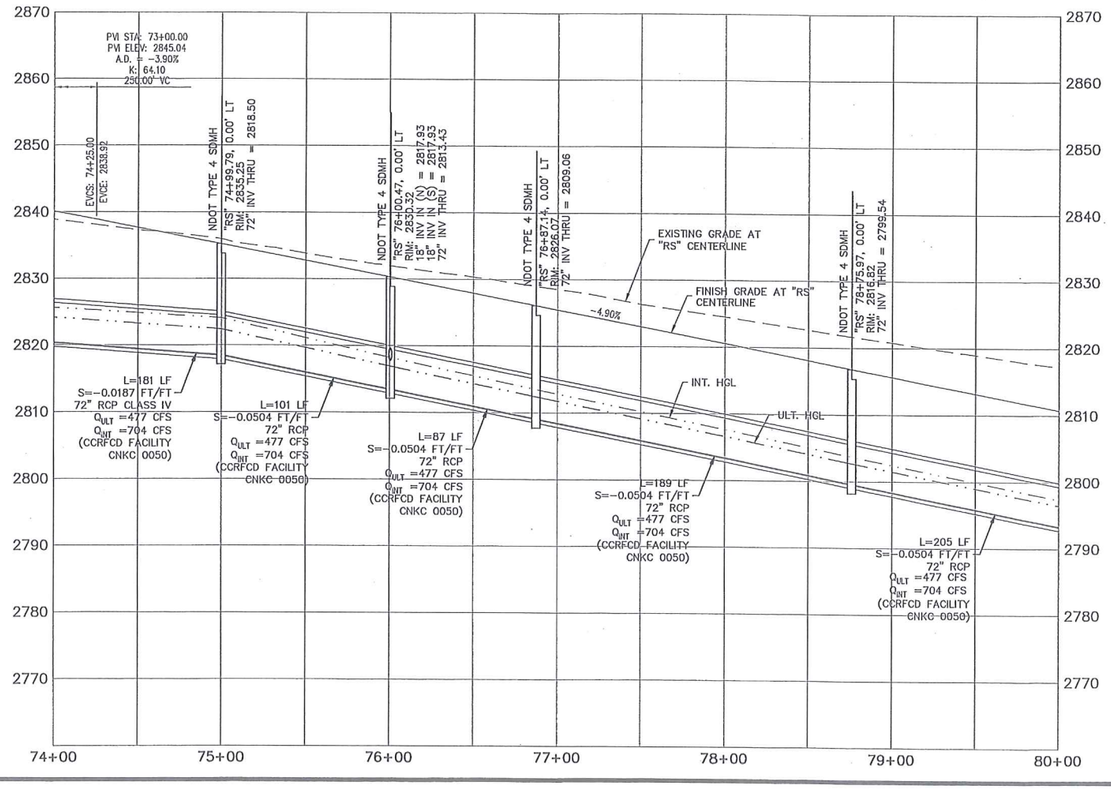
DATE: 5/13/14
DRAFTER: DAM
DESIGNER: DAM
CHECKED: JJS
PROJECT NO.
OLY1401-001

PROFESSIONAL ENGINEER — STATE OF NEVADA — STEPHEN M. JONES — Exp. 6/30/15 — CIVIL — No. 019638 — 5/13/2014

SD-14
SHEET 17 OF 42

J:\OLY1401.001 Skye Canyon\Dwg\Plans\14-0207 Drainage Study\SD-14.dwg, 5/13/2014 10:48:22 AM, sswr





STORM DRAIN NOTES

1. CONSTRUCT TYPE "CM2" DROP INLET (USDCCA STD. DWG. NO. 412.1)
2. CONSTRUCT 60" TYPE I MANHOLE (USDCCA STD. DWG. NO. 403.1)
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4. CONSTRUCT 60" TYPE III MANHOLE WITH TYPE IA RISER (USDCCA STD. DWG. NO. 404.1 AND 406.1)
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NOTES

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5. ALL PIPES ARE PUBLICLY MAINTAINED.

LEGEND

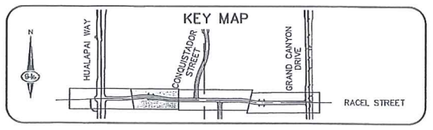
(1) STORM DRAIN LATERAL # (SEE SHEETS SD-25 THRU SD-31)

I CERTIFY THAT THIS GRADING PLAN IS IN CONFORMANCE WITH THE APPROVED TECHNICAL DRAINAGE STUDY DS-4681 ON FILE AT THE CITY OF LAS VEGAS FOR THE SUBJECT PROJECT

STEPHEN JONES, P.E. 019638 — DATE

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Call before you Dig. Avoid cutting underground utility lines. It's costly. Call 811 or 1-800-227-2600

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NINETY-FIVE MANAGEMENT LLC

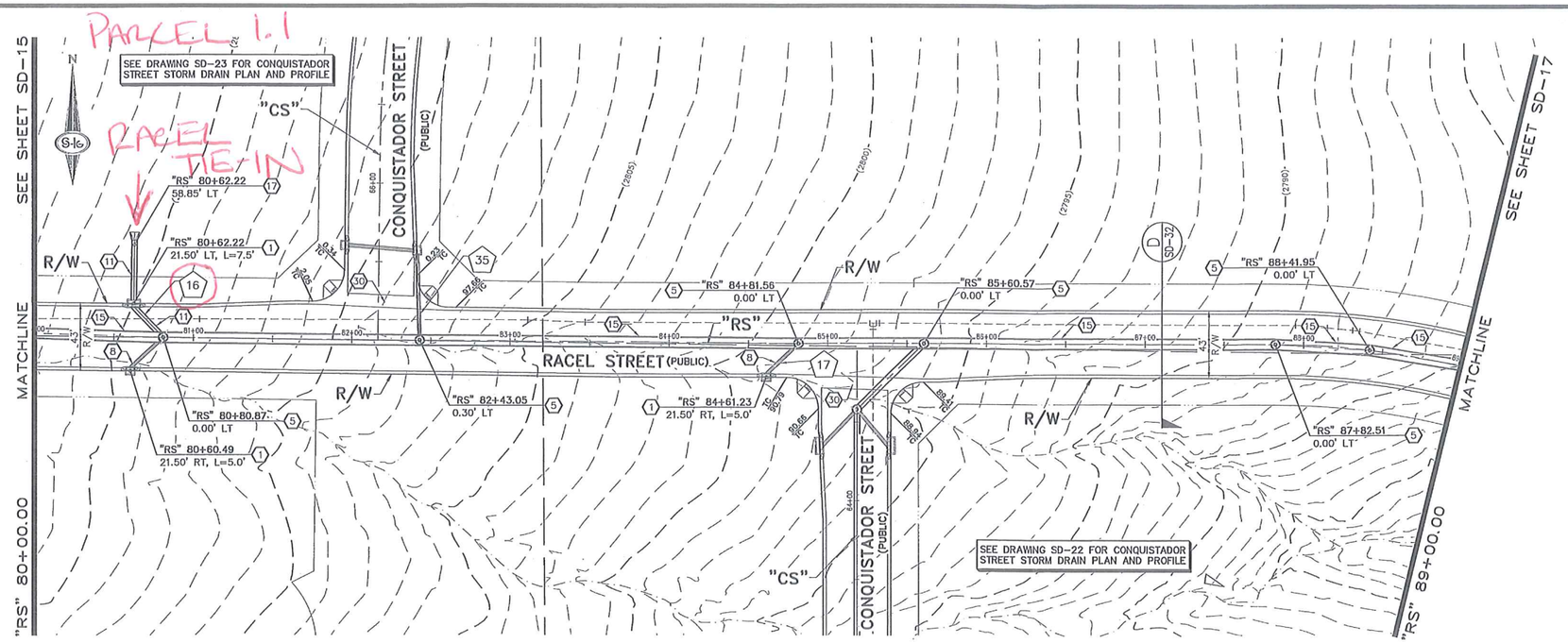
SKYE CANYON PHASE 1
RACEL STREET STORM DRAIN PLAN AND PROFILE
"RS" 74+00.00 TO "RS" 80+00.00

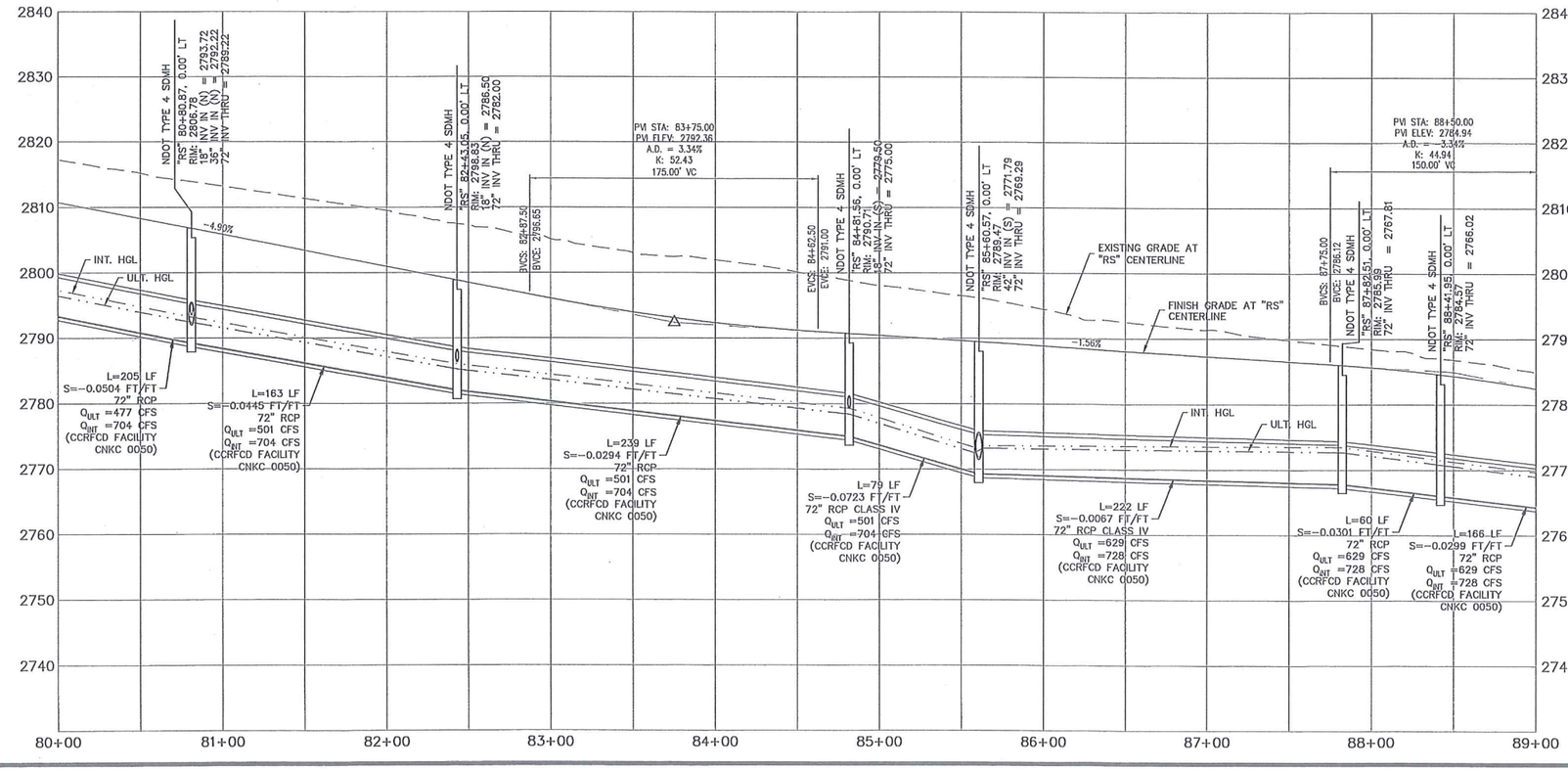
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DRAFTER: DAM
DESIGNER: DAM
CHECKED: JJS
PROJECT NO.
OLY1401-001

PROFESSIONAL ENGINEER STATE OF NEVADA STEPHEN M. JONES Exp. 6/30/15 CIVIL No. 019638
6/13/2014

SD-15
SHEET 18 OF 42

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STORM DRAIN NOTES

1. CONSTRUCT TYPE "CM2" DROP INLET (USDCCA STD. DWG. NO. 412.1)
2. CONSTRUCT 60" TYPE I MANHOLE (USDCCA STD. DWG. NO. 403.1)
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NOTES

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4. SEE STRUCTURAL PLANS FOR ADDITIONAL STRUCTURAL DETAILS AND CONNECTIONS.
5. ALL PIPES ARE PUBLICLY MAINTAINED.

LEGEND

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

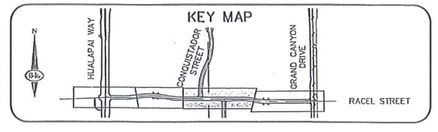
I CERTIFY THAT THIS GRADING PLAN IS IN CONFORMANCE WITH THE APPROVED TECHNICAL DRAINAGE STUDY 05-4681 ON FILE AT THE CITY OF LAS VEGAS FOR THE SUBJECT PROJECT

STEPHEN JONES, P.E. 019638 — DATE

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KEY MAP



SCALE: 40 0 40 80 FEET

CALL BEFORE YOU DIG OVERHEAD — CALL BEFORE YOU DO OVERHEAD — 1-702-227-2929

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

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

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NINETY-FIVE MANAGEMENT LLC

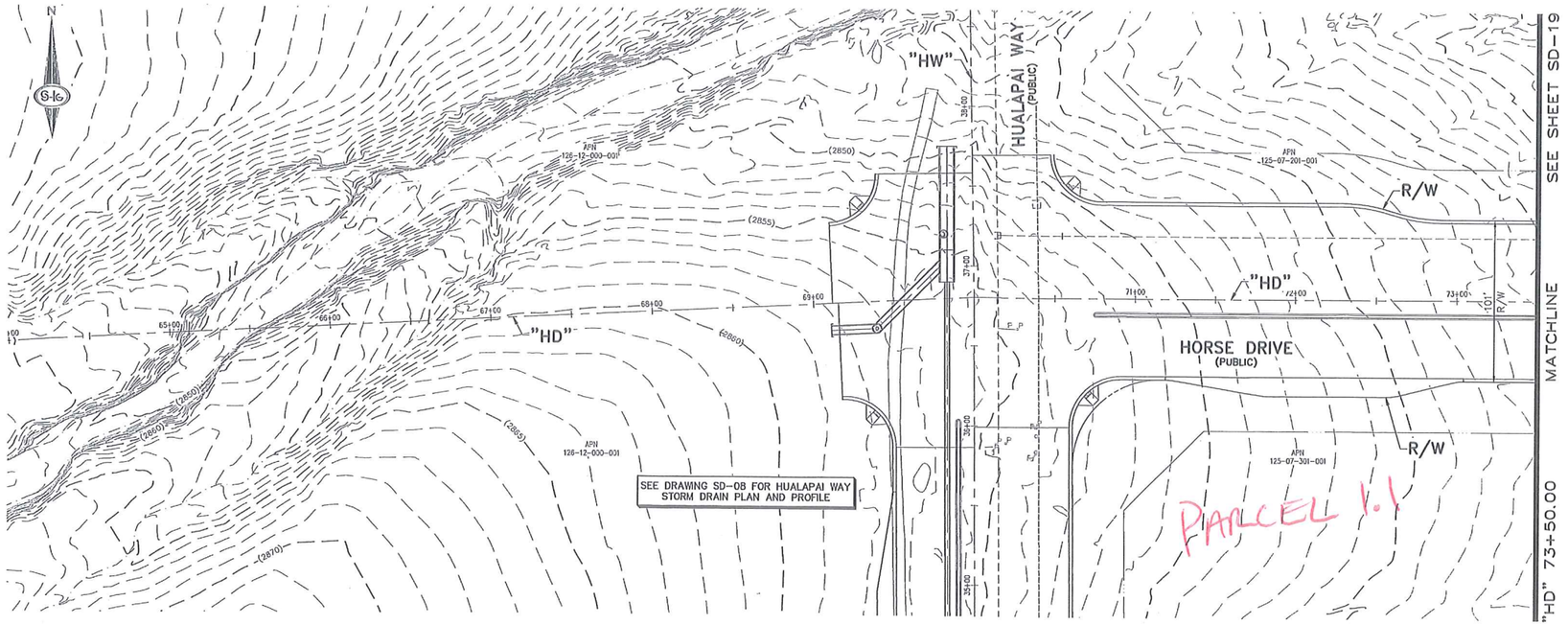
SKYE CANYON PHASE 1
RACEL STREET STORM DRAIN PLAN AND PROFILE
"RS" 80+00.00 TO "RS" 89+00.00

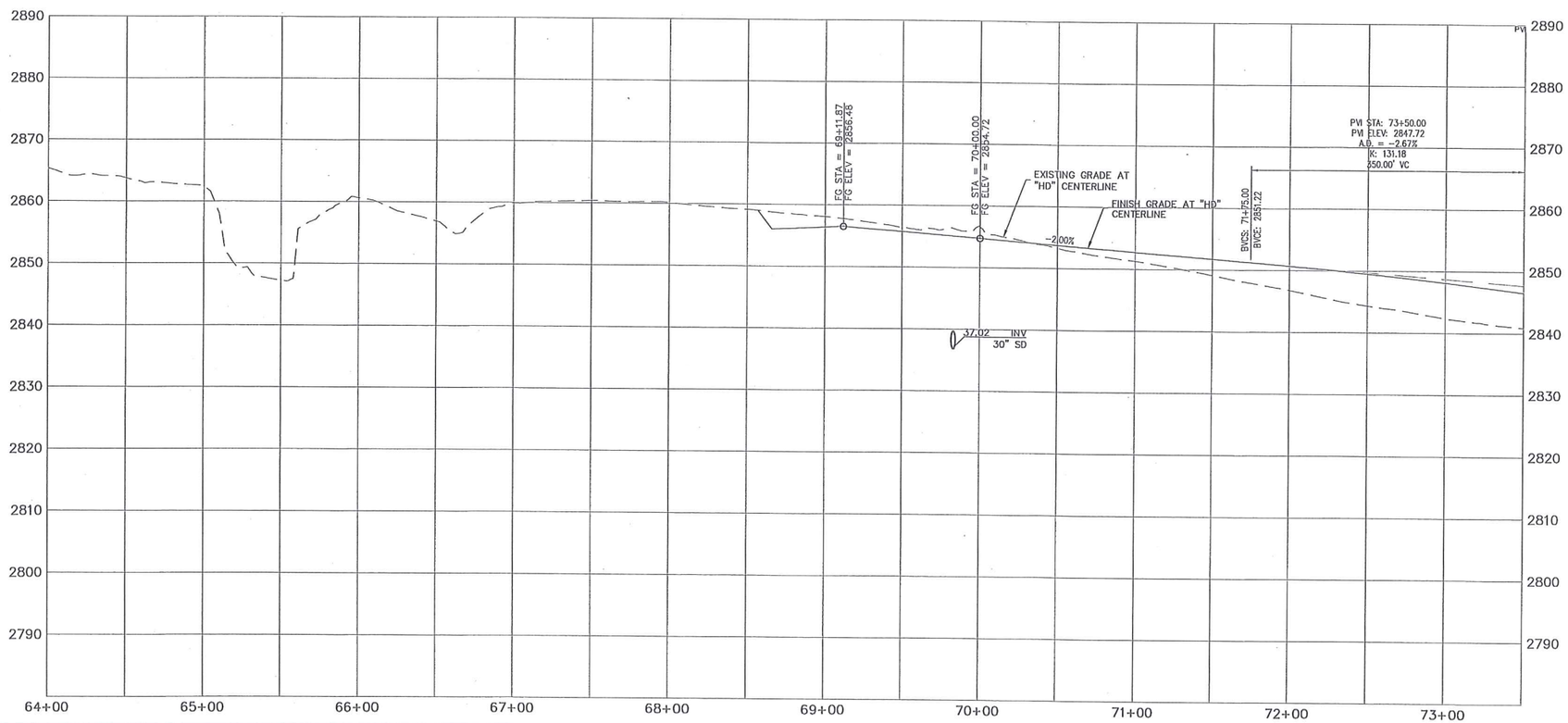
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DRAFTER: DAM
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CHECKED: JJS
PROJECT NO. OLY1401-001

PROFESSIONAL ENGINEER — STATE OF NEVADA — STEPHEN M. JONES — Exp. 6/30/15 — CIVIL — No. 019638 — 5/13/2014

SD-16
SHEET 19 OF 42

J:\OLY\1401-001 Skye Canyon\Dwg\Engineer\140307 Drainage Study\420-16.dwg, 5/13/2014 10:05:51 AM, dam





STORM DRAIN NOTES

1. CONSTRUCT TYPE "CM2" DROP INLET (USDCCA STD. DWG. NO. 412.1)
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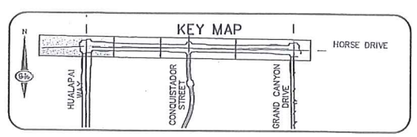
1 STORM DRAIN LATERAL # (SEE SHEETS SD-25 THRU SD-31)

I CERTIFY THAT THIS GRADING PLAN IS IN CONFORMANCE WITH THE APPROVED TECHNICAL DRAINAGE STUDY DS-4661 ON FILE AT THE CITY OF LAS VEGAS FOR THE SUBJECT PROJECT

STEPHEN JONES, P.E. 019638 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) PANELS: 32003C1735E, 32003C1745E, 32003C1750E, ALL DATED SEPTEMBER 27, 2002



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NO.	DESCRIPTION	DATE	BY	APP. DATE	APP.

NINETY-FIVE MANAGEMENT LLC

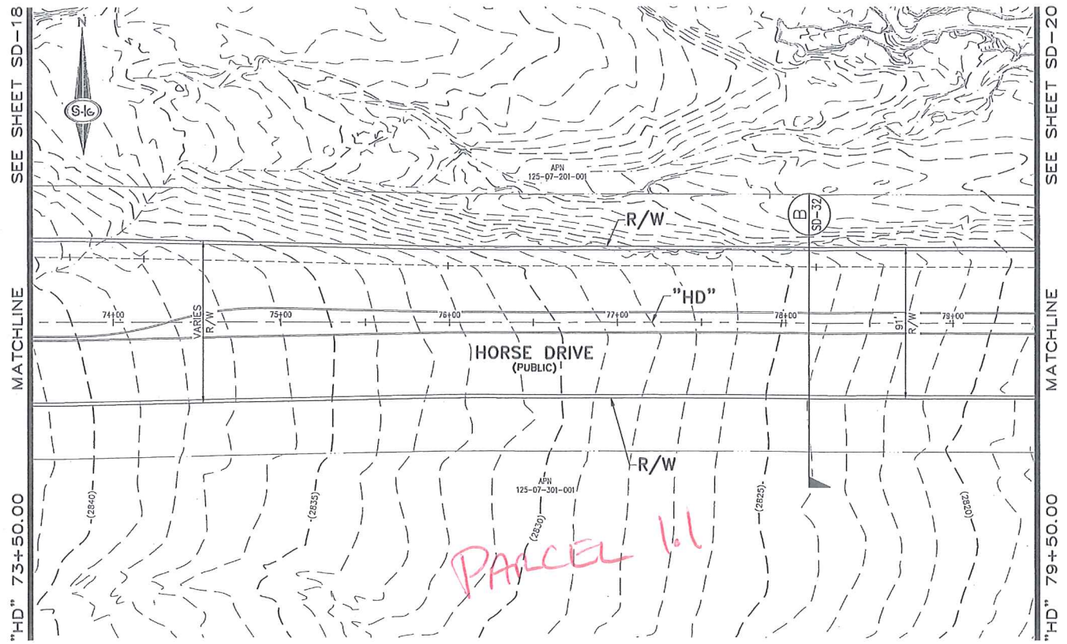
SKYE CANYON PHASE 1
HORSE DRIVE STORM DRAIN PLAN AND PROFILE
"HD" 64+00.00 TO "HD" 73+50.00

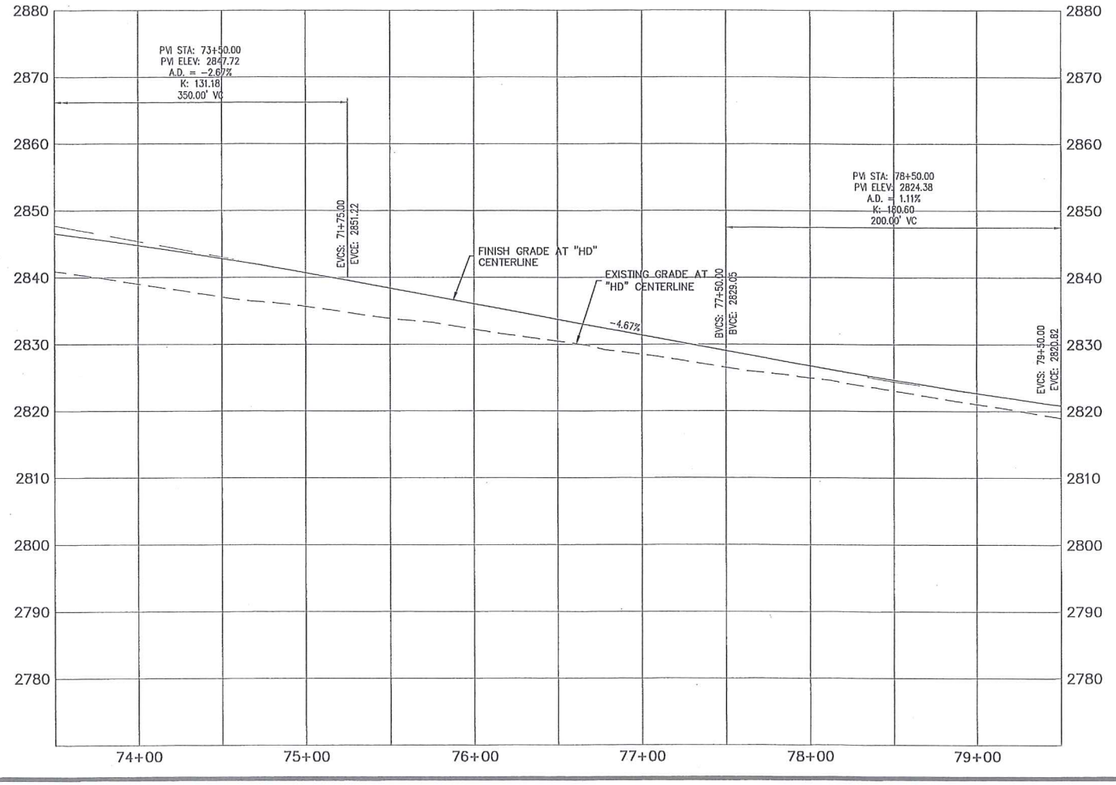
DATE: 5/13/14
DRAFTER: DAM
DESIGNER: DAM
CHECKED: JJS
PROJECT NO.
OLY1401-001

PROFESSIONAL ENGINEER - STATE OF NEVADA
STEPHEN M. JONES
Exp. 6/30/15
CIVIL
No. 019638
5/13/2014

SD-18
SHEET 21 OF 42

J:\OLY-1401-001 Skye Canyon\Dwg\Sheets\402SD Drawings Dwg\SD-18.dwg, 5/13/2014 10:23:18 AM, user





STORM DRAIN NOTES

1. CONSTRUCT TYPE "CM2" DROP INLET (USDCCA STD. DWG. NO. 412.1)
2. CONSTRUCT 60" TYPE I MANHOLE (USDCCA STD. DWG. NO. 403.1)
3. CONSTRUCT 60" TYPE III MANHOLE (USDCCA STD. DWG. NO. 406.1)
4. CONSTRUCT 60" TYPE III MANHOLE WITH TYPE IA RISER (USDCCA STD. DWG. NO. 404.1 AND 406.1)
5. CONSTRUCT NDOT TYPE 4 MANHOLE (NDOT STD. PLAN R-4.3.2)
6. CONSTRUCT RCA ACCESS MANHOLE
7. CONSTRUCT 48" ACCESS MANHOLE
8. INSTALL 18" RCP (USDCCA STD. DWG. NO. 503.2)
9. INSTALL 24" RCP (USDCCA STD. DWG. NO. 503.2)
10. INSTALL 30" RCP (USDCCA STD. DWG. NO. 503.2)
11. INSTALL 36" RCP (USDCCA STD. DWG. NO. 503.2)
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15. INSTALL 72" RCP (USDCCA STD. DWG. NO. 503.2) W/ 1" SACRIFICIAL CONCRETE
16. INSTALL 30" RCP END SECTION (NDOT STD. PLAN R-2.3.1)
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19. CONSTRUCT 6' X 4' RCA (SEE STRUCTURAL DETAILS BY OTHERS)
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21. CONSTRUCT 8' X 6' RCA (SEE STRUCTURAL DETAILS BY OTHERS) W/ 1" SACRIFICIAL CONCRETE
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24. CONSTRUCT BRICK AND MORTAR PLUG (SEE DETAIL 1, DRAWING SD-34)
25. CONSTRUCT CONCRETE COLLAR (SEE DETAIL 2, DRAWING SD-34)
26. INSTALL NDOT TYPE 2 DROP INLET WITH 3' CONCRETE APRON (NDOT STD. PLAN R-4.2.1)
27. CONSTRUCT JUNCTION STRUCTURE (SEE STRUCTURAL DETAILS BY OTHERS)
28. CONSTRUCT TRANSITION STRUCTURE (SEE STRUCTURAL DETAILS BY OTHERS)
29. CONSTRUCT NDOT TYPE 2B DROP INLET (NDOT STD. PLAN R-4.2.2)
30. CONSTRUCT CONCRETE CROSS GUTTER (USDCCA STD. DWG. NO. 228)
31. CONSTRUCT TYPE "C" DROP INLET (USDCCA STD. DWG. NO. 413)

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.

LEGEND

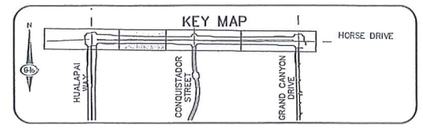
(1) STORM DRAIN LATERAL # (SEE SHEETS SD-25 THRU SD-31)

I CERTIFY THAT THIS GRADING PLAN IS IN CONFORMANCE WITH THE APPROVED TECHNICAL DRAINAGE STUDY DS-4661 ON FILE AT THE CITY OF LAS VEGAS FOR THE SUBJECT PROJECT

STEPHEN JONES, P.E. 019938 DATE

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NO.	DESCRIPTION	DATE	BY	APP. DATE	APP.

NINETY-FIVE MANAGEMENT LLC

SKYE CANYON PHASE 1
HORSE DRIVE STORM DRAIN PLAN AND PROFILE
"HD" 73+50.00 TO "HD" 79+50.00

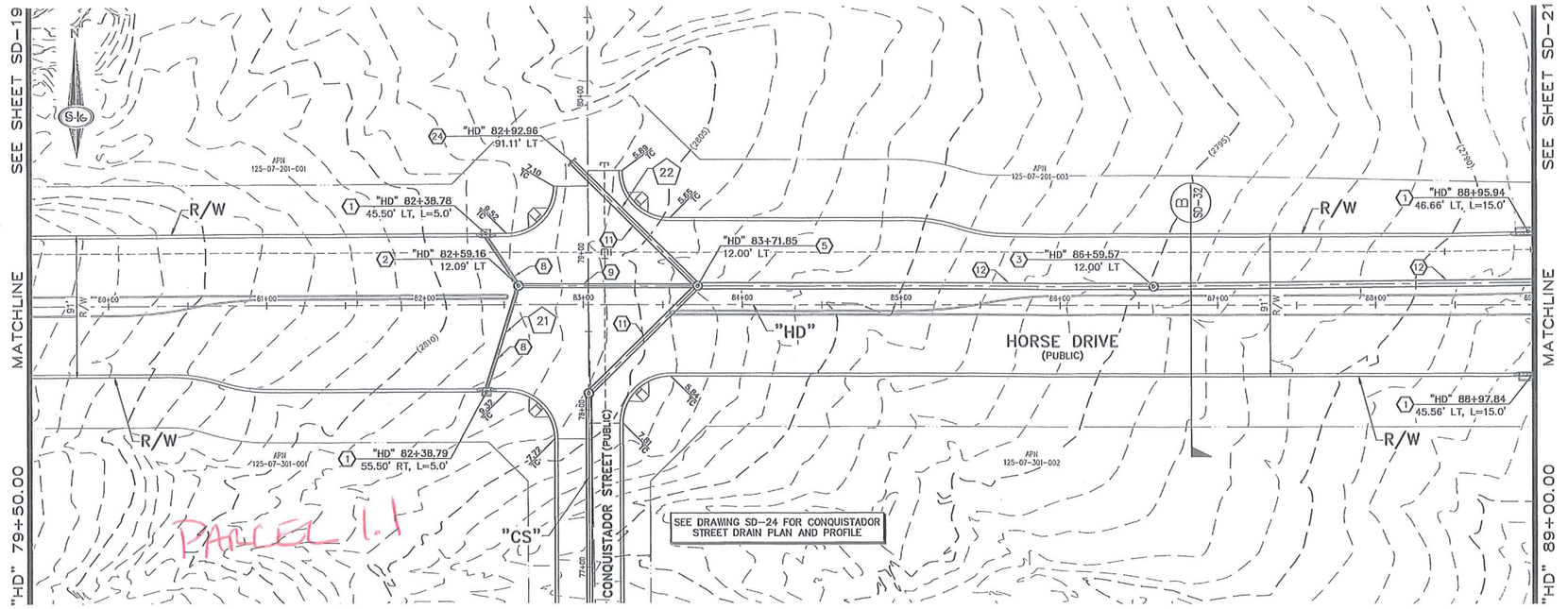
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DRAFTER: DAM
DESIGNER: DAM
CHECKED: JJS

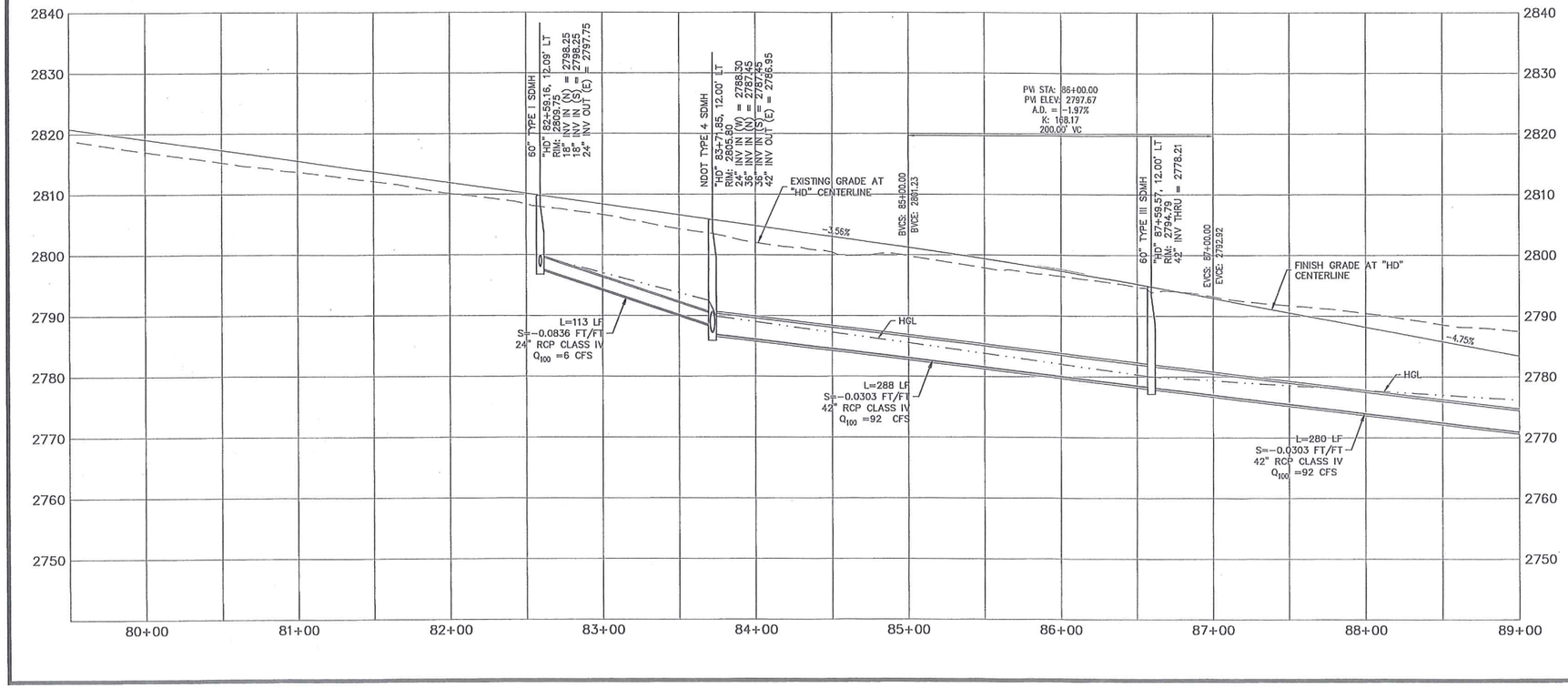
PROJECT NO.
OLY1401-001

PROFESSIONAL ENGINEER — STATE OF NEVADA — STEPHEN M. JONES — Exp. 6/30/15 — CIVIL — No. 019938 — 5/13/2014

SD-19
SHEET 22 OF 42

J:\OLY\1401-001 Skye Canyon\Dwg\Plans\HD007 Drainage Study\SD-19.dwg, 5/13/2014 11:55:43 AM, user





STORM DRAIN NOTES

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4. CONSTRUCT 60" TYPE III MANHOLE WITH TYPE IA RISER (USDCCA STD. DWG. NO. 404.1 AND 406.1)
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31. CONSTRUCT TYPE "C" DROP INLET (USDCCA STD. DWG. NO. 413)

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LEGEND

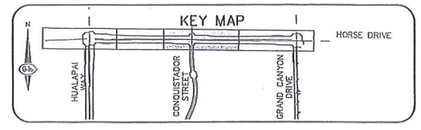
(1) STORM DRAIN LATERAL # (SEE SHEETS SD-25 THRU SD-31)

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STEPHEN JONES, P.E. 019638 DATE

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NO.	DESCRIPTION	DATE	BY	APP. DATE	APP.

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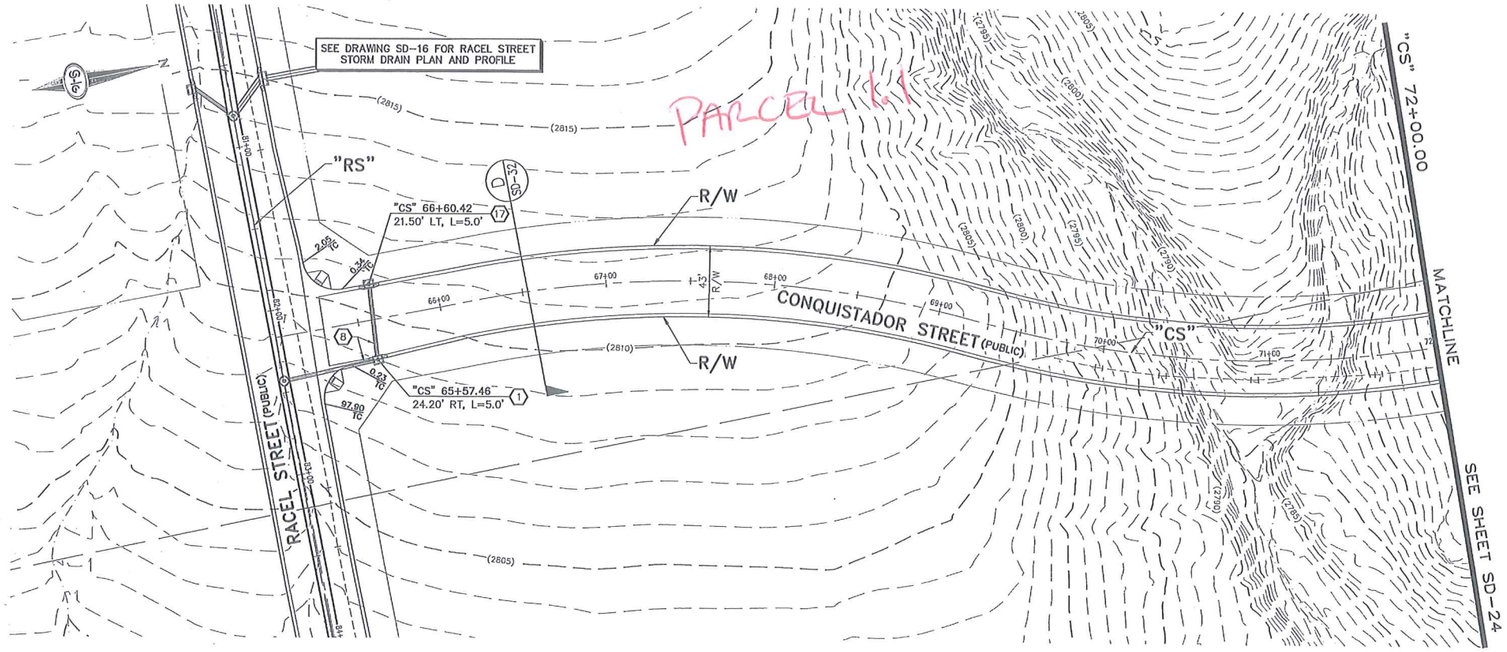
SKYE CANYON PHASE 1
HORSE DRIVE STORM DRAIN PLAN AND PROFILE
"HD" 79+50.00 TO "HD" 89+00.00

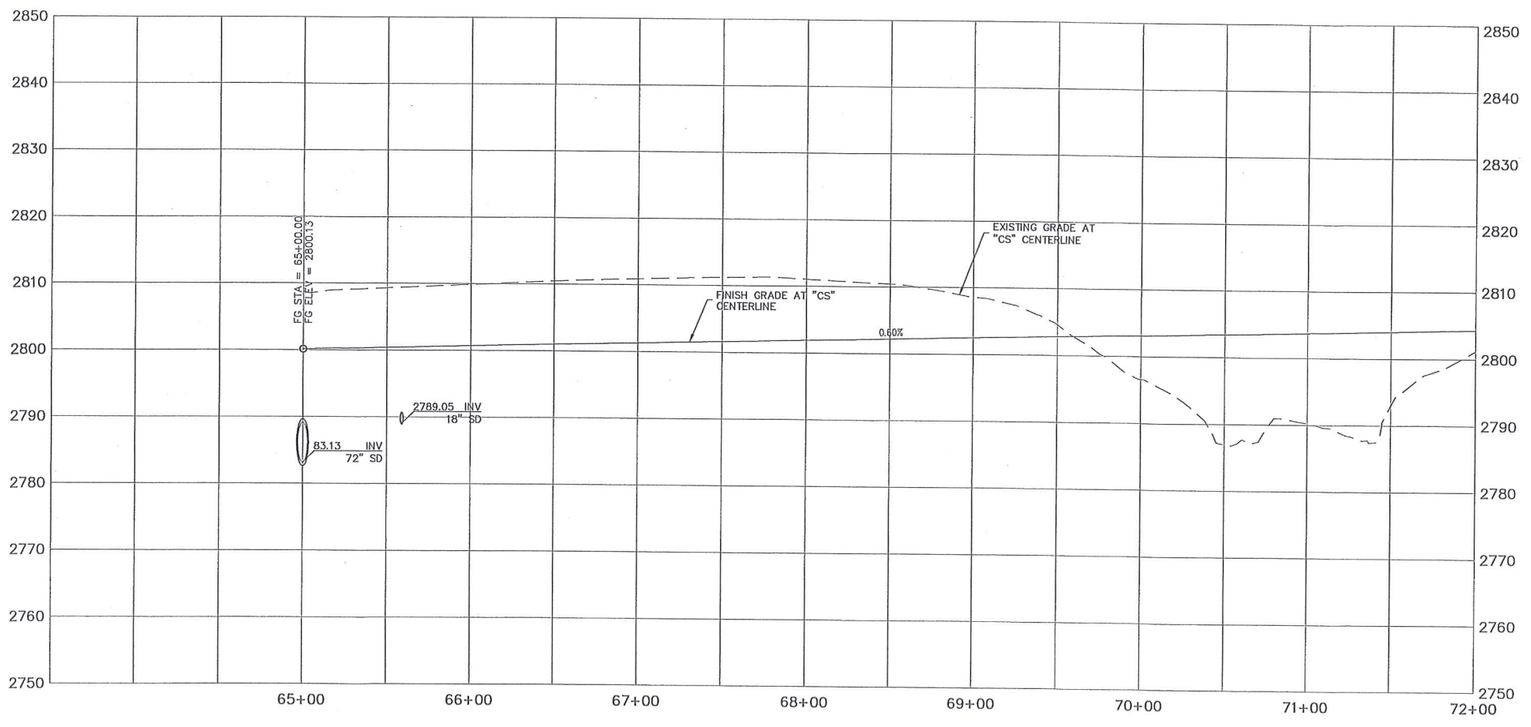
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DRAFTER: DAM
DESIGNER: DAM
CHECKED: JJS
PROJECT NO.
OLY1401-001

PROFESSIONAL ENGINEER — STATE OF NEVADA
STEPHEN M. JONES
Exp. 6/30/15
CIVIL
No. 019638
5/13/2014

SD-20
SHEET 23 OF 42

J:\OLY\1401.001 Skye Canyon\Dwg\Plans\14SD7 Drainage Study\SD-20.dwg, 5/13/2014 10:55:59 AM, esmf





STORM DRAIN NOTES

1. CONSTRUCT TYPE "CM2" DROP INLET (USDCCA STD. DWG. NO. 412.1)
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30. CONSTRUCT CONCRETE CROSS GUTTER (USDCCA STD. DWG. NO. 228)
31. CONSTRUCT TYPE "C" DROP INLET (USDCCA STD. DWG. NO. 413)

NOTES

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LEGEND

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

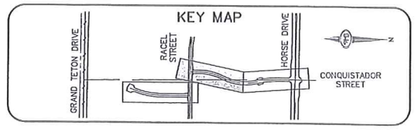
I CERTIFY THAT THIS GRADING PLAN IS IN CONFORMANCE WITH THE APPROVED TECHNICAL DRAINAGE STUDY DS-4661 ON FILE AT THE CITY OF LAS VEGAS FOR THE SUBJECT PROJECT

STEPHEN JONES, P.E. 019638 — DATE

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KEY MAP



SCALE: 40 0 40 80 FEET

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NINETY-FIVE MANAGEMENT LLC

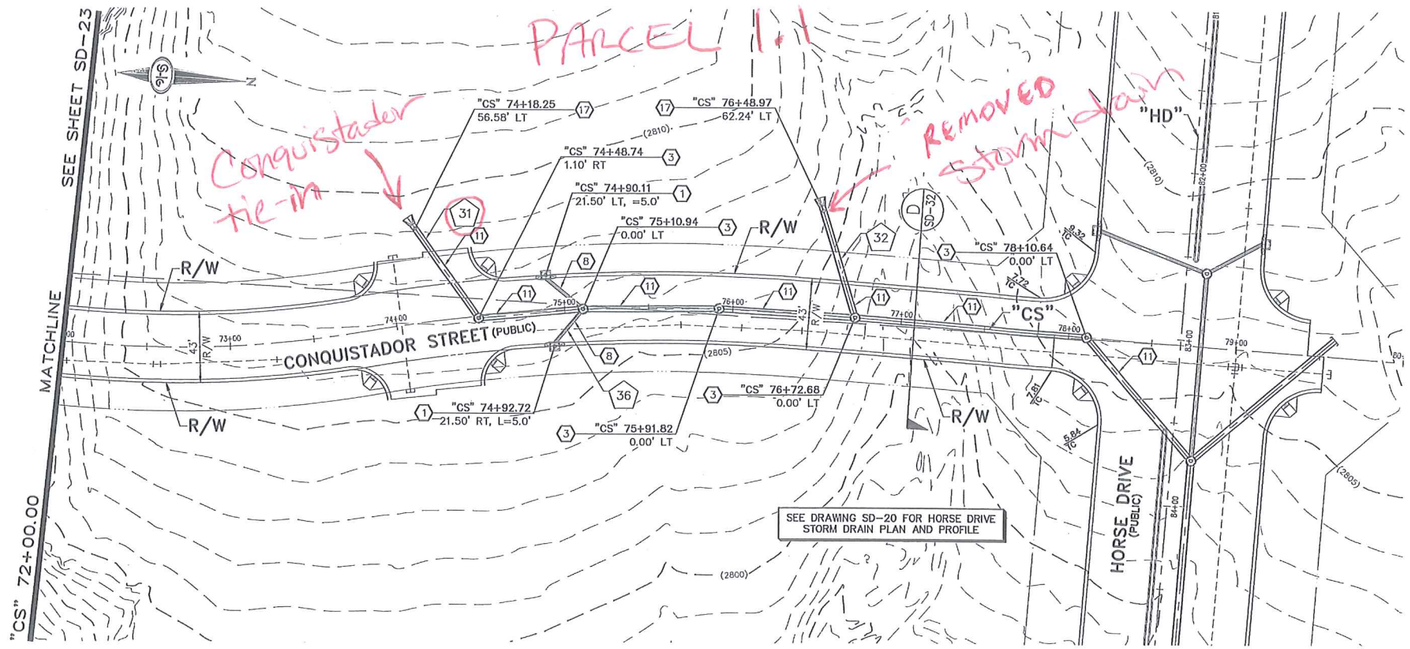
SKYE CANYON PHASE 1
CONQUISTADOR STREET STORM DRAIN PLAN AND PROFILE
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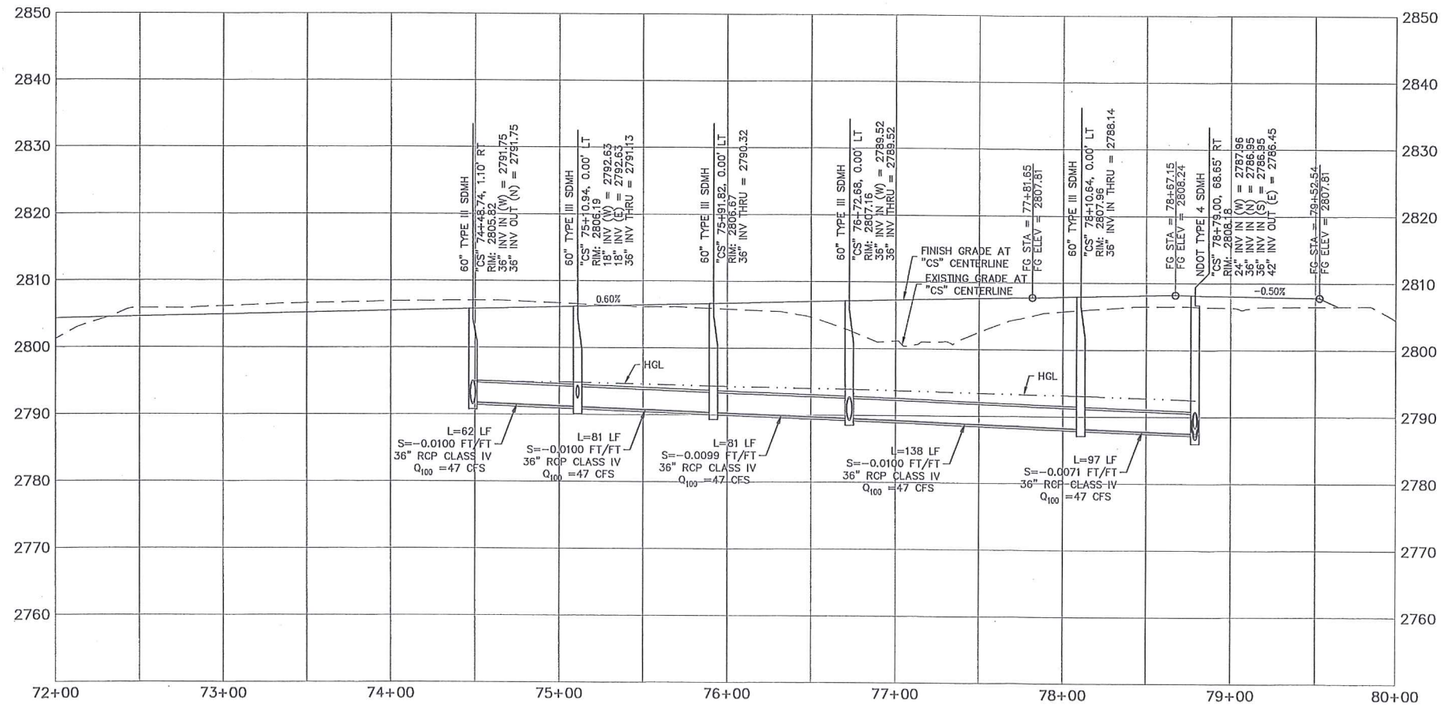
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DRAFTER: DAM
DESIGNER: DAM
CHECKED: JJS
PROJECT NO. OLY1401-001

NATIONAL ENGINEER — STATE OF NEVADA — STEPHEN M. JONES — No. 019638 — CIVIL — Exp. 6/15/15 — 5/13/2014

SD-23
SHEET 26 OF 42

J:\OLY1401-001 Skye Canyon\Dwg\Plans\Hydro\Drainage Study\SD-23.dwg, 5/13/2014 10:53:33 AM, slater





STORM DRAIN NOTES

1. CONSTRUCT TYPE "CM2" DROP INLET (USDCCA STD. DWG. NO. 412.1)
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LEGEND

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

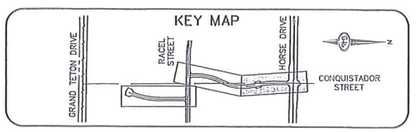
I CERTIFY THAT THIS GRADING PLAN IS IN CONFORMANCE WITH THE APPROVED TECHNICAL DRAINAGE STUDY DS-4661 ON FILE AT THE CITY OF LAS VEGAS FOR THE SUBJECT PROJECT

STEPHEN JONES, P.E. 019638 — 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) PANELS: 32003C1735E, 32003C1745E, 32003C1750E, ALL DATED SEPTEMBER 27, 2002

KEY MAP



SCALE: 40 0 40 80 FEET

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5740 S. ARVILLE STREET #216, LAS VEGAS, NV 89118
PHONE (702) 254-3300 FAX (702) 254-3339

NO.	DESCRIPTION	DATE	BY	APP. DATE	APP.

NINETY-FIVE MANAGEMENT LLC

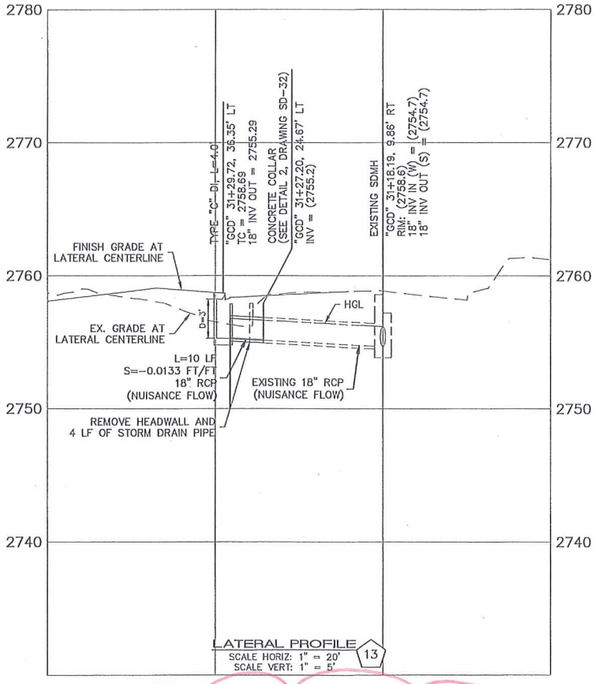
SKYE CANYON PHASE 1
CONQUISTADOR STREET STORM DRAIN PLAN AND PROFILE
"CS" 72+00.00 TO "CS" 80+00.00

DATE: 5/13/14
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PROJECT NO. OLY1401-001

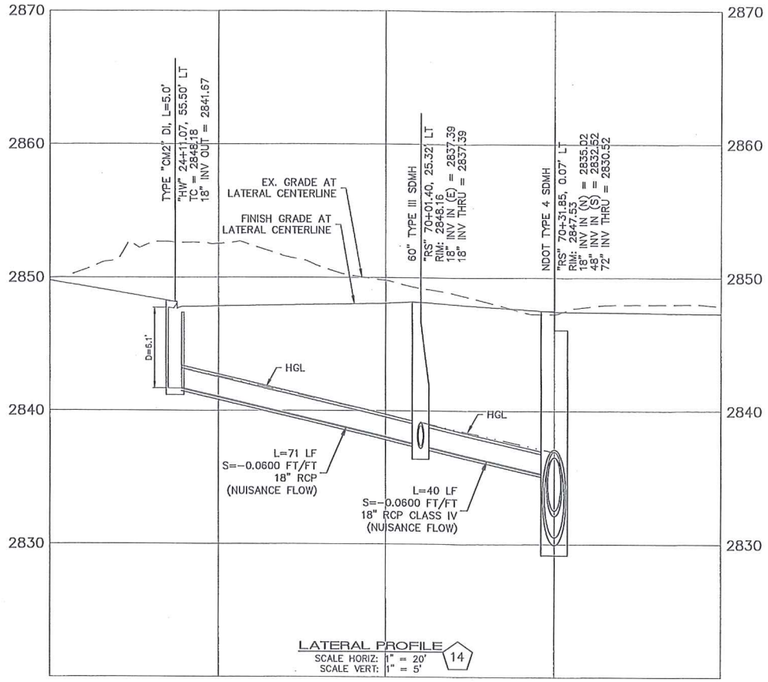
PROFESSIONAL ENGINEER — STATE OF NEVADA — STEPHEN M. JONES — Exp. 6/30/15 — CIVIL — No. 019638 — 5/13/2014

SD-24
SHEET 27 OF 42

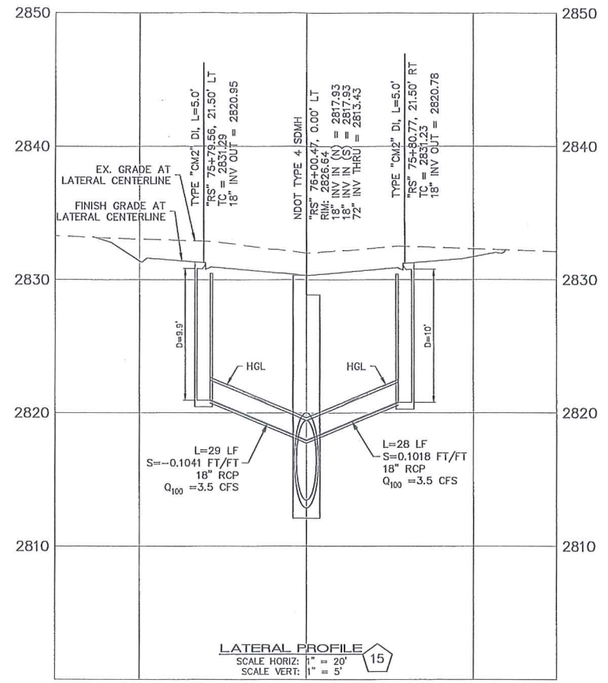
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SCALE VERT: 1" = 5'
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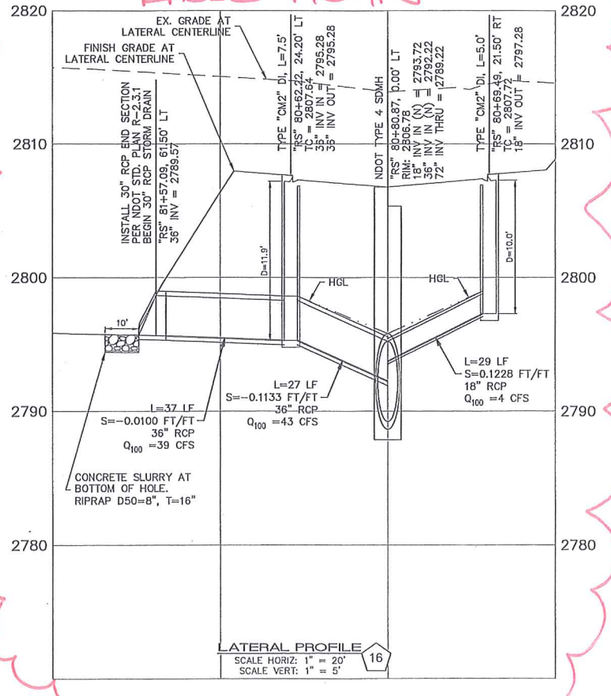


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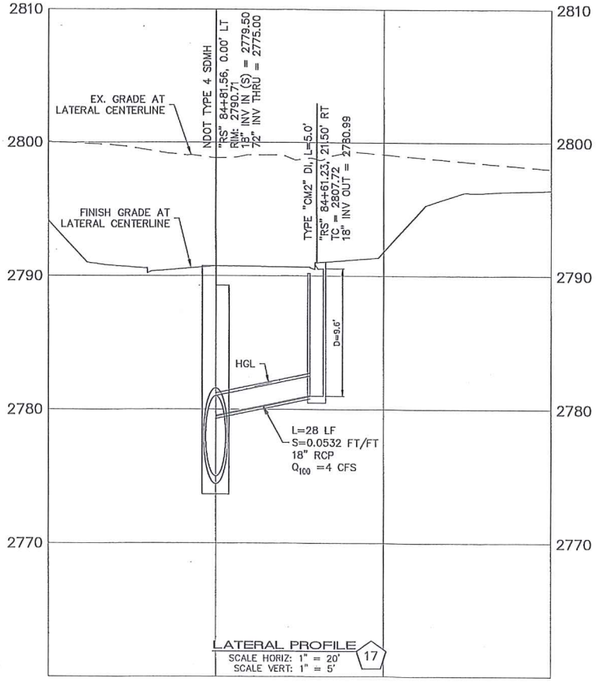


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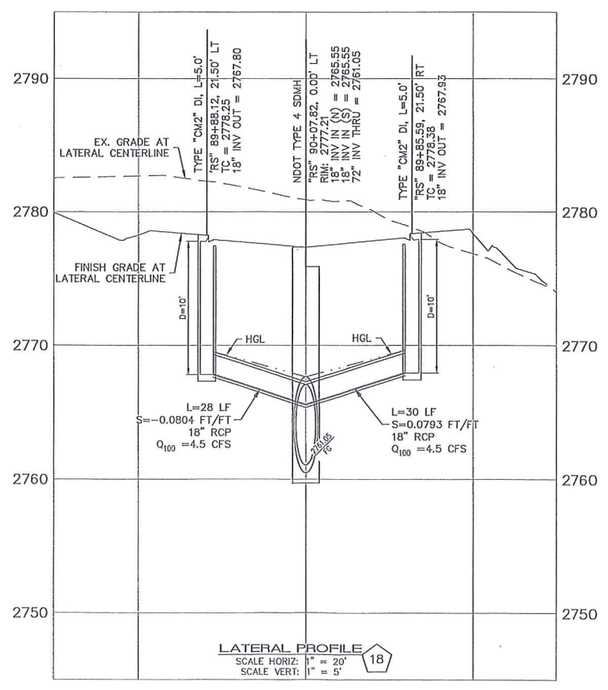
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16



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



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

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NO.	DESCRIPTION	DATE	BY	APP. DATE	APP.

NINETY-FIVE MANAGEMENT LLC

SKYE CANYON PHASE 1

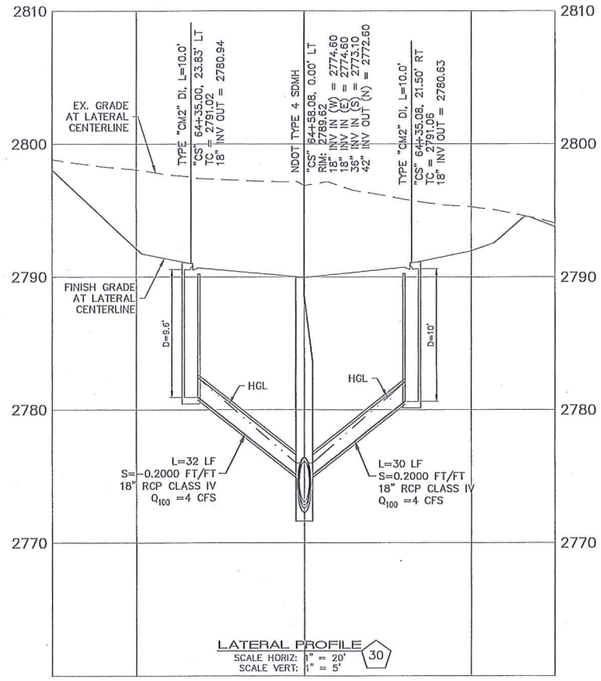
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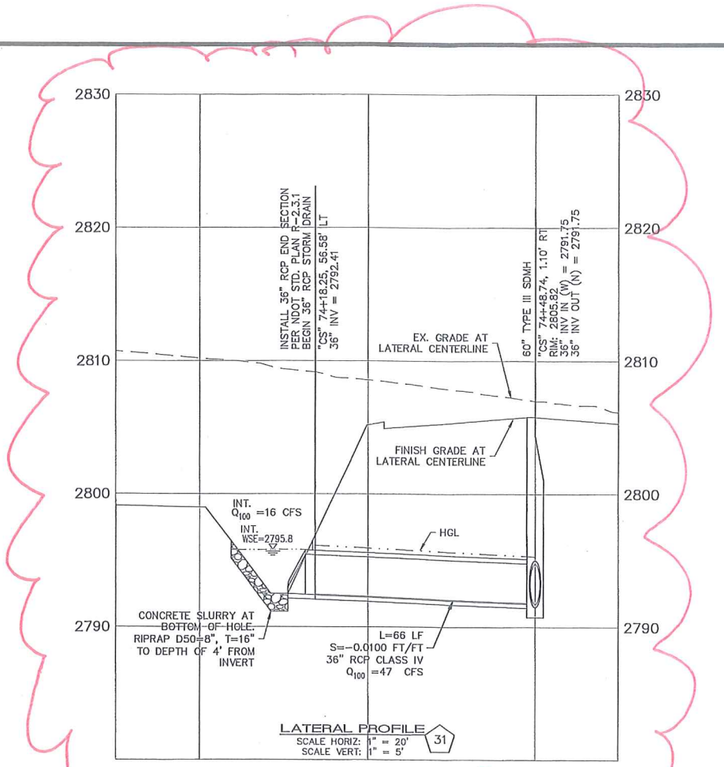
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PROJECT NO.
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STEPHEN M. JONES
Exp. 6/30/15
CIVIL
No. 019638
5/13/2014

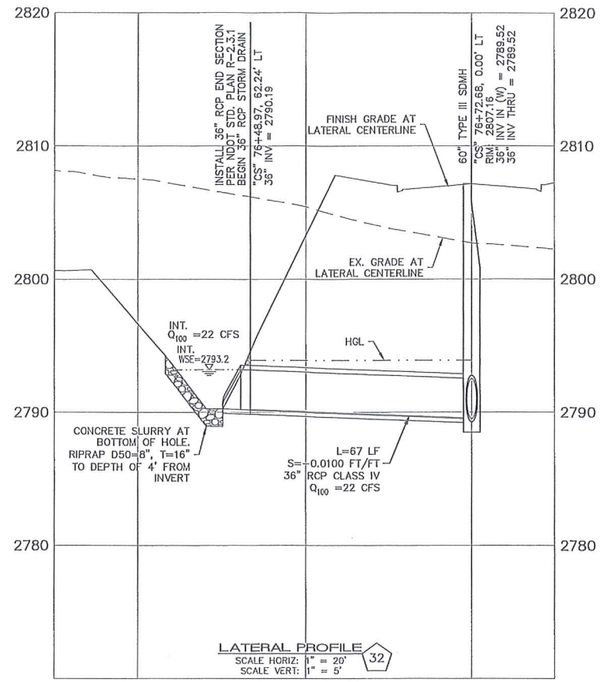
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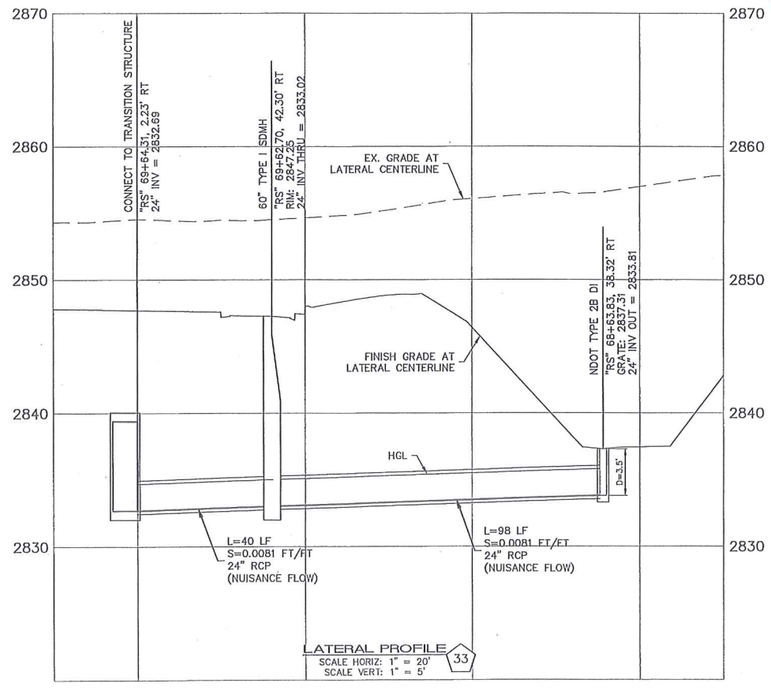
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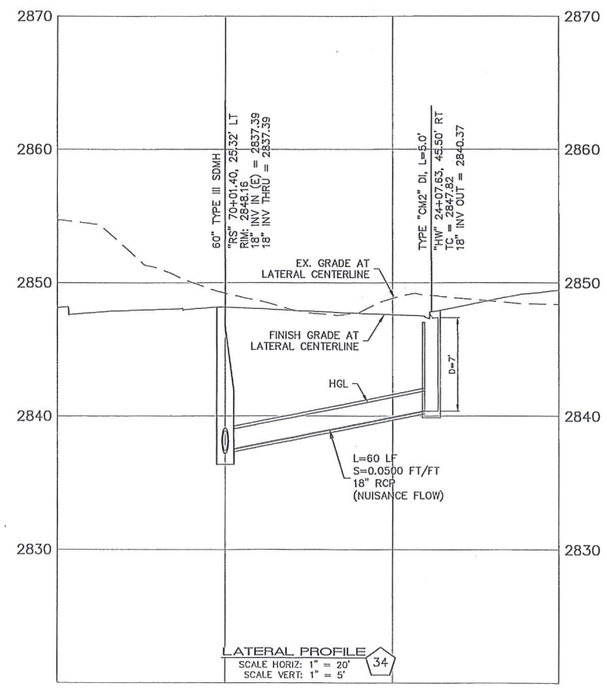




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5740 S. ARVILLE STREET #216, LAS VEGAS, NV 89118
PHONE (702) 284-5300 FAX (702) 284-5399

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NINETY-FIVE MANAGEMENT LLC

SKYE CANYON PHASE 1

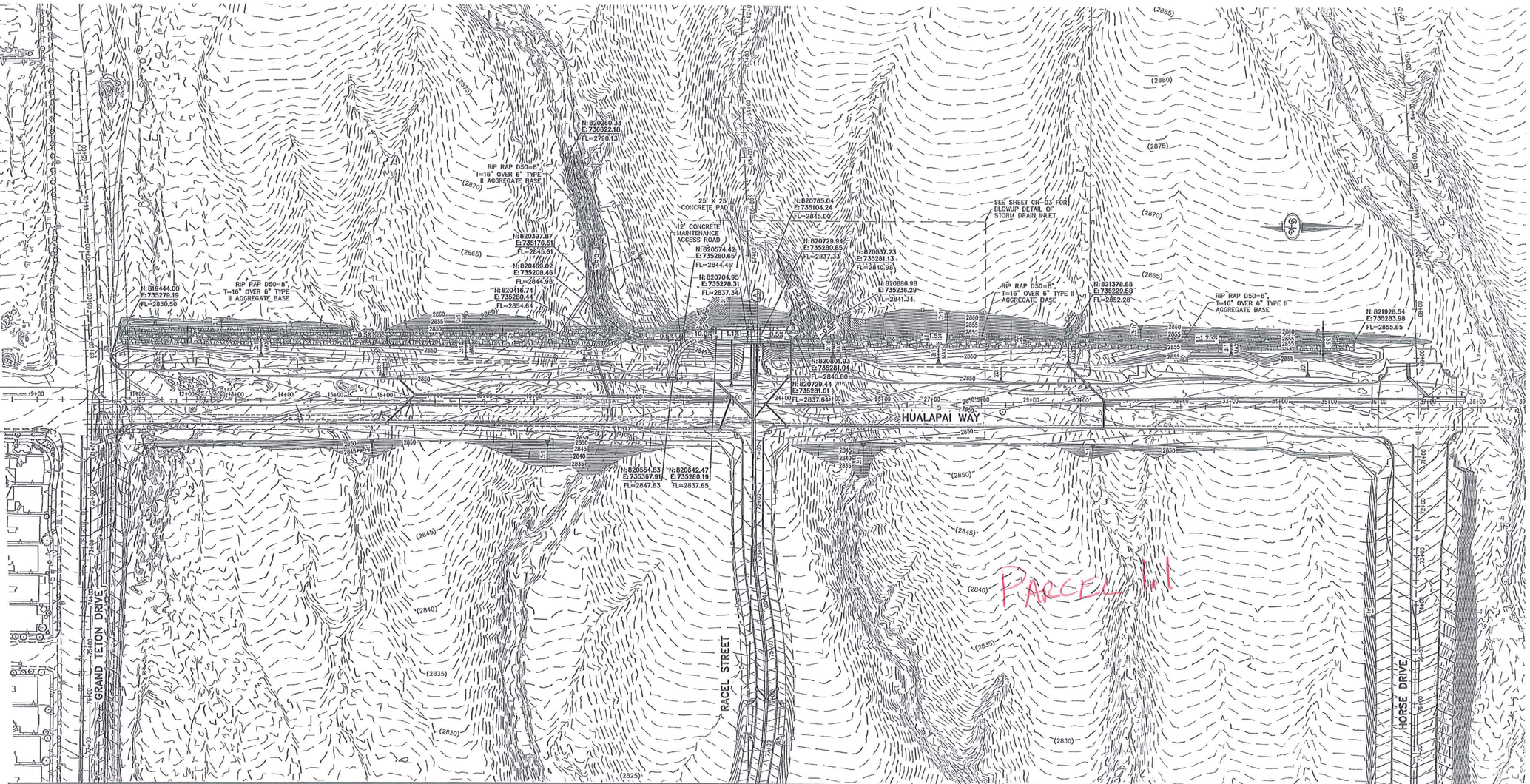
STORM DRAIN LATERAL PROFILES

DATE: 5/13/14
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PROJECT NO.
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PROFESSIONAL ENGINEER - STATE OF NEVADA
STEPHEN M. JONES
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No. 019638
5/13/2014

SD-30
SHEET 33 OF 42

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MATCHLINE SEE SHEET GR-02

SCALE 100 0 100 200 FEET

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SKYE CANYON PHASE 1

GRADING PLAN - 1

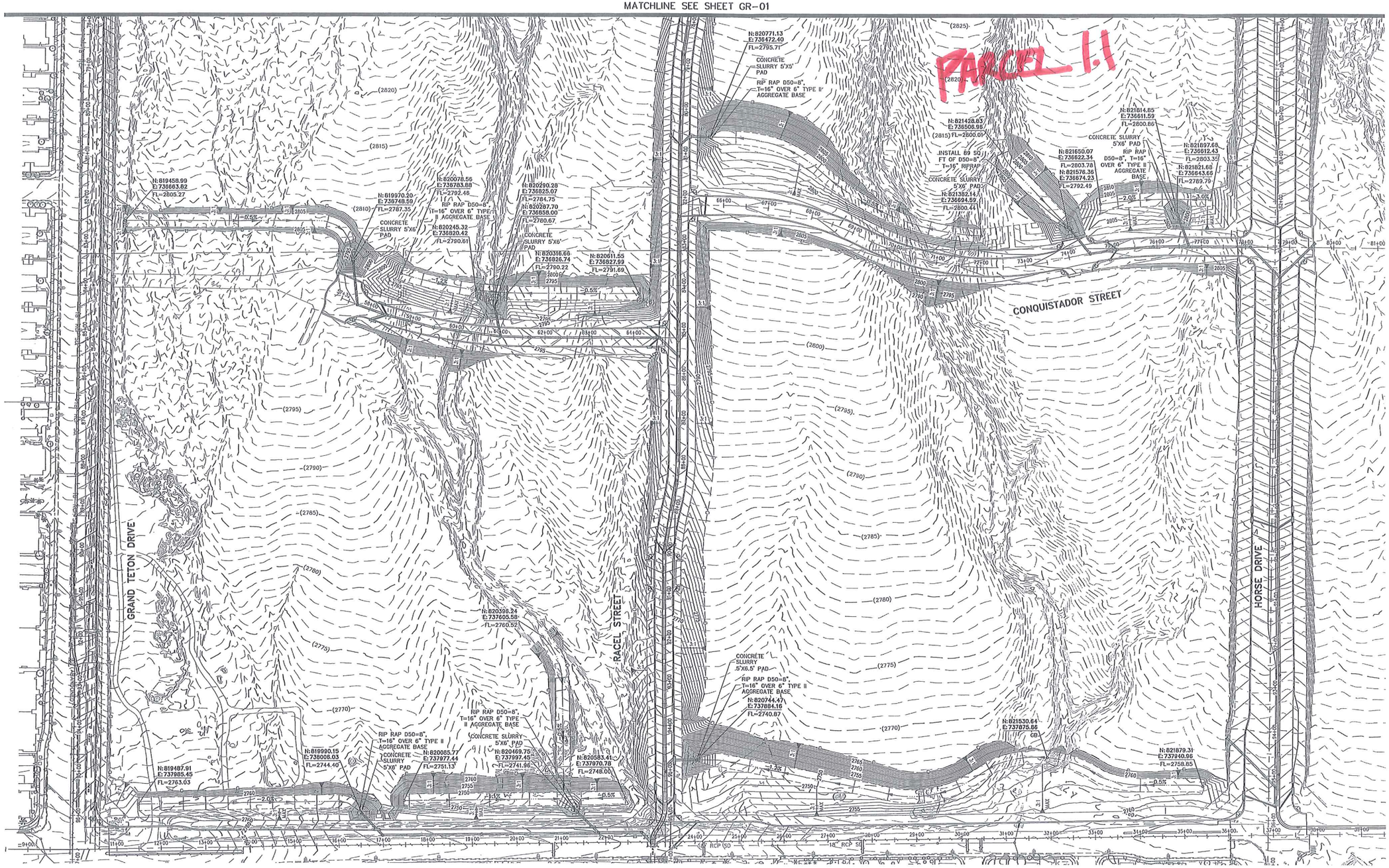
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GR-01
SHEET 39 OF 42

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NO.	DESCRIPTION	DATE	BY	APP. DATE	APP.

NINETY-FIVE MANAGEMENT LLC

SKYE CANYON PHASE 1

GRADING PLAN - 2

DATE: 5/13/14
DRAFTER: DAM
DESIGNER: DAM
CHECKED: JJS
PROJECT NO. OLY1401-001

PROFESSIONAL ENGINEER STATE OF NEVADA STEPHEN M. JONES Exp. 6/30/15 CIVIL No. 019639 5/13/2014

GR-02
SHEET 40 OF 42

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APPENDIX H

Correspondence with City of Las Vegas

2/5/2014 Kick-off Meeting Summary Notes

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

SLATER HANIFAN GROUP
CONSULTING ENGINEERS & PLANNERS

MEETING NOTES

Project Number: OLY1401.001
Project Name: Skye Canyon
Meeting Date: 2/5/2014
Meeting Location: CLV Public Works – Turquoise Room
Meeting Topic: Phase 1 Drainage Kickoff

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

Meeting Notes:

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

Prepared By: Steve Jones, SHG

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

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

Prepared By: Steve Jones, SHG

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

SLATER HANIFAN GROUP

CONSULTING ENGINEERS & PLANNERS

OLY1401.001

March 10, 2014
Revised: May 5, 2014

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

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

Dear Mr. Kwon:

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

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

- *"The technical drainage studies for the infrastructure improvements may be submitted with conditional approval of this Master Drainage Study. However, final approval of the Master Drainage Study must be obtained prior to conditional approval of the infrastructure drainage studies."*
- *"The technical drainage studies for the POD's may not be submitted until the conditional approval of the pertinent infrastructure drainage study is obtained. Final approval for the infrastructure drainage study must be obtained prior to conditional approval of the impacted POD drainage studies."*

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

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

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

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

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

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

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

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

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

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

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

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

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

Master Drainage Study Update

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

Detention Basin

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

Future Phase(s)

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

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

Respectfully Submitted,
SLATER HANIFAN GROUP

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

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

GEND

- PROJECT BOUNDARY
- PHASE BOUNDARY
- PHASE 1
- FUTURE PHASES (DETENTION BASIN)
- FUTURE PHASES
- SHADOW OF PROTECTION FROM DETENTION BASIN 1
- SHADOW OF PROTECTION FROM DETENTION BASIN 2
- SHADOW OF PROTECTION FROM DETENTION BASIN 3

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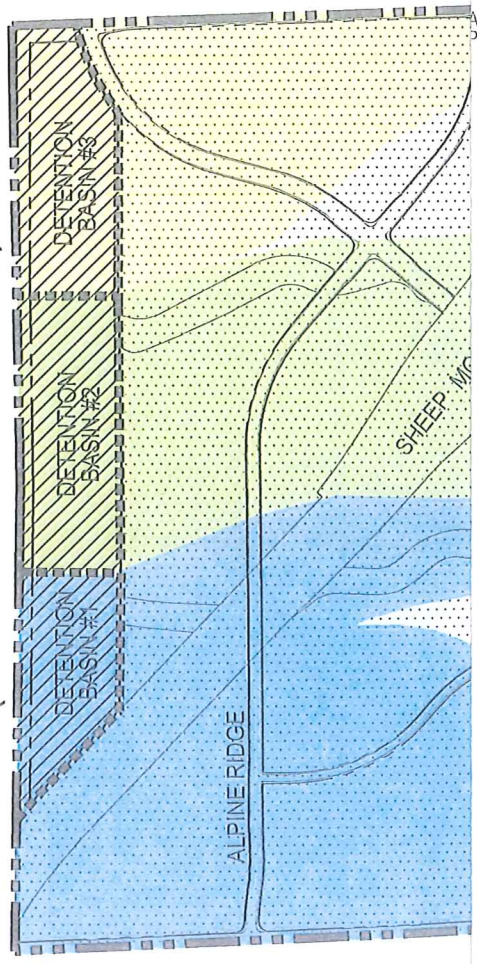
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)ETENTION BASIN(S) MAY BE REQUIRED TO BE IN PLACE AND UNCTIONING TO PROTECT THE APPLICABLE SHADOW OF PROTECTION AREAS, UNLESS OTHERWISE ABLE TO DEMONSTRATE THAT)EVELOPMENT OF AN AFFECTED AREA DOES NOT ADVERSELY IMPACT)OWNSTREAM PROPERTY.

ALL AREAS NOT LOCATED WITHIN A SHADOW OF PROTECTION AREA WILL BE REQUIRED TO SHOW DEVELOPMENT DOES NOT ADVERSELY MPACT DOWNSTREAM PROPERTY.

A MASTER DRAINAGE STUDY UPDATE WILL FOLLOW IN A SUBSEQUENT PHASE, AS WARRANTED, AFTER COMPLETION OF PHASE 1.

FUTURE PHASES
(DETENTION BASIN)



DEVELOPMENT PHASING AND SHADOW OF PROTECTION EXHIBIT

SKYE CANYON

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

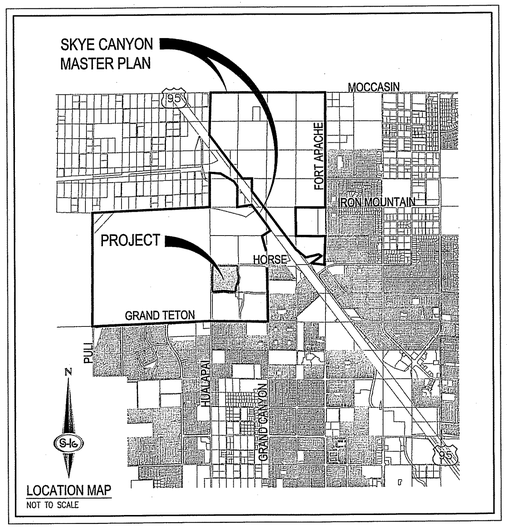
Olympia Companies

DATE: 03-10-14

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APPENDIX I

Grading Plan, Storm Drain Profile and Detail Sheets

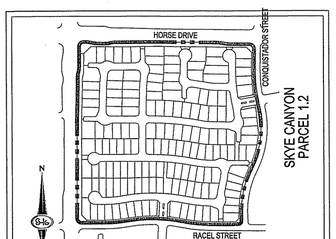


IMPROVEMENT PLANS
FOR
SKYE CANYON PARCEL 1.1

A SINGLE FAMILY RESIDENTIAL PROJECT
APN: 125-07-301-001
LYING WITHIN THE NORTHWEST QUARTER (NW 1/4) OF THE SOUTHWEST QUARTER (SW 1/4) OF SECTION 7,
TOWNSHIP 19 SOUTH, RANGE 60 EAST M.D.M., CLARK COUNTY, NEVADA

CITY OF LAS VEGAS NEVADA

SHEET INDEX		
No.	SHEET	TITLE
1	C-1	COVER SHEET
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4	G-2	GRADING PLAN II
5	G-3	GRADING PLAN III
6	G-4	GRADING PLAN IV
7	D-1	STREET SECTIONS AND GRADING DETAILS I
8	D-2	GRADING DETAILS II
9	PP-1	STORM DRAIN PLAN AND PROFILE
10	PP-2	STORM DRAIN PLAN AND PROFILE



OWNER
K A G DEVELOPMENT SOUTH LLC
C/O OLYMPIA COMPANIES
11411 SOUTHERN HIGHLANDS
PARKWAY, SUITE 300
LAS VEGAS, NV 89141

DEVELOPER
NINETY-FIVE MANAGEMENT LLC
C/O OLYMPIA COMPANIES, LLC
11411 SOUTHERN HIGHLANDS
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LAS VEGAS, NV 89141
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ENGINEER
SLATER HANIFAN GROUP
5740 S. ARVILLE, SUITE 216
LAS VEGAS, NV 89118-3071
PHONE: (702) 284-5300
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LEGAL DESCRIPTION
BEING A PORTION OF THE NORTHWEST QUARTER (NW 1/4) OF THE SOUTHWEST QUARTER (SW 1/4) OF SECTION 7, TOWNSHIP 19 SOUTH, RANGE 60 EAST M.D.M., CLARK COUNTY, NEVADA.

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

BENCHMARK
USDA BRASS CAP ON AN IRON PIPE, 140' SOUTHWEST OF TELEPHONE POLE #26994T, SOUTHWEST CORNER OF THE U.S. 95/KYLE CANYON TURNOFF.

ELEVATION = 2817.62 FEET, 858.813 METERS
N.A.V.D. 88 DATUM
PER THE CLARK COUNTY VERTICAL CONTROL LAST REVISED 2003

PROJECT INFORMATION

ACREAGE (GROSS):	= 39.46 AC
ACREAGE (NET):	= 35.28 AC
ACREAGE (NET-NET):	= 32.55 AC
DENSITY (LOTS/NET ACRE):	= 4.68 DU/NET AC
EXISTING ZONING:	= T-D
TOTAL NO. OF RESIDENTIAL LOTS	= 165
TOTAL NO. OF COMMON ELEMENTS *	= 19
MINIMUM LOT SIZE	= 4,740 SF±
MAXIMUM LOT SIZE	= 10,524 SF±
PROVIDED OPEN SPACE	= 20,969 SF±

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

EARTHWORK SUMMARY (UNADJUSTED)

CUT	------ CY.
FILL	------ CY.
NET	------ CY.

APPROVALS

CITY ENGINEER-DAVID BOWERS PE, PTOE #16736 DATE

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

LAS VEGAS FIRE AND RESCUE DATE

CHRIS KNIGHT, DIRECTOR 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
PROJECT NO. _____ DATE: _____
SHEETS: 1, 2, 9, 13 THRU 22, & 35 THRU 37

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

NV ENERGY DATE

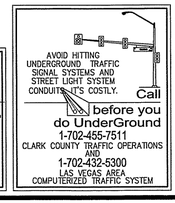
NV ENERGY ACKNOWLEDGES THAT WE HAVE RECEIVED YOUR PLANS AND WILL PROVIDE SERVICE TO ALL ELECTRICAL NEEDS ASSOCIATED WITH THIS PROJECT. NV ENERGY RESERVES THE RIGHT TO ADDRESS ANY EXISTING OR FUTURE CONFLICTS ONCE THE FINAL DESIGN IS COMPLETED. THE NEW SERVICE AND THE RESOLUTION OF ANY CONFLICTS WILL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

SOUTHWEST GAS DATE

COX COMMUNICATIONS LAS VEGAS, INC. DATE

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.







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, NEVADA

NINETY-FIVE MANAGEMENT LLC

SKYE CANYON PARCEL 1.1
COVER SHEET

T 12 S
S 7
R 60 E

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

PROJECT NO.
OLY1401-002

PROFESSIONAL ENGINEER - STATE OF NEVADA - STEPHEN M. KOHNEN - No. 019535 - Exp. 6/30/15 - 6/30/2014

C-1
SHEET 1 OF 10

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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 INTERFERENCES WHICH MAY AFFECT HIS OPERATION DURING CONSTRUCTION AND SHALL TAKE ALL NECESSARY PRECAUTIONS TO AVOID DAMAGE TO SAME. THE CONTRACTOR SHALL USE EXTREME CAUTION WHEN WORKING NEAR OVERHEAD UTILITIES SO AS TO SAFELY PROTECT ALL PERSONNEL AND EQUIPMENT, AND SHALL BE RESPONSIBLE FOR ALL COST AND LIABILITY IN CONNECTION THEREWITH.

3. THE CONTRACTOR SHALL TAKE ALL PRECAUTIONARY MEASURES NECESSARY TO PROTECT EXISTING UTILITY LINES, STRUCTURES AND STREET IMPROVEMENTS WHICH ARE TO REMAIN IN PLACE, FROM DAMAGE, AND ALL SUCH IMPROVEMENTS OR STRUCTURES DAMAGED BY THE CONTRACTOR'S OPERATIONS SHALL BE REPAIRED OR REPLACED SATISFACTORY TO THE CITY ENGINEER AND OWNING UTILITY COMPANY AT THE EXPENSE OF THE CONTRACTOR.

4. ALL CONSTRUCTION SHALL BE AS SHOWN ON THESE PLANS, ANY REVISIONS SHALL HAVE THE 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 236. 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 XXXX, REPORT #XXXXX, XXXXXXX 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. ALL ABOVE GROUND UTILITY APPERTANANCES SHALL CONFORM TO THE REQUIREMENTS OF 19.12.040.

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 APPLICABLE SECTIONS OF NDOT OR THE CLARK COUNTY AREA SPECIFICATIONS (AS APPLICABLE) AND THE PLANS AND DETAILS SHOWN HEREON.

20. WHEN INSTALLING UNDERGROUND FACILITIES THAT REQUIRE UNDERGROUND LOCATING DEVICES SUCH AS MARKER BALLS, LOCATING RIBBON, ETC, THE CONTRACTOR SHALL PROVIDE WRITTEN DOCUMENTATION TO OFFSITE INSPECTION AND TESTING CERTIFYING THAT ALL DEVICES HAVE BEEN PLACED AND VERIFIED TO BE IN GOOD WORKING CONDITION PRIOR TO THE CONSTRUCTION OF ANY ROAD BASE.

21. SANITARY SEWER AND STORM DRAIN FINAL LOCATION MAP(S) SHALL BE PROVIDED TO THE OFFSITE INSPECTION AND TESTING SECTION PRIOR TO PROJECT ACCEPTANCE AND BOND RELEASE. THE MAP(S) SHALL INCLUDE THE HORIZONTAL AND VERTICAL (INVERT) LOCATION OF PUBLIC SEWER MANHOLES, STORM DRAIN MANHOLES, STORM DRAIN LATERALS AT THE CONNECTION TO THE MAIN STORM DRAIN MAIN AND AT THE CONNECTION TO A DROP INLET, AND THE CONNECTION OF SEWER SERVICE LATERALS TO THE SEWER MAIN AND WHERE THE SEWER SERVICE LATERALS EXITS THE PUBLIC RIGHT-OF-WAY. THE LOCATION SHALL BE DESCRIBED BY STATE PLANE COORDINATES WHICH SHALL BE BASED ON THE "NEVADA COORDINATE SYSTEM OF 1983, EAST ZONE" AS DEFINED BY THE NEVADA REVISED STATUTES CHAPTER 327, AND TIED TO THE CITY OF LAS VEGAS VERTICAL CONTROL BENCHMARK NETWORK. COORDINATES MUST BE CERTIFIED BY A NEVADA PROFESSIONAL LAND SURVEYOR TO HAVE POSITIONAL CERTAINTIES OF +/- 0.1 METER (+/- 0.3 FEET). A SEPARATE ELECTRONIC COMMA DELIMITED FILE FOR THE SANITARY SEWER AND STORM DRAIN COORDINATES SHALL ALSO ACCOMPANY THE SANITARY SEWER AND STORM DRAIN FINAL LOCATION MAP(S).

22. STORM DRAIN LATERALS REQUIRE THE INSTALLATION OF A MARKER BALL AT THE CONNECTION OF THE STORM DRAIN LATERAL TO THE STORM DRAIN MAIN AND WHERE THE STORM DRAIN LATERAL EXITS THE PUBLIC RIGHT-OF-WAY OR WHERE THE STORM DRAIN LATERAL CONNECTS TO A DROP INLET. THE MARKER BALL SHALL BE 3M 4" MARKER BALL 1404-XR OR APPROVED EQUAL.

23. CCTV VIDEO INSPECTION IS REQUIRED FOR ALL SEWER AND STORM DRAINS. THE CCTV VIDEO INSPECTIONS NEED TO BE PERFORMED PER THE DESIGN AND CONSTRUCTION STANDARDS FOR WASTEWATER COLLECTION SYSTEMS LATEST ADDITION.

24. A SEPARATE BORING PERMIT IS REQUIRED FOR ALL BORING ACTIVITIES.

2.2 CITY OF LAS VEGAS SEWER NOTES

1. ALL CONSTRUCTION AND MATERIALS SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE DESIGN AND CONSTRUCTION STANDARDS FOR WASTEWATER COLLECTION SYSTEMS AND THE UNIFORM STANDARD SPECIFICATIONS FOR PUBLIC WORKS' CONSTRUCTION OFF-SITE IMPROVEMENTS, CLARK COUNTY AREA, NEVADA, AS AMENDED. IT WILL BE THE RESPONSIBILITY OF THE CONTRACTOR TO BE AWARE OF THE CONTENTS OF THE ABOVE SPECIFICATIONS.

2. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO PERFORM CONSTRUCTION AS PER PLANS, ANY ADDITIONS, DELETIONS, OR CHANGES SHALL FIRST MEET WITH THE APPROVAL OF THE CITY ENGINEER.

3. 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 UP 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.

2.3 CITY OF LAS VEGAS TRAFFIC NOTES

1. ALL CONSTRUCTION SIGNING, BARRICADING, AND TRAFFIC DELINEATION SHALL CONFORM TO THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES", LATEST EDITION.

2. THE STREET SIGN CONTRACTOR SHALL OBTAIN STREET NAMES AND BLOCK NUMBERING FROM THE PLANNING DEPARTMENT PRIOR TO CONSTRUCTION.

3. BEFORE ANY WORK IS STARTED IN THE RIGHT-OF-WAY, THE CONTRACTOR SHALL INSTALL ALL ADVANCE WARNING SIGNS FOR THE CONSTRUCTION ZONE. THE CONTRACTOR SHALL INSTALL TEMPORARY STOP SIGNS AT ALL NEW STREET ENCROACHMENTS INTO EXISTING CITY STREETS WHERE WARRANTED IMMEDIATELY AFTER FIRST GRADING WORK IS ACCOMPLISHED, AND SHALL MAINTAIN SAID SIGNS UNTIL PERMANENT SIGNS ARE INSTALLED.

4. WHEN A DESIGNATED "SAFE ROUTE TO SCHOOL" IS ENCROACHED UPON BY A CONSTRUCTION WORK ZONE AND PUBLIC WORKS STAFF IDENTIFIES A NEED FOR STUDENTS TO BE ASSISTED IN THE SAFE CROSSING THROUGH THAT WORK ZONE, THE CONTRACTOR SHALL BE REQUIRED TO PROVIDE A QUALIFIED "CROSSING GUARD". THE GUARD SHALL BE PRESENT FOR THE FULL DURATION OF TIME THAT CHILDREN ARE LIKELY TO BE PRESENT.

5. IF THE IMPROVEMENTS NECESSITATE THE OBLITERATION, TEMPORARY OBSTRUCTION, TEMPORARY REMOVAL OR RELOCATION OF ANY EXISTING TRAFFIC PAVEMENT MARKING, SUCH PAVEMENT MARKING SHALL BE RESTORED OR REPLACED WITH LIKE MATERIALS TO THE SATISFACTION OF THE CITY TRAFFIC ENGINEER.

6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING AND INSTALLING ALL PERMANENT SIGNS SHOWN ON THE PLANS. ALL NEW TRAFFIC SIGNS SHALL BE FABRICATED WITH DIAMOND GRADE VIP CLASS 6 REFLECTIVE SHEETING OR APPROVED EQUAL. ALL NEW TRAFFIC SIGNS, EXCEPT STREET NAME AND SCHOOL SPEED LIMIT SIGNS, SHALL HAVE 3M SERIES 1160 OR APPROVED EQUIVALENT ANTI-GRAFFITI PROTECTIVE OVERLAY FILM; SCHOOL ZONE SIGNS SHALL HAVE 3M SERIES 1150 ANTI-GRAFFITI PROTECTIVE OVERLAY FILM. STREET NAME SIGNS SHALL CONFORM IN THEIR ENTIRETY TO CURRENT CITY STANDARDS. ALL OTHER SIGNS SHALL BE STANDARD SIZE UNLESS OTHERWISE SPECIFIED ON THE PLANS. ALL SIGN POSTS SHALL BE INSTALLED IN ACCORDANCE WITH THE CURRENT CITY STANDARDS.

7. WHEN A PROPOSED STREET LIGHT STANDARD IS LOCATED WITHIN FIVE (5') FEET OF ANY PROPOSED SIGN SHOWN ON THE PLANS TO BE MOUNTED ON A SIGNPOST, THE SIGN SHALL BE MOUNTED ON THE STREET LIGHT STANDARD AND THE SIGNPOST SHALL BE ELIMINATED.

8. ALL PERMANENT TRAFFIC CONTROL DEVICES CALLED FOR HEREON SHALL BE IN PLACE AND IN FINAL POSITION PRIOR TO ALLOWING ANY PUBLIC TRAFFIC ONTO THE PORTIONS OF THE ROAD(S) BEING IMPROVED HERE UNDER, REGARDLESS OF THE STATUS OF COMPLETION OF PAVING OR OTHER OFF-SITE IMPROVEMENTS CALLED FOR BY THESE PLANS.

9. STREET SIGNS AND STOPS SIGNS SHALL BE INSTALLED PER CITY STANDARD SPECIFICATIONS FOR PLACEMENT OF STREET NAME SIGNS.

10. THE CONTRACTOR SHALL PROVIDE ALL NECESSARY TRAFFIC CONTROL DEVICES AND FLAGGERS TO INSURE THE SAFETY OF THE PUBLIC IN OR ADJACENT TO THE WORK AREA. THE CONTRACTOR SHALL HAVE A CERTIFIED ATSSA TRAFFIC CONTROL TECHNICIAN OR MSA WORK ZONE SAFETY SPECIALIST SET UP, MAINTAIN AND/OR REMOVE ALL TRAFFIC CONTROL DEVICES IN THE CITY OF LAS VEGAS RIGHT OF WAY.

11. WORK IN PUBLIC STREETS, ONCE BEGUN, SHALL BE EXPEDITED TO COMPLETION SO AS TO PROVIDE MINIMUM INCONVENIENCE TO ADJACENT PROPERTY OWNERS AND TO THE TRAVELING PUBLIC.

12. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING CITIZENS AREA TRANSIT (C.A.T.) IF THE CONSTRUCTION INTERRUPTS OR RELOCATES A BUS STOP OR HAS AN ADVERSE EFFECT ON BUS SERVICE ON THAT STREET TO ARRANGE FOR TEMPORARY RELOCATION OF STOP.

13. GUARDS SHALL BE OBTAINED BY CONTACTING THE METROPOLITAN POLICE DEPARTMENT SPECIAL EVENTS UNIT (PHONE # 828-3442) WHO WILL PROVIDE OFFICERS PROPERLY TRAINED IN TRAFFIC CONTROL. FEES FOR THE USE OF THESE OFFICERS SHALL BE SET BY METRO AND WILL BE PAID BY THE CONTRACTOR. THE CONTRACTOR IS RESPONSIBLE FOR ALL ARRANGEMENTS WITH METRO.

14. ANY WORK WITHIN 300' OF A SIGNALIZED INTERSECTION WILL BE NIGHT WORK, UNLESS OTHERWISE DIRECTED BY THE CITY OF LAS VEGAS TRAFFIC ENGINEER.

15. THE CONTRACTOR SHALL CONTACT THE TRAFFIC ENGINEERING DIVISION (TRANSPORTATION SECTION) THROUGH THE PROJECT'S OFFSITE INSPECTOR PRIOR TO INITIATING PAVING TO RECEIVE DIRECTION FOR ANY PERMANENT OR TEMPORARY MODIFICATIONS TO THE APPROVED DRAWINGS REGARDING FINAL PAVEMENT TRANSITIONS, MARKINGS AND SIGNING THAT ARE REQUIRED TO MATCH ADJACENT ROADWAY SEGMENTS. THE CONTRACTOR SHALL PROVIDE A DRAWING FOR APPROVAL BY THE TRAFFIC ENGINEERING DIVISION DEPICTING ANY ADJUSTMENTS TO THE FINAL PAVEMENT MARKINGS AND SIGNAGE, WHICH MAY INCLUDE OMITTING, ADDING OR MODIFYING PAVEMENT MARKINGS AND TRAFFIC CONTROL SIGNS SUCH THAT ADEQUATE TRANSITIONS AND LANE TERMINATIONS BETWEEN ADJACENT ROADWAY SEGMENTS ARE CONSTRUCTED.

2.4 CITY OF LAS VEGAS STREETLIGHT NOTES

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

2. NO DEVIATION OF STREET LIGHT, PULL BOX, CONDUITS (ETC.) LOCATIONS SHALL BE PERMITTED WITHOUT WRITTEN APPROVAL OF TRAFFIC ENGINEERING AND THE CITY ENGINEER.

3. ALL EXISTING STREET LIGHTING SHALL REMAIN OPERATIONAL DURING CONSTRUCTION.

4. ALL STREET LIGHTING CONDUITS STUB SHALL HAVE AT LEAST ONE GREEN #8 THW WIRE INSTALLED, AS TRACER WIRE. WHEN "EMPTY" CONDUIT IS CERTIFY INSTALLED FROM PB TO PB, IT SHALL HAVE MINIMUM OF 2 #4 AND 1 #8 THW WIRE WITH THE ENDS TAPED OR "SAFE OFF" PRIOR TO FINAL INSPECTION.

5. ANY STRUCTURE SUCH AS BLOCK WALLS, CHAIN LINK FENCES, RETAINING WALLS, ETC., SHALL LEAVE A MINIMUM CLEARANCE IN ACCORDANCE WITH THE USD NO. 328.

6. AS-BUILT DRAWINGS SHALL BE SUPPLIED TO THE TETO PRIOR TO ANY PRE-FINAL INSPECTION. THE ASBUILT DRAWING NEEDS TO BE STAMPED AS-BUILT AND SIGNED BY THE PREPARER.

7. SERVICE POINT SHALL BE COORDINATED WITH NV ENERGY COMPANY, AND WHEREVER POSSIBLE, BE LOCATED NEAR THE CENTER OF THE CIRCUIT. SERVICE POINTS SHALL BE SHOWN ON THE CIVIL PLANS.

8. IT SHALL BE ASSUMED THAT IN THE ABSENCE OF AN EXISTING, WORKABLE CIRCUIT TO ATTACH TO, ALL INSTALLATIONS SHALL REQUIRE A NEW SERVICE FOR OPERATION OF THE CIRCUIT.

9. WHEREVER THERE IS AN OVERHEAD UTILITY THAT MAY CONFLICT WITH THE INSTALLATION OF STREET LIGHTING CIRCUITS AND/OR POLES, THESE CONFLICTS MUST BE RESOLVED BETWEEN THE DEVELOPER AND THE UTILITIES INVOLVED, AT NO EXPENSE TO THE CITY OF LAS VEGAS, BEFORE STREETLIGHT BASES ARE INSTALLED.

10. THE CONTRACTOR SHALL FURNISH COMPLETE SERVICE TO TRANSFORMERS AND CONTROL SYSTEMS IF REQUIRED ON PLANS.

11. THE DEVELOPER/OWNER WILL BE REQUIRED TO SUPPLY POWER TO ALL NEW PUBLIC STREET LIGHTS INSTALLED UNDER THIS DESIGN PRIOR TO BOND RELEASE OR PROJECT COMPLETION. THE DEVELOPER/OWNER WILL BE RESPONSIBLE FOR ALL ITEMS ASSOCIATED WITH THE INSTALLATION, CONSTRUCTION, ENERGIZING, MAINTENANCE AND OPERATIONAL COST OF SAID STREET LIGHTS PRIOR TO PROJECT COMPLETION. REFER TO THE PLAN FOR ANY NEW SERVICE REQUIREMENTS. THE TRANSFER OF OWNERSHIP FROM THE DEVELOPER/OWNER TO THE CITY OF LAS VEGAS FOR ALL NEW PUBLIC STREET LIGHT/S AND/OR SERVICE/S INSTALLED UNDER THIS PLAN DESIGN WILL BE IN CONJUNCTION WITH THIS PROJECT COMPLETION; COORDINATE ALL MAINTENANCE AND OPERATIONAL TRANSFERS WITH THE CITY OF LAS VEGAS TRAFFIC ENGINEERING DEPARTMENT (TEFO) AT (702) 229-6331.

2.5 CITY OF LAS VEGAS GRADING NOTES

1. IN THE EVENT THAT ANY UNFORESEEN CONDITIONS NOT COVERED BY THESE NOTES ARE ENCOUNTERED DURING GRADING OPERATIONS, THE OWNER/ENGINEER SHALL BE IMMEDIATELY NOTIFIED FOR DIRECTION.

2. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO PERFORM ALL NECESSARY CUTS AND FILLS WITHIN THE LIMITS OF THIS PROJECT AND THE RELATED OFF-SITE WORK, SO AS TO GENERATE THE DESIRED SUBGRADE, FINISH GRADES AND 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 CONSTRUCTION WATER.

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

10. IN THE EVENT THAT ANY TEMPORARY CONSTRUCTION ITEM IS REQUIRED THAT IS NOT SHOWN ON THESE DRAWINGS, THE OWNER AGREES TO PROVIDE AND INSTALL SUCH ITEM AT HIS OWN EXPENSE AND AT THE DIRECTION OF THE CITY ENGINEER. TEMPORARY CONSTRUCTION INCLUDES DITCHES, BERMS, ROAD SIGNS AND BARRICADES, ETC.

CITY OF LAS VEGAS FIRE AND RESCUE GENERAL NOTES

1. ALL WORK SHALL BE DONE IN STRICT ACCORDANCE WITH THE LAS VEGAS FIRE AND RESCUE ADOPTED FIRE CODE, ORDINANCE # 6124 FOR HYDRANT SPECIFICATIONS AND HYDRANT INSTALLATION SPECIFICATIONS. AUTHORIZED FIRE HYDRANTS ARE AS FOLLOWS;

- KENNEDY – GUARDIAN MODELS K81A AND K81D
- MUELLER– SUPER CENTURION 250, MODEL A-423
- CLOW – MEDALLION MODEL F-2546LVD
- U.S.PIPE – METROFLOW/M-03

2. A PERMIT IS REQUIRED FROM LAS VEGAS FIRE AND RESCUE FOR THE INSTALLATION OF ON-SITE WATER LINES AND FIRE HYDRANTS. THE PERMIT AND CONTRACTORS MATERIAL TEST CERTIFICATE FOR UNDERGROUND PIPING FORM SHALL BE OBTAINED FROM THE FIRE PROTECTION ENGINEER BEFORE COMMENCEMENT OF WORK.

3. ON ANY RESIDENTIAL OR COMMERCIAL INSTALLATIONS, FIRE HYDRANTS SHALL BE INSTALLED AND FIRE APPARATUS ACCESS ROADS SHALL BE MAINTAINED BEFORE COMMENCEMENT OF ANY COMBUSTIBLE CONSTRUCTION. ALL FIRE HYDRANTS SHALL BE IN GOOD WORKING ORDER AND SHALL BE CAPABLE OF DELIVERING THE REQUIRED FIRE FLOW. SNFC #6124, SECTION 1412.

4. TO IDENTIFY THE FIRE HYDRANT LOCATIONS, THE CONTRACTOR SHALL PLACE A BLUE REFLECTIVE MARKER AT THE CENTER LINE OF THE STREET ADJACENT TO THE FIRE HYDRANTS. SNFC #6124 SECTION 507.5.7.3

5. ALL UNDERGROUND INSPECTIONS, PRESSURE AND FLUSH VERIFICATIONS OF ALL FIRE HYDRANTS AND FIRE LINES, SHALL BE CONDUCTED BEFORE COVERING THE LINES. CENTER LOADING IS ACCEPTABLE FOR THE HYDRO TESTS WITH PRIOR FIRE PREVENTION APPROVAL.

6. ALL ON-SITE UNDERGROUND WATER MAINS AND MATERIALS SHALL BE U.L. LISTED, A.W.W.A APPROVED AND SHALL BE RATED FOR THE APPROPRIATE WORKING PRESSURE. SNFC 507.2.1, NFPA 24

7. PAINTING OF CURBS, FIRE HYDRANTS, PADS, PROTECTION OF FIRE HYDRANTS FROM PHYSICAL DAMAGE, AND ALL OTHER WORK NECESSARY PER PLANS SHALL BE COMPLETED BEFORE APPROVAL BY LAS VEGAS FIRE AND RESCUE, FIRE PREVENTION DIVISION IFC 507; SNFC 507.5.7

8. PRIVATE HYDRANTS SHALL BE PANTED RED. SNFC 507.5.7.1

9. PRIOR TO THE FINAL OCCUPANCY, A FIRE FLOW TEST SHALL BE WITNESSED BY LAS VEGAS FIRE AND RESCUE, FIRE PREVENTION DIVISION TO VERIFY AVAILABILITY OF THE REQUIRED FIRE FLOW. IFC 507; SNFC 507.1

10. FIRE HYDRANT SPACING SHALL BE AS FOLLOWS: SNFC C102
- RESIDENTIAL– 500 FT UNSPRINKLERED; 600 FT SPRINKLERED.
- COMMERCIAL– 300 FT UNSPRINKLERED; 400 FT SPRINKLERED.

11. WHERE THE WATER MAINS ARE EXTENDED ALONG STREETS OR NEW STREETS ARE INSTALLED WHERE FIRE HYDRANTS ARE NOT NEEDED FOR PROTECTION OF THE STRUCTURES,FIRE HYDRANTS SHALL BE INSTALLED AT A MAXIMUM OF 1000 FT SPACING, TO PROVIDE FOR TRANSPORTATION HAZARDS. WHERE STREETS ARE PROVIDED WITH MEDIAN DIVIDERS OR HAVE FOUR (4) OR MORE TRAFFIC LANES AND HAVE A TRAFFIC COUNT OF MORE THAN 30,000 PER DAY, HYDRANTS ARE REQUIRED ON EACH SIDE OF THE STREET SPACED AT 500 FT ON AN ALTERNATING BASIS. SNFC C102.14

12. NO FIRE HYDRANTS SHALL BE LOCATED WITHIN THE RADIUS OF A CUL-DE-SAC OR WITHIN 20 FT OF THE PERIMETER OF THE RADIUS OF THE CUL-DE-SAC.

13. NO FIRE HYDRANTS SHALL BE LOCATED WITHIN 6 FT OF ANY CURB RETURN, DRIVEWAY, POWER POLE, STREETLIGHT OR ANY OTHER OBSTRUCTION. SNFC C102.12

14. A MAXIMUM DISTANCE FROM A FIRE HYDRANT TO A ONE-TWO FAMILY DWELLING SHALL NOT EXCEED 300 FT, AS MEASURED BY AN APPROVED ROUTE. SNFC 102.4

15. THE MAXIMUM DISTANCE FROM A FIRE HYDRANT TO A FIRE DEPARTMENT CONNECTION (FDC) SHALL NOT EXCEED 100 FT, AS MEASURED BY AN APPROVED ROUTE. SNFC C1 02.7

16. THE MAXIMUM DISTANCE FROM A HYDRANT TO THE END OF A DEAD-END STREET SHALL NOT EXCEED 200 FT. SNFC 102.6

17. TWO (2) SOURCES OF SUPPLY ARE REQUIRED WHENEVER THERE IS 4 OR MORE FIRE HYDRANTS/SPRINKLER LEAD-INS ARE INSTALLED ON A SINGLE SYSTEM. SECTIONAL CONTROL VALVES SHALL BE INSTALLED SO THAT NO MORE THAN 2 FIRE HYDRANTS CAN BE OUT OF SERVICE DUE TO A BREAK IN A WATER MAIN.

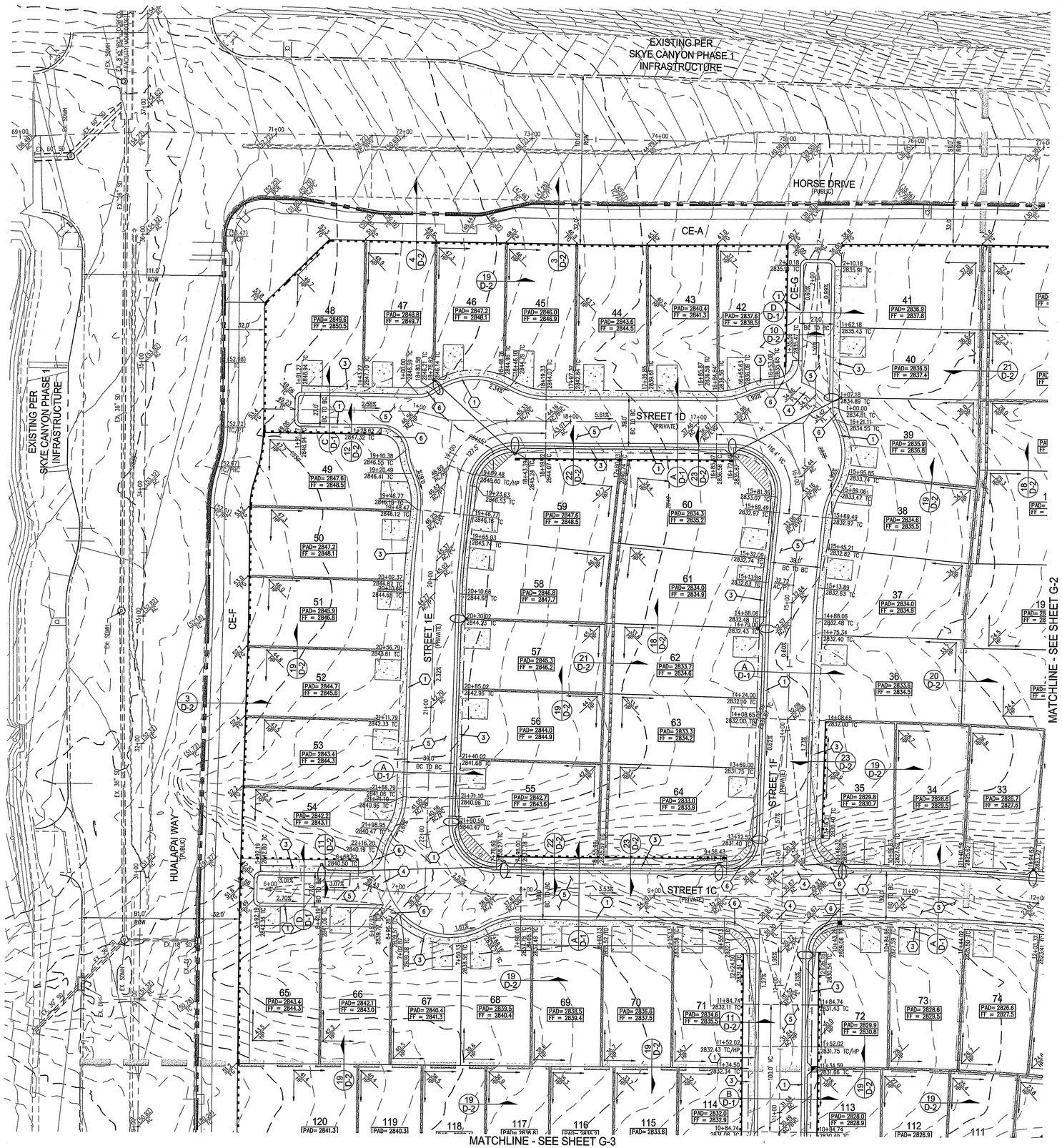
18. ALL FIRE APPARATUS ACCESS ROADS SHALL BE PAVED TO PROVIDE ALL-WEATHER DRIVING CAPABILITIES, AND SHALL BE DESIGNED AND MAINTAINED TO SUPPORT THE IMPOSED LOADS OF THE FIRE APPARATUS. SNFC 503.2.3

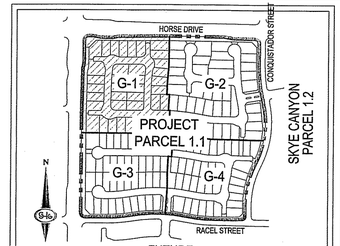
19. THE GRADIENT FOR THE FIRE APPARATUS ACCESS ROADS SHALL NOT EXCEED 12% ANGLES OF APPROACH AND ANGLES OF DEPARTURE SHALL NOT EXCEED 6% FOR 25 FT PRIOR TO OR AFTER THE GRADE CHANGE. ADJACENT TO THE STRUCTURES GRADIENT SHALL NOT EXCEED 6%. SNFC 503.2.7 / 503.2.8

20. THE TURNING RADIUS OF THE FIRE APPARATUS ACCESS ROADS SHALL BE NO LESS THAN 52 FT OUTSIDE AND 28 FT INSIDE TURNING RADIUS. SNFC 503.2.4

21. VERTICAL CLEARANCE OF ALL FIRE APPARATUS ACCESS ROADS SHALL NOT BE LESS THAN 13 FT 6 INS. SNFC 503.2.1.1 1 IFC 503

22. FIRE DEPARTMENT ACCESS ROADS IN ALL RESIDENTIAL DEVELOPMENTS (EXCEPT APARTMENT BUILDINGS) SHALL HAVE A MINIMUM UNOBSTRUCTED WIDTH OF NOT LESS THAN 36 FT FLOW LINE TO FLOW LINE (THIS WIDTH MAY BE REDUCED TO 24 FT IF ALL BUILDINGS FRONTING THE STREET ARE SPRINKLERED) FOR MAIN RESIDENTIAL STREETS, WITH PARKING PERMITTED





INDEX MAP
NOT TO SCALE

FUTURE
SKYE CANYON
PARCEL 1.3

0 40 80
SCALE – 1"=40' FEET

GRADING NOTES

1. INSTALL 30" ROLL CURB PER CCAUSD NO. 217.51 OVER 6" TYPE II AGGREGATE BASE
2. INSTALL "L" TYPE CURB AND GUTTER PER CCAUSD #216
3. INSTALL 5' WIDE CONCRETE SIDEWALK (4" THICK OVER 5" TYPE 2 AGGREGATE BASE) PER CCAUSD #234
4. INSTALL 8-FT CROSS GUTTER PER DETAIL ON SHEET D-1
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STORMWATER RUNOFF MANAGEMENT

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

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

FLOOD ZONE

THE PROJECT SITE IS LOCATED WITHIN A FEMA DESIGNATED ZONE X (UNSHADED) AS DEPICTED ON FLOOD INSURANCE RATE MAP (FIRM) PANEL 32003C1735E, 32003C1745E & 32003C1750E DATED SEPTEMBER 27, 2002. A ZONE X (UNSHADED) IS DESCRIBED AS AN AREA DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOOD.

STORM DRAIN NOTE

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

WALLS ADJACENT TO COMMON LOTS

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

LEGAL DESCRIPTION

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

BASIS OF BEARING

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

BENCHMARK

USDA BRASS CAP ON AN IRON PIPE, 140' SOUTHWEST OF TELEPHONE POLE #269947, SOUTHWEST CORNER OF THE U.S. 95/KYLE CANYON TURNOFF.

ELEVATION = 2817.62 FEET, 858.813 METERS
N.A.V.D. 88 DATUM
PER THE CLARK COUNTY VERTICAL CONTROL LAST REVISED 2003

GENERAL NOTES

1. SEE PLAN AND PROFILE SHEETS FOR CENTERLINE AND BACK OF CURB CURVE DATA.
2. FINAL GRADES ADJACENT TO STRUCTURES SHALL BE IN CONFORMANCE WITH IBC 2006, SECTION 2304.11.2.2.
3. THE CONTRACTOR SHALL VERIFY ALL CONDITIONS AND DIMENSIONS AND REPORT ALL DISCREPANCIES TO THE ENGINEER.
4. ALL IMPROVEMENTS TO BE PROTECTED FROM EROSION BY SWPPP.
5. MAXIMUM/MINIMUM SLOPES AND MINIMUM STREET SECTIONS NOT TO EXCEED THAT SHOWN ON GEOTECH REPORT.
6. SEE DETAIL SHEETS FOR STREET SECTIONS AND DETAILS.
7. ALL PUBLIC AND PRIVATE DRAINAGE IMPROVEMENTS TO BE BONDED FOR AND INSPECTED.
8. CONSTRUCTION OF BLOCK WALLS REQUIRES A SEPARATE BUILDING PERMIT AND APPROVAL.
9. EXISTING UTILITY LOCATIONS SHOWN HEREON ARE APPROXIMATE ONLY. CONTRACTOR TO VERIFY LOCATION AND ELEVATION OF EXISTING UTILITY STRUCTURES AND FACILITIES AND NOTIFY ENGINEER OF ANY DISCREPANCIES PRIOR TO CONSTRUCTION. CONTRACTOR TO PROTECT IN PLACE DURING CONSTRUCTION. ENGINEER/OWNER SHALL BE NOTIFIED OF PRIOR DAMAGE TO EXISTING FACILITIES PRIOR TO CONSTRUCTION. CONTRACTOR WILL BE RESPONSIBLE FOR REPAIR/REPLACING FACILITIES IF ENGINEER/OWNER IS NOT NOTIFIED OF EXISTING DAMAGE PRIOR TO CONSTRUCTION COMMENCING.
10. NO STRUCTURE, VEGETATION, OR OBJECTS OF ANY KIND IS PERMITTED OVER TWENTY-FOUR (24) INCHES IN HEIGHT (MEASURED FROM THE TOP OF THE ADJACENT CURB IF CURB EXIST) WITHIN THE SIGHT VISIBILITY ZONES.
11. ALL ELEVATIONS SHOWN, WITH EXCEPTION TO PAD, FINISHED FLOOR, AND CONTOUR ELEVATIONS, ARE THE VALUE SHOWN PLUS 3300'.

PERIMETER SIDEWALKS

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

DRAINAGE EASEMENT NOTE

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

PRIVATE STREETS NOTE

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

FLOOD CERTIFICATION

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

STEPHEN M. JONES, P.E. 019638 — DATE

DISCLAIMER NOTE

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







SLATER HANFAN 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, NEVADA

NINETY-FIVE MANAGEMENT LLC

SKYE CANYON PARCEL 1.1

GRADING PLAN I

T 12 S
R 60 E

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

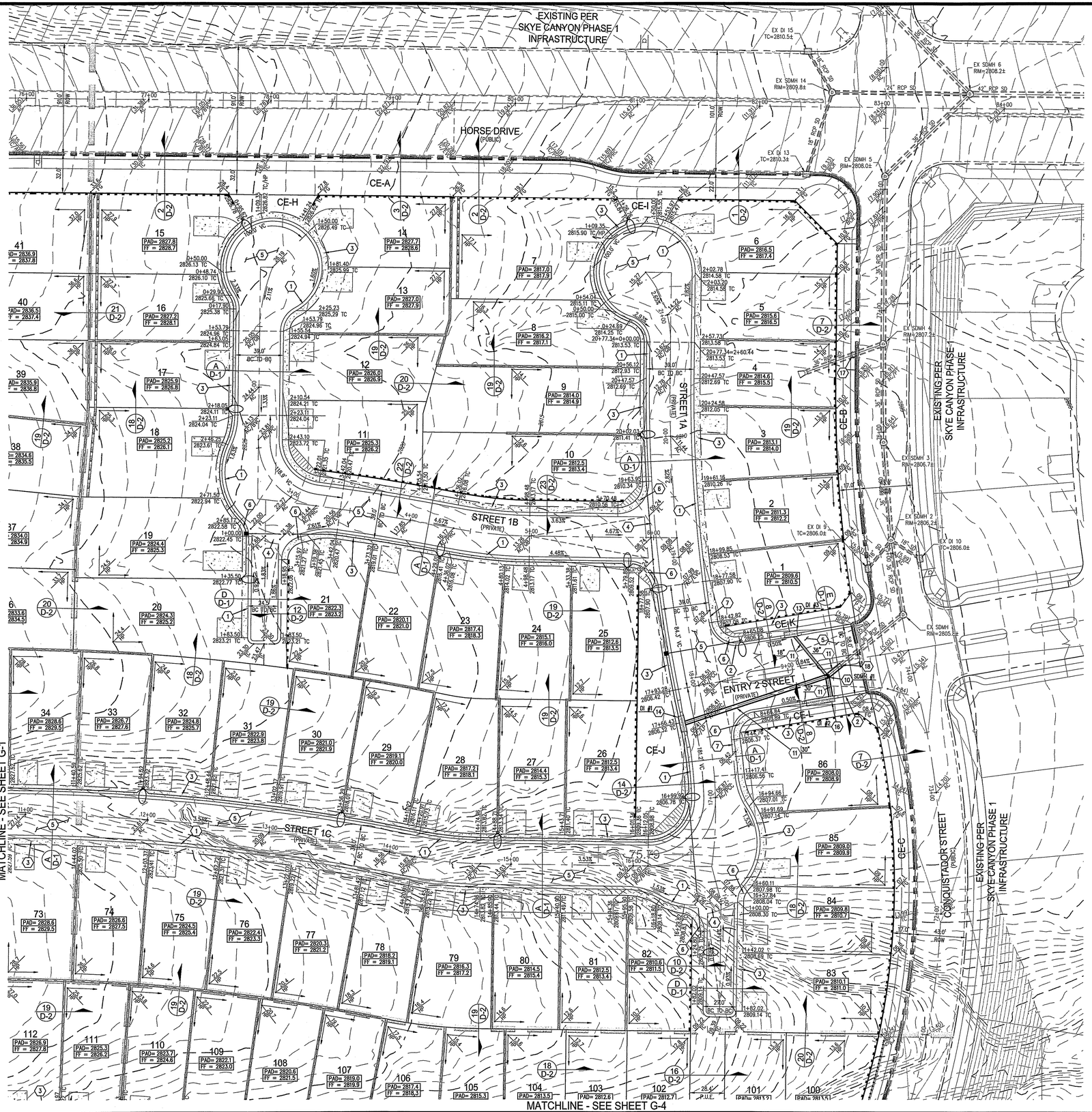
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OLY1401-002

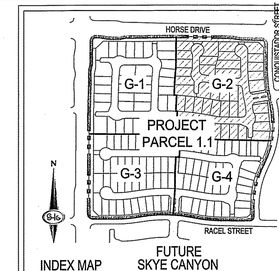
PROFESSIONAL ENGINEER — STATE OF NEVADA — STEPHEN M. JONES — Exp. 6/30/15 — CIVIL — No. 019638 — 6/30/2014

G-1
SHEET 3 OF 10

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INDEX MAP
NOT TO SCALE

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LEGAL DESCRIPTION

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USDA BRASS CAP ON AN IRON PIPE, 140' SOUTHWEST OF TELEPHONE POLE #2639947, SOUTHWEST CORNER OF THE U.S. 95/KYLE CANYON TURNOFF.

ELEVATION = 2817.62 FEET, 858.813 METERS
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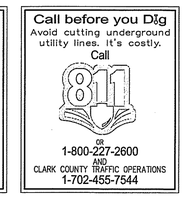
STEPHEN M. JONES, P.E. 019638 — DATE

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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.

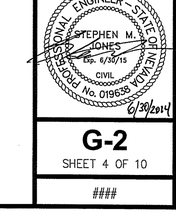
CITY OF LAS VEGAS, NEVADA

NINETY-FIVE MANAGEMENT LLC

SKYE CANYON PARCEL 1.1
GRADING PLAN II

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S 7

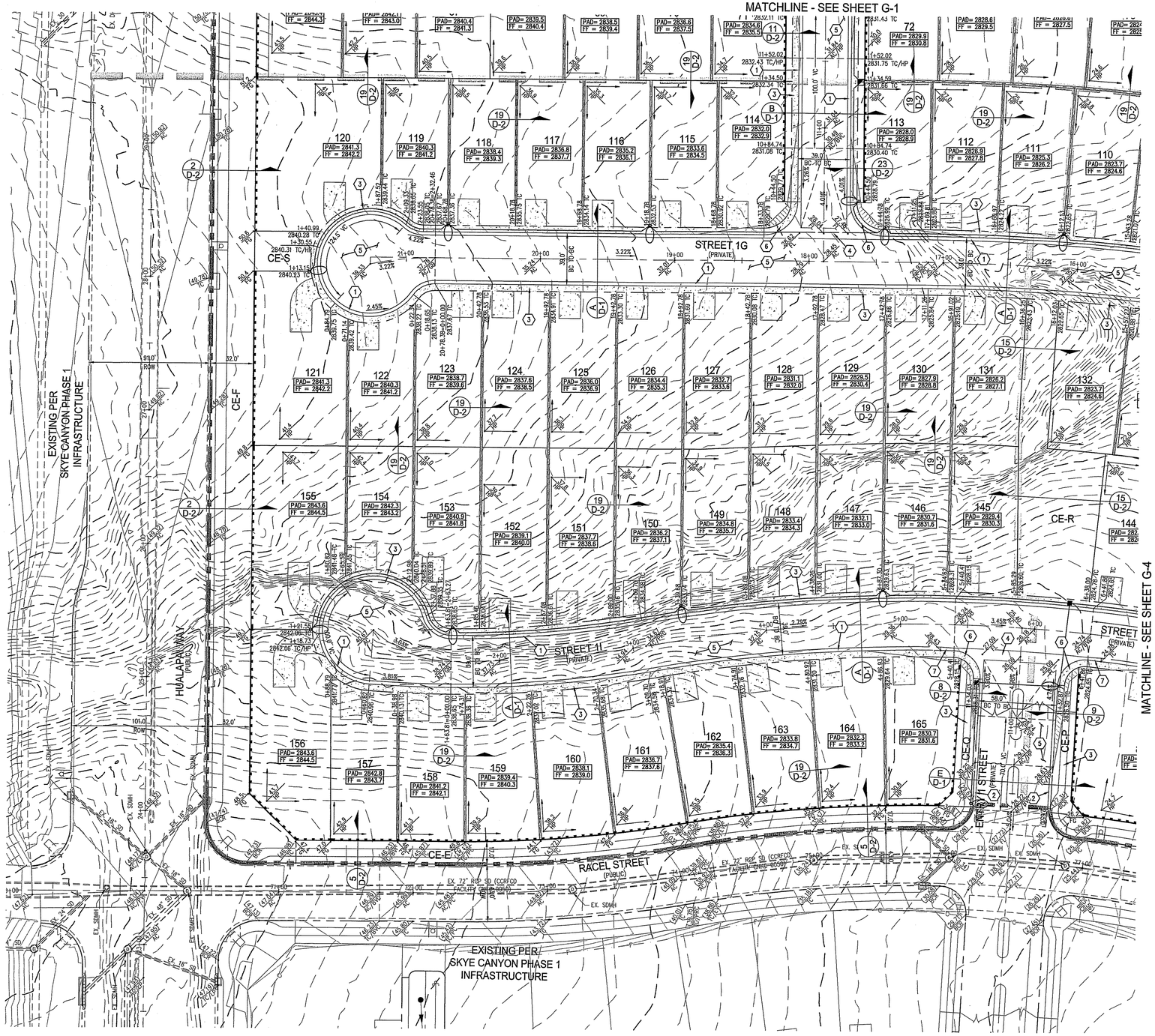
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DRAFTER: JTC
DESIGNER: MAK
CHECKED: CAL
PROJECT NO.
OLY1401-002

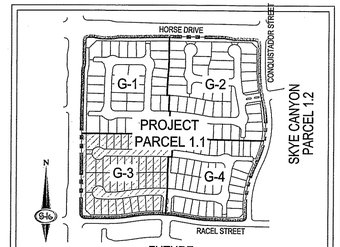


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SHEET 4 OF 10

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

AVOID HITTING UNDERGROUND TRAFFIC SIGNAL SYSTEMS AND STREET LIGHT SYSTEM CONDUITS. IT'S COSTLY.
Call before you do UnderGround
1-702-455-7511
CLARK COUNTY TRAFFIC OPERATIONS
AND
1-702-432-5300
LAS VEGAS AREA
COMPUTERIZED TRAFFIC SYSTEM

Call before you Dig
Avoid cutting underground utility lines. It's costly.
Call
811
OR
1-800-227-2600
AND
CLARK COUNTY TRAFFIC OPERATIONS
1-702-455-7544

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NO.	DESCRIPTION	DATE	BY	APP. DATE	APP.

CITY OF LAS VEGAS, NEVADA

NINETY-FIVE MANAGEMENT LLC

SKYE CANYON PARCEL 1.1

GRADING PLAN III

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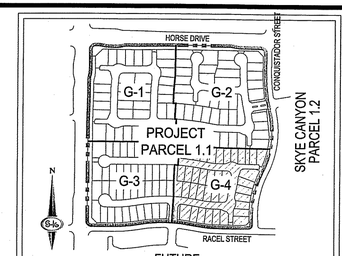
DATE: 6/24/14
DRAFTER: JTC
DESIGNER: MAK
CHECKED: CAL
PROJECT NO.
OLY1401-002

PROFESSIONAL ENGINEER STATE OF NEVADA
STEPHEN M. JONES
Exp. 6/30/15
CIVIL
No. 019638
6/20/2014

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SHEET 5 OF 10
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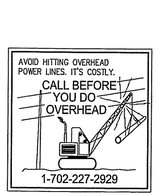
FLOOD CERTIFICATION

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

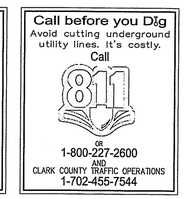
STEPHEN M. JONES, P.E. 019838 — DATE

DISCLAIMER NOTE

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







SLATER HANFAN 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, NEVADA

NINETY-FIVE MANAGEMENT LLC

SKYE CANYON PARCEL 1.1
GRADING PLAN IV

T 12 S
R 60 E

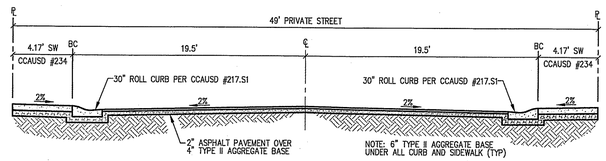
DATE: 6/24/14
DRAFTER: JTC
DESIGNER: MAK
CHECKED: CAL
PROJECT NO.
OLY1401-002

PROFESSIONAL ENGINEER – STATE OF NEVADA
STEPHEN M. JONES
Exp. 6/30/15
CIVIL
No. 019838
6/24/2014

G-4
SHEET 6 OF 10

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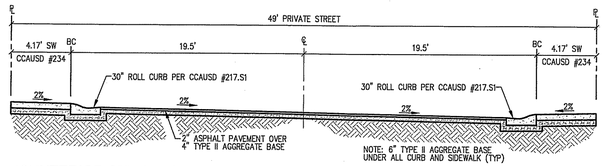
J:\Oly1401-002 skye canyon 1-1\Dwg\Improv\oly1401-002 pl-1 grad.dwg 6/30/2014 7:50 AM Matt Key



A. 49' INTERIOR STREET SECTION (PRIVATE)

NOT TO SCALE

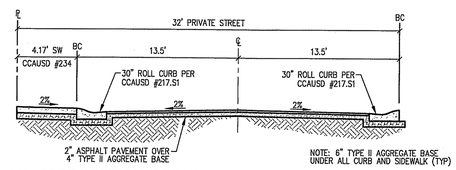
ONSITE PRIVATE STREETS
PER STD. DWG No. XXX



B. 49' INTERIOR STREET SECTION (PRIVATE)

NOT TO SCALE

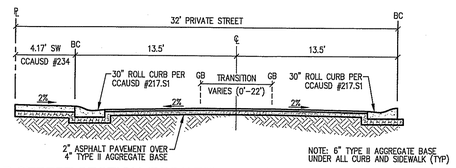
ONSITE PRIVATE STREETS
PER STD. DWG No. XXX



C. 32' INTERIOR STREET SECTION (PRIVATE)

NOT TO SCALE

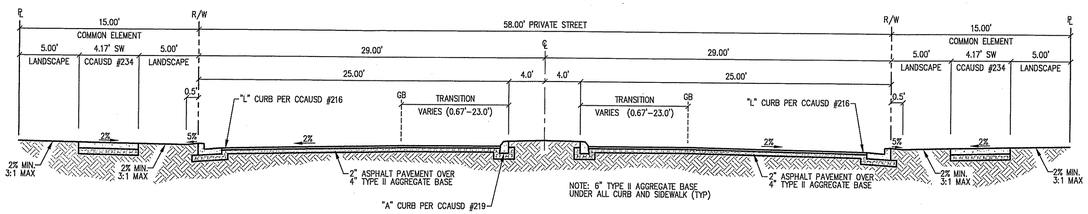
ONSITE PRIVATE STREETS
PER STD. DWG No. XXX



D. 32' INTERIOR STREET SECTION (PRIVATE)

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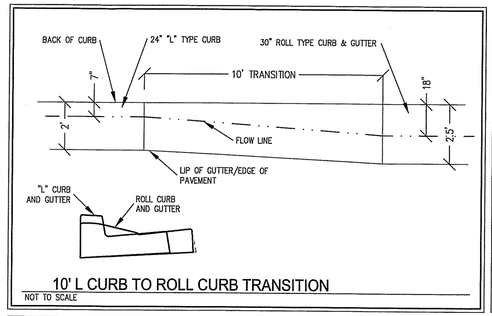
ONSITE PRIVATE STREETS
PER STD. DWG No. XXX



E. 58.00' ENTRY STREET SECTION (PRIVATE)

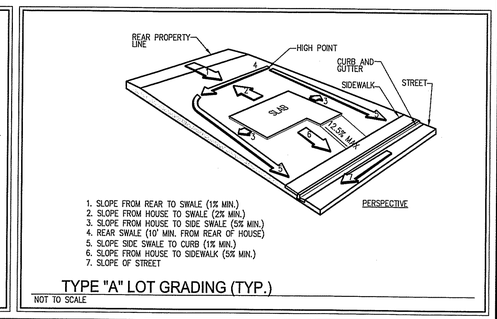
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ONSITE PRIVATE STREETS
PER STD. DWG No. XXX



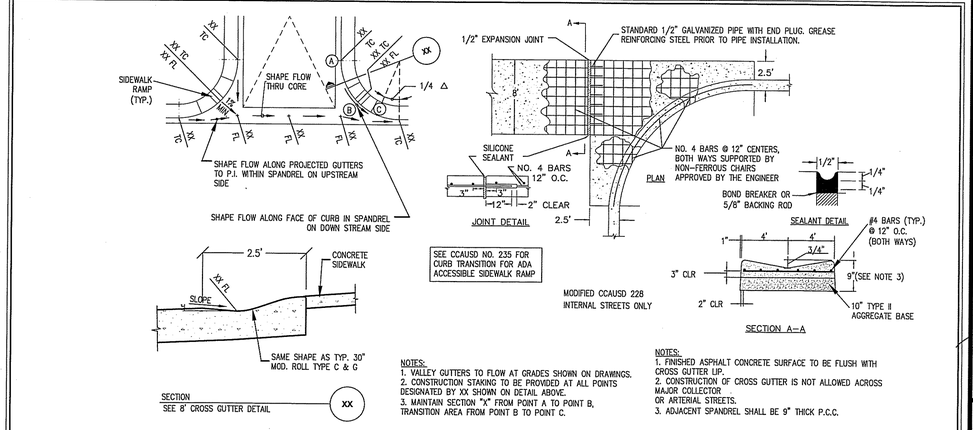
10' L CURB TO ROLL CURB TRANSITION

NOT TO SCALE



TYPE "A" LOT GRADING (TYP.)

NOT TO SCALE



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.

MODIFIED 8' WIDE CROSS GUTTER

NOT TO SCALE

SLATER HANIFAN GROUP
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NO.	DESCRIPTION	DATE	BY	APP. DATE	APP.

CITY OF LAS VEGAS, NEVADA

NINETY-FIVE MANAGEMENT LLC

SKYE CANYON PARCEL 1.1

STREET SECTIONS AND GRADING DETAILS I

T 12 S
R 60 E

DATE: 6/24/14

DRAFTER: JTC

DESIGNER: MAK

CHECKED: CAL

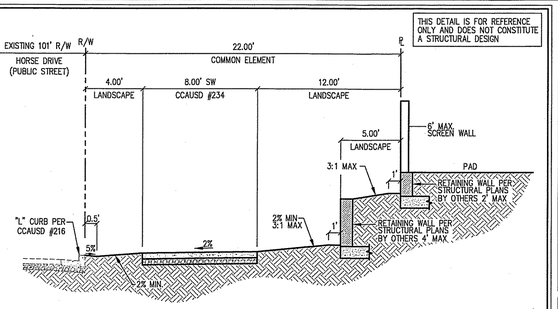
PROJECT NO.
OLY1401-002

PROFESSIONAL ENGINEER – STATE OF NEVADA
STEPHEN M. JONES
Exp. 6/30/15
CIVIL
No. 019632
6/30/2014

D-1
SHEET 7 OF 10

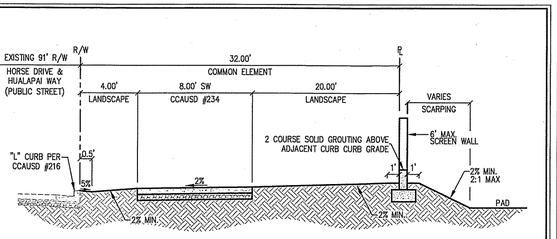
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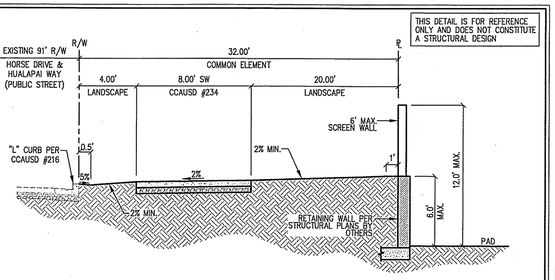
1. PERIMETER SECTION - PAD ABOVE STREET W/ RETAINING WALLS

NOT TO SCALE — HORSE DRIVE (PUBLIC)



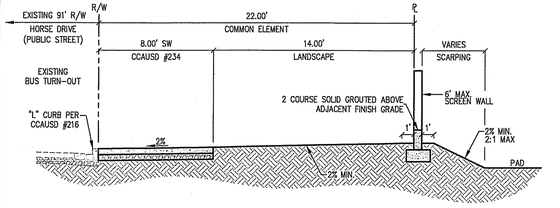
2. PERIMETER SECTION - PAD ABOVE STREET W/O RETAINING WALL

NOT TO SCALE — HORSE DR. & HUALAPAI WAY (PUBLIC)



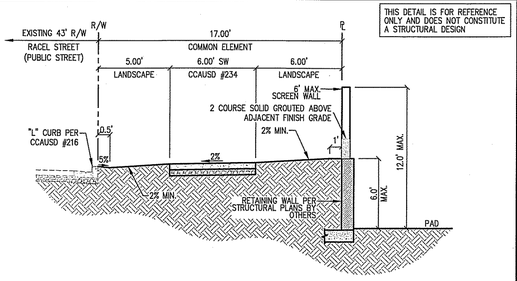
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NOT TO SCALE — HORSE DR. & HUALAPAI WAY (PUBLIC)



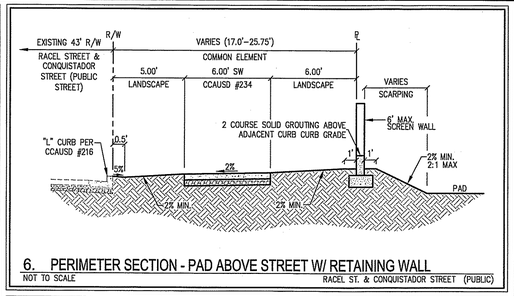
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NOT TO SCALE — HORSE DRIVE (PUBLIC)



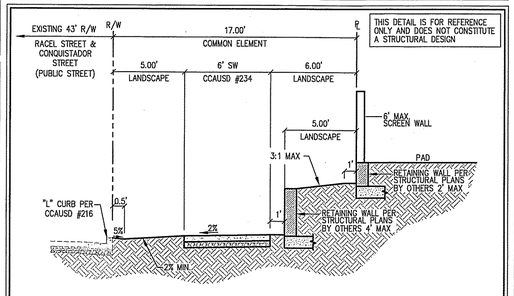
5. PERIMETER SECTION - PAD ABOVE STREET W/ RETAINING WALL

NOT TO SCALE — RACEL ST. (PUBLIC)



6. PERIMETER SECTION - PAD ABOVE STREET W/ RETAINING WALL

NOT TO SCALE — RACEL ST. & CONQUISTADOR STREET (PUBLIC)

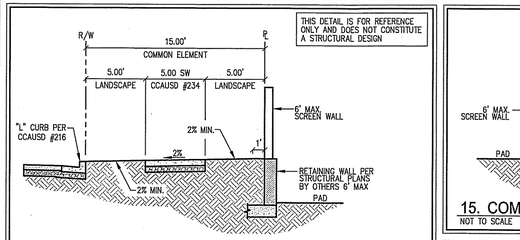


7. PERIMETER SECTION - PAD ABOVE STREET W/ RETAINING WALLS

NOT TO SCALE — RACEL ST. & CONQUISTADOR STREET (PUBLIC STREET)

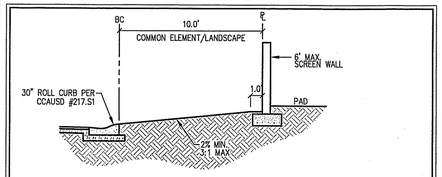
8. ENTRY STREET W/O RETAINING WALL

NOT TO SCALE — ON-SITE



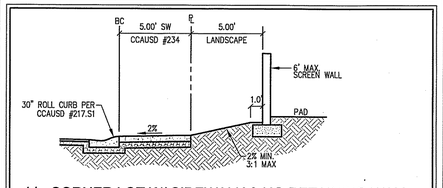
9. ENTRY STREET W/ RETAINING WALL

NOT TO SCALE — ON-SITE



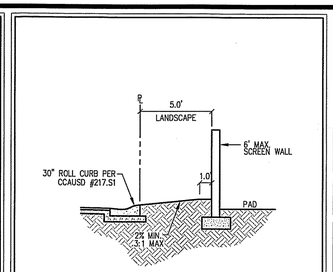
10. CORNER LOT W/O SIDEWALK & RETAINING WALL

NOT TO SCALE — ON-SITE



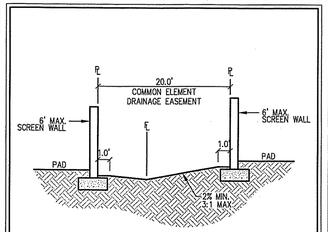
11. CORNER LOT W/ SIDEWALK & NO RETAINING WALL

NOT TO SCALE — ON-SITE



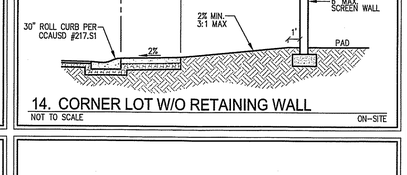
12. CORNER LOT W/O RETAINING WALL

NOT TO SCALE — ON-SITE



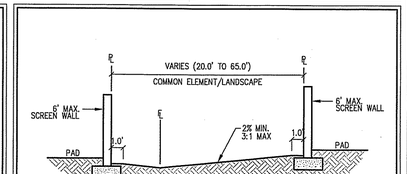
13. COMMON ELEMENT

NOT TO SCALE — ON-SITE



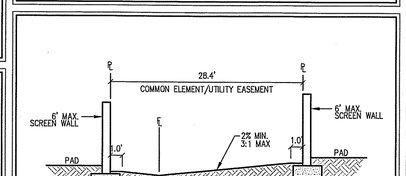
14. CORNER LOT W/O RETAINING WALL

NOT TO SCALE — ON-SITE



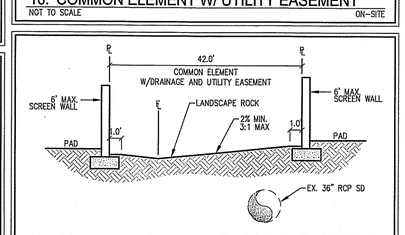
15. COMMON ELEMENT

NOT TO SCALE — ON-SITE



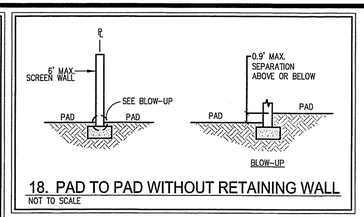
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NOT TO SCALE — ON-SITE



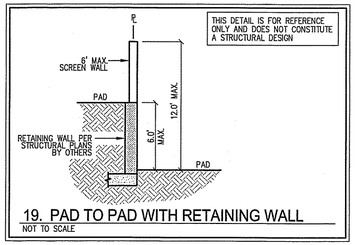
17. COMMON ELEMENT W/ DRAINAGE EASEMENT

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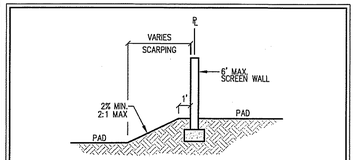
18. PAD TO PAD WITHOUT RETAINING WALL

NOT TO SCALE



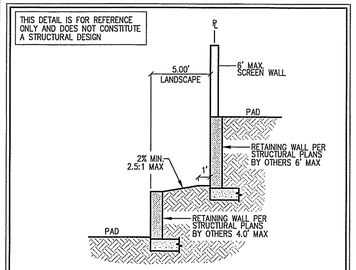
19. PAD TO PAD WITH RETAINING WALL

NOT TO SCALE



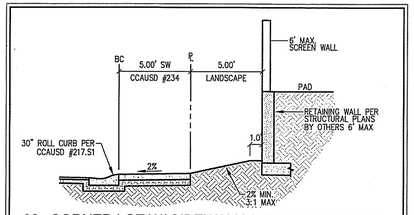
20. PAD TO PAD WITH SCARPING

NOT TO SCALE



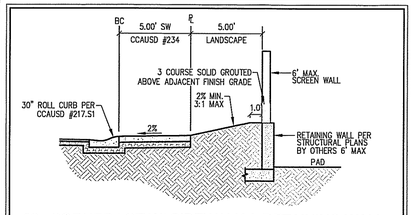
21. PAD TO PAD WITH RETAINING WALL

NOT TO SCALE



22. CORNER LOT W/ SIDEWALK & RETAINING WALL

NOT TO SCALE — ON-SITE



23. CORNER LOT W/ SIDEWALK & RETAINING WALL

NOT TO SCALE — ON-SITE

SLATER HANFAN GROUP
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5740 S. ARVILLE STREET #216, LAS VEGAS, NV 89118
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NO.	DESCRIPTION	DATE	BY	APP. DATE	APP.

CITY OF LAS VEGAS, NEVADA

NINETY-FIVE MANAGEMENT LLC

SKYE CANYON PARCEL 1.1

GRADING DETAILS II

T 12 S
R 60 E
S

DATE: 6/24/14
DRAFTER: JTC
DESIGNER: MAK
CHECKED: CAL
PROJECT NO.
OLY1401-002

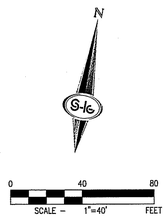
PROFESSIONAL ENGINEER - STATE OF NEVADA - STEPHEN M. JONES - Exp. 6/30/15 - CIVIL - No. 019658

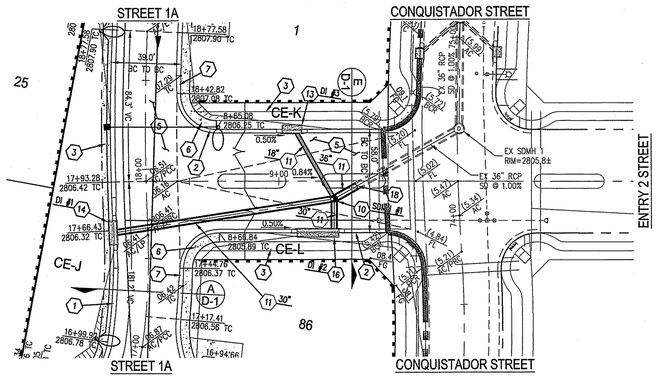
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D-2
SHEET 8 OF 10

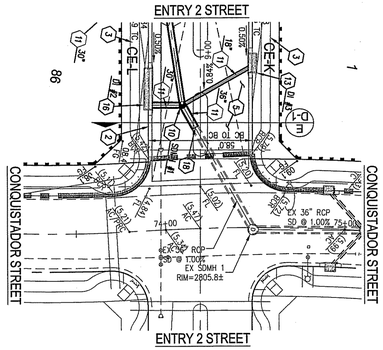
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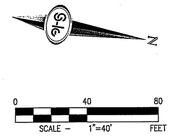


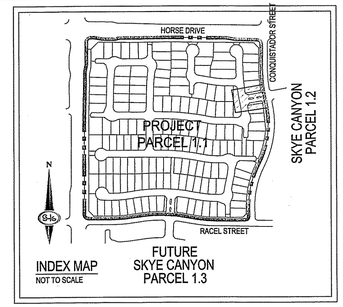


ENTRY 2 STREET
(PRIVATE)



SD LATERAL #1
(PRIVATE)





GRADING NOTES

1. INSTALL 30" ROLL CURB PER CCAUSD NO. 217.S1 OVER 6" TYPE II AGGREGATE BASE
2. INSTALL "L" TYPE CURB AND GUTTER PER CCAUSD #216
3. INSTALL 5' WIDE CONCRETE SIDEWALK (4" THICK OVER 5" TYPE 2 AGGREGATE BASE) PER CCAUSD #234
4. INSTALL 8-FT CROSS GUTTER PER DETAIL ON SHEET D-1
5. INSTALL 2" ASPHALT PAVEMENT OVER 4" TYPE II AGGREGATE BASE
6. CONSTRUCT SIDEWALK RAMPS USING ARMOR TILE TRUNCATED DOMES OR EQUIVALENT CCAUSD NO. 235, CASE 1 & 2.S.1
7. CONSTRUCT 10' TRANSITION FROM "L" CURB TO MOD. ROLL CURB PER DETAIL ON SHEET D-1
8. INSTALL 6' WIDE CONCRETE SIDEWALK (4" THICK OVER 5" TYPE 2 AGGREGATE BASE) PER CCAUSD #234
9. INSTALL 8' WIDE CONCRETE SIDEWALK (4" THICK OVER 5" TYPE 2 AGGREGATE BASE) PER CCAUSD #234
10. INSTALL TYPE III STORM DRAIN MANHOLE PER CCAUSD #406
11. INSTALL CLASS III RCP SD (PRIVATE) PIPE SIZE PER PLAN
12. INSTALL 5.0' MOD. TYPE "CM2" DROP INLET PER CCAUSD #412.1 AND #421
13. INSTALL 10.0' MOD. TYPE "CM2" DROP INLET PER CCAUSD #412.1 AND #421
14. INSTALL 12.5' MOD. TYPE "CM2" DROP INLET PER CCAUSD #412.1 AND #421
15. INSTALL 20.0' MOD. TYPE "CM2" DROP INLET PER CCAUSD #412.1 AND #421
16. INSTALL 22.5' MOD. TYPE "CM2" DROP INLET PER CCAUSD #412.1 AND #421
17. REMOVE EXISTING STORM DRAIN PIPE AT PROPOSED STRUCTURE OR 5 FEET BEHIND BACK OF CURB AND INSTALL CAP
18. REMOVE EXISTING CAP AND INSTALL PROPOSED STORM DRAIN PIPE

STORMWATER RUNOFF MANAGEMENT

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

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

FLOOD ZONE

THE PROJECT SITE IS LOCATED WITHIN A FEMA DESIGNATED ZONE X (UNSHADED) AS DEPICTED ON FLOOD INSURANCE RATE MAP (FIRM) PANEL 32003C1735E, 32003C1745E & 32003C1750E DATED SEPTEMBER 27, 2002. A ZONE X (UNSHADED) IS DESCRIBED AS AN AREA DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOOD.

STORM DRAIN NOTE

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

WALLS ADJACENT TO COMMON LOTS

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

LEGAL DESCRIPTION

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

BENCHMARK

USDA BRASS CAP ON AN IRON PIPE, 140' SOUTHWEST OF TELEPHONE POLE #26994T, SOUTHWEST CORNER OF THE U.S. 95/KYLE CANYON TURNOFF.

ELEVATION = 2817.62 FEET, 858.813 METERS
N.A.V.D. 88 DATUM
PER THE CLARK COUNTY VERTICAL CONTROL LAST REVISED 2003

BASIS OF BEARING

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

GENERAL NOTES

1. SEE PLAN AND PROFILE SHEETS FOR CENTERLINE AND BACK OF CURB CURVE DATA.
2. FINAL GRADES ADJACENT TO STRUCTURES SHALL BE IN CONFORMANCE WITH IBC 2006, SECTION 2304.11.2.2.
3. THE CONTRACTOR SHALL VERIFY ALL CONDITIONS AND DIMENSIONS AND REPORT ALL DISCREPANCIES TO THE ENGINEER.
4. ALL IMPROVEMENTS TO BE PROTECTED FROM EROSION BY SWPPP.
5. MAXIMUM/MINIMUM SLOPES AND MINIMUM STREET SECTIONS NOT TO EXCEED THAT SHOWN ON GEOTECH REPORT.
6. SEE DETAIL SHEETS FOR STREET SECTIONS AND DETAILS.
7. ALL PUBLIC AND PRIVATE DRAINAGE IMPROVEMENTS TO BE BONDED FOR AND INSPECTED.
8. CONSTRUCTION OF BLOCK WALLS REQUIRES A SEPARATE BUILDING PERMIT AND APPROVAL.
9. EXISTING UTILITY LOCATIONS SHOWN HEREON ARE APPROXIMATE ONLY. CONTRACTOR TO VERIFY LOCATION AND ELEVATION OF EXISTING UTILITY STRUCTURES AND FACILITIES AND NOTIFY ENGINEER OF ANY DISCREPANCIES PRIOR TO CONSTRUCTION. CONTRACTOR TO PROTECT IN PLACE DURING CONSTRUCTION. ENGINEER/OWNER SHALL BE NOTIFIED OF PRIOR DAMAGE TO EXISTING FACILITIES PRIOR TO CONSTRUCTION. CONTRACTOR WILL BE RESPONSIBLE FOR REPAIR/REPLACING FACILITIES IF ENGINEER/OWNER IS NOT NOTIFIED OF EXISTING DAMAGE PRIOR TO CONSTRUCTION COMMENCING.
10. NO STRUCTURE, VEGETATION, OR OBJECTS OF ANY KIND IS PERMITTED OVER TWENTY-FOUR (24) INCHES IN HEIGHT (MEASURED FROM THE TOP OF THE ADJACENT CURB IF CURB EXIST) WITHIN THE SIGHT VISIBILITY ZONES.
11. ALL ELEVATIONS SHOWN, WITH EXCEPTION TO PAD, FINISHED FLOOR, AND CONTOUR ELEVATIONS, ARE THE VALUE SHOWN PLUS 3300'.

PERIMETER SIDEWALKS

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

DRAINAGE EASEMENT NOTE

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

PRIVATE STREETS NOTE

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

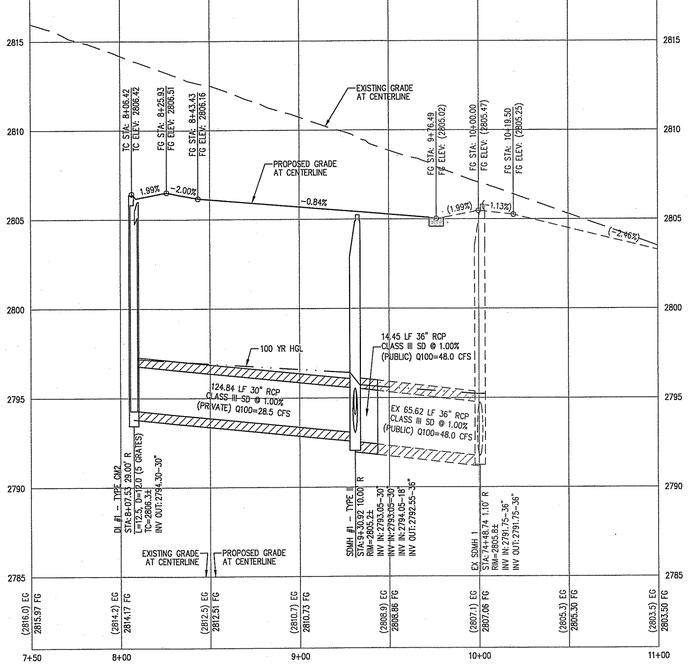
FLOOD CERTIFICATION

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

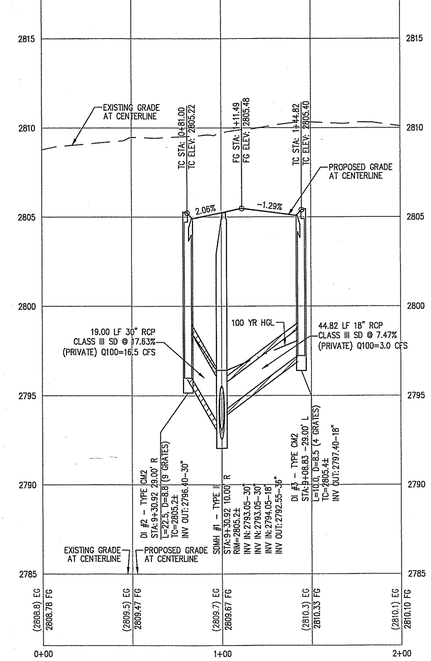
STEPHEN M. JONES, P.E. 019638 DATE

DISCLAIMER NOTE

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

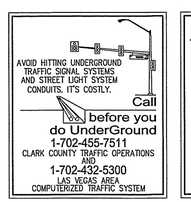


PROFILE
HORZ.:1"=40'
VERT.:1"=4'



PROFILE
HORZ.:1"=40'
VERT.:1"=4'







SLATER HANFAN 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, NEVADA

NINETY-FIVE MANAGEMENT LLC

SKYE CANYON PARCEL 1.1

PLAN AND PROFILE - STORM DRAIN

T-12 S
S-7
R-60 E

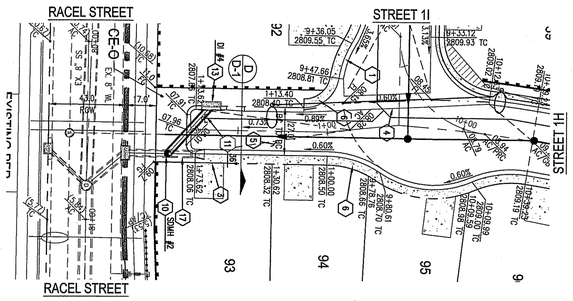
DATE: 6/24/14
DRAFTER: JTC
DESIGNER: MAK
CHECKED: CAL

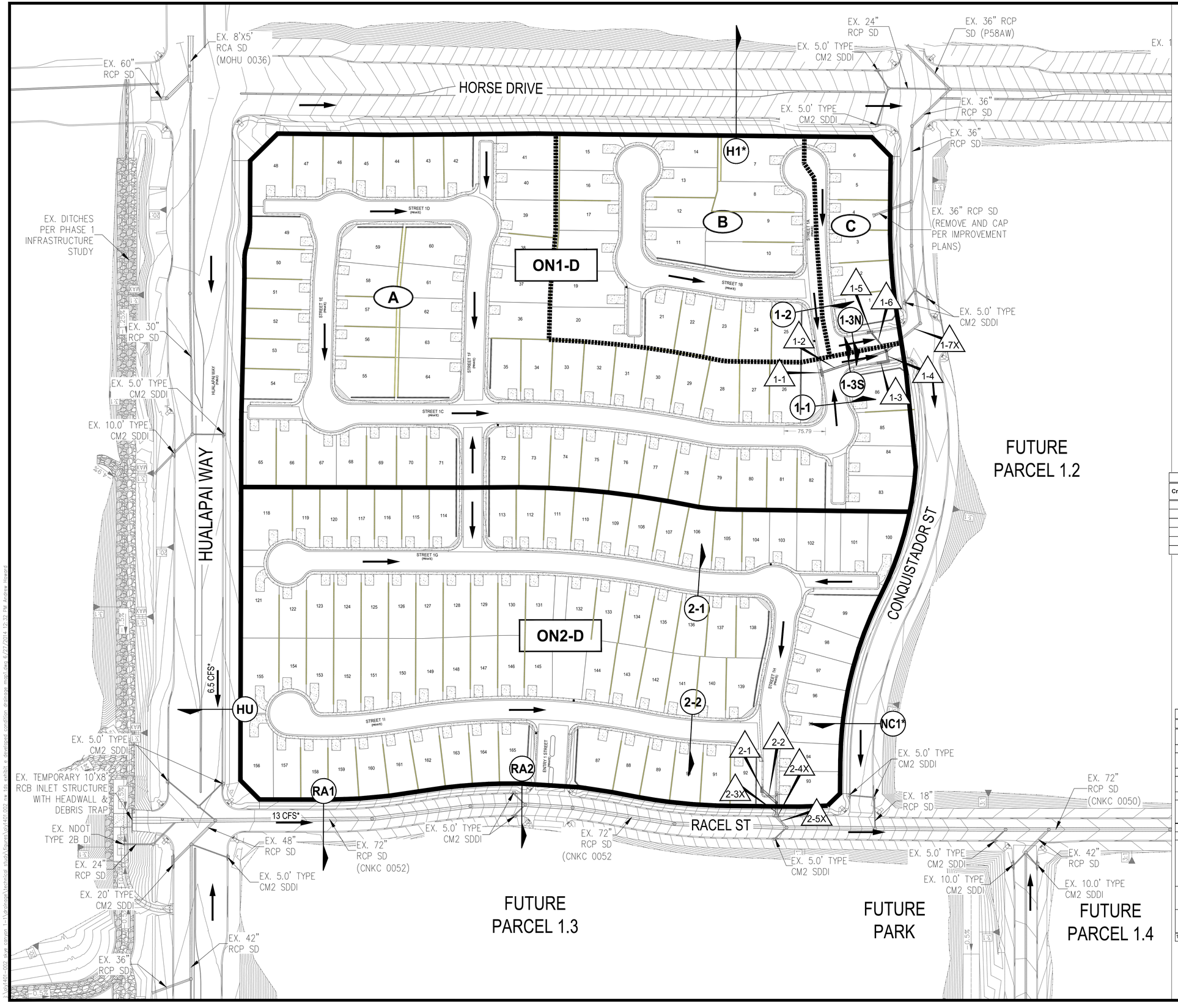
PROJECT NO.
OLY1401-002

PP-1
SHEET 9 OF 10

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k:\olv1401-002 skye canyon 1-1\dwg\mgrov\olv1401-002 p1-1 pp1.dwg 6/30/2014 7:52 AM Matt Key


RACEL STREET
STREET 1I
STREET 1H
EXISTING DIP
RACEL STREET
92
93
94
95
96
D-1
9+36.05
2809.55 TC
9+47.66
2808.81 TC
9+33.12
2809.93 TC
9+13.40
2809.40 TC
1.00%
0.60%
-1.00%
0.73%
0.60%
1400.00
1400.00
1400.00



LEGEND

- BASIN BOUNDARY
- PRO-RATED SUBBASIN BOUNDARY
- ID — BASIN ID
- (ID) — PRO-RATED SUBBASIN ID
- FLOW DIRECTION
- (000) — FLOWMASTER SECTION
- (PT1) — FACILITY ID

Basin Flow Rate Summary
(Developed Condition)

Basin ID	Area (ac)	Q_{100} (cfs)	Q_{10} (cfs)
ON1-D	18.2	48	21
ON2-D	14.4	39	17

Developed Condition Prorated Flow Summary

Basin ID	Q_{100} (cfs)	Q_{10} (cfs)	Area (acres)	Q_{100} Unit Flow (cfs/acre)	Q_{10} Unit Flow (cfs/acre)
ON1-D	48	21	18.2	2.6	1.2
Subbasin ID	**Q_{100} (cfs)**	**Q_{10} (cfs)**	**Area (acres)**	**Q_{100} Unit Flow (cfs/acre)**	**Q_{10} Unit Flow (cfs/acre)**
A	33	14	12.5	2.6	1.2
B	12	5	4.4	2.6	1.2
C	3	1	1.2	2.6	1.2
TOTAL	***48***	***21***	***18.2***		

100-Year Street Flow Summary

Cross Section	Contributing Source	Slope (%)	Q_{100} (cfs)	Depth (ft)	Velocity (fps)	DxV
1-1	ON1-D(A)	2.82	33	0.45	4.8	2.1
1-2	ON1-D(B+C)	2.82	15	0.35	4.6	1.6
1-3N	ON1-D(C)	0.56	3	0.37	2.1	0.8
1-3S	1/2(ON1-D(A))	0.56	16.5	0.61	2.6	1.6
2-1	1/2(ON2-D)	3.22	19.5	0.37	5.1	1.9
2-2	1/2(ON2-D)	2.79	19.5	0.37	4.8	1.8

100-Yr Perimeter Street Flow Summary
Developed Condition

Cross Section	Slope (%)	Q_{100} (cfs)	Depth (ft)	Velocity (fps)	DxV
H1*	3.56	15.0	0.37	5.2	1.9
NC1*	0.61	6.0	0.36	2.1	0.8
RA1	1.00	13*	0.43	3.0	1.3
RA2	4.90	10*	0.32	5.2	1.6
HU	0.50	6.5*	0.47	2.25	1.1

* Referenced from Skye Canyon Phase 1 Infrastructure Study

Developed Condition 100-Yr Flood Control Facility Summary

Facility ID[1]	Facility Description	Q_{100} (cfs)	Notes
1-1	12.5-ft Type CM2 SDDI	28.5	Sump inlet collecting: 1/2(ON1-D(A)) + ON1-D(B)
1-2	30-inch RCP	28.5	Conveying flow from Facility 1-1
1-3	22.5-ftType CM2 SDDI	16.5	Storm drain at-grade collecting: 1/2(ON1-D(A)) with 0cfs bypass
1-4	30-inch RCP	16.5	Conveying flow from Facility 1-3
1-5	10-ft Type CM2 SDDI	3	Storm drain at-grade collecting: ON1-D(C) with 0cfs bypass
1-6	18-inch RCP	3	Conveying flow from Facility 1-5
1-7X	36-inch RCP	48	Existing Conquistador storm drain lateral. Phase 1 Infrastructure Study 100-yr design flow = 47cfs
2-1	17.5-ft Type CM2 SDDI	39	Sump inlet collecting: ON2-D
2-2	36-inch RCP	39	Conveying flow from Facility 2-1
2-3X	36-inch RCP	39	Existing Racel storm drain lateral. Phase 1 Infrastructure Study 100-yr design flow = 39 cfs. Remove existing end section and portion of RCP beyond proposed manhole connection.
2-4X	7.5-ft Type CM2 SDDI	5	Existing Racel SDDI. Flow referenced from Phase 1 Infrastructure Study
2-5X	36-inch RCP	44	Existing Racel storm drain lateral. Phase 1 Infrastructure Study 100-yr design flow = 44 cfs.

1 - 'X' denotes an existing facility per Phase 1 Infrastructure improvements.

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NO.	DESCRIPTION	DATE	BY	APP. DATE	APP.

NINETY-FIVE MANAGEMENT, LLC.

SKYE CANYON - PARCEL 1.1

DEVELOPED CONDITION DRAINAGE MAP

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

EXHIBIT E
SHEET 1 OF 1

J:\OLY1401.002 - Skye Canyon 1.1\Admin\Technical Work\Grading\OLY1401.002 - Skye Canyon 1.1 - Developed Condition Drainage Map.dwg, 6/27/2014 12:39 PM, Andrew Hazard