

TECHNICAL DRAINAGE STUDY UPDATE No.3

**Skye Canyon
(Phase 2 Infrastructure)**

City of Las Vegas, Nevada

Job No.: OLY1501.001

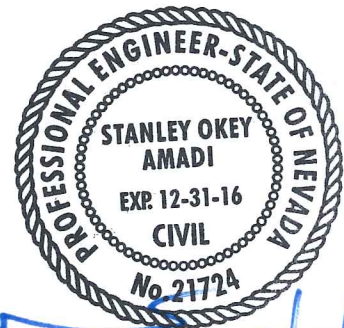
Date: December 2016

Prepared By:

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Prepared For:

Ninety-Five Management, LLC
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Stanley Okey Amadi, P.E.
NV Professional Engineer No. 21724

Assisted by: Erick Mata, E.I

HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL
DRAINAGE STUDY INFORMATION FORM

Name of Development: Skye Canyon – Phase 2 Infrastructure Update No.3 Date: December 2016
Location of Development: a) Descriptive (Cross Streets): North/South: Hualapai Way
East/West: Grand Teton Drive
b) Section: 12 Township: 19 South Range: 59 East
c) APN: Portion of 126-12-000-001

Name of Owner/Developer: Section 12, LLC / Ninety-Five Management, LLC
Telephone No.: 702-220-6565 Fax No.: 702-220-6566 E-mail Address: mbolduc@olympiacompanies.com
Address: 11411 Southern Highlands Parkway, Suite 300; Las Vegas, NV 89141

Contact Person – Name: Stanley Okey Amadi, P.E. Telephone No.: 702-284-5300
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Firm: Slater Hanifan Group
Address: 5740 S. Arville Street, Suite 216; Las Vegas, NV 89118

Type of Land Development/Land Disturbance Process:

☐ Rezoning	☐ Subdivision Map	☐ Clearing and grading Only
☐ Parcel Map	☐ Planned Unit Development	☒ Other (Please specify below)
☐ Large Parcel Map	☐ Building Permit	☐ Roadway & Storm Drain Infrastructure

1. Total Owned Land Area: At Site: 665 Acres Being Developed/Disturbed: 202 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.): Roadway & Storm Drain Infrastructure
5. Approximate upstream land area which drains to the subject site: 48 acre +/-
6. Has the site drainage been evaluated in the past? ☒ Yes** ☐ No If yes, please identify documentation: Master Drainage Study for Skye Canyon (SHG, DS4420); Master Drainage Study for Kyle Canyon (GCW, DS4091)
Technical Drainage Study for Skye Canyon Phase 2 Infrastructure (SHG, DS4739)
7. If known, please briefly identify the proposed discharge point(s) of runoff from the site: Racel Street thru CCRFCD CNKC 0050,
And Minor flows to the CCRFCD Moccasin-Hualapai Branch alignment, Hualapai Way (MOHU 0118)
8. Briefly describe your proposed schedule for the subject project: ASAP Upon Substantial Completion of Detention Basin 1 Facilities
Phase 2 – Roadway Infrastructure per this TDS; Future Phase 2 Residential Subdivisions to follow by separate TDS.



Engineer's Seal

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

***Newly Required Field**

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

Local Entity File No.	Revision	Date

REFERENCE: SHG Job No. OLY1501.001

STANDARD FORM 1

Updated 05/01/2008

OLY1501.001

December 14, 2016

Albert Sung, P.E.
Flood Control Project Engineer
City of Las Vegas Department of Public Works
333 N. Rancho Drive
Las Vegas, Nevada 89106

Subject: Technical Drainage Study Update No.3 for Skye Canyon Ph.2 Infrastructure

Dear Mr. Sung:

Submitted for your review is this *Technical Drainage Study Update No.3 for Skye Canyon Phase 2 Infrastructure* (hereinafter referred to as the Phase 2 Update No.3 Study). The site had been previously analyzed and designed as addressed in the Technical Drainage Study for Skye Canyon Phase 2 Infrastructure (CLV DS4739), prepared by Slater Hanifan Group (SHG). The Phase 2 Infrastructure Study was approved on January 11, 2016 and addressed the development of roadway and infrastructure improvements intended to support the development of approximately 202 acre portion of the Skye Canyon master planned community, identified hereinafter as the *Phase 2 Study*. Two previous updates (CLV DS4739D & DS4739E; hereinafter referred to as the Phase 2 Update No.1 and the Phase 2 Update No.2 respectively) had been approved for the site addressing additional bike lane widths and a land plan change per the Master Study respectively. The relevant approval letter(s) have been included in pertinent reference appendices of this submittal.

Overview & Purpose

Some of the parcels within the Phase 2 area of Skye Canyon Master Plan development are currently in planning with technical drainage studies currently under review by the City of Las Vegas. However, with the proposed site plans for the individual parcels, some of the storm drain stubs originally proposed for the drainage of the parcels do not align correctly with the interior streets conveying the flows to the stubs. The purpose of this update study is to address all the proposed stub and/or inlet relocations as well as any minor changes anticipated as a result of the development of the parcels. This update will specifically address the following:

- Revision to the profile of the proposed 24" RCP storm drain lateral stub (identified in the Phase 2 Study as Facility L7) located on Eagle Canyon Avenue near approximate station 59+00.00. The profile of the storm drain lateral stub is being flattened to accommodate the depth and headwater of the drop inlet proposed to capture the developed flows from Parcel 2.15.
- Relocation and realignment of the drop inlet and storm drain stub (identified in the Phase 2 Study as Facilities P9 & L12) located on Egan Crest Drive north of Eagle Canyon Avenue at approximate station 31+30.00. The facilities are being relocated to correctly align with Skye Arroyo Avenue (the interior street of Parcel 2.16) conveying the flows generated from the development of the parcel to the storm drain stub.

- Minor lateral shift of the drop inlet (identified in the Phase 2 Study as Facility P3B) located on Eagle Canyon Avenue just south of Egan Crest Drive at approximate station 49+00.00. The drop inlet will be laterally shifted approximately 5-ft to the east to accommodate the proposed sewer line to service Parcel 2.16.
- Reanalysis of the Eagle Canyon Avenue corridor to incorporate the ultimate developed condition flows from Parcels 2.23B and 2.23C (future park) in conformance to the MDS Update No.3 Study. This reanalysis will update all ultimate condition street flow computations, drop inlet capacity calculations and WSPGW analysis of the mainline storm along Eagle Canyon Avenue to address any impacts due to the flows from Parcels 2.23B and 2.23C now being conveyed along Eagle Canyon Drive. Note that the reanalysis only impacts the ultimate developed condition, hence the peak flows from Parcels 2.23B and 2.23C (Basins WML9 and WPRK5) have not changed from previous approved study, refer to Appendix F for applicable reference material. The street and storm drain hydraulics along Eagle Canyon Avenue have been re-assessed to show that criteria is met and that the approved facilities are still adequate.

The following provides discussions of the updated hydraulic calculations pertinent to the above listed revisions.

Street Flows and Hydraulic Sections

Eagle Canyon Avenue

The interim condition hydraulics in the street and storm drain remain the same as previously approved. The only change occurring in the ultimate condition is now Basins WML9 and WPRK5 contribute to the street and its drop inlets, rather than Facility L5. Therefore, street and drop inlet hydraulics in Eagle Canyon Avenue have changed. The revised street and drop inlet calculations have been provided in Appendix D and E, respectively. The following table provides a summary of the updated street capacity calculations.

100-Year Street Flow Summary Ultimate Condition					
Cross Section	Slope (%)	Q ₁₀₀ (cfs)	Depth (ft)	Velocity (fps)	DxV
ECA1	4.90	33	0.46	6.1	2.8
ECA2	4.90	99	0.62	8.5	5.2
ECA2b	2.00	47	0.58	4.7	2.7
ECA3a	4.94	17	0.38	5.3	2.0
ECA3b	4.94	23	0.42	5.6	2.4
ECA3c	4.94	30	0.45	6.0	2.7
ECA4	0.50	23	0.57	2.4	1.4

Review of the street flow summary table indicates that even with the addition of surface flows from basins WML9 and WPRK5, the street criteria is still satisfied along Eagle Canyon Avenue. The summary table also shows that the 100-year flows satisfied the 10-year criteria; thus, the 10-year street calculations are not necessary and have not been provided. Through use of

Flowmaster, Section ECA2 yields a velocity higher than 5 ft/s and depth above curb; however, HEC-RAS sections show the overbank velocity above the curb that would occur on the potential landscaping is non-erosive (2.13 ft/s) and does not require mitigation. The output file from the HEC-RAS model has been provided in Appendix C for reference. The HEC-RAS stations analyzed correspond to the street stationing along Eagle Canyon Avenue and the cross-sections have been indicated on the revised Ultimate Condition Drainage Map (Exhibit E) provided in Appendix A for spatial reference.

Storm Drain Models

Eagle Canyon Avenue Trunk line

The updated ultimate condition storm drain alignments and models remain as previously approved but incorporates the revised flows that will be captured by the inlets along the street. The storm drain alignment in Eagle Canyon Avenue consists of two systems named as models U-ECA and U-ECAW. The main trunk line for the eagle canyon alignment is model U-ECA. Model U-ECAW continues west from Facility P3B to the first set of inlets at the upstream end of Eagle Canyon Avenue where it ends. Model U-ECA starts at Facility L5 now intercepting only the flows from basin WML10 (38 cfs) at a stub behind the second set of inlets. The facility continues as 48" RCP and connects to the same stubs as previously approved. The revised HGLs due to the flow changes are now slightly lower than the previously approved models in both the interim and ultimate conditions. The lower HGLs mainly result from the redistribution of the flows from basin WML9 (now intercepted by inlets in the street) which reduced the junction losses.

Note that the previously proposed nuisance inlets (Facility P5B) have been analyzed in this update to capture some of the flows (≈ 5 cfs each) from Eagle Canyon Avenue. Although, the revised HGLs in the trunk line are lower than the previously approved, the lateral models have been updated accordingly for a more complete analysis. The revised WSPG models and the revised drop inlet computations are provided in Appendix D and Appendix E respectively. The storm drain plan and profile sheets have been updated to reflect the revised ultimate condition flow rates and HGLs and are provided in Appendix H.

Basin WL6B Stub - Facility L7

The profile of the proposed 24" RCP storm drain lateral stub (Facility L7) for basin WL6B has been revised from 8.21% to 0.92%. The profile of the stub is being flattened to accommodate the depth and headwater of the interior drop inlet proposed to capture the developed flows from Parcel 2.15 subdivision currently under design. The ultimate developed condition hydraulic analysis for the storm drain stub is being addressed in the Technical Drainage Study for Skye Canyon Parcel 2.15 (DS4840A) currently under review. Note that since the stub is flattened and the invert at the entrance is significantly lowered, the interim capacity of the stub will be increased.

Egan Crest Drive - Facilities P9 and L12

The location of the drop inlet and storm drain stub (Facilities P9 & L12) located on Egan Crest Drive north of Eagle Canyon Avenue are being revised to correctly align with Skye Arroyo Avenue (the interior street of Parcel 2.16) conveying the flows generated from the development

of the parcel to the storm drain stub. The WSPGW hydraulic analysis of the revised storm drain alignment and profile has been provided with this submittal. Note that the size of the relocated drop inlet has been increased from a 7.5-ft to a 10.0-ft Type CM2 to accommodate the skew of the lateral stub. The inlet computation has not been revised since the new inlet is slightly bigger than that previously proposed which also intercepted all the available surface flow in the street. The pertinent revised infrastructure plan and profile sheets have also been provided with this submittal.

Eagle Canyon Avenue - Facility P3B

The 20-ft long Type CM2 drop inlet (Facility P3B) located along Eagle Canyon Avenue just south of Egan Crest Drive at approximate station 49+00.00 will be slightly revised. The drop inlet will be laterally shifted approximately 5-ft to the east to accommodate the proposed sewer line to service the Parcel 2.16 subdivision. Note the storm drain lateral for the drop inlet will remain unchanged. Therefore, no revision to the inlet and lateral hydraulics will be necessary.

Conclusions

- This subject Phase 2 Update No.3 Study has been prepared in conformance to the approved Phase 2 Infrastructure Study and the current Master Drainage Study for Skye Canyon.
- This update proposes no changes to ultimate condition hydrology basin and flow rates from previously approved.
- The revised analyses show that the previously approved facilities sizes and streets still have adequate capacity to convey the design flows and still meet all CCRFCD design criteria. The facilities alignments, sizes and profiles will remain the same as previously approved but the flow rates and HGLs have been updated to reflect the revised computations.
- The realigned facilities in Egan Crest Drive have been analyzed for both the interim and ultimate condition flows and are also determined to satisfy the CCRFCD design criteria.

The revised improvement plans have been provided in Appendix H. If you have any questions or require additional information, please do not hesitate to contact us at 702-284-5300.

Respectfully Submitted,

SLATER HANIFAN GROUP



Erick Mata, EI
Project Manager - Flood Control Division

cc: Mark Failla, P.E., CFM - SHG
Steve Jones, P.E. - SHG
Jerry Slater, P.E. - SHG
Jerrod Ratcliffe - SHG

APPENDIX

- **Appendix A** – Drainage Exhibits
 - Exhibit E2 – Ultimate Condition Drainage Map
 - Exhibit F – Storm Drain Schematic Map
- **Appendix B** – Street Hydraulic Sections (Ultimate Condition)
- **Appendix C** – HEC-RAS Model for Eagle Canyon Avenue (Ultimate Condition)
- **Appendix D** – WSPG Models (Ultimate Condition)
 - Eagle Canyon Avenue & Laterals (U-ECA & U-ECAW)
 - Egan Crest Drive & Laterals (U-ECRS & U-ECRN)
- **Appendix E** – Drop Inlet Computations
- **Appendix F** – Reference Material
 - Technical Drainage Study for Skye Canyon Phase 2 Infrastructure,*
by Slater Hanifan Group
 - Approval Letter
 - Previously Approved Drainage Exhibit
 - Prior Approved Plans
- **Appendix G** – Electronic Copy of Study (CD)
- **Appendix H** – Revised Storm Drain Plans & Profiles

APPENDIX A

Drainage Exhibits

Exhibit E2 – Ultimate Condition Drainage Map

Exhibit F – Storm Drain Schematic Map

APPENDIX B

Street Hydraulic Sections (Ultimate Condition)

Section - ECA1 (Ultimate Condition)

Worksheet for Irregular Channel

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

Input Data	
Channel Slope	4.90 %
Discharge	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	0.016
Water Surface Elevation	0.46 ft
Elevation Range	0.00 to 0.56
Flow Area	5.4 ft ²
Wetted Perimeter	32.98 ft
Top Width	31.96 ft
Actual Depth	0.46 ft
Critical Elevation	0.61 ft
Critical Slope	0.60 %
Velocity	6.14 ft/s
Velocity Head	0.59 ft
Specific Energy	1.04 ft
Froude Number	2.64
Flow Type	Supercritical

Calculation Messages:
Flow is divided.

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

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

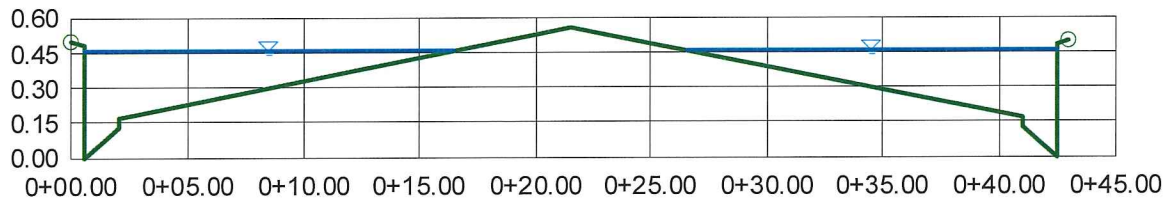
Section - ECA1 (Ultimate Condition) Worksheet for Irregular Channel

Notes: Q=33 cfs being WL4B + Half of WEGL1

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

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

Section Data	
Mannings Coefficient	0.016
Channel Slope	4.90 %
Water Surface Elevation	0.46 ft
Elevation Range	0.00 to 0.56
Discharge	33.00 cfs



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H:1
NTS

Section - ECA2 (Ultimate Condition)

Worksheet for Irregular Channel

Project Description	
Worksheet	Section - ECA2 (Ultimate Condition)
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data	
Channel Slope	4.90 %
Discharge	99.00 cfs

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

Results	
Mannings Coefficient	0.016
Water Surface Elevation	0.62 ft
Elevation Range	0.00 to 0.56
Flow Area	11.7 ft ²
Wetted Perimeter	44.30 ft
Top Width	43.00 ft
Actual Depth	0.62 ft
Critical Elevation	0.90 ft
Critical Slope	0.48 %
Velocity	8.46 ft/s
Velocity Head	1.11 ft
Specific Energy	1.73 ft
Froude Number	2.86
Flow Type	Supercritical

Calculation Messages:
 Water elevation exceeds lowest end station by 0.11904769 ft.

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

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

Section - ECA2 (Ultimate Condition) Worksheet for Irregular Channel

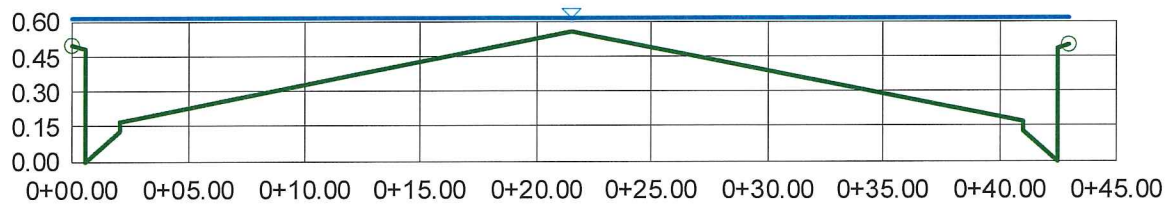
Notes: Q=99 cfs being WL4B + WEGL1 + WPRK5 + WML9

Section - ECA2 (Ultimate Condition)

Cross Section for Irregular Channel

Project Description	
Worksheet	Section - ECA2 (Ultimate Condition)
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

Section Data	
Mannings Coefficient	0.016
Channel Slope	4.90 %
Water Surface Elevation	0.62 ft
Elevation Range	0.00 to 0.56
Discharge	99.00 cfs



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H:1
NTS

Section - ECA2b (Ultimate Condition)

Worksheet for Irregular Channel

Project Description	
Worksheet	Section - ECA2b (Ultimate Condition)
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data	
Channel Slope	2.00 %
Discharge	47.00 cfs

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

Results	
Mannings Coefficient	0.016
Water Surface Elevation	0.58 ft
Elevation Range	0.00 to 1.18
Flow Area	9.9 ft ²
Wetted Perimeter	45.99 ft
Top Width	44.77 ft
Actual Depth	0.58 ft
Critical Elevation	0.69 ft
Critical Slope	0.58 %
Velocity	4.73 ft/s
Velocity Head	0.35 ft
Specific Energy	0.93 ft
Froude Number	1.77
Flow Type	Supercritical

Calculation Messages:

Flow is divided.

Water elevation exceeds lowest end station by 0.77716433e-1 ft.

Roughness Segments		
Start Station	End Station	Mannings Coefficient
0+00.00	0+65.00	0.016

Natural Channel Points	
Station (ft)	Elevation (ft)
0+00.00	0.50
0+00.50	0.48
0+00.50	0.00
0+02.00	0.13
0+02.00	0.17
0+26.00	0.65
0+26.01	0.73
0+26.25	1.04
0+26.42	1.06
0+32.50	1.18

Section - ECA2b (Ultimate Condition)

Worksheet for Irregular Channel

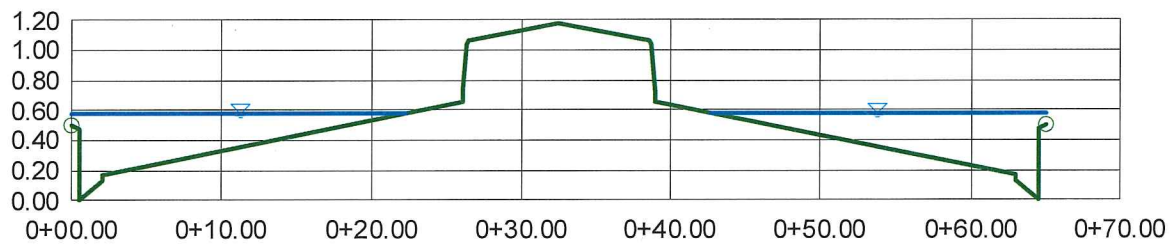
Natural Channel Points	
Station (ft)	Elevation (ft)
0+38.58	1.06
0+38.74	1.04
0+38.99	0.73
0+39.00	0.65
0+63.00	0.17
0+63.00	0.13
0+64.50	0.00
0+64.50	0.48
0+65.00	0.50

Notes: Q = ECA2 Bypass

Section - ECA2b (Ultimate Condition) Cross Section for Irregular Channel

Project Description	
Worksheet	Section - ECA2b (Ultimate Condition)
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

Section Data	
Mannings Coefficient	0.016
Channel Slope	2.00 %
Water Surface Elevation	0.58 ft
Elevation Range	0.00 to 1.18
Discharge	47.00 cfs



V:10.0
H:1
NTS

Section - ECA3a (Ultimate Condition)

Worksheet for Irregular Channel

Project Description	
Worksheet	Section - ECA3a (Ultimate Condition)
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data	
Channel Slope	4.94 %
Discharge	17.00 cfs

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

Results	
Mannings Coefficient	0.016
Water Surface Elevation	0.38 ft
Elevation Range	0.00 to 0.56
Flow Area	3.2 ft ²
Wetted Perimeter	25.22 ft
Top Width	24.36 ft
Actual Depth	0.38 ft
Critical Elevation	0.51 ft
Critical Slope	0.68 %
Velocity	5.25 ft/s
Velocity Head	0.43 ft
Specific Energy	0.81 ft
Froude Number	2.54
Flow Type	Supercritical

Calculation Messages:
Flow is divided.

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

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

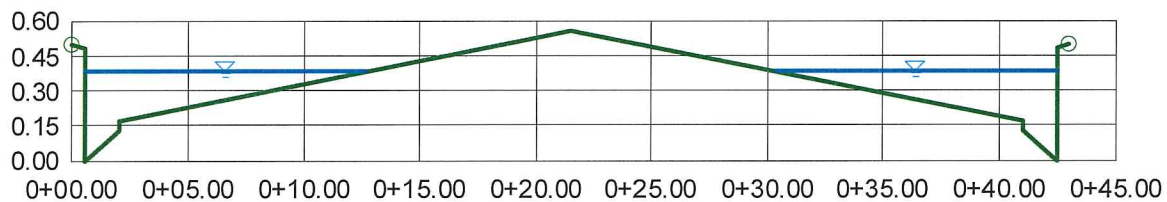
Section - ECA3a (Ultimate Condition) Worksheet for Irregular Channel

Notes: $Q = \text{WEGL2/4 (3 CFS)} + \text{EGAN1b BYPASS (3 CFS)} + \text{ECA2B BYPASS (11 CFS)} = 17 \text{ CFS}$

Section - ECA3a (Ultimate Condition) Cross Section for Irregular Channel

Project Description	
Worksheet	Section - ECA3a (Ultimate Condition)
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

Section Data	
Mannings Coefficient	0.016
Channel Slope	4.94 %
Water Surface Elevation	0.38 ft
Elevation Range	0.00 to 0.56
Discharge	17.00 cfs



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NTS

Section - ECA3b (Ultimate Condition)

Worksheet for Irregular Channel

Project Description	
Worksheet	Section - ECA3b (Ultimate Condition)
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data	
Channel Slope	4.94 %
Discharge	23.00 cfs

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

Results	
Mannings Coefficient	0.016
Water Surface Elevation	0.42 ft
Elevation Range	0.00 to 0.56
Flow Area	4.1 ft ²
Wetted Perimeter	28.52 ft
Top Width	27.59 ft
Actual Depth	0.42 ft
Critical Elevation	0.55 ft
Critical Slope	0.65 %
Velocity	5.64 ft/s
Velocity Head	0.49 ft
Specific Energy	0.91 ft
Froude Number	2.59
Flow Type	Supercritical

Calculation Messages:
Flow is divided.

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

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

Section - ECA3b (Ultimate Condition)

Worksheet for Irregular Channel

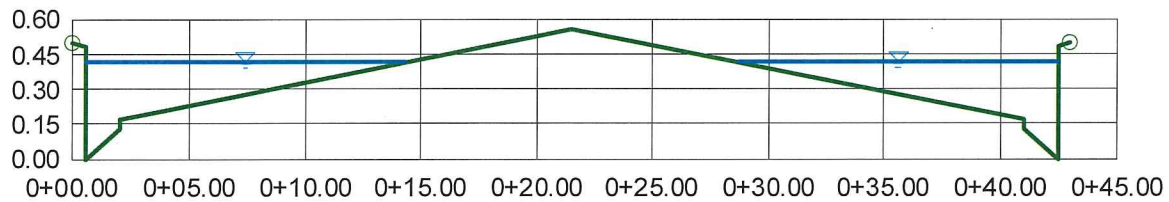
Notes: $Q = \text{WML13 (9 CFS)} + \text{EC3a BYPASS (11 CFS)} + \text{WEGL2/4 (3 CFS)} = 23 \text{ CFS}$

Section - ECA3b (Ultimate Condition)

Cross Section for Irregular Channel

Project Description	
Worksheet	Section - ECA3b (Ultimate Condition)
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

Section Data	
Mannings Coefficient	0.016
Channel Slope	4.94 %
Water Surface Elevation	0.42 ft
Elevation Range	0.00 to 0.56
Discharge	23.00 cfs



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H:1
NTS

Section - ECA3c (Ultimate Condition)

Worksheet for Irregular Channel

Project Description	
Worksheet	Section - ECA3c (Ultimate Condition)
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data	
Channel Slope	4.94 %
Discharge	30.00 cfs

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

Results	
Mannings Coefficient	0.016
Water Surface Elevation	0.45 ft
Elevation Range	0.00 to 0.56
Flow Area	5.0 ft ²
Wetted Perimeter	31.71 ft
Top Width	30.72 ft
Actual Depth	0.45 ft
Critical Elevation	0.59 ft
Critical Slope	0.62 %
Velocity	6.01 ft/s
Velocity Head	0.56 ft
Specific Energy	1.01 ft
Froude Number	2.63
Flow Type	Supercritical

Calculation Messages:
Flow is divided.

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

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

Section - ECA3c (Ultimate Condition) Worksheet for Irregular Channel

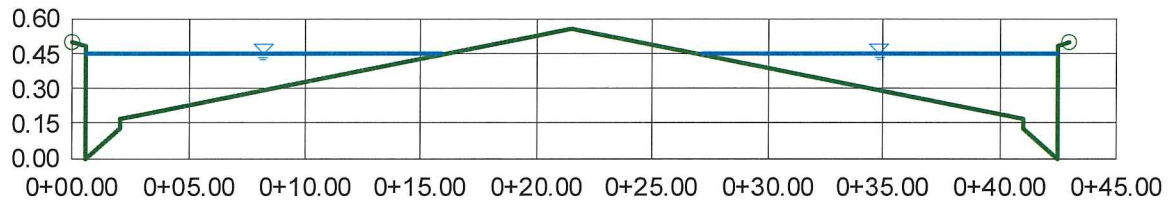
Notes: $Q = \text{WL6B (14 CFS)} + \text{EC3b BYPASS (13 CFS)} + \text{WEGL2/4 (3 CFS)} = 30 \text{ CFS}$

Section - ECA3c (Ultimate Condition)

Cross Section for Irregular Channel

Project Description	
Worksheet	Section - ECA3c (Ultimate Condition)
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

Section Data	
Mannings Coefficient	0.016
Channel Slope	4.94 %
Water Surface Elevation	0.45 ft
Elevation Range	0.00 to 0.56
Discharge	30.00 cfs



V:10.0
H:1
NTS

Section - ECA4 (Ultimate Condition)

Worksheet for Irregular Channel

Project Description	
Worksheet	Section - ECA4 (Ultimate Condition)
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data	
Channel Slope	0.50 %
Discharge	23.00 cfs

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

Results	
Mannings Coefficient	0.016
Water Surface Elevation	0.57 ft
Elevation Range	0.00 to 0.56
Flow Area	9.7 ft ²
Wetted Perimeter	44.20 ft
Top Width	43.00 ft
Actual Depth	0.57 ft
Critical Elevation	0.55 ft
Critical Slope	0.65 %
Velocity	2.38 ft/s
Velocity Head	0.09 ft
Specific Energy	0.66 ft
Froude Number	0.89
Flow Type	Subcritical

Calculation Messages:

Water elevation exceeds lowest end station by 0.71535487e-1 ft.

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

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

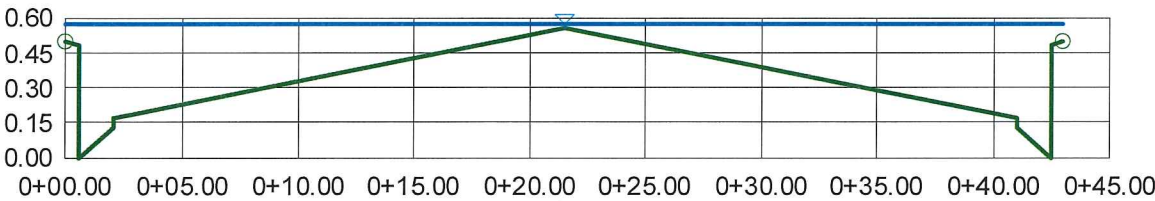
Section - ECA4 (Ultimate Condition) Worksheet for Irregular Channel

Notes: $Q = \text{WEGL2/4 (3 CFS)} + \text{ECA3c BYPASS (20 CFS)} = 23 \text{ CFS}$

Section - ECA4 (Ultimate Condition) Cross Section for Irregular Channel

Project Description	
Worksheet	Section - ECA4 (Ultimate Condition)
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

Section Data	
Mannings Coefficient	0.016
Channel Slope	0.50 %
Water Surface Elevation	0.57 ft
Elevation Range	0.00 to 0.56
Discharge	23.00 cfs



V:10.0
 H:1
 NTS

APPENDIX C

HEC-RAS Model for Eagle Canyon Avenue (Ultimate Condition)

HEC-RAS HEC-RAS 5.0.0 February 2016
 U.S. Army Corps of Engineers
 Hydrologic Engineering Center
 609 Second Street
 Davis, California

```

X   X   XXXXXX   XXXX   XXXX   XX   XXXX
X   X   X   X   X   X   X   X   X   X
X   X   X   X   X   X   X   X   X   X
XXXXXXXX XXXX   XXX XXXX XXXXXXX XXXX
X   X   X   X   X   X   X   X   X   X
X   X   X   X   X   X   X   X   X   X
X   X   XXXXXX   XXXX   X   X   X   XXXXX

```

PROJECT DATA

Project Title: Skye Canyon Phase 2 Infrastructure
 Project File : ECA.prj
 Run Date and Time: 12/8/2016 3:40:23 PM

Project in English units

Project Description:
 Slater Hanifan Group (SHG)
 December 2016 - Project Number: OLY1501.001

Skye
 Canyon Phase 2 Infrastructure Update No.3
 Eagle Canyon Avenue - Model To
 Demonstrate Non-Erosive Overbank Velocities On Adjacent Landscape
 Q100 = 99 cfs

PLAN DATA

Plan Title: Eagle Canyon Avenue - Ultimate Condition
 Plan File : j:\OLY1501-001 Skye Canyon Phase 2 Infrastructure\Drainage\Update Study No.3\HECRAS\ECA.p01
 Geometry Title: Eagle Canyon Avenue - Ultimate Condition
 Geometry File : j:\OLY1501-001 Skye Canyon Phase 2 Infrastructure\Drainage\Update Study No.3\HECRAS\ECA.g01
 Flow Title : Eagle Canyon Avenue - Ultimate Condition
 Flow File : j:\OLY1501-001 Skye Canyon Phase 2 Infrastructure\Drainage\Update Study No.3\HECRAS\ECA.f01

Plan Summary Information:

Number of: Cross Sections = 11 Multiple openings = 0
 Culverts = 0 Inline Structures = 0
 Bridges = 0 Lateral Structures = 0

Computational Information

Water surface calculation tolerance = 0.01
 Critical depth calculation tolerance = 0.01
 Maximum number of iterations = 20
 Maximum difference tolerance = 0.3
 Flow tolerance factor = 0.001

Computation Options

Critical depth computed only where necessary
 Conveyance Calculation Method: At breaks in n values only
 Friction Slope Method: Average Conveyance
 Computational Flow Regime: Mixed Flow

FLOW DATA

Flow Title: Eagle Canyon Avenue - Ultimate Condition
 Flow File : j:\OLY1501-001 Skye Canyon Phase 2 Infrastructure\Drainage\Update Study No.3\HECRAS\ECA.f01

Flow Data (cfs)

River	Reach	RS	PF 1
Eagle Canyon Ave	Sta 3800-4800	-3800	99

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
Eagle Canyon Ave	Sta 3800-4800	PF 1	Normal S = 0.049	Normal S = 0.049

GEOMETRY DATA

Geometry Title: Eagle Canyon Avenue - Ultimate Condition
 Geometry File : j:\OLY1501-001 Skye Canyon Phase 2 Infrastructure\Drainage\Update Study No.3\HECRAS\ECA.g01

CROSS SECTION

RIVER: Eagle Canyon Ave
 REACH: Sta 3800-4800 RS: -3800

INPUT

Description:

Station Elevation Data		num=	15	Sta		Elev	Sta	Elev	Sta	Elev
-10	2974.82	-5	2974.72	0	2974.62	.5	2974.6	.5	2974.12	
2	2974.25	2	2974.29	21.5	2974.68	41	2974.29	41	2974.25	
42.5	2974.12	42.5	2974.6	43	2974.62	48	2974.72	53	2974.82	

Manning's n Values		num=	5	Sta		n Val	Sta	n Val	Sta	n Val
-10	.013	-5	.025	0	.016	43	.025	48	.013	

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
0	43	100	100	100	.1	.3	

CROSS SECTION OUTPUT Profile #PF 1

	E.G. Elev (ft)	Left OB	Channel	Right OB
Vel Head (ft)	2975.83	0.025	0.016	0.025
W.S. Elev (ft)	2974.74	100.00	100.00	100.00
Crit W.S. (ft)	2974.99	0.34	11.57	0.34
E.G. Slope (ft/ft)	0.049004	0.34	11.57	0.34
Q Total (cfs)	99.00	0.72	97.57	0.72
Top Width (ft)	34.61	5.80	43.00	5.80
Vel Total (ft/s)	8.08	2.13	8.43	2.13
Max Chl Dpth (ft)	0.62	0.06	0.27	0.06
Conv. Total (cfs)	447.2	3.2	440.7	3.2
Length Wtd. (ft)	100.00	5.81	44.06	5.81
Min Ch El (ft)	2974.12	0.18	0.80	0.18
Alpha	1.07	0.38	6.77	0.38
Frctn Loss (ft)	4.90	0.01	0.27	0.01
C & E Loss (ft)	0.00	0.13	0.99	0.13

Warning: The cross section had to be extended vertically during the critical depth calculations.
 Warning: The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.

CROSS SECTION

RIVER: Eagle Canyon Ave

REACH: Sta 3800-4800 RS: -3900

INPUT

Description:

Station Elevation Data		num=	15	Sta		Elev	Sta	Elev	Sta	Elev
-10	2969.92	-5	2969.82	0	2969.72	.5	2969.7	.5	2969.22	
2	2969.35	2	2969.39	21.5	2969.78	41	2969.39	41	2969.35	
42.5	2969.22	42.5	2969.7	43	2969.72	48	2969.82	53	2969.92	

Manning's n Values		num=	5	Sta		n Val	Sta	n Val	Sta	n Val
-10	.013	-5	.025	0	.016	43	.025	48	.013	

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
0	43	100	100	100	100	.1	.3	

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	2970.93	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.09	Wt. n-Val.	0.025	0.016	0.025
W.S. Elev (ft)	2969.84	Reach Len. (ft)	100.00	100.00	100.00
Crit W.S. (ft)	2970.09	Flow Area (sq ft)	0.34	11.58	0.34
E.G. Slope (ft/ft)	0.048925	Area (sq ft)	0.34	11.58	0.34
Q Total (cfs)	99.00	Flow (cfs)	0.72	97.56	0.72
Top Width (ft)	54.61	Top Width (ft)	5.81	43.00	5.81
Vel Total (ft/s)	8.08	Avg. Vel. (ft/s)	2.13	8.43	2.13
Max Chl Dpth (ft)	0.62	Hydr. Depth (ft)	0.06	0.27	0.06
Conv. Total (cfs)	447.6	Conv. (cfs)	3.2	441.1	3.2
Length Wtd. (ft)	100.00	Wetted Per. (ft)	5.81	44.06	5.81
Min Ch El (ft)	2969.22	Shear (lb/sq ft)	0.18	0.80	0.18
Alpha	1.07	Stream Power (lb/ft s)	0.38	6.76	0.38
Frctn Loss (ft)	4.90	Cum Volume (acre-ft)	0.01	0.24	0.01
C & E Loss (ft)	0.00	Cum SA (acres)	0.12	0.89	0.12

Warning: The cross section had to be extended vertically during the critical depth calculations.
 Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
 Warning: The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.

CROSS SECTION

RIVER: Eagle Canyon Ave
REACH: Sta 3800-4800 RS: -4000

INPUT

Description:

Station Elevation Data		num=	15	Sta		Elev	Sta	Elev	Sta	Elev
-10	2964.02	-5	2964.92	0	2964.82	.5	2964.8	.5	2964.32	
2	2964.45	2	2964.49	21.5	2964.88	41	2964.49	41	2964.45	
42.5	2964.32	42.5	2964.8	43	2964.82	48	2964.92	53	2965.02	

Manning's n Values		num=	5	Sta		n Val	Sta	n Val	Sta	n Val
-10	.013	-5	.025	0	.016	43	.025	48	.013	

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
0	43	100	100	100	100	.1	.3	

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	2966.03	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.09	Wt. n-Val.	0.025	0.016	0.025
W.S. Elev (ft)	2964.94	Reach Len. (ft)	100.00	100.00	100.00
Crit W.S. (ft)	2965.19	Flow Area (sq ft)	0.34	11.57	0.34
E.G. Slope (ft/ft)	0.049004	Area (sq ft)	0.34	11.57	0.34
Q Total (cfs)	99.00	Flow (cfs)	0.72	97.57	0.72
Top Width (ft)	54.61	Top Width (ft)	5.80	43.00	5.80
Vel Total (ft/s)	8.08	Avg. Vel. (ft/s)	2.13	8.43	2.13
Max Chl Dpth (ft)	0.62	Hydr. Depth (ft)	0.06	0.27	0.06
Conv. Total (cfs)	447.2	Conv. (cfs)	3.2	440.7	3.2
Length Wtd. (ft)	100.00	Wetted Per. (ft)	5.81	44.06	5.81
Min Ch El (ft)	2964.32	Shear (lb/sq ft)	0.18	0.80	0.18
Alpha	1.07	Stream Power (lb/ft s)	0.38	6.77	0.38
Frctn Loss (ft)	4.90	Cum Volume (acre-ft)	0.01	0.21	0.01
C & E Loss (ft)	0.00	Cum SA (acres)	0.11	0.79	0.11

Warning: The cross section had to be extended vertically during the critical depth calculations.
 Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
 Warning: The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.

CROSS SECTION

RIVER: Eagle Canyon Ave
REACH: Sta 3800-4800 RS: -4100

INPUT

Description:

Station Elevation Data		num=	15	Sta		Elev	Sta	Elev	Sta	Elev
-10	2960.12	-5	2960.02	0	2959.92	.5	2959.9	.5	2959.42	
2	2959.55	2	2959.59	21.5	2959.98	41	2959.59	41	2959.55	
42.5	2959.42	42.5	2959.9	43	2959.92	48	2960.02	53	2960.12	

Manning's n Values		num=	5	Sta		n Val	Sta	n Val	Sta	n Val
-10	.013	-5	.025	0	.016	43	.025	48	.013	

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff	Contr.	Expan.
0	43	100	100	100	100	.1	.3	

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	2961.13	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.09	Wt. n-Val.	0.025	0.016	0.025
W.S. Elev (ft)	2960.04	Reach Len. (ft)	100.00	100.00	100.00
Crit W.S. (ft)	2960.29	Flow Area (sq ft)	0.34	11.57	0.34
E.G. Slope (ft/ft)	0.048991	Area (sq ft)	0.34	11.57	0.34
Q Total (cfs)	99.00	Flow (cfs)	0.72	97.56	0.72
Top Width (ft)	54.61	Top Width (ft)	5.80	43.00	5.80
Vel Total (ft/s)	8.08	Avg. Vel. (ft/s)	2.13	8.43	2.13
Max Chl Dpth (ft)	0.62	Hydr. Depth (ft)	0.06	0.27	0.06
Conv. Total (cfs)	447.3	Conv. (cfs)	3.2	440.8	3.2
Length Wtd. (ft)	100.00	Wetted Per. (ft)	5.81	44.06	5.81
Min Ch El (ft)	2959.42	Shear (lb/sq ft)	0.18	0.80	0.18
Alpha	1.07	Stream Power (lb/ft s)	0.38	6.77	0.38
Frctn Loss (ft)	4.90	Cum Volume (acre-ft)	0.01	0.19	0.01
C & E Loss (ft)	0.00	Cum SA (acres)	0.09	0.69	0.09

Warning: The cross section had to be extended vertically during the critical depth calculations.
 Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
 Warning: The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.

CROSS SECTION

RIVER: Eagle Canyon Ave
REACH: Sta 3800-4800 RS: -4200

INPUT

Description:

Station Elevation Data		num=	15	Sta		Elev	Sta	Elev	Sta	Elev
------------------------	--	------	----	-----	--	------	-----	------	-----	------

-10 2955.22	-5 2955.12	0 2955.02	.5 2955	.5 2954.52
2 2954.65	2 2954.69	21.5 2955.08	41 2954.69	41 2954.65
42.5 2954.52	42.5 2955	43 2955.02	48 2955.12	53 2955.22

Manning's n Values		num=	5
Sta	n Val	Sta	n Val
-10	.013	-5	.025
		0	.016
		43	.025
		48	.013

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff	Contr.	Expan.
0	43	100	100	100	.1	.3	

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	2956.23	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.09	Wt. n-Val.	0.025	0.016	0.025
W.S. Elev (ft)	2955.14	Reach Len. (ft)	100.00	100.00	100.00
Crit W.S. (ft)	2955.39	Flow Area (sq ft)	0.34	11.58	0.34
E.G. Slope (ft/ft)	0.048920	Area (sq ft)	0.34	11.58	0.34
Q Total (cfs)	99.00	Flow (cfs)	0.72	97.56	0.72
Top Width (ft)	54.61	Top Width (ft)	5.81	43.00	5.81
Vel Total (ft/s)	8.08	Avg. Vel. (ft/s)	2.13	8.43	2.13
Max chl Dpth (ft)	0.62	Hydr. Depth (ft)	0.06	0.27	0.06
Conv. Total (cfs)	447.6	Conv. (cfs)	3.2	441.1	3.2
Length Wtd. (ft)	100.00	Wetted Per. (ft)	5.81	44.06	5.81
Min ch El (ft)	2954.52	Shear (lb/sq ft)	0.18	0.80	0.18
Alpha	1.07	Stream Power (lb/ft s)	0.38	6.76	0.38
Frctn Loss (ft)	4.90	Cum Volume (acre-ft)	0.00	0.16	0.00
C & E Loss (ft)	0.00	Cum SA (acres)	0.08	0.59	0.08

Warning: The cross section had to be extended vertically during the critical depth calculations.

Warning: The energy loss was greater than 1.0 ft (0.3 m), between the current and previous cross section. This may indicate the need for additional cross sections.

Warning: The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.

CROSS SECTION

RIVER: Eagle Canyon Ave
 REACH: Sta 3800-4800 RS: -4300

INPUT

Description:

Station Elevation Data		num=	15
Sta	Elev	Sta	Elev
-10 2950.32	-5 2950.22	0 2950.12	.5 2950.1
2 2949.75	2 2949.79	21.5 2950.18	41 2949.79
42.5 2949.62	42.5 2950.1	43 2950.12	48 2950.22
		53 2950.32	

Manning's n Values		num=	5
Sta	n Val	Sta	n Val
-10	.013	-5	.025
		0	.016
		43	.025
		48	.013

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff	Contr.	Expan.
0	43	100	100	100	.1	.3	

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	2951.33	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.09	Wt. n-Val.	0.025	0.016	0.025
W.S. Elev (ft)	2950.24	Reach Len. (ft)	100.00	100.00	100.00
Crit W.S. (ft)	2950.49	Flow Area (sq ft)	0.34	11.57	0.34
E.G. Slope (ft/ft)	0.049004	Area (sq ft)	0.34	11.57	0.34
Q Total (cfs)	99.00	Flow (cfs)	0.72	97.57	0.72
Top Width (ft)	54.61	Top Width (ft)	5.80	43.00	5.80
Vel Total (ft/s)	8.08	Avg. Vel. (ft/s)	2.13	8.43	2.13
Max chl Dpth (ft)	0.62	Hydr. Depth (ft)	0.06	0.27	0.06
Conv. Total (cfs)	447.2	Conv. (cfs)	3.2	440.7	3.2
Length Wtd. (ft)	100.00	Wetted Per. (ft)	5.80	44.06	5.81
Min ch El (ft)	2949.62	Shear (lb/sq ft)	0.18	0.80	0.18
Alpha	1.07	Stream Power (lb/ft s)	0.38	6.77	0.38
Frctn Loss (ft)	4.90	Cum Volume (acre-ft)	0.00	0.13	0.00
C & E Loss (ft)	0.00	Cum SA (acres)	0.07	0.49	0.07

Warning: The cross section had to be extended vertically during the critical depth calculations.

Warning: The energy loss was greater than 1.0 ft (0.3 m), between the current and previous cross section. This may indicate the need for additional cross sections.

Warning: The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.

CROSS SECTION

RIVER: Eagle Canyon Ave
 REACH: Sta 3800-4800 RS: -4400

INPUT

Description:

Station Elevation Data		num=	15
Sta	Elev	Sta	Elev
-10 2945.42	-5 2945.32	0 2945.22	.5 2945.2
2 2944.85	2 2944.89	21.5 2945.28	41 2944.89
42.5 2944.72	42.5 2945.2	43 2945.22	48 2945.32
		53 2945.42	

Manning's n Values		num=	5
Sta	n Val	Sta	n Val
-10	.013	-5	.025
		0	.016
		43	.025
		48	.013

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff	Contr.	Expan.
0	43	100	100	100	.1	.3	

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	2946.43	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.09	Wt. n-Val.	0.025	0.016	0.025
W.S. Elev (ft)	2945.34	Reach Len. (ft)	100.00	100.00	100.00
Crit W.S. (ft)	2945.59	Flow Area (sq ft)	0.34	11.57	0.34
E.G. Slope (ft/ft)	0.049080	Area (sq ft)	0.34	11.57	0.34
Q Total (cfs)	99.00	Flow (cfs)	0.71	97.57	0.71
Top Width (ft)	54.59	Top Width (ft)	5.79	43.00	5.79
Vel Total (ft/s)	8.09	Avg. Vel. (ft/s)	2.13	8.44	2.13
Max chl Dpth (ft)	0.62	Hydr. Depth (ft)	0.06	0.27	0.06
Conv. Total (cfs)	446.9	Conv. (cfs)	3.2	440.4	3.2
Length Wtd. (ft)	100.00	Wetted Per. (ft)	5.80	44.06	5.80
Min ch El (ft)	2944.72	Shear (lb/sq ft)	0.18	0.80	0.18
Alpha	1.07	Stream Power (lb/ft s)	0.38	6.79	0.38
Frctn Loss (ft)	4.90	Cum Volume (acre-ft)	0.00	0.11	0.00
C & E Loss (ft)	0.00	Cum SA (acres)	0.05	0.39	0.05

Warning: The cross section had to be extended vertically during the critical depth calculations.

Warning: The energy loss was greater than 1.0 ft (0.3 m), between the current and previous cross section. This may indicate the need for additional cross sections.

Warning: The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.

CROSS SECTION

RIVER: Eagle Canyon Ave
 REACH: Sta 3800-4800 RS: -4500

INPUT

Description:

Station Elevation Data		num=	15
Sta	Elev	Sta	Elev
-10 2940.52	-5 2940.42	0 2940.32	.5 2940.3
2 2939.95	2 2939.99	21.5 2940.38	41 2939.99
42.5 2939.82	42.5 2940.3	43 2940.32	48 2940.42
		53 2940.52	

Manning's n Values		num=	5
Sta	n Val	Sta	n Val
-10	.013	-5	.025
		0	.016
		43	.025
		48	.013

-10 .013 -5 .025 0 .016 43 .025 48 .013
 Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 0 43 100 100 100 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	2941.53	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.09	Wt. n-Val.	0.025	0.016	0.025
W.S. Elev (ft)	2940.44	Reach Len. (ft)	100.00	100.00	100.00
Crit W.S. (ft)	2940.69	Flow Area (sq ft)	0.34	11.57	0.34
E.G. Slope (ft/ft)	0.049004	Area (sq ft)	0.34	11.57	0.34
Q Total (cfs)	99.00	Flow (cfs)	0.72	97.57	0.72
Top Width (ft)	54.61	Top Width (ft)	5.80	43.00	5.80
Vel Total (ft/s)	8.08	Avg. Vel. (ft/s)	2.13	8.43	2.13
Max Chl Dpth (ft)	0.62	Hydr. Depth (ft)	0.06	0.27	0.06
Conv. Total (cfs)	447.2	Conv. (cfs)	3.2	440.7	3.2
Length Wtd. (ft)	100.00	Wetted Per. (ft)	5.81	44.06	5.81
Min Ch El (ft)	2939.82	Shear (lb/sq ft)	0.18	0.80	0.18
Alpha	1.07	Stream Power (lb/ft s)	0.38	6.77	0.38
Frctn Loss (ft)	4.91	Cum Volume (acre-ft)	0.00	0.08	0.00
C & E Loss (ft)	0.00	Cum SA (acres)	0.04	0.30	0.04

Warning: The cross section had to be extended vertically during the critical depth calculations.
 Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
 Warning: The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.

CROSS SECTION

RIVER: Eagle Canyon Ave
 REACH: Sta 3800-4800 RS: -4600

INPUT

Description:

Station Elevation Data	num=	15	Sta	Elev	Sta	Elev	Sta	Elev
-10 2935.62	-5 2935.52	0 2935.42	.5 2935.4	.5 2934.92				
2 2935.05	2 2935.09	21.5 2935.48	41 2935.09	41 2935.05				
42.5 2934.92	42.5 2935.4	43 2935.42	48 2935.52	53 2935.62				

Manning's n Values	num=	5	Sta	n Val	Sta	n Val	Sta	n Val
-10 .013	-5 .025	0 .016	43 .025	48 .013				

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 0 43 100 100 100 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	2936.63	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.09	Wt. n-Val.	0.025	0.016	0.025
W.S. Elev (ft)	2935.54	Reach Len. (ft)	100.00	100.00	100.00
Crit W.S. (ft)	2935.79	Flow Area (sq ft)	0.34	11.56	0.34
E.G. Slope (ft/ft)	0.049147	Area (sq ft)	0.34	11.56	0.34
Q Total (cfs)	99.00	Flow (cfs)	0.71	97.57	0.71
Top Width (ft)	54.59	Top Width (ft)	5.79	43.00	5.79
Vel Total (ft/s)	8.09	Avg. Vel. (ft/s)	2.13	8.44	2.13
Max Chl Dpth (ft)	0.62	Hydr. Depth (ft)	0.06	0.27	0.06
Conv. Total (cfs)	446.6	Conv. (cfs)	3.2	440.1	3.2
Length Wtd. (ft)	100.00	Wetted Per. (ft)	5.79	44.06	5.79
Min Ch El (ft)	2934.92	Shear (lb/sq ft)	0.18	0.81	0.18
Alpha	1.07	Stream Power (lb/ft s)	0.38	6.79	0.38
Frctn Loss (ft)	4.90	Cum Volume (acre-ft)	0.00	0.05	0.00
C & E Loss (ft)	0.00	Cum SA (acres)	0.03	0.20	0.03

Warning: The cross section had to be extended vertically during the critical depth calculations.
 Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
 Warning: The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.

CROSS SECTION

RIVER: Eagle Canyon Ave
 REACH: Sta 3800-4800 RS: -4700

INPUT

Description:

Station Elevation Data	num=	15	Sta	Elev	Sta	Elev	Sta	Elev
-10 2930.72	-5 2930.62	0 2930.52	.5 2930.5	.5 2930.02				
2 2930.15	2 2930.19	21.5 2930.58	41 2930.19	41 2930.15				
42.5 2930.02	42.5 2930.5	43 2930.52	48 2930.62	53 2930.72				

Manning's n Values	num=	5	Sta	n Val	Sta	n Val	Sta	n Val
-10 .013	-5 .025	0 .016	43 .025	48 .013				

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 0 43 100 100 100 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	2931.73	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.09	Wt. n-Val.	0.025	0.016	0.025
W.S. Elev (ft)	2930.64	Reach Len. (ft)	100.00	100.00	100.00
Crit W.S. (ft)	2930.89	Flow Area (sq ft)	0.34	11.58	0.34
E.G. Slope (ft/ft)	0.048920	Area (sq ft)	0.34	11.58	0.34
Q Total (cfs)	99.00	Flow (cfs)	0.72	97.56	0.72
Top Width (ft)	54.61	Top Width (ft)	5.81	43.00	5.81
Vel Total (ft/s)	8.08	Avg. Vel. (ft/s)	2.13	8.43	2.13
Max Chl Dpth (ft)	0.62	Hydr. Depth (ft)	0.06	0.27	0.06
Conv. Total (cfs)	447.6	Conv. (cfs)	3.2	441.1	3.2
Length Wtd. (ft)	100.00	Wetted Per. (ft)	5.81	44.06	5.81
Min Ch El (ft)	2930.02	Shear (lb/sq ft)	0.18	0.80	0.18
Alpha	1.07	Stream Power (lb/ft s)	0.38	6.76	0.38
Frctn Loss (ft)	4.90	Cum Volume (acre-ft)	0.00	0.03	0.00
C & E Loss (ft)	0.00	Cum SA (acres)	0.01	0.10	0.01

Warning: The cross section had to be extended vertically during the critical depth calculations.
 Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
 Warning: The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.

CROSS SECTION

RIVER: Eagle Canyon Ave
 REACH: Sta 3800-4800 RS: -4800

INPUT

Description:

Station Elevation Data	num=	15	Sta	Elev	Sta	Elev	Sta	Elev
-10 2925.82	-5 2925.72	0 2925.62	.5 2925.6	.5 2925.12				
2 2925.25	2 2925.29	21.5 2925.68	41 2925.29	41 2925.25				
42.5 2925.12	42.5 2925.6	43 2925.62	48 2925.72	53 2925.82				

Manning's n Values	num=	5	Sta	n Val	Sta	n Val	Sta	n Val
-10 .013	-5 .025	0 .016	43 .025	48 .013				

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 0 43 100 100 100 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	2926.83	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.09	Wt. n-Val.	0.025	0.016	0.025
W.S. Elev (ft)	2925.74	Reach Len. (ft)			
Crit W.S. (ft)	2925.99	Flow Area (sq ft)	0.34	11.57	0.34
E.G. Slope (ft/ft)	0.049004	Area (sq ft)	0.34	11.57	0.34
Q Total (cfs)	99.00	Flow (cfs)	0.72	97.57	0.72
Top Width (ft)	54.61	Top Width (ft)	5.80	43.00	5.80
Vel Total (ft/s)	8.08	Avg. Vel. (ft/s)	2.13	8.43	2.13
Max Chl Dpth (ft)	0.62	Hydr. Depth (ft)	0.06	0.27	0.06
Conv. Total (cfs)	447.2	Conv. (cfs)	3.2	440.7	3.2
Length Wtd. (ft)		Wetted Per. (ft)	5.81	44.06	5.81
Min Ch El (ft)	2925.12	Shear (lb/sq ft)	0.18	0.80	0.18
Alpha	1.07	Stream Power (lb/ft s)	0.38	6.77	0.38
Frctn Loss (ft)		Cum Volume (acre-ft)			
C & E Loss (ft)		Cum SA (acres)			

Warning: The cross section had to be extended vertically during the critical depth calculations.
 Warning: The energy loss was greater than 1.0 ft (0.3 m) between the current and previous cross section. This may indicate the need for additional cross sections.
 Warning: The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.

SUMMARY OF MANNING'S N VALUES

River: Eagle Canyon Ave

Reach	River Sta.	n1	n2	n3	n4	n5
Sta 3800-4800	-3800	.013	.025	.016	.025	.013
Sta 3800-4800	-3900	.013	.025	.016	.025	.013
Sta 3800-4800	-4000	.013	.025	.016	.025	.013
Sta 3800-4800	-4100	.013	.025	.016	.025	.013
Sta 3800-4800	-4200	.013	.025	.016	.025	.013
Sta 3800-4800	-4300	.013	.025	.016	.025	.013
Sta 3800-4800	-4400	.013	.025	.016	.025	.013
Sta 3800-4800	-4500	.013	.025	.016	.025	.013
Sta 3800-4800	-4600	.013	.025	.016	.025	.013
Sta 3800-4800	-4700	.013	.025	.016	.025	.013
Sta 3800-4800	-4800	.013	.025	.016	.025	.013

SUMMARY OF REACH LENGTHS

River: Eagle Canyon Ave

Reach	River Sta.	Left	Channel	Right
Sta 3800-4800	-3800	100	100	100
Sta 3800-4800	-3900	100	100	100
Sta 3800-4800	-4000	100	100	100
Sta 3800-4800	-4100	100	100	100
Sta 3800-4800	-4200	100	100	100
Sta 3800-4800	-4300	100	100	100
Sta 3800-4800	-4400	100	100	100
Sta 3800-4800	-4500	100	100	100
Sta 3800-4800	-4600	100	100	100
Sta 3800-4800	-4700	100	100	100
Sta 3800-4800	-4800	0	0	0

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS

River: Eagle Canyon Ave

Reach	River Sta.	Contr.	Expan.
Sta 3800-4800	-3800	.1	.3
Sta 3800-4800	-3900	.1	.3
Sta 3800-4800	-4000	.1	.3
Sta 3800-4800	-4100	.1	.3
Sta 3800-4800	-4200	.1	.3
Sta 3800-4800	-4300	.1	.3
Sta 3800-4800	-4400	.1	.3
Sta 3800-4800	-4500	.1	.3
Sta 3800-4800	-4600	.1	.3
Sta 3800-4800	-4700	.1	.3
Sta 3800-4800	-4800	.1	.3

Profile Output Table - Standard Table 1

Reach	River Sta.	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Ch1
Sta 3800-4800	-3800	PF 1	99.00	2974.12	2974.74	2974.99	2975.83	0.049004	8.43	12.25	54.61	2.87
Sta 3800-4800	-3900	PF 1	99.00	2969.22	2969.84	2970.09	2970.93	0.048925	8.43	12.25	54.61	2.86
Sta 3800-4800	-4000	PF 1	99.00	2964.32	2964.94	2965.19	2966.03	0.049004	8.43	12.25	54.61	2.87
Sta 3800-4800	-4100	PF 1	99.00	2959.42	2960.04	2960.29	2961.13	0.048991	8.43	12.25	54.61	2.87
Sta 3800-4800	-4200	PF 1	99.00	2954.52	2955.14	2955.39	2956.23	0.048920	8.43	12.25	54.61	2.86
Sta 3800-4800	-4300	PF 1	99.00	2949.62	2950.24	2950.49	2951.33	0.049004	8.43	12.25	54.61	2.87
Sta 3800-4800	-4400	PF 1	99.00	2944.72	2945.34	2945.59	2946.43	0.049080	8.44	12.24	54.59	2.87
Sta 3800-4800	-4500	PF 1	99.00	2939.82	2940.44	2940.69	2941.53	0.049004	8.43	12.25	54.61	2.87
Sta 3800-4800	-4600	PF 1	99.00	2934.92	2935.54	2935.79	2936.63	0.049147	8.44	12.23	54.59	2.87
Sta 3800-4800	-4700	PF 1	99.00	2930.02	2930.64	2930.89	2931.73	0.048920	8.43	12.25	54.61	2.86
Sta 3800-4800	-4800	PF 1	99.00	2925.12	2925.74	2925.99	2926.83	0.049004	8.43	12.25	54.61	2.87

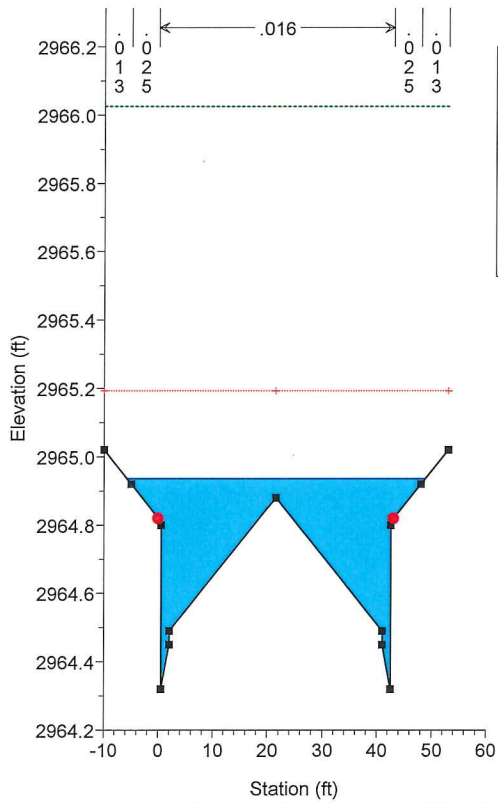
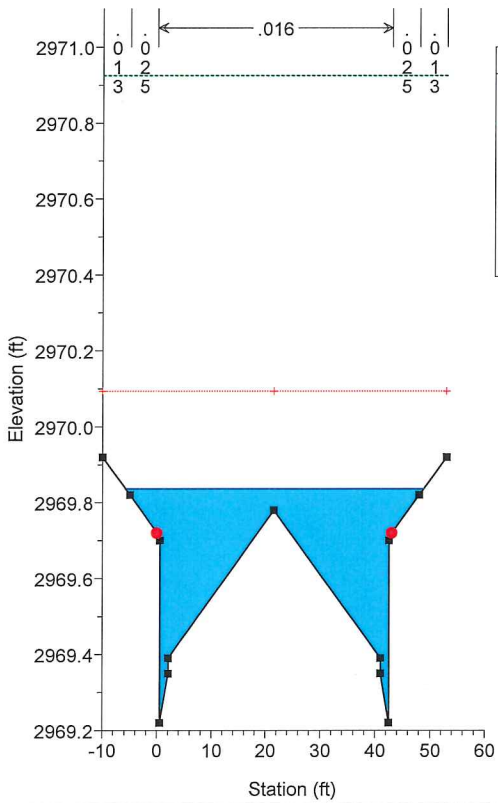
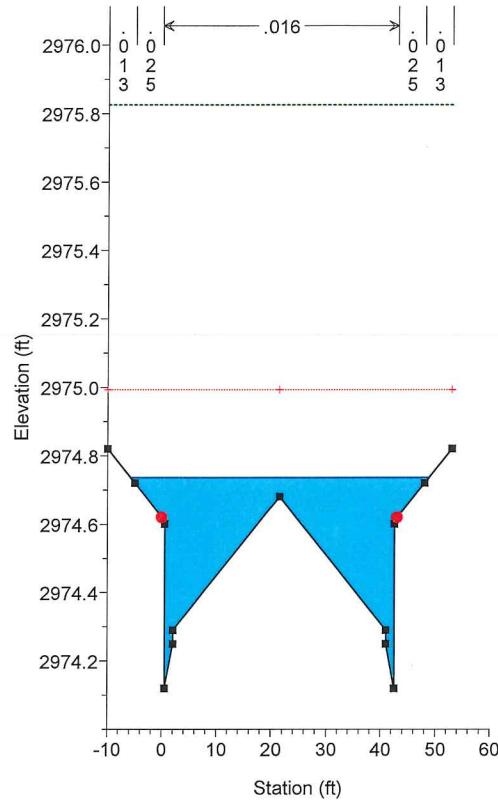
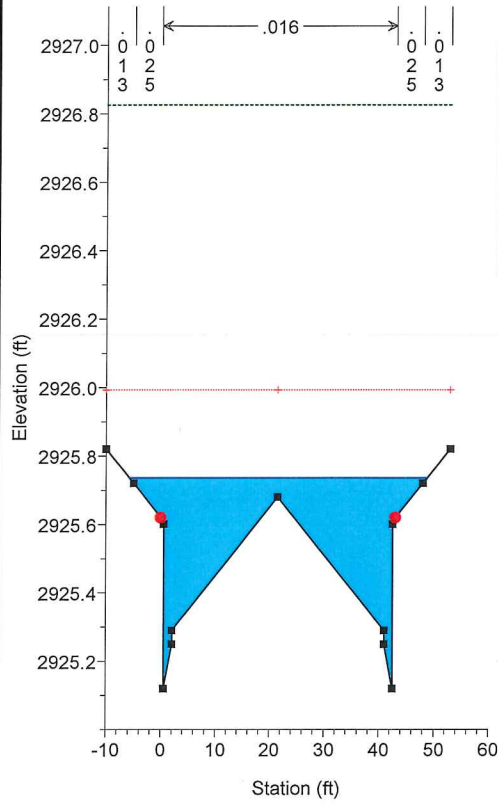
Profile Output Table - Velocity Table

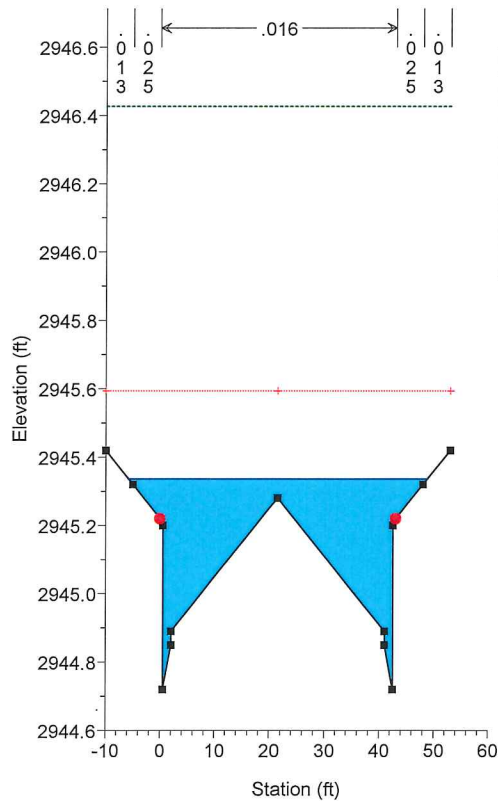
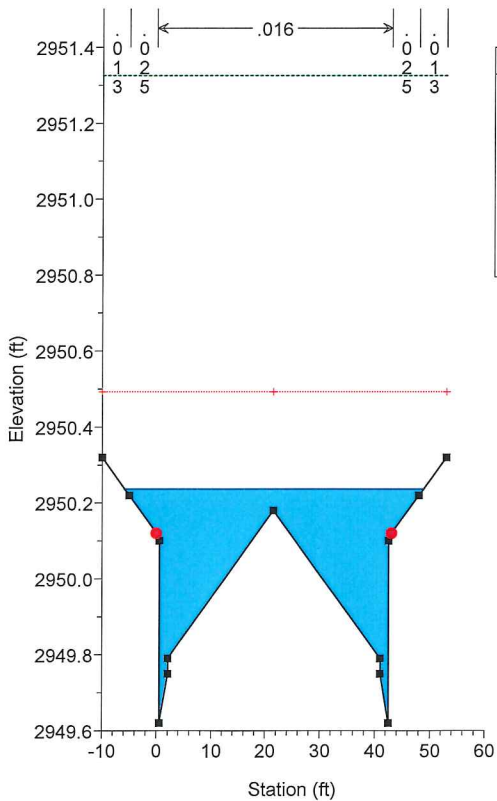
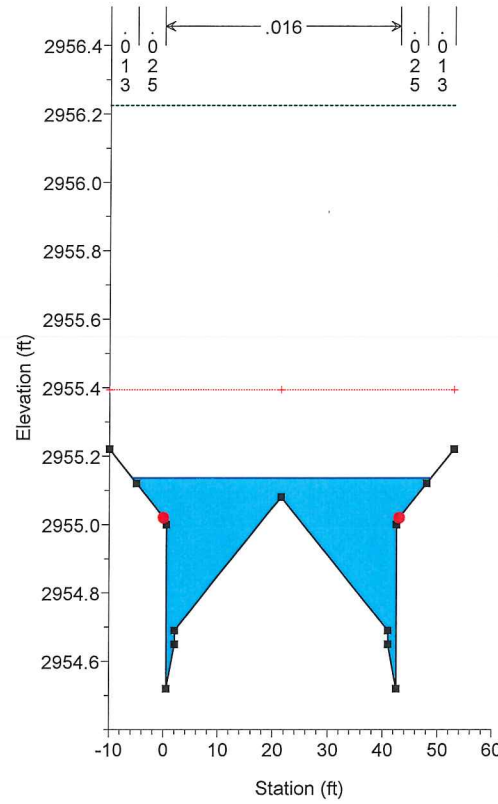
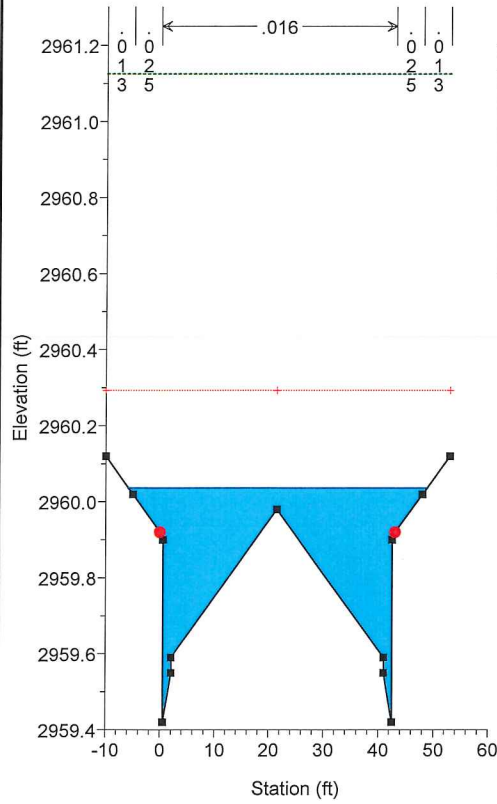
Reach	River Sta.	Profile	E.G. Elev (ft)	W.S. Elev (ft)	Vel Head (ft)	Frctn Loss (ft)	C & E Loss (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Top width (ft)	Vel Left (ft/s)	Vel Right (ft/s)	Vel Chnl (ft/s)
Sta 3800-4800	-3800	PF 1	2975.83	2974.74	1.09	4.90	0.00	0.72	97.57	0.72	54.61	2.13	2.13	8.43
Sta 3800-4800	-3900	PF 1	2970.93	2969.84	1.09	4.90	0.00	0.72	97.56	0.72	54.61	2.13	2.13	8.43
Sta 3800-4800	-4000	PF 1	2966.03	2964.94	1.09	4.90	0.00	0.72	97.57	0.72	54.61	2.13	2.13	8.43
Sta 3800-4800	-4100	PF 1	2961.13	2960.04	1.09	4.90	0.00	0.72	97.56	0.72	54.61	2.13	2.13	8.43
Sta 3800-4800	-4200	PF 1	2956.23	2955.14	1.09	4.90	0.00	0.72	97.56	0.72	54.61	2.13	2.13	8.43
Sta 3800-4800	-4300	PF 1	2951.33	2950.24	1.09	4.90	0.00	0.72	97.57	0.72	54.61	2.13	2.13	8.43
Sta 3800-4800	-4400	PF 1	2946.43	2945.34	1.09	4.90	0.00	0.71	97.57	0.71	54.59	2.13	2.13	8.44
Sta 3800-4800	-4500	PF 1	2941.53	2940.44	1.09	4.91	0.00	0.72	97.57	0.72	54.61	2.13	2.13	8.43
Sta 3800-4800	-4600	PF 1	2936.63	2935.54	1.09	4.90	0.00	0.71	97.57	0.71	54.59	2.13	2.13	8.44
Sta 3800-4800	-4700	PF 1	2931.73	2930.64	1.09	4.90	0.00	0.72	97.56	0.72	54.61	2.13	2.13	8.43
Sta 3800-4800	-4800	PF 1	2926.83	2925.74	1.09			0.72	97.57	0.72	54.61	2.13	2.13	8.43

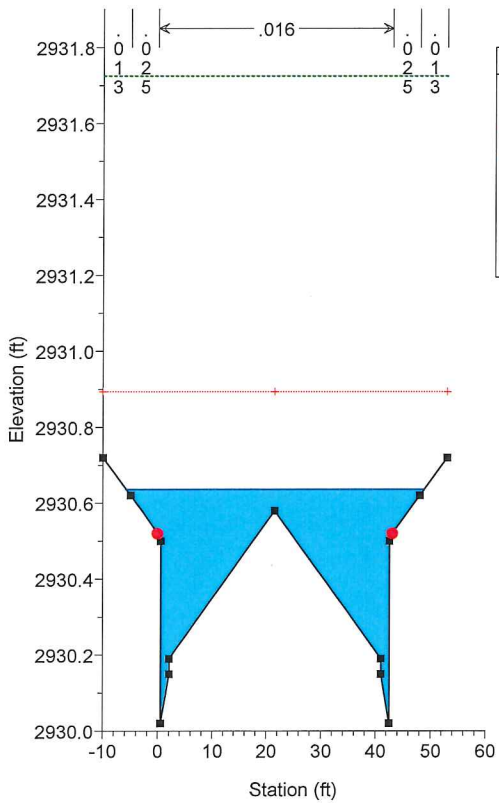
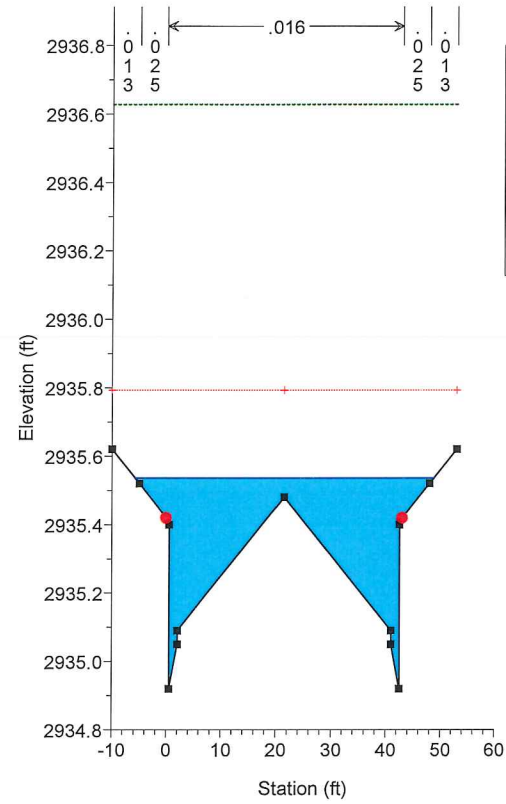
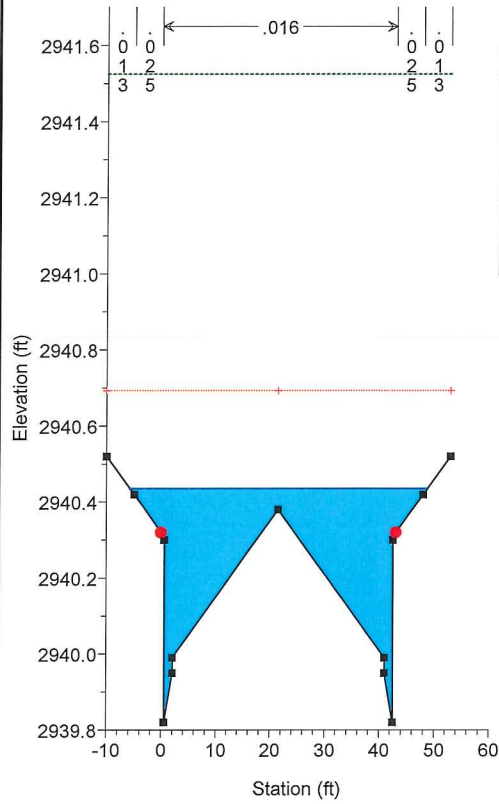
Profile Output Table - HEC-FDA

Reach	River Sta.	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)
Sta 3800-4800	-3800	PF 1	99.00	2974.12	2974.74
Sta 3800-4800	-3900	PF 1	99.00	2969.22	2969.84
Sta 3800-4800	-4000	PF 1	99.00	2964.32	2964.94
Sta 3800-4800	-4100	PF 1	99.00	2959.42	2960.04
Sta 3800-4800	-4200	PF 1	99.00	2954.52	2955.14
Sta 3800-4800	-4300	PF 1	99.00	2949.62	2950.24
Sta 3800-4800	-4400	PF 1	99.00	2944.72	2945.34
Sta 3800-4800	-4500	PF 1	99.00	2939.82	2940.44
Sta 3800-4800	-4600	PF 1	99.00	2934.92	2935.54
Sta 3800-4800	-4700	PF 1	99.00	2930.02	2930.64
Sta 3800-4800	-4800	PF 1	99.00	2925.12	2925.74

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APPENDIX D

WSPG Models (Ultimate Condition)

Eagle Canyon Avenue & Laterals (U-ECA & U-ECAW)

0
Q
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38.0

U-ECA.WSQ

U-ECA.OUT

DATE: 12/ 7/2016
TIME: 14:15

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	18	4			1.50														
CD	24	4			2.00														
CD	30	4			2.50														
CD	36	4			3.00														
CD	42	4			3.50														
CD	48	4			4.00														
CD	54	4			4.50														
CD	60	4			5.00														
CD	66	4			5.50														
CD	72	4			6.00														
CD	78	4			6.50														

PAGE NO 3

F 0 5 1 5 P

WATER SURFACE PROFILE - TITLE CARD LISTING

HEADING LINE NO 1 IS -

SKYE CANYON INFRASTRUCTURE - PHASE 2 (UPDATE NO.3)

HEADING LINE NO 2 IS -

BY OLYMPIA COMPANIES

HEADING LINE NO 3 IS -

EAGLE CANYON - TRUNK STORM DRAIN

F 0 5 1 5 P

WATER SURFACE PROFILE - ELEMENT CARD LISTING

ELEMENT NO	1 IS A SYSTEM OUTLET U/S DATA	STATION	INVERT	SECT	W S ELEV
		613.00	2823.35	72	2829.26
ELEMENT NO	2 IS A REACH U/S DATA	STATION	INVERT	SECT	
		900.00	2830.52	72	
ELEMENT NO	3 IS A JUNCTION U/S DATA	STATION	INVERT	SECT	
		900.00	2830.52	72	
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	
		950.00	2831.58	72	
ELEMENT NO	5 IS A WALL ENTRANCE U/S DATA	STATION	INVERT	SECT	
		950.00	2831.58	72	

F

PAGE NO 2

RADIUS 0.00
ANGLE 0.00
ANG PT 0.00
MAN H 1

Q4 0.0
Q3 97.5
INVERT-3 0.0
INVERT-4 0.00
PHI 3 45.00
PHI 4 0.00

RADIUS 0.00
ANGLE 0.00
ANG PT 0.00
MAN H 1

ELEMENT NO	6	IS A TRANSITION U/S DATA	STATION 1000.00	* INVERT 2835.61	* SECT 66	U-ECA.OUT N 0.013
ELEMENT NO	7	IS A WALL EXIT U/S DATA	STATION 1000.00	* INVERT 2835.61	* SECT 66	
ELEMENT NO	8	IS A REACH U/S DATA	STATION 1093.00	* INVERT 2837.13	* SECT 66	N 0.013
ELEMENT NO	9	IS A JUNCTION U/S DATA	STATION 1093.00	* INVERT 2838.13	* SECT LAT-1 LAT-2 54 42 42	* Q3 44.0 Q4 37.0 INVERT-3 INVERT-4 2839.13 2839.13
ELEMENT NO	10	IS A REACH U/S DATA	STATION 1389.50	* INVERT 2839.63	* SECT 54	N 0.013
ELEMENT NO	11	IS A JUNCTION U/S DATA	STATION 1394.50	* INVERT 2840.13	* SECT LAT-1 LAT-2 48 18 18 F 0 5 1 5 P	* Q3 5.0 Q4 5.0 INVERT-3 INVERT-4 2842.63 2842.63

WATER SURFACE PROFILE - ELEMENT CARD LISTING

ELEMENT NO	12	IS A REACH U/S DATA	STATION 1632.00	* INVERT 2854.48	* SECT 48	N 0.013
ELEMENT NO	13	IS A REACH U/S DATA	STATION 1762.00	* INVERT 2862.62	* SECT 48	N 0.013
ELEMENT NO	14	IS A REACH U/S DATA	STATION 1883.00	* INVERT 2868.57	* SECT 48	N 0.013
ELEMENT NO	15	IS A REACH U/S DATA	STATION 1992.00	* INVERT 2873.94	* SECT 48	N 0.013
ELEMENT NO	16	IS A JUNCTION U/S DATA	STATION 1992.00	* INVERT 2873.94	* SECT LAT-1 LAT-2 48 18 24	* Q3 5.0 Q4 21.0 INVERT-3 INVERT-4 2876.44 2875.94
THE ABOVE ELEMENT CONTAINED AN INVERT ELEV WHICH WAS NOT GREATER THAN THE PREVIOUS INVERT ELEV -WARNING						
THE ABOVE ELEMENT CONTAINED AN INVERT ELEV WHICH WAS NOT GREATER THAN THE PREVIOUS INVERT ELEV -WARNING						
ELEMENT NO	17	IS A REACH U/S DATA	STATION 2072.00	* INVERT 2877.87	* SECT 48	N 0.013
ELEMENT NO	18	IS A REACH U/S DATA	STATION 2167.00	* INVERT 2882.51	* SECT 48	N 0.013
ELEMENT NO	19	IS A REACH U/S DATA	STATION 2262.00	* INVERT 2885.16	* SECT 48	N 0.013

ELEMENT NO 20 IS A REACH U/S DATA * * * * * U-ECA.OUT
 STATION INVERT SECT * * * * *
 2422.00 2888.80 48 N 0.013

ELEMENT NO 21 IS A JUNCTION U/S DATA * * * * *
 STATION INVERT SECT LAT-1 LAT-2 Q3 Q4 INVERT-3 INVERT-4 PHI 3 PHI 4
 2422.00 2888.80 48 30 18 0.013 43.0 3.0 2890.30 2891.30 45.00 45.00
 THE ABOVE ELEMENT CONTAINED AN INVERT ELEV WHICH WAS NOT GREATER THAN THE PREVIOUS INVERT ELEV -WARNING
 THE ABOVE ELEMENT CONTAINED AN INVERT ELEV WHICH WAS NOT GREATER THAN THE PREVIOUS INVERT ELEV -WARNING
 F 0 5 1 5 P PAGE NO 4

WATER SURFACE PROFILE - ELEMENT CARD LISTING

ELEMENT NO 22 IS A REACH U/S DATA * * * * *
 STATION INVERT SECT * * * * *
 2820.00 2903.13 48 N 0.013

ELEMENT NO 23 IS A JUNCTION U/S DATA * * * * *
 STATION INVERT SECT LAT-1 LAT-2 Q3 Q4 INVERT-3 INVERT-4 PHI 3 PHI 4
 2820.00 2903.13 48 42 0 0.013 86.0 0.0 2903.63 0.00 45.00 0.00
 THE ABOVE ELEMENT CONTAINED AN INVERT ELEV WHICH WAS NOT GREATER THAN THE PREVIOUS INVERT ELEV -WARNING
 THE ABOVE ELEMENT CONTAINED AN INVERT ELEV WHICH WAS NOT GREATER THAN THE PREVIOUS INVERT ELEV -WARNING

ELEMENT NO 24 IS A REACH U/S DATA * * * * *
 STATION INVERT SECT * * * * *
 3004.00 2908.81 48 N 0.013

ELEMENT NO 25 IS A JUNCTION U/S DATA * * * * *
 STATION INVERT SECT LAT-1 LAT-2 Q3 Q4 INVERT-3 INVERT-4 PHI 3 PHI 4
 3004.00 2908.81 48 36 18 0.013 52.0 18.0 2909.81 2911.31 60.00 45.00
 THE ABOVE ELEMENT CONTAINED AN INVERT ELEV WHICH WAS NOT GREATER THAN THE PREVIOUS INVERT ELEV -WARNING
 THE ABOVE ELEMENT CONTAINED AN INVERT ELEV WHICH WAS NOT GREATER THAN THE PREVIOUS INVERT ELEV -WARNING

ELEMENT NO 26 IS A REACH U/S DATA * * * * *
 STATION INVERT SECT * * * * *
 3024.00 2910.72 48 N 0.013

ELEMENT NO 27 IS A JUNCTION U/S DATA * * * * *
 STATION INVERT SECT LAT-1 LAT-2 Q3 Q4 INVERT-3 INVERT-4 PHI 3 PHI 4
 3024.00 2910.72 48 48 0 0.013 18.0 0.0 2912.12 0.00 90.00 0.00
 THE ABOVE ELEMENT CONTAINED AN INVERT ELEV WHICH WAS NOT GREATER THAN THE PREVIOUS INVERT ELEV -WARNING
 THE ABOVE ELEMENT CONTAINED AN INVERT ELEV WHICH WAS NOT GREATER THAN THE PREVIOUS INVERT ELEV -WARNING

ELEMENT NO 28 IS A REACH U/S DATA * * * * *
 STATION INVERT SECT * * * * *
 3060.00 2912.43 48 N 0.013

ELEMENT NO 29 IS A SYSTEM HEADWORKS U/S DATA * * * * *
 STATION INVERT SECT * * * * *
 3060.00 2912.43 48 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
 LICENSEE: SLATER HANIFAN GROUP F0515P WATER SURFACE PROFILE LISTING

SKYE CANYON INFRASTRUCTURE - PHASE 2 (UPDATE NO.3)

BY OLYMPIA COMPANIES

EAGLE CANYON - TRUNK STORM DRAIN

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

L/ELEM SO ***** U-ECA. OUT SF AVE HF ***** NORM DEPTH ***** ZR *****

613.00 2823.35 3.839 2827.189 472.5 24.73 9.499 2836.688 0.00 5.602 6.00 0.00 0.00 0 0.00
167.58 0.02498 .021801 3.65 3.720 0.00

780.58 2827.54 3.960 2831.497 472.5 23.87 8.845 2840.342 0.00 5.602 6.00 0.00 0.00 0 0.00
119.42 0.02498 .019688 2.35 3.720 0.00

900.00 2830.52 4.132 2834.652 472.5 22.76 8.041 2842.693 0.00 5.602 6.00 0.00 0.00 0 0.00
JUNCT STR 0.00000 .021264 0.00 0.00

900.00 2830.52 3.251 2833.771 375.0 23.97 8.924 2842.695 0.00 5.210 6.00 0.00 0.00 0 0.00
50.00 0.02120 .024310 1.22 3.378 0.00

950.00 2831.58 3.225 2834.805 375.0 24.22 9.105 2843.910 0.00 5.210 6.00 0.00 0.00 0 0.00
TRANS STR 0.08060 .018784 0.94 0.00

1000.00 2835.61 4.420 2840.030 375.0 18.32 5.214 2845.244 0.00 5.118 5.50 0.00 0.00 0 0.00
WALL EXIT 0.00

1000.00 2835.61 4.419 2840.029 375.0 18.33 5.216 2845.245 0.00 5.118 5.50 0.00 0.00 0 0.00
33.70 0.01634 .012649 0.43 3.980 0.00

1033.70 2836.16 4.531 2840.692 375.0 17.91 4.980 2845.672 0.00 5.118 5.50 0.00 0.00 0 0.00
43.42 0.01634 .011858 0.51 3.980 0.00

1077.12 2836.87 4.789 2841.659 375.0 17.08 4.528 2846.187 0.00 5.118 5.50 0.00 0.00 0 0.00
15.88 0.01634 .011072 0.18 3.980 0.00

1093.00 2837.13 5.118 2842.248 375.0 16.28 4.115 2846.363 0.00 5.118 5.50 0.00 0.00 0 0.00
JUNCT STR 0.00000 .016569 0.00 0.00

1093.00 2838.13 4.799 2842.929 294.0 18.49 5.306 2848.235 0.00 4.378 4.50 0.00 0.00 0 0.00
296.50 0.00506 .022352 6.63 4.500 0.00

LICENSEE: SLATER HANIFAN GROUP F0515P WATER SURFACE PROFILE LISTING

SKYE CANYON INFRASTRUCTURE - PHASE 2 (UPDATE NO.3)

BY OLYMPIA COMPANIES

EAGLE CANYON - TRUNK STORM DRAIN

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

L/ELEM SO ***** SF AVE HF ***** NORM DEPTH ***** ZR *****
1389.50 2839.63 10.192 2849.822 294.0 18.49 5.306 2855.128 0.00 4.378 4.50 0.00 0.00 0 0.00
JUNCT STR 0.10000 0.00

U-ECA.OUT

1394.50	2840.13	2.750	2842.880	284.0	30.83	14.759	2857.639	0.00	3.961	4.00	0.00	0.00	0.00
237.50	0.06042					.055399	13.16		2.717		0.00		
1632.00	2854.48	2.870	2857.350	284.0	29.43	13.446	2870.796	0.00	3.961	4.00	0.00	0.00	0.00
73.15	0.06262					.050010	3.66		2.681		0.00		
1705.15	2859.06	2.981	2862.041	284.0	28.27	12.412	2874.453	0.00	3.961	4.00	0.00	0.00	0.00
56.85	0.06262					.045308	2.58		2.681		0.00		
1762.00	2862.62	3.126	2865.746	284.0	26.96	11.284	2877.030	0.00	3.961	4.00	0.00	0.00	0.00
28.74	0.04917					.042458	1.22		2.943		0.00		
1790.74	2864.03	3.158	2867.191	284.0	26.68	11.057	2878.248	0.00	3.961	4.00	0.00	0.00	0.00
92.26	0.04917					.040079	3.70		2.943		0.00		
1883.00	2868.57	3.324	2871.894	284.0	25.44	10.052	2881.946	0.00	3.961	4.00	0.00	0.00	0.00
28.72	0.04927					.037431	1.08		2.941		0.00		
1911.72	2869.99	3.407	2873.392	284.0	24.90	9.629	2883.021	0.00	3.961	4.00	0.00	0.00	0.00
48.03	0.04927					.035477	1.70		2.941		0.00		
1959.75	2872.35	3.620	2875.971	284.0	23.74	8.754	2884.725	0.00	3.961	4.00	0.00	0.00	0.00
32.25	0.04927					.035146	1.13		2.941		0.00		
1992.00	2873.94	3.961	2877.901	284.0	22.64	7.957	2885.858	0.00	3.961	4.00	0.00	0.00	0.00
JUNCT STR	0.00000					.034149	0.00				0.00		
1992.00	2873.94	6.662	2880.602	258.0	20.53	6.546	2887.148	0.00	3.943	4.00	0.00	0.00	0.00
80.00	0.04913					.032260	2.58		2.732		0.00		

LICENSEE: SLATER HANIFAN GROUP

SKYE CANYON INFRASTRUCTURE - PHASE 2 (UPDATE NO.3)
BY OLYMPIA COMPANIES
EAGLE CANYON - TRUNK STORM DRAIN

WATER SURFACE PROFILE LISTING

F0515P

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		
2072.00	2877.87	5.748	2883.618	258.0	20.53	6.546	2890.164	0.00	3.943	4.00	4.00	0.00	0.00	0	0.00
95.00	0.04884					.032260	3.06			2.737			0.00		
2167.00	2882.51	4.608	2887.118	258.0	20.53	6.546	2893.664	0.00	3.943	4.00	4.00	0.00	0.00	0	0.00
95.00	0.02789					.032260	3.06			4.000			0.00		
2262.00	2885.16	5.458	2890.618	258.0	20.53	6.546	2897.164	0.00	3.943	4.00	4.00	0.00	0.00	0	0.00

U-ECA.OUT													
STATION	INVERT ELEV	DEPTH OF FLOW	W.S. ELEV	Q	VEL	VEL HEAD	ENERGY GRD.EL.	SUPER ELEV	CRITICAL DEPTH	HGT/DIA	BASE/ID NO.	ZL PIER	NO AVBPR
160.00	0.02275												
2422.00	2888.80	7.307	2896.107	258.0	20.53	6.546	2902.653	0.00	3.943	4.00	0.00	0.00	0.00
JUNCT STR	0.00000					.027021	0.00					0.00	
2422.00	2888.80	10.891	2899.691	212.0	16.87	4.420	2904.111	0.00	3.877	4.00	0.00	0.00	0.00
398.00	0.03601					.021782	8.67					0.00	
2820.00	2903.13	5.452	2908.582	212.0	16.87	4.420	2913.002	0.00	3.877	4.00	0.00	0.00	0.00
JUNCT STR	0.00000					.014738	0.00					0.00	
2820.00	2903.13	9.825	2912.955	126.0	10.03	1.561	2914.516	0.00	3.368	4.00	0.00	0.00	0.00
184.00	0.03087					.007694	1.42					0.00	
3004.00	2908.81	5.948	2914.758	126.0	10.03	1.561	2916.319	0.00	3.368	4.00	0.00	0.00	0.00
JUNCT STR	0.00000					.004607	0.00					0.00	
3004.00	2908.81	7.660	2916.470	56.0	4.46	0.308	2916.778	0.00	2.251	4.00	0.00	0.00	0.00
20.00	0.09550					.001520	0.03					0.00	
3024.00	2910.72	5.796	2916.516	56.0	4.46	0.308	2916.824	0.00	2.251	4.00	0.00	0.00	0.00
JUNCT STR	0.00000					.001110	0.00					0.00	
3024.00	2910.72	6.129	2916.849	38.0	3.02	0.142	2916.991	0.00	1.838	4.00	0.00	0.00	0.00
36.00	0.04750					.000700	0.03					0.00	

PAGE 4

LICENSEE: SLATER HANIFAN GROUP
 WATER SURFACE PROFILE LISTING
 SKYE CANYON INFRASTRUCTURE - PHASE 2 (UPDATE NO.3)
 BY OLYMPIA COMPANIES
 EAGLE CANYON - TRUNK STORM DRAIN

STATION	INVERT ELEV	DEPTH OF FLOW	W.S. ELEV	Q	VEL	VEL HEAD	ENERGY GRD.EL.	SUPER ELEV	CRITICAL DEPTH	HGT/DIA	BASE/ID NO.	ZL PIER	NO AVBPR
3060.00	2912.43	4.451	2916.881	38.0	3.02	0.142	2917.023	0.00	1.838	4.00	0.00	0.00	0.00

SKYE CANYON INFRASTRUCTURE - PHASE 2 (UPDATE NO.3)
 BY OLYMPIA COMPANIES
 EAGLE CANYON - TRUNK STORM DRAIN

613.00	.I	WCH	E	.	.	.	.	.	.	.	.	.	R
649.52	.												
686.04	.												
722.57	.												
759.09	.												
795.61	.	I	W X	E									R
832.13	.												

U-ECA.OUT

[illegible]

[illegible]

NOTES

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

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

0	T1 SKYE CANYON INFRASTRUCTURE - PHASE 2 (UPDATE NO.3)	
	T2 BY OLYMPIA COMPANIES	
	T3 EAGLE CANYON - LATERAL P3B-L	
	SO 1000.002911.31 18	2916.47
	R 1021.002912.36 18	
	SH 1021.002912.36 18	.013
	CD 18 4	1.5
	CD 24 4	2.
	CD 30 4	2.5
	CD 36 4	3.
	CD 42 4	3.5
	CD 48 4	4.
	CD 54 4	4.5
	CD 60 4	5.
	CD 66 4	5.5
	CD 72 4	6.
	CD 78 4	6.5

0
Q
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18.0

P3B-L.WSQ

P3B-L.OUT

DATE: 12/ 9/2016
TIME: 11:26

F0515P
WATER SURFACE PROFILE - CHANNEL DEFINITION LISTING

PAGE 1

CARD CODE	SECT NO	CHN TYPE	NO OF PIERS	AVE PIER WIDTH	HEIGHT 1 DIAMETER	BASE WIDTH	ZL	ZR	INV DROP	Y(1)	Y(2)	Y(3)	Y(4)	Y(5)	Y(6)	Y(7)	Y(8)	Y(9)	Y(10)
CD	18	4			1.50														
CD	24	4			2.00														
CD	30	4			2.50														
CD	36	4			3.00														
CD	42	4			3.50														
CD	48	4			4.00														
CD	54	4			4.50														
CD	60	4			5.00														
CD	66	4			5.50														
CD	72	4			6.00														
CD	78	4			6.50														

F 0 5 1 5 P

PAGE NO 3

WATER SURFACE PROFILE - TITLE CARD LISTING

HEADING LINE NO 1 IS -

SKYE CANYON INFRASTRUCTURE - PHASE 2 (UPDATE NO.3)

HEADING LINE NO 2 IS -

BY OLYMPIA COMPANIES

HEADING LINE NO 3 IS -

EAGLE CANYON - LATERAL P3B-L
F 0 5 1 5 P

PAGE NO 2

WATER SURFACE PROFILE - ELEMENT CARD LISTING

ELEMENT NO	1 IS A SYSTEM OUTLET U/S DATA	STATION	INVERT SECT	W S ELEV
		1000.00	2911.31	2916.47
ELEMENT NO	2 IS A REACH U/S DATA	STATION	INVERT SECT	RADIUS
		1021.00	2912.36	0.00
ELEMENT NO	3 IS A SYSTEM HEADWORKS U/S DATA	STATION	INVERT SECT	ANG PT
		1021.00	2912.36	0.00
				MAN H
				1

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

PAGE 1

F0515P
WATER SURFACE PROFILE LISTING
SKYE CANYON INFRASTRUCTURE - PHASE 2 (UPDATE NO.3)

BY OLYMPIA COMPANIES
EAGLE CANYON - LATERAL P3B-L

P3B-L.OUT

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	2911.31	5.160	2916.470	18.0	10.19	1.611	2918.081	0.00	1.451	1.50	0.00	0.00	0	0.00
21.00	0.05000					.029364	0.62		0.980			0.00		
1021.00	2912.36	4.807	2917.167	18.0	10.19	1.611	2918.778	0.00	1.451	1.50	0.00	0.00	0	0.00#

** WARNING NO. 22 ** - NO PLOT GENERATED, BAD DATA OR NOT ENOUGH POINTS, 3 OR LESS #

0	T1	SKYE CANYON INFRASTRUCTURE - PHASE 2 (UPDATE NO.3)			
	T2	BY OLYMPIA COMPANIES			
	T3	EAGLE CANYON LATERAL P4-L1			
	SO	1000.002890.30 30		2899.69	
	R	1022.002894.54 30	.013		45. 1
	JX	1022.002894.58 30 30	.013	3.0	
	R	1072.002894.89 30	.013		90.00 1
	SH	1072.002894.89 30			
	CD	18 4	1.5		
	CD	24 4	2.		
	CD	30 4	2.5		
	CD	36 4	3.		
	CD	42 4	3.5		
	CD	48 4	4.		
	CD	54 4	4.5		
	CD	60 4	5.		
	CD	66 4	5.5		
	CD	72 4	6.		
	CD	78 4	6.5		

0 40.0

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DATE: 12/ 9/2016
TIME: 11:27

F0515P
WATER SURFACE PROFILE - CHANNEL DEFINITION LISTING

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F0515P

WATER SURFACE PROFILE - TITLE CARD LISTING

SKYE CANYON INFRASTRUCTURE - PHASE 2 (UPDATE NO.3)

BY OLYMPIA COMPANIES

EAGLE CANYON LATERAL P4-L1 F 0 5 1 5 P

WATER SURFACE PROFILE - ELEMENT CARD LISTING

ELEMENT NO	1	IS A	SYSTEM OUTLET U/S DATA	* STATION 1000.00	* INVERT 2890.30	* SECT 30	W S ELEV 2899.69				
ELEMENT NO	2	IS A	REACH U/S DATA	* STATION 1022.00	* INVERT 2894.54	* SECT 30	N 0.013	RADIUS 0.00	ANGLE 0.00	ANG PT 45.00	MAN H 1
ELEMENT NO	3	IS A	JUNCTION U/S DATA	* STATION 1022.00	* INVERT 2894.58	* SECT 30	* LAT-1 30	* INVERT-4 0.00	* PHI 3 90.00	* PHI 4 0.00	
ELEMENT NO	4	IS A	REACH U/S DATA	* STATION 1072.00	* INVERT 2894.89	* SECT 30	* LAT-2 0	Q3 3.0	Q4 0.0	INVERT-3 2894.58	
ELEMENT NO	5	IS A	SYSTEM HEADWORKS U/S DATA	* STATION	* INVERT	* SECT	N 0.013	RADIUS 0.00	ANGLE 0.00	ANG PT 0.00	MAN H 1

NO EDIT ERRORS ENCOUNTERED-COMPUTATION IS NOW BEGINNING
 ** WARNING NO. 2 ** - WATER SURFACE ELEVATION GIVEN IS LESS THAN OR EQUALS INVERT ELEVATION IN HDWKDS, W.S.ELEV = INV + DC ±
 LICENSEE: SLATER HANIFAN GROUP F0515p PAGE 1

1072	00	2894	89	30
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NO EDIT ERRORS ENCOUNTERED-COMPUTATION IS NOW BEGINNING
 *** WARNING NO. 2 ** - WATER SURFACE ELEVATION GIVEN IS 1
 LICENSEE: SLATER HANIFAN GROUP

WATER SURFACE PROFILE LISTING

SKYE CANYON INFRASTRUCTURE - PHASE 2 (UPDATE NO.3)

EAGLE CANYON LATERAL P4-L1

STATION	INVERT ELEV	DEPTH OF FLOW	W.S. ELEV	Q	VEL HEAD	ENERGY GRD, EL.	SUPER ELEV	CRITICAL DEPTH	HGT/ DTA	BASE/ ID NO.	ZL	NO AVBPR PIER
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L/ELEM      SO      SF AVE      HF      NORM DEPTH      ZR
*****

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1000.00	2890.30	9.390	2899.690	43.0	8.76	1.191	2900.881	0.00	2.190	2.50	0.00	0.00
22.00	0.19273					.010990	0.24		0.830		0.00	

JUNCT STR	0.00000	.010250	0.00	0.00	0.00	0.00
1022.00	2894.54	5.628	2900.168	43.0	8.76	1.191
						2901.359
						0.00
						2.190
						2.50
						0.00
						0.00
						0.00

1022.00	2894.58	5.909	2900.489	40.0	8.15	1.031	2901.520	0.00	2.129	2.50	0.00	0.00
50.00	0.00620					.009510	0.48			2.500	0.00	

1072.00	2894.89	6.126	2901.016	40.0	8.15	1.031	2902.047	0.00	2.129	2.50	0.00	0.00	0.00
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SKYE CANYON INFRASTRUCTURE - PHASE 2 (UPDATE NO.3)
BY OLYMPIA COMPANIES
EAGLE CANYON LATERAL P4-L1

[illegible]

	I	C	H	R
1032.33	.	.	.	.
1033.80	.	.	.	.
1035.27	.	.	.	.
1036.73	.	.	.	.
1038.20	.	.	.	.
1039.67	.	.	.	.
1041.14	.	.	.	.
1042.61	.	.	.	.
1044.08	.	.	.	.
1045.55	.	.	.	.
1047.02	.	.	.	.
1048.49	.	.	.	.
1049.96	.	.	.	.
1051.43	.	.	.	.
1052.90	.	.	.	.
1054.37	.	.	.	.
1055.84	.	.	.	.
1057.31	.	.	.	.
1058.78	.	.	.	.
1060.24	.	.	.	.
1061.71	.	.	.	.
1063.18	.	.	.	.
1064.65	.	.	.	.
1066.12	.	.	.	.
1067.59	.	.	.	.
1069.06	.	.	.	.
1070.53	.	.	.	E.
1072.00	.	.	.	.
2890.30	2891.47	2892.65	2893.82	2895.00
		2896.17	2897.35	2898.52
			2899.70	2900.87
				2902.05

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

0	T1	SKYE CANYON INFRASTRUCTURE - PHASE 2 (UPDATE NO.3)	
	T2	BY OLYMPIA COMPANIES	
	T3	EAGLE CANYON LATERAL P4-L2	
	SO	1000.002891.30 30	2899.69
	R	1051.002896.37 30	.013
	SH	1051.002896.37 30	
	CD	18 4	1.5
	CD	24 4	2.
	CD	30 4	2.5
	CD	36 4	3.
	CD	42 4	3.5
	CD	48 4	4.
	CD	54 4	4.5
	CD	60 4	5.
	CD	66 4	5.5
	CD	72 4	6.
	CD	78 4	6.5

0

3.0

P4-L2.WSQ

P4-L2.OUT

DATE: 12/ 9/2016
TIME: 11:28

F0515P
WATER SURFACE PROFILE - CHANNEL DEFINITION LISTING

CARD	SECT	CHN	NO OF	AVE	PIER	HEIGHT	BASE	ZL	ZR	INV	Y(1)	Y(2)	Y(3)	Y(4)	Y(5)	Y(6)	Y(7)	Y(8)	Y(9)	Y(10)	PAGE
CODE	NO	TYPE	PIERS	WIDTH	DIA	1	WIDTH			DROP											

CD	18	4				1.50															
CD	24	4				2.00															
CD	30	4				2.50															
CD	36	4				3.00															
CD	42	4				3.50															
CD	48	4				4.00															
CD	54	4				4.50															
CD	60	4				5.00															
CD	66	4				5.50															
CD	72	4				6.00															
CD	78	4				6.50															

F 0 5 1 5 P

PAGE NO 3

WATER SURFACE PROFILE - TITLE CARD LISTING

HEADING LINE NO 1 IS -

SKYE CANYON INFRASTRUCTURE - PHASE 2 (UPDATE NO.3)

HEADING LINE NO 2 IS -

BY OLYMPIA COMPANIES

HEADING LINE NO 3 IS -

EAGLE CANYON LATERAL P4-L2
F 0 5 1 5 P

PAGE NO 2

WATER SURFACE PROFILE - ELEMENT CARD LISTING

ELEMENT NO	1	IS A SYSTEM OUTLET	STATION	INVERT	SECT	W S ELEV
		U/S DATA	1000.00	2891.30	30	2899.69

ELEMENT NO	2	IS A REACH	STATION	INVERT	SECT	RADIUS	ANGLE	ANG PT	MAN H
		U/S DATA	1051.00	2896.37	30	0.00	0.00	45.00	1

ELEMENT NO	3	IS A SYSTEM HEADWORKS	STATION	INVERT	SECT	W S ELEV
		U/S DATA	1051.00	2896.37	30	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 2 (UPDATE NO.3)

BY OLYMPIA COMPANIES

EAGLE CANYON LATERAL P4-L2

Page 1

P4-L2.OUT

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
L/ELEM	SO					SF AVE	HF		NORM DEPTH			ZR	
1000.00	2891.30	8.390	2899.690	3.0	0.61	0.006	2899.696	0.00	0.567	2.50	0.00	0.00	0 0.00
51.00	0.09941					.000053	0.00		0.260			0.00	
1051.00	2896.37	3.324	2899.694	3.0	0.61	0.006	2899.700	0.00	0.567	2.50	0.00	0.00	0 0.00‡

** WARNING NO. 22 ** - NO PLOT GENERATED, BAD DATA OR NOT ENOUGH POINTS, 3 OR LESS ‡

0	T1	SKYE CANYON INFRASTRUCTURE - PHASE 2 (UPDATE NO.3)	
	T2	BY OLYMPIA COMPANIES	
	T3	EAGLE CANYON LATERAL P5B-L1	
	SO	1000.002842.63 18	2849.82
	R	1028.002845.39 18	.013
	SH	1028.002845.39 18	
	CD	18 4	1.5
	CD	24 4	2.
	CD	30 4	2.5
	CD	36 4	3.
	CD	42 4	3.5
	CD	48 4	4.
	CD	54 4	4.5
	CD	60 4	5.
	CD	66 4	5.5
	CD	72 4	6.
	CD	78 4	6.5

0 0 5.0

P5B-L1.OUT

DATE: 12/ 9/2016
TIME: 11:29

F0515P
WATER SURFACE PROFILE - CHANNEL DEFINITION LISTING

PAGE 1

CARD CODE	SECT NO	CHN TYPE	NO OF PIERS	AVE PIER WIDTH	HEIGHT 1 DIAMETER	BASE WIDTH	ZL	ZR	INV	Y(1)	Y(2)	Y(3)	Y(4)	Y(5)	Y(6)	Y(7)	Y(8)	Y(9)	Y(10)
CD	18	4			1.50														
CD	24	4			2.00														
CD	30	4			2.50														
CD	36	4			3.00														
CD	42	4			3.50														
CD	48	4			4.00														
CD	54	4			4.50														
CD	60	4			5.00														
CD	66	4			5.50														
CD	72	4			6.00														
CD	78	4			6.50														

F 0 5 1 5 P

PAGE NO 3

WATER SURFACE PROFILE - TITLE CARD LISTING

HEADING LINE NO 1 IS -

SKYE CANYON INFRASTRUCTURE - PHASE 2 (UPDATE NO.3)

HEADING LINE NO 2 IS -

BY OLYMPIA COMPANIES

HEADING LINE NO 3 IS -

EAGLE CANYON LATERAL P5B-L1
F 0 5 1 5 P

PAGE NO 2

WATER SURFACE PROFILE - ELEMENT CARD LISTING

ELEMENT NO	1	IS A SYSTEM OUTLET	* INVERT SECT	U/S DATA	STATION	1000.00	2842.63	18	W S ELEV	2849.82
ELEMENT NO	2	IS A REACH	* INVERT SECT	U/S DATA	STATION	1028.00	2845.39	18	RADIUS	0.00
ELEMENT NO	3	IS A SYSTEM HEADWORKS	* INVERT SECT	U/S DATA	STATION	1028.00	2845.39	18	ANGLE	0.00
									PT	45.00
									MAN	H
										1

PAGE 1

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 2 (UPDATE NO.3)

BY OLYMPIA COMPANIES
EAGLE CANYON LATERAL P5B-L1

P5B-L1.OUT

STATION L/ELEM	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
***** SO ***** SF AVE ***** HF ***** NORM DEPTH ***** ZR *****													
1000.00	2842.63	7.190	2849.820	5.0	2.83	0.124	2849.944	0.00	0.860	1.50	0.00	0.00	0 0.00
28.00	0.09857					.002266	0.06		0.400			0.00	
1028.00	2845.39	4.518	2849.908	5.0	2.83	0.124	2850.032	0.00	0.860	1.50	0.00	0.00	0 0.00‡

** WARNING NO. 22 ** - NO PLOT GENERATED, BAD DATA OR NOT ENOUGH POINTS, 3 OR LESS ‡

0	T1	SKYE CANYON INFRASTRUCTURE - PHASE 2 (UPDATE NO.3)		
	T2	BY OLYMPIA COMPANIES		
	T3	EAGLE CANYON LATERAL P5B-L2		
	SO	1000.002842.63 18	2849.82	
	R	1028.002845.39 18		45. 1
	SH	1028.002845.39 18		
	CD	18 4	1.5	
	CD	24 4	2.	
	CD	30 4	2.5	
	CD	36 4	3.	
	CD	42 4	3.5	
	CD	48 4	4.	
	CD	54 4	4.5	
	CD	60 4	5.	
	CD	66 4	5.5	
	CD	72 4	6.	
	CD	78 4	6.5	

0 0

5.0

P5B-L2.OUT

†
DATE: 12/ 9/2016
TIME: 11:29

F0515P																			
WATER SURFACE PROFILE - CHANNEL DEFINITION LISTING																			
CARD	SECT	CHN	NO OF	AVE	HEIGHT	BASE	ZL	ZR	INV	Y(1)	Y(2)	Y(3)	Y(4)	Y(5)	Y(6)	Y(7)	Y(8)	Y(9)	Y(10)
CODE	NO	TYPE	PIERS	WIDTH	DIAMETER	WIDTH			DROP										
CD	18	4			1.50														
CD	24	4			2.00														
CD	30	4			2.50														
CD	36	4			3.00														
CD	42	4			3.50														
CD	48	4			4.00														
CD	54	4			4.50														
CD	60	4			5.00														
CD	66	4			5.50														
CD	72	4			6.00														
CD	78	4			6.50														
F 0 5 1 5 P										PAGE NO 3									

WATER SURFACE PROFILE - TITLE CARD LISTING

HEADING LINE NO 1 IS -

SKYE CANYON INFRASTRUCTURE - PHASE 2 (UPDATE NO.3)

HEADING LINE NO 2 IS -

BY OLYMPIA COMPANIES

HEADING LINE NO 3 IS -

EAGLE CANYON LATERAL P5B-L2
F 0 5 1 5 P

WATER SURFACE PROFILE - ELEMENT CARD LISTING

ELEMENT NO	1	IS A	SYSTEM OUTLET	U/S DATA	STATION	INVERT	SECT	W S ELEV	RADIUS	ANGLE	ANG PT	MAN H	PAGE 2
					1000.00	2842.63	18	2849.82					
ELEMENT NO	2	IS A	REACH	U/S DATA	STATION	INVERT	SECT						
					1028.00	2845.39	18						
ELEMENT NO	3	IS A	SYSTEM HEADWORKS	U/S DATA	STATION	INVERT	SECT	W S ELEV					
					1028.00	2845.39	18	0.00					
NO EDIT ERRORS ENCOUNTERED-COMPUTATION IS NOW BEGINNING												PAGE 1	
** WARNING NO.2 ** - WATER SURFACE ELEVATION GIVEN IS LESS THAN OR EQUALS INVERT ELEVATION IN HDWKDS, W.S.ELEV = INV + DC †												PAGE 1	
LICENSEE: SLATER HANIFAN GROUP												PAGE 1	

F0515P
WATER SURFACE PROFILE LISTING

SKYE CANYON INFRASTRUCTURE - PHASE 2 (UPDATE NO.3)
BY OLYMPIA COMPANIES
EAGLE CANYON LATERAL P5B-L2

P5B-L2.OUT

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	2842.63	7.190	2849.820	5.0	2.83	0.124	2849.944	0.00	0.860	1.50	0.00	0.00	0	0.00
28.00	0.09857					.002266	0.06		0.400			0.00		
1028.00	2845.39	4.518	2849.908	5.0	2.83	0.124	2850.032	0.00	0.860	1.50	0.00	0.00	0	0.00#

** WARNING NO. 22 ** - NO PLOT GENERATED, BAD DATA OR NOT ENOUGH POINTS, 3 OR LESS #

0	T1	SKYE CANYON INFRASTRUCTURE - PHASE 2 (UPDATE NO.3)	
	T2	BY OLYMPIA COMPANIES	
	T3	EAGLE CANYON LATERAL P5-L1	
	SO	1000.002876.44 18	2880.60
	R	1020.002876.64 18	.013
	SH	1020.002876.64 18	
	CD	18 4	1.5
	CD	24 4	2.
	CD	30 4	2.5
	CD	36 4	3.
	CD	42 4	3.5
	CD	48 4	4.
	CD	54 4	4.5
	CD	60 4	5.
	CD	66 4	5.5
	CD	72 4	6.
	CD	78 4	6.5
	+		

0 0

5.0

P5-L1.WSQ

P5-L1.OUT

DATE: 12/ 9/2016
TIME: 11:30

F0515P
WATER SURFACE PROFILE - CHANNEL DEFINITION LISTING

CARD	SECT	CHN	NO OF	AVE	PIER	HEIGHT	1	BASE	ZL	ZR	INV	Y(1)	Y(2)	Y(3)	Y(4)	Y(5)	Y(6)	Y(7)	Y(8)	Y(9)	Y(10)	PAGE	1
CODE	NO	TYPE	PIERS	WIDTH	DIAMETER	WIDTH				DROP													
CD	18	4			1.50																		
CD	24	4			2.00																		
CD	30	4			2.50																		
CD	36	4			3.00																		
CD	42	4			3.50																		
CD	48	4			4.00																		
CD	54	4			4.50																		
CD	60	4			5.00																		
CD	66	4			5.50																		
CD	72	4			6.00																		
CD	78	4			6.50																		

F 0 5 1 5 P

PAGE NO 3

WATER SURFACE PROFILE - TITLE CARD LISTING

HEADING LINE NO 1 IS -

SKYE CANYON INFRASTRUCTURE - PHASE 2 (UPDATE NO.3)

HEADING LINE NO 2 IS -

BY OLYMPIA COMPANIES

HEADING LINE NO 3 IS -

EAGLE CANYON LATERAL P5-L1
F 0 5 1 5 P

PAGE NO 2

WATER SURFACE PROFILE - ELEMENT CARD LISTING

ELEMENT NO	1	IS A	SYSTEM OUTLET	*	INVERT	SECT	*	W S ELEV	RADIUS	ANGLE	ANG	PT	MAN	H
			U/S DATA	STATION	1000.00	2876.44	18	2880.60	0.00	0.00	45.00	1		
ELEMENT NO	2	IS A	REACH	*	INVERT	SECT	*							
			U/S DATA	STATION	1020.00	2876.64	18							
ELEMENT NO	3	IS A	SYSTEM HEADWORKS	*	INVERT	SECT	*							
			U/S DATA	STATION	1020.00	2876.64	18							

NO EDIT ERRORS ENCOUNTERED-COMPUTATION IS NOW BEGINNING

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

LICENSEE: SLATER HANIIFAN GROUP

F0515P

PAGE 1

WATER SURFACE PROFILE LISTING

SKYE CANYON INFRASTRUCTURE - PHASE 2 (UPDATE NO.3)

BY OLYMPIA COMPANIES

EAGLE CANYON LATERAL P5-L1

Page 1

P5-L1.0UT

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
L/ELEM	SO					SF AVE	HF		NORM DEPTH			ZR	
1000.00	2876.44	4.160	2880.600	5.0	2.83	0.124	2880.724	0.00	0.860	1.50	0.00	0.00	0 0.00
20.00	0.01000					.002266	0.05		0.730			0.00	
1020.00	2876.64	4.030	2880.670	5.0	2.83	0.124	2880.794	0.00	0.860	1.50	0.00	0.00	0 0.00

** WARNING NO. 22 ** - NO PLOT GENERATED, BAD DATA OR NOT ENOUGH POINTS, 3 OR LESS

0	T1	SKYE CANYON INFRASTRUCTURE - PHASE 2 (UPDATE NO.3)			
	T2	BY OLYMPIA COMPANIES			
	T3	EAGLE CANYON LATERAL P5-L2			
	SO	1000.002875.94 24	2880.60		
	R	1021.002877.32 24		45.	1
	JX	1021.002877.36 24	5.0	90.00	
	R	1051.002877.66 24			1
	SH	1051.002877.66 24			
	CD	18 4			
	CD	24 4			
	CD	30 4			
	CD	36 4			
	CD	42 4			
	CD	48 4			
	CD	54 4			
	CD	60 4			
	CD	66 4			
	CD	72 4			
	CD	78 4			

P5-L2

0 9 t

16.0

P5-L2

DATE: 12/15/2016
TIME: 10: 0

WATER SURFACE PROFILE - CHANNEL DEFINITION LISTING
F051SP
PAGE 1

CARD CODE	SECT NO	CHN TYPE	NO OF PIERS	AVE WIDTH	BASE WIDTH	ZL	ZR	INV	Y(1)	Y(2)	Y(3)	Y(4)	Y(5)	Y(6)	Y(7)	Y(8)	Y(9)	Y(10)
CD	18	4																
CD	24	4																
CD	30	4																
CD	36	4																
CD	42	4																
CD	48	4																
CD	54	4																
CD	60	4																
CD	66	4																
CD	72	4																
CD	78	4																

PAGE NO 3

F 0 5 1 5 P

WATER SURFACE PROFILE - TITLE CARD LISTING

HEADING LINE NO 1 IS -

SKYE CANYON INFRASTRUCTURE - PHASE 2 (UPDATE NO.3)

BY OLYMPIA COMPANIES

HEADING LINE NO 3 IS -

EAGLE CANYON LATERAL P5-L2

F 0 5 1 5 P

PAGE NO 2

WATER SURFACE PROFILE - ELEMENT CARD LISTING

ELEMENT NO	1 IS A SYSTEM OUTLET U/S DATA	INVERT SECT	STATION	INVERT SECT	STATION	Q	W.S. ELEV	W.S. ELEV	INVERT-3	INVERT-4	PHI 3	PHI 4	RADIUS	ANGLE	ANG PT	MAN H
ELEMENT NO 2 IS A REACH U/S DATA			1021.00	2877.32	24		2880.60	2880.60								
ELEMENT NO 3 IS A JUNCTION U/S DATA			1021.00	2877.36	24		2877.36	2877.36	5.0	0.0	90.00	0.00				
ELEMENT NO 4 IS A REACH U/S DATA			1051.00	2877.66	24		2877.66	2877.66								
ELEMENT NO 5 IS A SYSTEM HEADWORKS U/S DATA			1051.00	2877.66	24		2877.66	2877.66								

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

WATER SURFACE PROFILE LISTING
F051SP
SKYE CANYON INFRASTRUCTURE - PHASE 2 (UPDATE NO.3)
BY OLYMPIA COMPANIES
EAGLE CANYON LATERAL P5-L2

STATION	INVERT ELEV	DEPTH OF FLOW	W.S. ELEV	Q	VEL	VEL HEAD	ENERGY GRD-EL.	CRITICAL DEPTH	HGT/DIA	BASE/ID NO.	ZL	NO AVBPR PIER
1000.00	2875.94	4.660	2880.600	21.0	6.68	0.694	2881.294	0.00	1.642	2.00	0.00	0 0.00
21.00	0.06571					.008617	0.18				0.830	0.00

Page 1

[illegible]

SKYE CANYON INFRASTRUCTURE - PHASE 2 (UPDATE NO.3)
BY OLYMPIA COMPANIES
EAGLE CANYON LATERAL P5-L2

[illegible]

NOTE S
1. GLOSSARY
I = INVERT ELEVATION
C = CRITICAL DEPTH
W = WATER SURFACE ELEVATION

P5-L2

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.

0	T1	SKYE CANYON INFRASTRUCTURE - PHASE 2 (UPDATE NO.3)			
	T2	BY OLYMPIA COMPANIES			
	T3	EAGLE CANYON LATERAL P6-L1			
	SO	1000.002839.13 42	2842.93		
	R	1030.002839.30 42	.013	45.	1
	JX	1030.002839.28 36	.013	20.0	
	R	1065.002839.48 36	.013	90.00	1
	SH	1065.002839.48 36			
	CD	18 4	1.5		
	CD	24 4	2.		
	CD	30 4	2.5		
	CD	36 4	3.		
	CD	42 4	3.5		
	CD	48 4	4.		
	CD	54 4	4.5		
	CD	60 4	5.		
	CD	66 4	5.5		
	CD	72 4	6.		
	CD	78 4	6.5		

0

24.0

P6-L1.WSQ

P6-L1.OUT

DATE: 12/ 9/2016
TIME: 11:31

F0515P
WATER SURFACE PROFILE - CHANNEL DEFINITION LISTING

CARD	SECT	CHN	NO OF	AVE	PIER	HEIGHT	1	BASE	ZL	ZR	INV	Y(1)	Y(2)	Y(3)	Y(4)	Y(5)	Y(6)	Y(7)	Y(8)	Y(9)	Y(10)	PAGE
CODE	NO	TYPE	PIERS	WIDTH	DIAMETER	WIDTH					DROP											

CD	18	4				1.50																
CD	24	4				2.00																
CD	30	4				2.50																
CD	36	4				3.00																
CD	42	4				3.50																
CD	48	4				4.00																
CD	54	4				4.50																
CD	60	4				5.00																
CD	66	4				5.50																
CD	72	4				6.00																
CD	78	4				6.50																

F 0 5 1 5 P

PAGE NO 3

WATER SURFACE PROFILE - TITLE CARD LISTING

HEADING LINE NO 1 IS -

SKYE CANYON INFRASTRUCTURE - PHASE 2 (UPDATE NO.3)

HEADING LINE NO 2 IS -

BY OLYMPIA COMPANIES

HEADING LINE NO 3 IS -

EAGLE CANYON LATERAL P6-L1
F 0 5 1 5 P

♀

PAGE NO 2

WATER SURFACE PROFILE - ELEMENT CARD LISTING

ELEMENT NO	1 IS A SYSTEM OUTLET U/S DATA	STATION	INVERT	SECT	W S ELEV
------------	-------------------------------	---------	--------	------	----------

2842.93

ELEMENT NO	2 IS A REACH U/S DATA	STATION	INVERT	SECT	
		1030.00	2839.30	42	

N 0.013

ELEMENT NO	3 IS A JUNCTION U/S DATA	STATION	INVERT	SECT	
		1030.00	2839.28	36	

N 0.013

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	
		1065.00	2839.48	36	

N 0.013

RADIUS	ANGLE	ANG	PT	MAN	H
--------	-------	-----	----	-----	---

1

Page 1

ELEMENT NO 5 IS A SYSTEM HEADWORKS P6-L1.OUT *
U/S DATA STATION INVERT SECT W S ELEV
1065.00 2839.48 36 0.00
NO EDIT ERRORS ENCOUNTERED-COMPUTATION IS NOW BEGINNING
** WARNING NO. 2 ** - WATER SURFACE ELEVATION GIVEN IS LESS THAN OR EQUALS INVERT ELEVATION IN HDWKDS, W.S.ELEV = INV + DC ±
LICENSEE: SLATER HANIFAN GROUP F0515P PAGE 1

WATER SURFACE PROFILE LISTING
SKYE CANYON INFRASTRUCTURE - PHASE 2 (UPDATE NO.3)
BY OLYMPIA COMPANIES
EAGLE CANYON LATERAL P6-L1

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							
1000.00	2839.13	3.800	2842.930	44.0	4.57	0.325	2843.255	0.00	2.068	3.50	0.00	0.00	0	0.00
30.00	0.00567					.001913	0.06					0.00		
1030.00	2839.30	3.752	2843.052	44.0	4.57	0.325	2843.377	0.00	2.068	3.50	0.00	0.00	0	0.00
JUNCT STR	0.00000					.001604	0.00					0.00		
1030.00	2839.28	4.217	2843.497	24.0	3.40	0.179	2843.676	0.00	1.579	3.00	0.00	0.00	0	0.00
35.00	0.00571					.001295	0.05					0.00		
1065.00	2839.48	4.072	2843.552	24.0	3.40	0.179	2843.731	0.00	1.579	3.00	0.00	0.00	0	0.00

SKYE CANYON INFRASTRUCTURE - PHASE 2 (UPDATE NO.3)
BY OLYMPIA COMPANIES
EAGLE CANYON LATERAL P6-L1

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1007.96	.	.	.	.	.	.	.	.	.	.	.	.	.	.
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1019.90	.	.	.	.	.	.	.	.	.	.	.	.	.	.
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1023.88	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1025.20	.	.	.	.	.	.	.	.	.	.	.	.	.	.

[illegible]NOTES
1. GLOSSARY

- 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 $\frac{1}{2}$ IN WALL ENTRANCE OR EXIT

0	T1	SKYE CANYON INFRASTRUCTURE - PHASE 2 (UPDATE NO.3)			
	T2	BY OLYMPIA COMPANIES			
	T3	EAGLE CANYON LATERAL P6-L1			
	SO	1000.002839.13 42	2842.93		
	R	1028.002839.49 42	.013	45.	1
	JX	1028.002840.99 24 24	.013	20.0	
	R	1058.002841.44 24	.013	90.00	1
	SH	1058.002841.44 24			
	CD	18 4	1.5		
	CD	24 4	2.		
	CD	30 4	2.5		
	CD	36 4	3.		
	CD	42 4	3.5		
	CD	48 4	4.		
	CD	54 4	4.5		
	CD	60 4	5.		
	CD	66 4	5.5		
	CD	72 4	6.		
	CD	78 4	6.5		

DATE: 12/ 9/2016
TIME: 11:31

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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)	PAGE	1
CD	18	4			1.50															
CD	24	4			2.00															
CD	30	4			2.50															
CD	36	4			3.00															
CD	42	4			3.50															
CD	48	4			4.00															
CD	54	4			4.50															
CD	60	4			5.00															
CD	66	4			5.50															
CD	72	4			6.00															
CD	78	4			6.50															

F 0 5 1 5 P

PAGE NO 3

WATER SURFACE PROFILE - TITLE CARD LISTING

HEADING LINE NO 1 IS -

SKYE CANYON INFRASTRUCTURE - PHASE 2 (UPDATE NO.3)

HEADING LINE NO 2 IS -

BY OLYMPIA COMPANIES

HEADING LINE NO 3 IS -

EAGLE CANYON LATERAL P6-L1
F 0 5 1 5 P

PAGE NO 2

WATER SURFACE PROFILE - ELEMENT CARD LISTING

ELEMENT NO	1 IS A SYSTEM OUTLET U/S DATA	STATION	INVERT	SECT	W S ELEV
		1000.00	2839.13	42	2842.93
ELEMENT NO	2 IS A REACH U/S DATA	STATION	INVERT	SECT	
		1028.00	2839.49	42	
ELEMENT NO	3 IS A JUNCTION U/S DATA	STATION	INVERT	SECT	
		1028.00	2840.99	24	
ELEMENT NO	4 IS A REACH U/S DATA	STATION	INVERT	SECT	
		1058.00	2841.44	24	
ELEMENT NO	5 IS A SYSTEM HEADWORKS U/S DATA	STATION	INVERT	SECT	

Page 1

1058.00 2841.44 24 P6-L2.OUT 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 1
LICENSEE: SLATER HANIFAN GROUP F0515P PAGE 1

WATER SURFACE PROFILE LISTING
SKYE CANYON INFRASTRUCTURE - PHASE 2 (UPDATE NO.3)
BY OLYMPIA COMPANIES
EAGLE CANYON LATERAL P6-L1

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					
1000.00	2839.13	3.800	2842.930	37.0	3.85	0.230	2843.160	0.00	1.889	3.50	0.00	0.00	0	0.00
28.00	0.01286					.001352	0.04		1.370			0.00		
1028.00	2839.49	3.523	2843.013	37.0	3.85	0.230	2843.243	0.00	1.889	3.50	0.00	0.00	0	0.00
JUNCT STR	0.00000					.003500	0.00					0.00		
1028.00	2840.99	2.268	2843.258	17.0	5.41	0.455	2843.713	0.00	1.486	2.00	0.00	0.00	0	0.00
30.00	0.01500					.005647	0.17		1.130			0.00		
1058.00	2841.44	2.010	2843.450	17.0	5.41	0.455	2843.905	0.00	1.486	2.00	0.00	0.00	0	0.00

SKYE CANYON INFRASTRUCTURE - PHASE 2 (UPDATE NO.3)
BY OLYMPIA COMPANIES
EAGLE CANYON LATERAL P6-L1

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0	T1	SKYE CANYON INFRASTRUCTURE - PHASE 2 (UPDATE NO.3)			
	T2	BY OLYMPIA COMPANIES			
	T3	EAGLE CANYON - TRUNK STORM DRAIN (WEST PORTION)			
	SO	1000.002909.81 36		2916.47	
	R	1118.002913.45 36	.013		
	JX	1118.002913.45 36 18	.013	26.0	2914.95
	R	1138.002915.42 36	.013		
	SH	1138.002915.42 36			
	CD	18 4			1.5
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WATER SURFACE PROFILE - CHANNEL DEFINITION LISTING

PAGE 1

CARD CODE	SECT NO	CHN TYPE	NO OF PIERS	AVE PIER WIDTH	HEIGHT 1 DIAMETER	BASE WIDTH	ZL	ZR	INV DROP	Y(1)	Y(2)	Y(3)	Y(4)	Y(5)	Y(6)	Y(7)	Y(8)	Y(9)	Y(10)
CD	18	4			1.50														
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CD	30	4			2.50														
CD	36	4			3.00														
CD	42	4			3.50														
CD	48	4			4.00														
CD	54	4			4.50														
CD	60	4			5.00														
CD	66	4			5.50														
CD	72	4			6.00														
CD	78	4			6.50														

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PAGE NO 3

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WATER SURFACE PROFILE - TITLE CARD LISTING

HEADING LINE NO 1 IS -

SKYE CANYON INFRASTRUCTURE - PHASE 2 (UPDATE NO.3)

HEADING LINE NO 2 IS -

BY OLYMPIA COMPANIES

HEADING LINE NO 3 IS -

EAGLE CANYON - TRUNK STORM DRAIN (WEST PORTION)
F 0 5 1 5 P

PAGE NO 2

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WATER SURFACE PROFILE - ELEMENT CARD LISTING

ELEMENT NO	1	IS A SYSTEM OUTLET U/S DATA	*	STATION 1000.00	*	INVERT 2909.81	*	SECT 36																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														</
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NO EDIT ERRORS ENCOUNTERED-COMPUTATION IS NOW BEGINNING

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

WATER SURFACE PROFILE LISTING
SKYE CANYON INFRASTRUCTURE - PHASE 2 (UPDATE NO.3)
BY OLYMPIA COMPANIES
EAGLE CANYON - TRUNK STORM DRAIN (WEST PORTION)

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	2909.81	6.660	2916.470	52.0	7.36	0.840	2917.310	0.00	2.345	3.00	0.00	0.00	0	0.00
118.00	0.03085					.006078	0.72		1.400			0.00		
1118.00	2913.45	3.946	2917.396	52.0	7.36	0.840	2918.236	0.00	2.345	3.00	0.00	0.00	0	0.00
JUNCT STR	0.00000					.003799	0.00					0.00		
1118.00	2913.45	4.576	2918.026	26.0	3.68	0.210	2918.236	0.00	1.647	3.00	0.00	0.00	0	0.00
16.25	0.09850					.001508	0.02		0.712			0.00		
1134.25	2915.05	3.000	2918.051	26.0	3.68	0.210	2918.261	0.00	1.647	3.00	0.00	0.00	0	0.00
2.65	0.09850					.001413	0.00		0.712			0.00		
1136.90	2915.31	2.721	2918.032	26.0	3.86	0.231	2918.263	0.00	1.647	3.00	0.00	0.00	0	0.00
1.10	0.09850					.001362	0.00		0.712			0.00		
1138.00	2915.42	2.597	2918.017	26.0	4.00	0.248	2918.265	0.00	1.647	3.00	0.00	0.00	0	0.00

SKYE CANYON INFRASTRUCTURE - PHASE 2 (UPDATE NO.3)
BY OLYMPIA COMPANIES
EAGLE CANYON - TRUNK STORM DRAIN (WEST PORTION)

1000.00	.I	.	.	.	.	.	.	.	.	.	.	.	.	.
1002.82	.	.	.	.	.	.	.	.	.	.	.	.	.	R
1005.63	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1008.45	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1011.27	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1014.08	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1016.90	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1019.71	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1022.53	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1025.35	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1028.16	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1030.98	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1033.80	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1036.61	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1039.43	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1042.24	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1045.06	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1047.88	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1050.69	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1053.51	.	.	.	.	.	.	.	.	.	.	.	.	.	.

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1. GLOSSARY

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 |

Page 3

P3-L1.WSP

[illegible]

P3-L1.WSQ

0 Q ±

26.0

P3-L1.OUT

DATE: 12/ 9/2016
TIME: 11:32

F0515P
WATER SURFACE PROFILE - CHANNEL DEFINITION LISTING

CARD CODE	SECT NO	CHN TYPE	NO OF PIERS	AVE WIDTH	PIER WIDTH	HEIGHT 1	BASE DIAMETER	ZL	ZR	INV DROP	Y(1)	Y(2)	Y(3)	Y(4)	Y(5)	Y(6)	Y(7)	Y(8)	Y(9)	Y(10)	PAGE
CD	18	4				1.50															1
CD	24	4				2.00															
CD	30	4				2.50															
CD	36	4				3.00															
CD	42	4				3.50															
CD	48	4				4.00															
CD	54	4				4.50															
CD	60	4				5.00															
CD	66	4				5.50															
CD	72	4				6.00															
CD	78	4				6.50															

F 0 5 1 5 P

PAGE NO 3

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WATER SURFACE PROFILE - TITLE CARD LISTING

HEADING LINE NO 1 IS -

SKYE CANYON INFRASTRUCTURE - PHASE 2 (UPDATE NO.3)

HEADING LINE NO 2 IS -

BY OLYMPIA COMPANIES

HEADING LINE NO 3 IS -

EAGLE CANYON WEST LATERAL P3-L1
F 0 5 1 5 P

⌘

PAGE NO 2

WATER SURFACE PROFILE - ELEMENT CARD LISTING

ELEMENT NO	1 IS A SYSTEM OUTLET U/S DATA	STATION	INVERT	SECT	W S ELEV	2 IS A REACH U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
		1000.00	2914.95	18	2918.03						0.00	0.00	0.00	1
		1021.00	2917.05	18						0.013				

ELEMENT NO	3 IS A SYSTEM HEADWORKS U/S DATA	STATION	INVERT	SECT	W S ELEV
		1021.00	2917.05	18	0.00

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

PAGE 1

F0515P
WATER SURFACE PROFILE LISTING

SKYE CANYON INFRASTRUCTURE - PHASE 2 (UPDATE NO.3)
BY OLYMPIA COMPANIES
EAGLE CANYON WEST LATERAL P3-L1

Page 1

P3-L1.OUT

STATION	INVERT ELEV	DEPTH OF FLOW	W.S. ELEV	Q	VEL	VEL HEAD	ENERGY GRD.EL.	SUPER ELEV	CRITICAL DEPTH	HGT/ DIA	BASE/ ID NO.	ZL NO	AVBPR PIER
L/ELEM	SO					SF AVE	HF		NORM DEPTH			ZR	
1000.00	2914.95	3.080	2918.030	26.0	14.71	3.362	2921.392	0.00	1.488	1.50	0.00	0.00	0 0.00
21.00	0.10000					.061265	1.29		1.000			0.00	
1021.00	2917.05	2.435	2919.485	26.0	14.71	3.362	2922.847	0.00	1.488	1.50	0.00	0.00	0 0.00

** WARNING NO. 22 ** - NO PLOT GENERATED, BAD DATA OR NOT ENOUGH POINTS, 3 OR LESS

Egan Crest Drive & Laterals (U-ECRS & U-ECRN)

U-ECRS.WSP

	SKYE CANYON INFRASTRUCTURE - PHASE 2 (UPDATE NO.3)	
T1 T2 BY OLYMPIA COMPANIES		
T3 EGAN CREST SOUTH - TRUNK STORM DRAIN		
SO	1000.002903.63 42	2912.8
R	1025.002905.35 42	.013
R	1075.002905.60 42	.013
JX	1075.002905.60 42 18	2.0
R	1171.002906.08 42	.013
R	1306.002906.76 42	.013
R	1406.002907.76 42	.013
R	1503.502910.00 42	.013
TS	1508.502910.50 36	.013
R	1600.002912.86 36	.013
JX	1600.002912.86 36 18	18 .013
R	1689.002915.09 36	.013
R	1759.002916.14 36	.013
R	1793.002922.43 36	.013
JX	1793.002922.63 48	.013
R	1801.002922.91 48	.013
SH	1801.002922.91 48	
CD	18 4	1.5
CD	24 4	2.
CD	30 4	2.5
CD	36 4	3.
CD	42 4	3.5
CD	48 4	4.
CD	54 4	4.5
CD	60 4	5.
CD	66 4	5.5
CD	72 4	6.
CD	78 4	6.5

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U-ECRS.WSQ

U-ECRS.OUT

DATE: 12/ 7/2016
TIME: 14:27

F0515P
WATER SURFACE PROFILE - CHANNEL DEFINITION LISTING

PAGE 1

CARD NO	SECT NO	CHN TYPE	NO OF PIERS	AVE WIDTH	PIER WIDTH	HEIGHT 1	BASE DIAMETER	ZL	ZR	INV DROP	Y(1)	Y(2)	Y(3)	Y(4)	Y(5)	Y(6)	Y(7)	Y(8)	Y(9)	Y(10)
CD	18	4				1.50														
CD	24	4				2.00														
CD	30	4				2.50														
CD	36	4				3.00														
CD	42	4				3.50														
CD	48	4				4.00														
CD	54	4				4.50														
CD	60	4				5.00														
CD	66	4				5.50														
CD	72	4				6.00														
CD	78	4				6.50														

F 0 5 1 5 P

PAGE NO 3

WATER SURFACE PROFILE - TITLE CARD LISTING

HEADING LINE NO 1 IS -

SKYE CANYON INFRASTRUCTURE - PHASE 2 (UPDATE NO.3)

HEADING LINE NO 2 IS -

BY OLYMPIA COMPANIES

HEADING LINE NO 3 IS -

EGAN CREST SOUTH - TRUNK STORM DRAIN
F 0 5 1 5 P

PAGE NO 2

WATER SURFACE PROFILE - ELEMENT CARD LISTING

ELEMENT NO	1 IS A SYSTEM OUTLET U/S DATA	STATION	INVERT	SECT	W S ELEV
		1000.00	2903.63	42	2912.96

ELEMENT NO	2 IS A REACH U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
		1025.00	2905.35	42	0.013	0.00	0.00	45.00	1

ELEMENT NO	3 IS A REACH U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
		1075.00	2905.60	42	0.013	0.00	0.00	0.00	1

ELEMENT NO	4 IS A JUNCTION U/S DATA	STATION	INVERT	SECT	LAT-1	LAT-2	N	Q3	Q4	INVERT-3	INVERT-4	PHI 3	PHI 4
		1075.00	2905.60	42	18	0	0.013	2.0	0.0	2907.60	0.00	90.00	0.00

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

ELEMENT NO	5 IS A REACH U/S DATA	STATION	* INVERT	* SECT	U-ECRS.OUT	RADIUS	ANGLE	ANG PT	MAN H
ELEMENT NO	6 IS A REACH U/S DATA	STATION	* INVERT	* SECT	N 0.013	0.00	0.00	5.00	1
ELEMENT NO	7 IS A REACH U/S DATA	STATION	* INVERT	* SECT	N 0.013	0.00	0.00	5.00	1
ELEMENT NO	8 IS A REACH U/S DATA	STATION	* INVERT	* SECT	N 0.013	0.00	0.00	5.00	1
ELEMENT NO	9 IS A TRANSITION U/S DATA	STATION	* INVERT	* SECT	N 0.013	0.00	0.00	5.00	1
ELEMENT NO	10 IS A REACH U/S DATA	STATION	* INVERT	* SECT	N 0.013	0.00	0.00	0.00	1
ELEMENT NO	11 IS A JUNCTION U/S DATA	STATION	* INVERT	* SECT	N 0.013	0.00	0.00	0.00	1
THE ABOVE ELEMENT CONTAINED AN INVERT ELEV WHICH WAS NOT GREATER THAN THE PREVIOUS INVERT ELEV -WARNING THE ABOVE ELEMENT CONTAINED AN INVERT ELEV WHICH WAS NOT GREATER THAN THE PREVIOUS INVERT ELEV -WARNING F 0 5 1 5 P									
PAGE NO 3									

WATER SURFACE PROFILE - ELEMENT CARD LISTING

ELEMENT NO	12 IS A REACH U/S DATA	STATION	* INVERT	* SECT	N 0.013	RADIUS	ANGLE	ANG PT	MAN H
ELEMENT NO	13 IS A REACH U/S DATA	STATION	* INVERT	* SECT	N 0.013	0.00	0.00	5.00	1
ELEMENT NO	14 IS A REACH U/S DATA	STATION	* INVERT	* SECT	N 0.013	0.00	0.00	75.00	0
ELEMENT NO	15 IS A JUNCTION U/S DATA	STATION	* INVERT	* SECT	N 0.013	0.00	0.00	0.00	0
ELEMENT NO	16 IS A REACH U/S DATA	STATION	* INVERT	* SECT	N 0.013	0.00	0.00	0.00	0
ELEMENT NO	17 IS A SYSTEM HEADWORKS U/S DATA	STATION	* INVERT	* SECT	N 0.013	0.00	0.00	0.00	0
NO EDIT ERRORS ENCOUNTERED-COMPUTATION IS NOW BEGINNING W S ELEV 0.00									

U-ECRS.OUT
 F0515P

WATER SURFACE PROFILE LISTING
 SKYE CANYON INFRASTRUCTURE - PHASE 2 (UPDATE NO.3)
 BY OLYMPIA COMPANIES
 EGAN CREST SOUTH - TRUNK STORM DRAIN

STATION	INVERT ELEV	DEPTH OF FLOW	W.S. ELEV	Q	VEL	VEL HEAD	ENERGY GRD.EL.	SUPER ELEV	CRITICAL DEPTH	HGT/ DIA	BASE/ ID NO.	ZL	NO PIER	AVBPR
L/ELEM	SO													
*****	*****	*****	*****	*****	*****	SF AVE	HF	*****	*****	*****	*****	*****	*****	*****
1000.00	2903.63	9.330	2912.960	86.0	8.94	1.241	2914.201	0.00	2.887	3.50	0.00	0.00	0	0.00
25.00	0.06880					.007307	0.18		1.374			0.00		
1025.00	2905.35	8.039	2913.389	86.0	8.94	1.241	2914.630	0.00	2.887	3.50	0.00	0.00	0	0.00
50.00	0.00500					.007307	0.37		3.500			0.00		
1075.00	2905.60	8.216	2913.816	86.0	8.94	1.241	2915.057	0.00	2.887	3.50	0.00	0.00	0	0.00
JUNCT STR	0.00000					.007139	0.00					0.00		
1075.00	2905.60	8.330	2913.930	84.0	8.73	1.184	2915.114	0.00	2.857	3.50	0.00	0.00	0	0.00
96.00	0.00500					.006971	0.67		3.500			0.00		
1171.00	2906.08	8.598	2914.678	84.0	8.73	1.184	2915.862	0.00	2.857	3.50	0.00	0.00	0	0.00
135.00	0.00504					.006971	0.94		3.500			0.00		
1306.00	2906.76	8.938	2915.698	84.0	8.73	1.184	2916.882	0.00	2.857	3.50	0.00	0.00	0	0.00
100.00	0.01000					.006971	0.70		2.444			0.00		
1406.00	2907.76	8.714	2916.474	84.0	8.73	1.184	2917.658	0.00	2.857	3.50	0.00	0.00	0	0.00
97.50	0.02297					.006971	0.68		1.853			0.00		
1503.50	2910.00	7.232	2917.232	84.0	8.73	1.184	2918.416	0.00	2.857	3.50	0.00	0.00	0	0.00
TRANS STR	0.10000					.011416	0.06					0.00		
1508.50	2910.50	5.982	2916.482	84.0	11.88	2.193	2918.675	0.00	2.805	3.00	0.00	0.00	0	0.00
91.50	0.02579					.015861	1.45		2.000			0.00		
1600.00	2912.86	5.183	2918.043	84.0	11.88	2.193	2920.236	0.00	2.805	3.00	0.00	0.00	0	0.00
JUNCT STR	0.00000					.015305	0.00					0.00		
1600.00	2912.86	5.483	2918.343	81.0	11.46	2.039	2920.382	0.00	2.780	3.00	0.00	0.00	0	0.00
84.23	0.02506					.014748	1.24		1.970			0.00		

LICENSEE: SLATER HANIFAN GROUP

F0515P

U-ECRS OUT
WATER SURFACE PROFILE LISTING
SKYE CANYON INFRASTRUCTURE - PHASE 2 (UPDATE NO.3)
BY OLYMPIA COMPANIES
EGAN CREST SOUTH - TRUNK STORM DRAIN

STATION	INVERT ELEV	DEPTH OF FLOW	W.S. ELEV	Q	VEL	VEL HEAD	ENERGY GRD.ELEV.	SUPER ELEV	CRITICAL DEPTH	NORM DEPTH	HGT/ DIA	BASE/ ID NO.	ZL	NO PIER	AVBPR
L/ELEM	SO														
*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****
1684.23	2914.97	4.748	2919.718	81.0	11.46	2.039	2921.757	0.00	2.780		3.00	0.00	0.00	0	0.00
HYDRAULIC JUMP															
1684.23	2914.97	1.719	2916.689	81.0	19.34	5.809	2922.498	0.00	2.780		3.00	0.00	0.00	0	0.00
4.77	0.02506					.037990	0.18			1.970			0.00		
1689.00	2915.09	1.711	2916.801	81.0	19.44	5.870	2922.671	0.00	2.780		3.00	0.00	0.00	0	0.00
16.99	0.01500					.040364	0.69			2.434			0.00		
1705.99	2915.34	1.656	2917.001	81.0	20.24	6.361	2923.362	0.00	2.780		3.00	0.00	0.00	0	0.00
18.91	0.01500					.045308	0.86			2.434			0.00		
1724.90	2915.63	1.593	2917.222	81.0	21.23	7.000	2924.222	0.00	2.780		3.00	0.00	0.00	0	0.00
17.62	0.01500					.051374	0.91			2.434			0.00		
1742.52	2915.89	1.534	2917.427	81.0	22.26	7.698	2925.125	0.00	2.780		3.00	0.00	0.00	0	0.00
16.48	0.01500					.058319	0.96			2.434			0.00		
1759.00	2916.14	1.478	2917.618	81.0	23.35	8.466	2926.084	0.00	2.780		3.00	0.00	0.00	0	0.00
1.33	0.18500					.061113	0.08			1.090			0.00		
1760.33	2916.39	1.490	2917.877	81.0	23.10	8.283	2926.160	0.00	2.780		3.00	0.00	0.00	0	0.00
5.42	0.18500					.056616	0.31			1.090			0.00		
1765.75	2917.39	1.547	2918.937	81.0	22.02	7.531	2926.468	0.00	2.780		3.00	0.00	0.00	0	0.00
4.63	0.18500					.049893	0.23			1.090			0.00		
1770.38	2918.24	1.607	2919.852	81.0	21.00	6.845	2926.697	0.00	2.780		3.00	0.00	0.00	0	0.00
3.97	0.18500					.044008	0.17			1.090			0.00		
1774.35	2918.98	1.670	2920.649	81.0	20.02	6.223	2926.872	0.00	2.780		3.00	0.00	0.00	0	0.00
3.41	0.18500					.038861	0.13			1.090			0.00		

U-ECRS. OUT

BY OLYMPIA COMPANIES
EGAN CREST SOUTH - 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						HF								
1777.76	2919.61	1.737	2921.347	81.0	19.09	5.659	2927.006	0.00	2.780	1.090	3.00	0.00	0.00	0	0.00
2.95	0.18500					.034356	0.10						0.00		
1780.71	2920.16	1.807	2921.963	81.0	18.20	5.142	2927.105	0.00	2.780	1.090	3.00	0.00	0.00	0	0.00
2.54	0.18500					.030408	0.08						0.00		
1783.25	2920.63	1.881	2922.508	81.0	17.35	4.675	2927.183	0.00	2.780	1.090	3.00	0.00	0.00	0	0.00
2.19	0.18500					.026964	0.06						0.00		
1785.44	2921.03	1.961	2922.992	81.0	16.54	4.250	2927.242	0.00	2.780	1.090	3.00	0.00	0.00	0	0.00
1.88	0.18500					.023957	0.05						0.00		
1787.32	2921.38	2.045	2923.423	81.0	15.77	3.864	2927.287	0.00	2.780	1.090	3.00	0.00	0.00	0	0.00
1.59	0.18500					.021335	0.03						0.00		
1788.91	2921.67	2.136	2923.809	81.0	15.04	3.513	2927.322	0.00	2.780	1.090	3.00	0.00	0.00	0	0.00
1.32	0.18500					.019065	0.03						0.00		
1790.23	2921.92	2.235	2924.153	81.0	14.34	3.194	2927.347	0.00	2.780	1.090	3.00	0.00	0.00	0	0.00
1.09	0.18500					.017109	0.02						0.00		
1791.32	2922.12	2.343	2924.462	81.0	13.67	2.903	2927.365	0.00	2.780	1.090	3.00	0.00	0.00	0	0.00
0.84	0.18500					.015450	0.01						0.00		
1792.16	2922.28	2.464	2924.739	81.0	13.04	2.639	2927.378	0.00	2.780	1.090	3.00	0.00	0.00	0	0.00
0.59	0.18500					.014090	0.01						0.00		
1792.75	2922.39	2.603	2924.988	81.0	12.43	2.400	2927.388	0.00	2.780	1.090	3.00	0.00	0.00	0	0.00
0.25	0.18500					.013129	0.00						0.00		
1793.00	2922.43	2.780	2925.210	81.0	11.85	2.180	2927.390	0.00	2.780	1.090	3.00	0.00	0.00	0	0.00
JUNCT STR	0.00000					.007975	0.00						0.00		

LICENSEE: SLATER HANIFAN GROUP

SKYE CANYON INFRASTRUCTURE - PHASE 2 (UPDATE NO.3)
BY OLYMPIA COMPANIES
EGAN CREST SOUTH - TRUNK STORM DRAIN

U-ECRS.OUT

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													
1793.00	2922.63	4.116	2926.746	81.0	6.45	0.645	2927.391	0.00	2.727	4.00	0.00	0.00	0	0.00
3.64	0.03500					.003158	0.01		1.505			0.00		
1796.64	2922.76	4.000	2926.757	81.0	6.45	0.645	2927.402	0.00	2.727	4.00	0.00	0.00	0	0.00
4.36	0.03500					.002954	0.01		1.505			0.00		
1801.00	2922.91	3.842	2926.752	81.0	6.53	0.662	2927.414	0.00	2.727	4.00	0.00	0.00	0	0.00

SKYE CANYON INFRASTRUCTURE - PHASE 2 (UPDATE NO.3)
BY OLYMPIA COMPANIES
EGAN CREST SOUTH - TRUNK STORM DRAIN

1000.00	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1011.28	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1022.56	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1033.85	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1045.13	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1056.41	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1067.69	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1078.97	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1090.25	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1101.54	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1112.82	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1124.10	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1135.38	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1146.66	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1157.94	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1169.23	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1180.51	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1191.79	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1203.07	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1214.35	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1225.63	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1236.92	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1248.20	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1259.48	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1270.76	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1282.04	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1293.32	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1304.61	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1315.89	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1327.17	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1338.45	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1349.73	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1361.01	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1372.30	.	.	.	.	.	.	.	.	.	.	.	.	.	.

[illegible]

NOTES

1. GLOSSARY

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

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

U-ECRN

T1 SKYE CANYON INFRASTRUCTURE - PHASE 2 (UPDATE NO.3)									
T2 ULTIMATE CONDITION OF EAGAN CREST (NORTH) - TRUNK STORM DRAIN									
T3 STARTING WSE TAKEN FROM TOP OF PIPE									
SO	1000.00	2805.68	36				2908.68		
R	1139.00	2806.60	36	.013				00.0	1
JX	1139.00	2806.60	36	.013	2.000		2908.10	90.0	
R	1167.00	2807.71	36	.013				55.0	1
R	1182.00	2808.29	36	.013				00.0	1
JX	1182.00	2808.29	36	.013	2.000		2908.29	90.0	
R	1233.00	2910.33	36	.013				00.0	1
SH	1233.00	2910.33	36						
CD	18	4	1	.000	.000	.000	.00		
CD	36	4	1	.000	.000	.000	.00		
Q				67.0	.0				

Program Package Serial Number: 1704
WATER SURFACE PROFILE LISTING
SKYE CANYON INFRASTRUCTURE - PHASE 2 (UPDATE NO.3)
ULTIMATE CONDITION OF EAGAN CREST (NORTH) - TRUNK STORM DRAIN
STARTING WSE TAKEN FROM TOP OF PIPE

Date:12-13-2016 Time:10:21:22

Station	Invert Elev	Depth (FT)	Water Elev	Q (cfs)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Base Dia.-Ft or I.D.	No Wth Prs/Pip		
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	Type Ch	ZR
1000.000	2905.680	3.000	2908.680	71.00	10.04	1.57	2910.25	.00	2.67	.00	3.000	.000	1	.0
132.332	.0066	-	-	-	-	.0113	1.50	3.00	.00	3.00	.013	.00	PIPE	
1132.332	2906.556	3.697	2910.253	71.00	10.04	1.57	2911.82	.00	2.67	.00	3.000	.000	1	.0
HYDRAULIC JUMP														
1132.332	2906.556	1.858	2908.414	71.00	15.45	3.70	2912.12	.00	2.67	2.91	3.000	.000	1	.0
6.668	.0066	-	-	-	-	.0233	.16	1.86	2.17	3.00	.013	.00	PIPE	
1139.000	2906.600	1.834	2908.434	71.00	15.68	3.82	2912.25	.00	2.67	2.92	3.000	.000	1	.0
JUNCT STR	.0000	-	-	-	-	.0253	.00	1.83	2.22	-	.013	.00	PIPE	
1139.000	2906.600	1.730	2908.330	69.00	16.35	4.15	2912.48	.00	2.64	2.96	3.000	.000	1	.0
9.162	.0396	-	-	-	-	.0262	.24	1.73	2.41	1.53	.013	.00	PIPE	
1148.162	2906.963	1.756	2908.719	69.00	16.05	4.00	2912.72	.00	2.64	2.96	3.000	.000	1	.0
18.838	.0396	-	-	-	-	.0241	.45	1.76	2.35	1.53	.013	.00	PIPE	
1167.000	2907.710	1.827	2909.537	69.00	15.30	3.64	2913.17	.00	2.64	2.93	3.000	.000	1	.0
.450	.0387	-	-	-	-	.0226	.01	1.83	2.17	1.55	.013	.00	PIPE	
1167.450	2907.727	1.829	2909.556	69.00	15.28	3.63	2913.18	.00	2.64	2.93	3.000	.000	1	.0
14.550	.0387	-	-	-	-	.0213	.31	1.83	2.17	1.55	.013	.00	PIPE	
1182.000	2908.290	1.906	2910.196	69.00	14.57	3.30	2913.49	.00	2.64	2.89	3.000	.000	1	.0
JUNCT STR	.0000	-	-	-	-	.0214	.00	1.91	2.01	-	.013	.00	PIPE	
W S P G W - CIVILDESIGN version 14.06														
FILE: U-ECRN.WSW														

Program Package Serial Number: 1704
WATER SURFACE PROFILE LISTING
SKYE CANYON INFRASTRUCTURE - PHASE 2 (UPDATE NO.3)
ULTIMATE CONDITION OF EAGAN CREST (NORTH) - TRUNK STORM DRAIN
STARTING WSE TAKEN FROM TOP OF PIPE

Date:12-13-2016 Time:10:21:22

Station	Invert Elev	Depth (Ft)	Water Elev	Q (cfs)	Vel (fps)	Vel Head	Energy Grd.El	Super Elev	Critical Depth	Flow Top Width	Height/Base Dia.-Ft	No with Prs/Pip	ZL	
L/Elem	Ch slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch

1182.000	2908.290	1.787	2910.077	67.00	15.26	3.62	2913.69	.00	2.62	2.94	3.000	.000	.00	1.0
5.376	.0400	-	-	-	-	.0224	.12	1.79	2.20	1.50	.013	.00	.00	PIPE
1187.376	2908.505	1.812	2910.317	67.00	15.01	3.50	2913.81	.00	2.62	2.93	3.000	.000	.00	1.0
12.546	.0400	-	-	-	-	.0206	.26	1.81	2.14	1.50	.013	.00	.00	PIPE
1199.922	2909.007	1.887	2910.894	67.00	14.31	3.18	2914.07	.00	2.62	2.90	3.000	.000	.00	1.0
9.678	.0400	-	-	-	-	.0183	.18	1.89	1.98	1.50	.013	.00	.00	PIPE
1209.600	2909.394	1.966	2911.360	67.00	13.64	2.89	2914.25	.00	2.62	2.85	3.000	.000	.00	1.0
7.486	.0400	-	-	-	-	.0163	.12	1.97	1.83	1.50	.013	.00	.00	PIPE

1217.086	2909.694	2.051	2911.745	67.00	13.01	2.63	2914.37	.00	2.62	2.79	3.000	.000	.00	1	.0
5.794	.0400	-	-	-	-	.0145	.08	-	2.05	1.69	1.50	.013	.00	PIPE	
1222.880	2909.925	2.142	2912.067	67.00	12.40	2.39	2914.46	.00	2.62	2.71	3.000	.000	.00	1	.0
4.329	.0400	-	-	-	-	.0129	.06	-	2.14	1.55	1.50	.013	.00	PIPE	
1227.209	2910.098	2.242	2912.341	67.00	11.82	2.17	2914.51	.00	2.62	2.61	3.000	.000	.00	1	.0
3.150	.0400	-	-	-	-	.0116	.04	-	2.24	1.41	1.50	.013	.00	PIPE	
1230.359	2910.224	2.350	2912.574	67.00	11.27	1.97	2914.55	.00	2.62	2.47	3.000	.000	.00	1	.0
1.947	.0400	-	-	-	-	.0105	.02	-	2.35	1.28	1.50	.013	.00	PIPE	
1232.306	2910.302	2.472	2912.774	67.00	10.75	1.79	2914.57	.00	2.62	2.28	3.000	.000	.00	1	.0
.694	.0400	-	-	-	-	.0096	.01	-	2.47	1.15	1.50	.013	.00	PIPE	

* FILE: U-ECRN.WSW
 W S P G W - CIVILDESIGN version 14.06
 Program Package Serial Number: 1704
 SKYE CANYON INFRASTRUCTURE - PHASE 2 (UPDATE NO.3)
 ULTIMATE CONDITION OF EAGAN CREST (NORTH) - TRUNK STORM DRAIN
 STARTING WSE TAKEN FROM TOP OF PIPE

Date:12-13-2016 Time:10:21:22

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Base Dia.- Ft or I.D.	No with Prs/Pip	ZL	No with Prs/Pip
L/Elev	Ch Slope					HF	SE Dpth	Froude N						
1233.000	2910.330	2.615	2912.945	67.00	10.25	1.63	2914.58	.00	2.62	2.01	3.000	.000	.00	1

SKYE CANYON INFRASTRUCTURE - PHASE 2 (UPDATE NO.3)

ULTIMATE CONDITION OF EAGAN CREST (NORTH) - TRUNK STORM DRAIN

STARTING WSE TAKEN FROM TOP OF PIPE

1000.00	.I														
1004.76	.														
1009.51	.														
1014.27	.														
1019.02	.														
1023.78	.														
1028.53	.														
1033.29	.														
1038.04	.														

[illegible]

P9-L

0	T1 SKYE CANYON INFRASTRUCTURE -- PHASE 2 (UPDATE NO.3)	
	T2 BY OLYMPIA COMPANIES	
	T3 EAGLE CANYON NORTH LATERAL P9-L	
	S0 1000.002908.10 18	2908.43
	P 1052.002908.36 18	
	SH 1052.002908.36 18	.013
	CD 18 4	1:5
	CD 24 4	2:5
	CD 30 4	2:5
	CD 36 4	3:5
	CD 42 4	3:5
	CD 48 4	4:5
	CD 54 4	4:5
	CD 60 4	5:5
	CD 66 4	5:5
	CD 72 4	6:5
	CD 78 4	6:5

1

†
DATE: 12/15/2016
TIME: 9: 6

F0513P																			
WATER SURFACE PROFILE - CHANNEL DEFINITION LISTING																			
CARD	SECT	CHN	NO OF	AVE	HEIGHT 1	ZL	ZR	INV	Y(1)	Y(2)	Y(3)	Y(4)	Y(5)	Y(6)	Y(7)	Y(8)	Y(9)	PAGE	1
CODE	NO	TYPE	PIERS	WIDTH	DIAMETER	BASE		DROP											
00	18	4			1.50														
00	24	4			2.00														
00	30	4			2.50														
00	36	4			3.00														
00	42	4			3.50														
00	48	4			4.00														
00	54	4			4.50														
00	60	4			5.00														
00	66	4			5.50														
00	72	4			6.00														
00	78	4			6.50														

†
PAGE NO 3

WATER SURFACE PROFILE - TITLE CARD LISTING

HEADING LINE NO 1 IS -

SKYE CANYON INFRASTRUCTURE - PHASE 2 (UPDATE NO.3)

HEADING LINE NO 2 IS -

BY OLYMPIA COMPANIES

HEADING LINE NO 3 IS -

EAGLE CANYON NORTH LATERAL P9-L
F 0 5 1 5 P

†

PAGE NO 2

WATER SURFACE PROFILE - ELEMENT CARD LISTING

ELEMENT NO	1 IS A SYSTEM OUTLET U/S DATA	* STATION	* INVERT SECT	* INVERT SECT	W S ELEV
ELEMENT NO 1	1000.00	2908.10	18		2908.43
ELEMENT NO	2 IS A REACH U/S DATA	* STATION	* INVERT SECT	* INVERT SECT	
ELEMENT NO 2	1052.00	2908.36	18		
ELEMENT NO	3 IS A SYSTEM HEADWORKS U/S DATA	* STATION	* INVERT SECT	* INVERT SECT	
ELEMENT NO 3	1052.00	2908.36	18		

RADIUS 0.00
ANGLE 0.00
ANG PT 0.00
MAN H 1

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 †
LICENSEE: SLATER HANIFAN GROUP
F0513P
WATER SURFACE PROFILE LISTING
SKYE CANYON INFRASTRUCTURE - PHASE 2 (UPDATE NO.3)
BY OLYMPIA COMPANIES
EAGLE CANYON NORTH LATERAL P9-L

PAGE 1

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													
1000.00	2908.10	0.530	2908.630	2.0	3.58	0.199	2908.829	0.00	0.533	1.50	0.00	0.00	0	0.00
50.67	0.00500					.005059	0.26			0.530		0.00		
1050.67	2908.35	0.530	2908.883	2.0	3.58	0.199	2909.082	0.00	0.533	1.50	0.00	0.00	0	0.00
1.33	0.00500					.005006	0.01			0.530		0.00		
1052.00	2908.36	0.533	2908.893	2.0	3.55	0.196	2909.089	0.00	0.533	1.50	0.00	0.00	0	0.00†

SKYE CANYON INFRASTRUCTURE - PHASE 2 (UPDATE NO.3)
BY OLYMPIA COMPANIES
EAGLE CANYON NORTH LATERAL P9-L

[illegible]

NOTES

1. GLOSSARY

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

2. STATIONS FOR POINTS AT A JUNCTION

Page 2

APPENDIX E

Drop Inlet Computations

Project:		Skye Canyon Infrastructure - Phase 2 Update No.3	
Title:		Type CM2 Drop Inlet (Continuous Grade)	
Subtitle:		7.5-ft Drop Inlet at Section ECA3b	
By:		ETM	
Date:		12/7/2016	
Input:		Variable:	Input:
Street Flow (cfs)		Q	11.5
Longitudinal Slope (ft/ft)		S _o	0.0494
Manning's Coefficient		n	0.016
Street Flow Velocity (fps)		V	5.64
Street Flow Depth (ft)		D	0.42
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	5.0
Length of Curb Opening (ft)		L _c	7.5
Clogging Factor - Grate (%)		CF _g	50%
Clogging Factor - Curb (%)		CF _c	50%
Effective Grate Length (ft)		L _{ge}	2.5
Effective Curb Opening Length (ft)		L _{ce}	3.75
Output (Grate):		Equation:	Output (Grate):
¹ R _f - Frontal Flow Factor	1-0.09*(V-V _x) if V>V _x ; else Frontal Flow Factor=1		1.00
² V _o - Splash Over Velocity (fps)	V _x =p+q*L _g -r*L _{ge} ² +sy*L _{ge} ³ ; where p=0.30,q=4.85,r=1.31,sy=0.15 (for Vane Grate)		6.58
¹ E - Grate Flow Ratio	Frontal Flow/Side Flow		0.29
² Q _w - Frontal Flow (cfs)	Q _w = Q[1-(1-(W/T)) ^{2.67}]		3.29
¹ Q _s - Side Flow (cfs)	Q _s = Q-Q _w		8.2
T - Side Flow Spread (ft)	(D-D _g)/S _x		12.67
¹ R _s - Side Flow Factor	1/(1+(0.15*V ^{1.8})/(S _x *L _{ge} ^{2.3}))		0.05
¹ Q _{gi} - Intercepted Flow (cfs)	(R _f *E+R _s *(1-E))*Q		3.7
Output (Curb):		Equation:	Output (Curb):
¹ S _e - Equivalent Cross Slope (ft/ft)	S _x +S _g *E		0.052
Q _{sx} - Remaining Flow After Grate Interception (cfs)	Q-Q _{gi}		7.832
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}		40.82
¹ Q _{ci} - Intercepted Flow (cfs)	(1-(1-L _{ce} /L _t) ^{1.8})*Q _{sx}		1.2
	or Q _{sx} if L _t is less than L _{ce}		
Output (Combination):			Output (Combination):
Total Intercepted Flow (cfs)	Intercepted (Grate) + Intercepted (Curb)		5
¹ Formula referenced from the CCRFCD Manual			
² Formula referenced from FHWA Urban Drainage Design Manual (HEC-22)			

Project:	Skye Canyon Infrastructure - Phase 2 Update No.3	
Title:	Type CM2 Drop Inlet (SUMP)	
Subtitle:	17.5-ft Drop Inlet at Section ECA4	
By:	ETM	
Date:	12/7/2016	
Input:	Variable:	Input:
Depth at Inlet (ft)	D	0.67
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}	14.8
	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}	19.20
	orifice: O _c *(Adj. Curb Open Area)*(64.4*(D-H/2)) ^{0.5}	
Output (Combination):		Output (Combination):
Total Intercepted Flow (cfs)	Intercepted (Grate) + Intercepted (Curb)	34
Total Capacity for Two Inlets =		68 cfs
Actual Flow Collected =		40 cfs

APPENDIX F

Reference Material

Technical Drainage Study for Skye Canyon Phase 2 Infrastructure,
by Slater Hanifan Group

Approval Letter

Previously Approved Drainage Exhibit

Prior Approved Plans

CITY OF LAS VEGAS INTER-OFFICE MEMORANDUM		DATE: REVISED June 21, 2016
TO: Land Development Services Department of Building & Safety		FROM: Albert Sung, P.E. <i>AS</i> Flood Control Project Engineer Department of Public Works
SUBJECT:	Drainage Study for:	
	Skye Canyon – Phase 2 Infrastructure	
Cross Streets:	NWC of Grand Teton Blvd. & Hualapai Way	COPIES TO: Slater Hanifan Group, Inc.
File Number:	F:\Depot\DSMemos\DS4739E Revised.doc	Section 12, LLC / Ninety Five Mgmt.
Parcel Number:	Portion of 126-12-000-001	Bart Anderson, P.E., DevCo
Zoning Action:	TMP-58560	CCRFC
FEMA Flood Zone	YES	NO X
Proposed Storm Drain	YES X	NO

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

REMARKS: Revised Memo, Approved "At Risk".

5th Submittal: Update #2 and CCRFC concurrence received

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

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

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

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

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

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

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

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

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

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

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

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

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

END OF REMARKS
AYS/PBJ

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

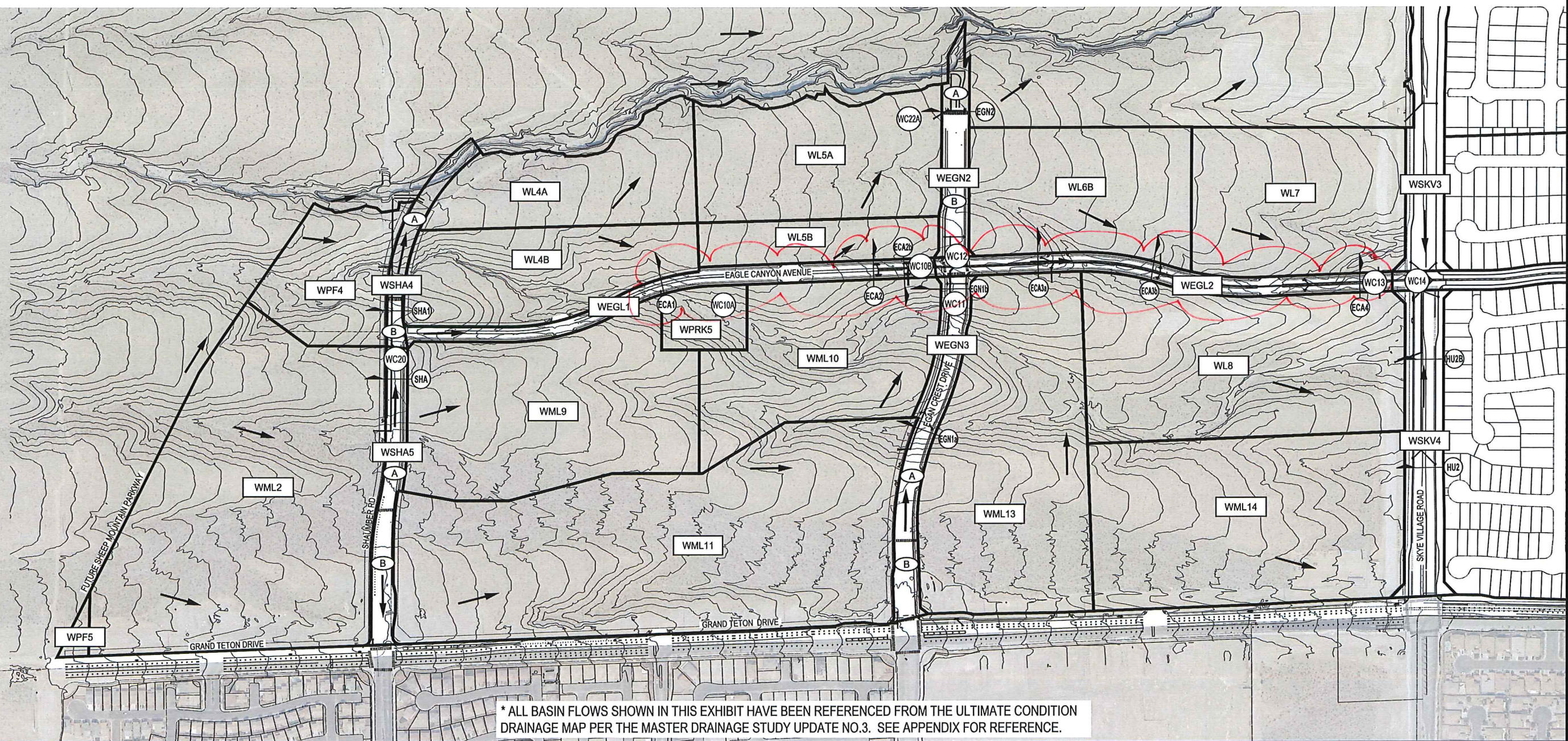
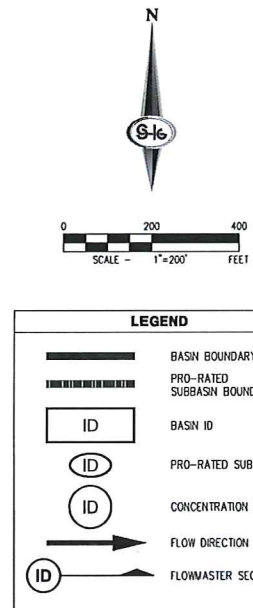
Cross Section	Slope (%)	Q ₁₀₀ (cfs)	Depth (ft)	Velocity (fps)	DxV
ECA1	4.90	35	0.48	6.4	3.0
ECA2	4.90	44	0.50	6.5	3.2
ECA2b	2.00	14	0.41	3.6	1.5
ECA3a	4.94	6	0.29	4.2	1.2
ECA3b	4.94	28	0.44	5.9	2.6
ECA4	0.50	39	0.66	2.9	1.9
EGW1a	2.46	4	0.29	2.9	0.8
*EGN1b	0.50	2.5	0.38	1.6	0.6
EGN2	0.50	4	0.35	1.6	0.5
*SHA	2.75	4	0.33	3.3	1.1
*SHA (West Hall)	2.75	4	0.28	2.5	0.7
SH1	2.75	3	0.26	2.9	0.7
*HJ1	0.57	59	0.92	3.8	3.5
*HJ2b	0.57	43	0.83	3.5	2.9

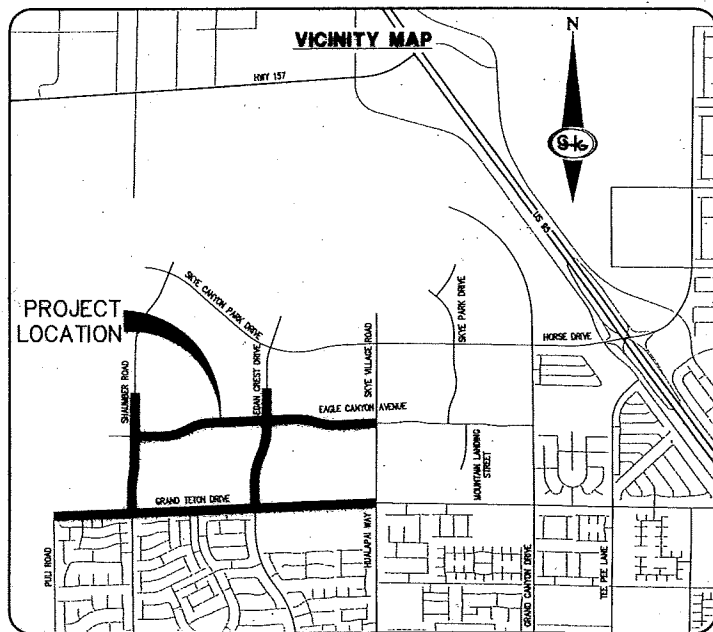
* Modified as Half Streets

Referenced Ultimate Condition Flow Rate Summary Concentration Points			
Basin/Concentration Point ID	Area (sq. m)	Q ₁₀₅ (cfs)	Q ₁₁₀ (cfs)
WC10A Q = WM1.5 + WFRK5	0.03	60	30
WC10B Q = WC10A + WEG1.4 + WEG1.1	0.05	99	48
WC11 Q = WM.10 + WEGN.3	0.07	127	61
WC12 Q = WC10B + WC11	0.11	226	109
WC13 Q = WC12 + WL6.9 + WL.7 + WM1.3 + WEG1.2	0.17	352	170
WC14 Q = WM1.4 + WL.6 + WSKV3 + WSKV4	0.24	485	236
WC20 Q = WPF5 + WM2.2 + WSH4.5	0.05	86	42
WC22A Q = WL4A + WL.5A + WL.5B	0.05	67	43

Ultimate Condition Prorated Flow Summary			
Basin	Q ₁₅₀ (cfs)	Area (acres)	Unit Flow (cfs/acre)
WSHA4	6	1.4	4.2
WSHA5	8	2.4	3.4
WEGN2	6	2.1	3.0
WEGN3	10	3.3	3.0
Subbasin	Q ₁₅₀ (cfs)	Area (acres)	Unit Flow (cfs/acre)
WSHA4-A	5	1.1	4.2
WSHA4-B	1	0.3	4.2
TOTAL	6	1.4	
WSHA5-A	4	1.3	3.4
WSHA5-B	4	1.1	3.4
TOTAL	8	2.4	
WEGN2-A	2	0.6	3.0
WEGN2-B	4	1.5	3.0
TOTAL	6	2.1	
WEGN3-A	8	2.5	3.0
WEGN3-B	2	0.8	3.0
TOTAL	10	3.3	

Referenced Ultimate Condition Flow Rate Summary			
Basin/Concentration Point ID	Area (ac)	Q ₁₀₀ (cfs)	Q ₁₅ (cfs)
WL4A	8.0	23	10
WL4B	8.9	27	12
WL5A	10.9	32	15
WL5B	3.8	12	5
WL6B	10.6	30	14
WL7	11.5	34	16
WL8	17.4	48	22
WML10	11.6	38	19
WML11	16.0	48	23
WML13	16.4	49	25
WML14	19.2	59	29
WML2	27.4	78	38
WML9	16.4	55	28
WPF4	5.7	19	9
WPF5	0.4	1	0
WPRK5	2.0	5	2
WEST ROADWAY BASINS			
WEG1	3.4	12	6
WEG2	3.3	12	7
WEGN2	2.1	2	1
WEGN3	3.3	10	6
WSHA4	1.4	6	3
WSHA5	2.4	8	5
WSKV3	4.2	14	7
WSKV4	4.5	15	8





MASS GRADING FOR SKYE CANYON PHASE 2



BENCHMARK

MONUMENT ID: USDA (1934) 19
U.S. DEPARTMENT OF AGRICULTURE BRASS DISC AT SOUTHWEST CORNER OF U.S. 95 AND KYLE CANYON ROAD.
ELEVATION = 2817.61 FEET, 858.810 METERS
NAVD 88 DATUM
PER THE CITY OF LAS VEGAS BENCHMARK BOOK - 2008 ADJUSTMENT (UPDATED 05/24/2010)

BASIS OF BEARING

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

OWNER

SECTION 12 LLC
% OLYMPIA COMPANIES LLC
11411 SOUTHERN HIGHLANDS PARKWAY, SUITE 300
LAS VEGAS, NV 89141

DEVELOPER

NINETY-FIVE MANAGEMENT LLC
% OLYMPIA COMPANIES LLC
11411 SOUTHERN HIGHLANDS PARKWAY, SUITE 300
LAS VEGAS, NV 89141
PH (702) 220-6565
FX (702) 220-6566

ENGINEER

SLATER HANIFAN GROUP
5740 S. ARVILLE STREET #216
LAS VEGAS, NV 89118
(702) 284-5300

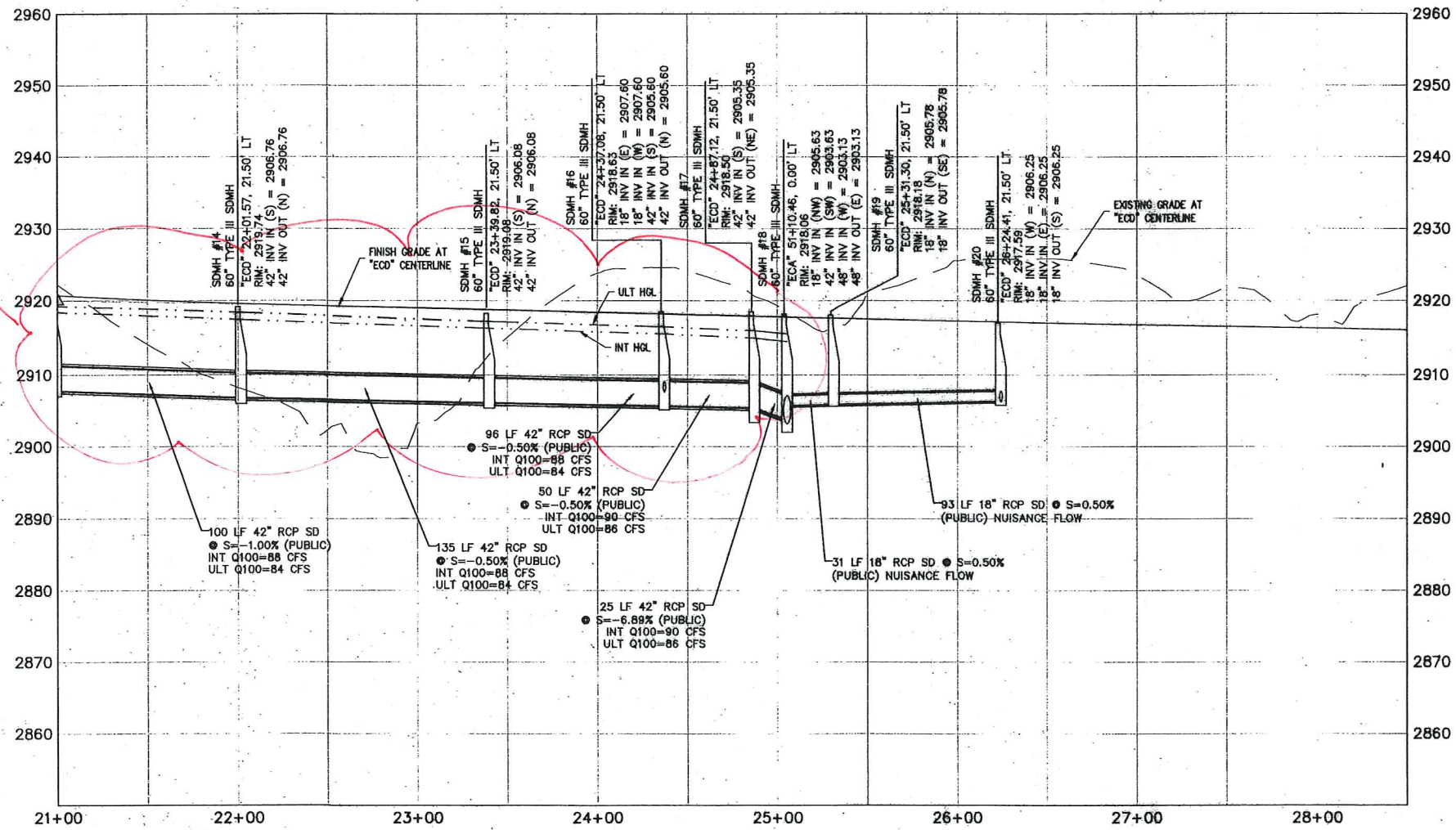
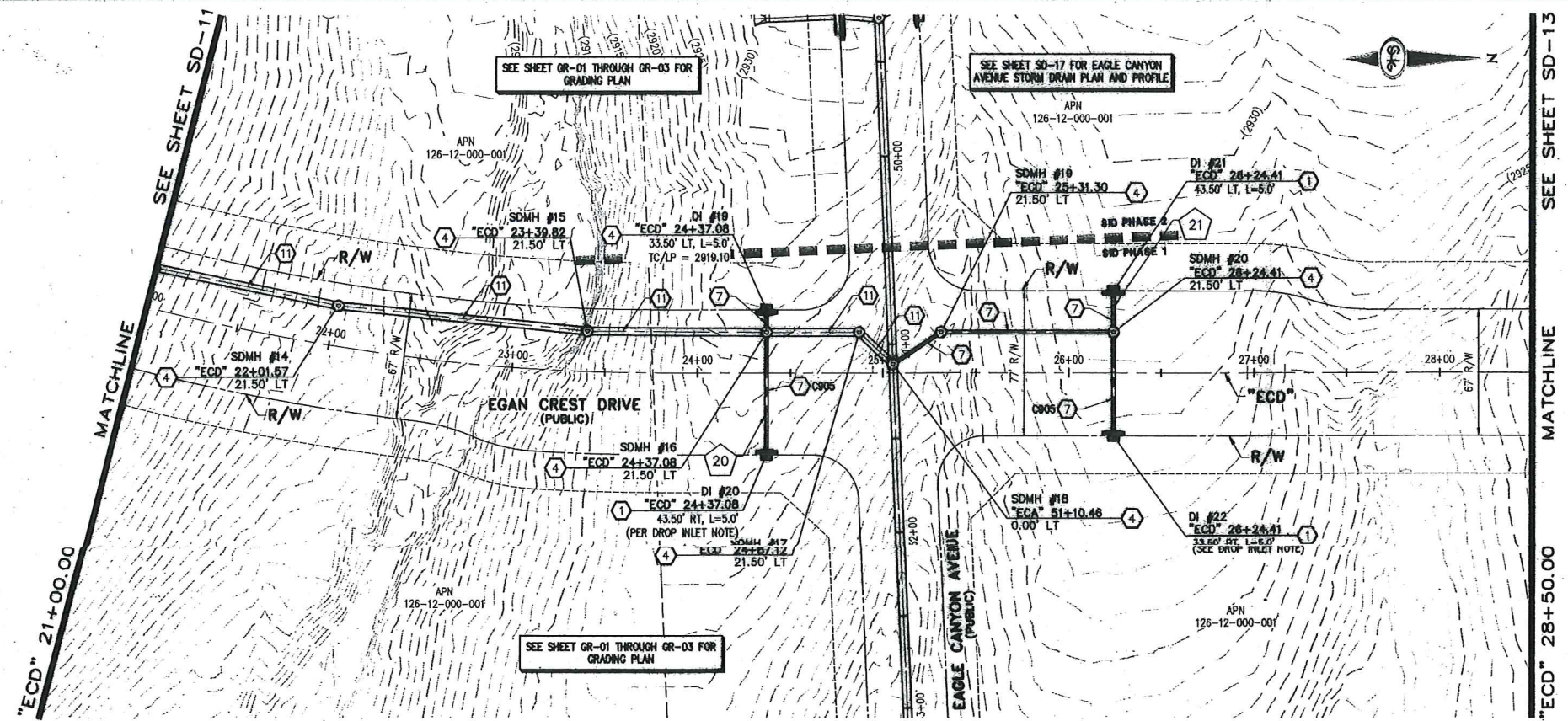


APPROVALS	
 CITY ENGINEER-ALLEN E. PAVELKA PE #9029	11-21-16 DATE
APPROVAL OF THESE PLANS BY THE CITY ENGINEER IS LIMITED TO THOSE IMPROVEMENTS CONSTRUCTED IN THE DEDICATED RIGHT-OF-WAY, AND/OR DEDICATED EASEMENTS. THIS APPROVAL DOES NOT AUTHORIZE CONSTRUCTION OF ANY IMPROVEMENTS THAT DEVIATE FROM ADOPTED STANDARDS AND/OR SPECIFICATIONS EXCEPT THOSE SPECIALLY LISTED UNDER DEVIATIONS FROM 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.	
 CHRIS KNIGHT DIRECTOR, BUILDING AND SAFETY	11-21-16 DATE
THIS PLAN MEETS THE APPLICABLE STANDARDS OF THE PLANNING DEPARTMENT.	
APPROVED FOR CONSTRUCTION	
 J. DISCHINGER LAS VEGAS VALLEY-WATER DISTRICT, ENGINEERING SERVICES MANAGER	11-21-16 DATE
PROJECT NO. 124568 DATE: 10/18/16 SHEETS: G-01 THRU G-03, SD-01 THRU SD-24	
APPROVAL BY THE FIRE DEPARTMENT HAVING JURISDICTION IS REQUIRED PRIOR TO OBTAINING FINAL APPROVAL FROM THE LAS VEGAS VALLEY WATER DISTRICT.	
 K. SMITH LAS VEGAS FIRE AND RESCUE	9/13/16 DATE
 D. SMITH NV ENERGY	11/11/16 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.	
 BEN BEAMAN CENTRAL TELEPHONE CO, DBA CENTURYLINK	6/17/2016 DATE
THE AFFIRED CENTRAL TELEPHONE CO, DBA CENTURYLINK APPROVAL DOES NOT ASSUME OR GUARANTEE LIABILITY FOR KNOWN OR UNKNOWN CONFLICTS WITH EXISTING OR PROPOSED IMPROVEMENTS. RESOLUTION OF ANY CONFLICT WILL BE ACCOMPLISHED PURSUANT TO LOCAL ORDINANCES, NEVADA REVISED STATUTES AND/OR PUBLIC UTILITY COMMISSION RULES AND REGULATIONS.	
 J. SMITH SOUTHWEST GAS	8-4-16 DATE
 J. SMITH COR. COMMUNICATIONS LAS VEGAS, INC.	8-22-16 DATE

INDEX OF DRAWINGS

SHT. NO.	DWG. NO.	DESCRIPTION
1	G-01	COVER SHEET
2	G-02	GENERAL NOTES
3	G-03	ABBREVIATIONS, KEY MAP, LEGEND AND QUANTITIES
4	SD-01	GRAND TETON DRIVE STORM DRAIN PLAN AND PROFILE "GTD" 14+00.00 TO "GTD" 23+50.00
5	SD-02	GRAND TETON DRIVE STORM DRAIN PLAN AND PROFILE "GTD" 23+50.00 TO "GTD" 33+00.00
6	SD-03	GRAND TETON DRIVE STORM DRAIN PLAN AND PROFILE "GTD" 33+00.00 TO "GTD" 42+50.00
7	SD-04	GRAND TETON DRIVE STORM DRAIN PLAN AND PROFILE "GTD" 42+50.00 TO "GTD" 52+00.00
8	SD-05	GRAND TETON DRIVE STORM DRAIN PLAN AND PROFILE "GTD" 52+00.00 TO "GTD" 61+50.00
9	SD-06	GRAND TETON DRIVE STORM DRAIN PLAN AND PROFILE "GTD" 61+50.00 TO "GTD" 71+00.00
10	SD-07	SHAUMBER ROAD STORM DRAIN PLAN AND PROFILE "SR" 8+00.00 TO "SR" 16+50.00
11	SD-08	SHAUMBER ROAD STORM DRAIN PLAN AND PROFILE "SR" 16+50.00 TO "SR" 25+50.00
12	SD-09	SHAUMBER ROAD STORM DRAIN PLAN AND PROFILE "SR" 25+50.00 TO "SR" 30+00.00
14	SD-11	EGAN CREST DRIVE STORM DRAIN PLAN AND PROFILE "ECD" 15+50.00 TO "ECD" 21+00.00
15	SD-12	EGAN CREST DRIVE STORM DRAIN PLAN AND PROFILE "ECD" 21+00.00 TO "ECD" 28+50.00
16	SD-13	EGAN CREST DRIVE STORM DRAIN PLAN AND PROFILE "ECD" 28+50.00 TO "ECD" 34+00.00
17	SD-14	EAGLE CANYON AVENUE STORM DRAIN PLAN AND PROFILE "ECA" 25+00.00 TO "ECA" 33+00.00
18	SD-15	EAGLE CANYON AVENUE STORM DRAIN PLAN AND PROFILE "ECA" 33+00.00 TO "ECA" 39+00.00
19	SD-16	EAGLE CANYON AVENUE STORM DRAIN PLAN AND PROFILE "ECA" 39+00.00 TO "ECA" 47+00.00
20	SD-17	EAGLE CANYON AVENUE STORM DRAIN PLAN AND PROFILE "ECA" 47+00.00 TO "ECA" 56+00.00
21	SD-18	EAGLE CANYON AVENUE STORM DRAIN PLAN AND PROFILE "ECA" 56+00.00 TO "ECA" 63+00.00
22	SD-19	EAGLE CANYON AVENUE STORM DRAIN PLAN AND PROFILE "ECA" 63+00.00 TO "ECA" 71+50.00
23	SD-20	STORM DRAIN LATERAL PROFILES
24	SD-21	STORM DRAIN LATERAL PROFILES
25	SD-22	STORM DRAIN LATERAL PROFILES
26	SD-23	STORM DRAIN LATERAL PROFILES
27	SD-24	STORM DRAIN LATERAL PROFILES
28	SD-25	STORM DRAIN DETAILS
29	SD-26	STORM DRAIN DETAILS
30	GR-01	GRADING PLAN 1
31	GR-02	GRADING PLAN 2
32	GR-03	GRADING PLAN 3
	SO.1	GENERAL STRUCTURAL NOTES
	SO.2	TYPICAL DETAILS
	SI.1	PLAN AND SECTION

SLATER HANIFAN GROUP	
CONSULTING ENGINEERS & PLANNERS	
5740 S. ARVILLE STREET #216, LAS VEGAS, NV 89118	
PHONE (702) 284-5300 FAX (702) 284-5399	
DATE:	6/16/16
DRAFTER:	JAS
DESIGNER:	DAM
CHECKED:	JSR
PROJECT NO.	OLY1501-001
G-01	
SHEET 1 OF 32	
H4 83875	
107V 6750	



- ### STORM DRAIN NOTES
1. CONSTRUCT TYPE "CM2" DROP INLET (USDCCA STD. DWG. NO. 412.1)
 2. REMOVE EXISTING LATERAL STUB AND CONSTRUCT RCB PLUG (SEE DETAIL 5, DRAWING SD-25)
 3. CONSTRUCT 60" TYPE I MANHOLE (USDCCA STD. DWG. NO. 403.1)
 4. CONSTRUCT 60" TYPE III MANHOLE (USDCCA STD. DWG. NO. 406.1)
 5. CONSTRUCT 60" TYPE III MANHOLE WITH TYPE IA RISER (USDCCA STD. DWG. NO. 404.1 AND 406.1)
 6. CONSTRUCT NDOT TYPE 4 MANHOLE (NDOT STD. PLAN R-4.3.2)
 7. INSTALL 18" RCP OR WATER QUALITY C905 AS SHOWN ON PROFILES (USDCCA STD. DWG. NO. 503.2)
 8. INSTALL 24" RCP OR WATER QUALITY C905 AS SHOWN ON PROFILES (USDCCA STD. DWG. NO. 503.2)
 9. INSTALL 30" RCP (USDCCA STD. DWG. NO. 503.2)
 10. INSTALL 36" RCP (USDCCA STD. DWG. NO. 503.2)
 11. INSTALL 42" RCP (USDCCA STD. DWG. NO. 503.2)
 12. INSTALL 54" RCP (USDCCA STD. DWG. NO. 503.2)
 13. INSTALL 60" RCP (USDCCA STD. DWG. NO. 503.2)
 14. INSTALL 66" RCP (USDCCA STD. DWG. NO. 503.2)
 15. INSTALL 18" RCP END SECTION (NDOT STD. PLAN R-2.3.1)
 16. INSTALL 24" RCP END SECTION (NDOT STD. PLAN R-2.3.1)
 17. INSTALL 30" RCP END SECTION (NDOT STD. PLAN R-2.3.1)
 18. INSTALL 36" RCP END SECTION (NDOT STD. PLAN R-2.3.1)
 19. INSTALL 42" RCP END SECTION (NDOT STD. PLAN R-2.3.1)
 20. PIPE PENETRATION (SEE DETAIL 4, DRAWING SD-25)
 21. CONSTRUCT CONCRETE COLLAR (SEE DETAIL 2, DRAWING SD-25)
 22. CONSTRUCT BRICK AND MORTAR PILING (SEE DETAIL 1, DRAWING SD-25)
 23. INSTALL 48" RCP (USDCCA STD. DWG. NO. 503.2)
 24. INSTALL 48" RCP END SECTION (NDOT STD. PLAN R-2.3.1)
 25. INSTALL DRIVEWAY (USDCCA STD. DWG. NO. 224)
 26. CONSTRUCT TYPE "CM" DROP INLET (USDCCA STD. DWG. NO. 422)

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

APPROVED FOR CONSTRUCTION
LVVMD WILL HAVE TO BE PRESENT AND VIEW INSTALLATION OF STORM DRAIN THAT WILL BE INSTALLED THAT MAY AFFECT THE WATER MAINS
[Signature] 10/10/16
DATE
LVVMD ENGINEERING SERVICES MANAGER
PROJECT NO. 124568

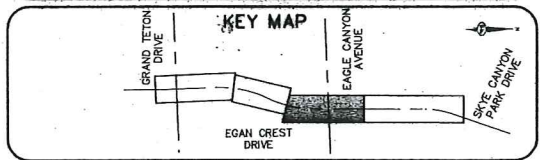
DROP INLET NOTE
WHERE 10 FEET PARALLEL SEPARATION IS NOT PRACTICABLE:
CAST-IN-PLACE MONOLITHIC POUR WITH WATERSTOP BETWEEN SLAB AND WALLS. BASE, WALLS AND TOP TO BE CONSTRUCTED WITH WATERSTOPS, CENTER BUILT, OR FLAT STRIP (VINYLEX, GREENSTREAK PLASTIC PRODUCTS OR APPROVED EQUAL).

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

I CERTIFY THAT THIS GRADING PLAN IS IN CONFORMANCE WITH THE APPROVED TECHNICAL DRAINAGE STUDY 05-4739A ON FILE AT THE CITY OF LAS VEGAS FOR THE SUBJECT PROJECT
[Signature] 9.8.16
DATE
JERRY SLATER, P.E. 14167

FLOOD ZONE
THE PROJECT SITE IS LOCATED WITHIN A FEMA DESIGNATED ZONE "X" (OUTSIDE THE 500-YEAR FLOOD PLAIN) ON THE FLOOD INSURANCE RATE MAP (FIRM) PANEL: 8003031750E, DATED SEPTEMBER 27, 2002

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



40 0 40 80
SCALE FEET

FAST
Call before you Dig
1-702-482-2000

811
Call before you Dig
1-800-227-2800

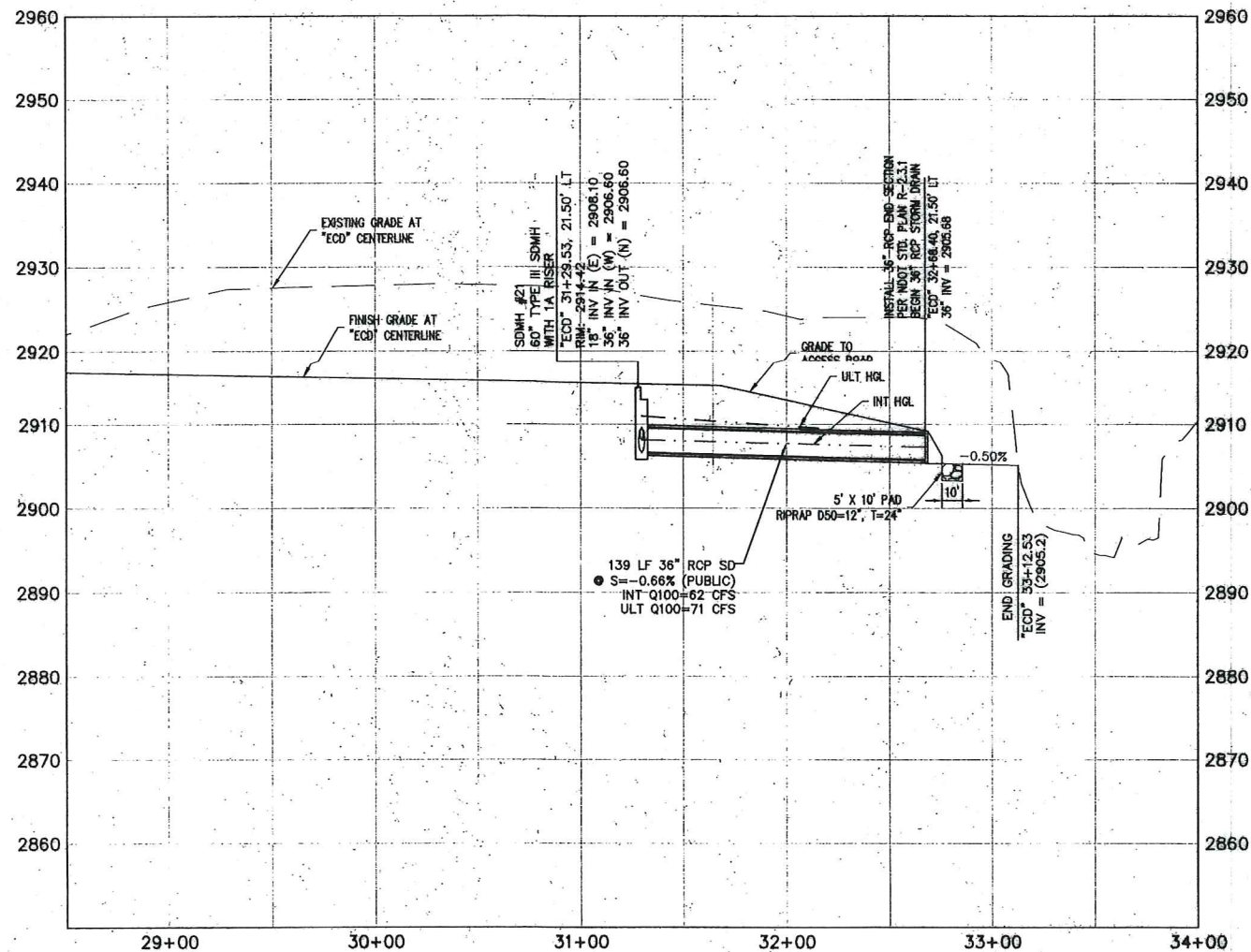
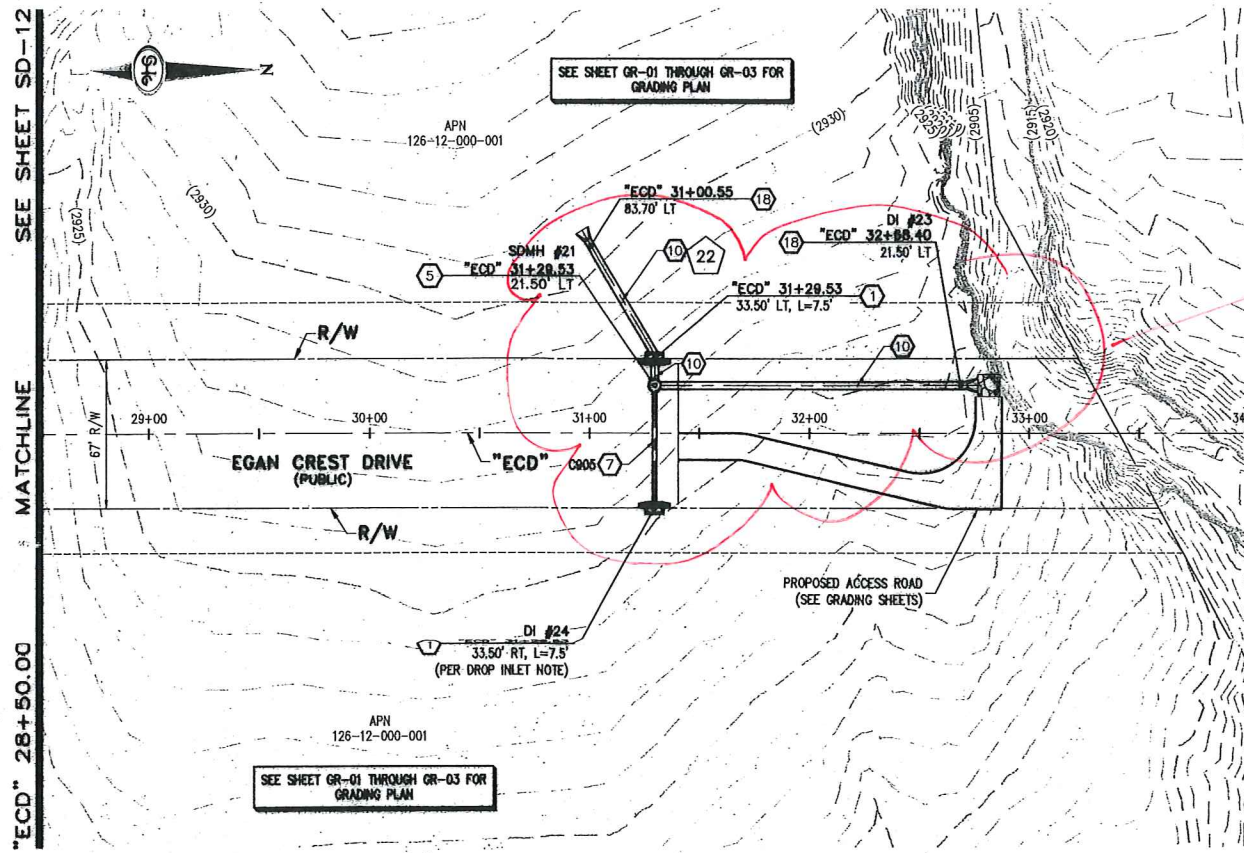
SD-12
SHEET 15 OF 32
107.63875
107.63750

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

NINETY-FIVE MANAGEMENT LLC
SKYE CANYON II PHASE 2 MASS GRADE
EGAN CREST STORM DRAIN PLAN AND PROFILE
"ECD" 21+00.00 TO "ECD" 28+50.00

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

ENGINEER
JERRY SLATER
No. 14167
SD-12
SHEET 15 OF 32
107.63875
107.63750



STORM DRAIN NOTES

1. CONSTRUCT TYPE "CM" DROP INLET (USDCCA STD. DWG. NO. 412.1)
2. REMOVE EXISTING LATERAL STUB AND CONSTRUCT RCB PLUG (SEE DETAIL 5, DRAWING SD-25)
3. CONSTRUCT 60" TYPE I MANHOLE (USDCCA STD. DWG. NO. 403.1)
4. CONSTRUCT 60" TYPE III MANHOLE (USDCCA STD. DWG. NO. 406.1)
5. CONSTRUCT 60" TYPE III MANHOLE WITH TYPE IA RISER (USDCCA STD. DWG. NO. 404.1 AND 406.1)
6. CONSTRUCT NDOT TYPE 4 MANHOLE (NDOT STD. PLAN R-4.3.2)
7. INSTALL 18" RCP OR WATER QUALITY C905 AS SHOWN ON PROFILES (USDCCA STD. DWG. NO. 503.2)
8. INSTALL 24" RCP OR WATER QUALITY C905 AS SHOWN ON PROFILES (USDCCA STD. DWG. NO. 503.2)
9. INSTALL 30" RCP (USDCCA STD. DWG. NO. 503.2)
10. INSTALL 36" RCP (USDCCA STD. DWG. NO. 503.2)
11. INSTALL 42" RCP (USDCCA STD. DWG. NO. 503.2)
12. INSTALL 54" RCP (USDCCA STD. DWG. NO. 503.2)
13. INSTALL 60" RCP (USDCCA STD. DWG. NO. 503.2)
14. INSTALL 66" RCP (USDCCA STD. DWG. NO. 503.2)
15. INSTALL 18" RCP END SECTION (NDOT STD. PLAN R-2.3.1)
16. INSTALL 24" RCP END SECTION (NDOT STD. PLAN R-2.3.1)
17. INSTALL 30" RCP END SECTION (NDOT STD. PLAN R-2.3.1)
18. INSTALL 36" RCP END SECTION (NDOT STD. PLAN R-2.3.1)
19. INSTALL 42" RCP END SECTION (NDOT STD. PLAN R-2.3.1)
20. PIPE PENETRATION (SEE DETAIL 4, DRAWING SD-25)
21. CONSTRUCT CONCRETE COLLAR (SEE DETAIL 2, DRAWING SD-25)
22. CONSTRUCT BRICK AND MORTAR PLUG (SEE DETAIL 1, DRAWING SD-25)
23. INSTALL 48" RCP (USDCCA STD. DWG. NO. 503.2)
24. INSTALL 48" RCP END SECTION (NDOT STD. PLAN R-2.3.1)
25. INSTALL DRIVEWAY (USDCCA STD. DWG. NO. 224)
26. CONSTRUCT TYPE "CM" DROP INLET (USDCCA STD. DWG. NO. 422)

NOTES

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

APPROVED FOR CONSTRUCTION

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

Y. Disapari FOR *JSR* 10/10/16
LYVND ENGINEERING SERVICES MANAGER
PROJECT NO. 124588
DATE

DROP INLET NOTE

WHERE 10 FEET PARALLEL SEPARATION IS NOT PRACTICABLE:
CAST-IN-PLACE MONOLITHIC POUR WITH WATERSTOP BETWEEN SLAB AND WALLS.
BASE, WALLS AND TOP TO BE CONSTRUCTED WITH WATERSTOPS, CENTER BULB, OR FLAT STRIP (VINYLEX, GREENSTREAK PLASTIC PRODUCTS OR APPROVED EQUAL).

LEGEND



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

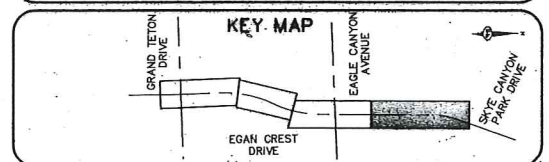
I CERTIFY THAT THIS GRADING PLAN IS IN CONFORMANCE WITH THE APPROVED TECHNICAL DRAINAGE STUDY D5-4739A ON FILE AT THE CITY OF LAS VEGAS FOR THE SUBJECT PROJECT.
J. Slater
JERRY SLATER, P.E. 14167
DATE

FLOOD ZONE

THE PROJECT SITE IS LOCATED WITHIN A FEMA DESIGNATED ZONE "X" (OUTSIDE THE 500-YEAR FLOOD PLAIN) ON THE FLOOD INSURANCE RATE MAP (FIRM) PANEL 32003C1750E, DATED SEPTEMBER 22, 2002.

NOTE:

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



SLATER
HANIFAN
GROUP
CONSULTING ENGINEERS & PLANNERS
5740 S. ARVILLE STREET #216, LAS VEGAS, NV 89118
PHONE (702) 284-5390 FAX (702) 284-5398

NINETY-FIVE MANAGEMENT LLC

SKYE CANYON II PHASE 2 MASS GRADE
EGAN CREST STORM DRAIN PLAN AND PROFILE
"ECD" 28+50.00 TO "ECD" 34+00.00

DATE: 8/3/16

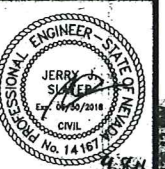
DRAFTER: JAS

DESIGNER: DAM

CHECKED: JSR

PROJECT NO.

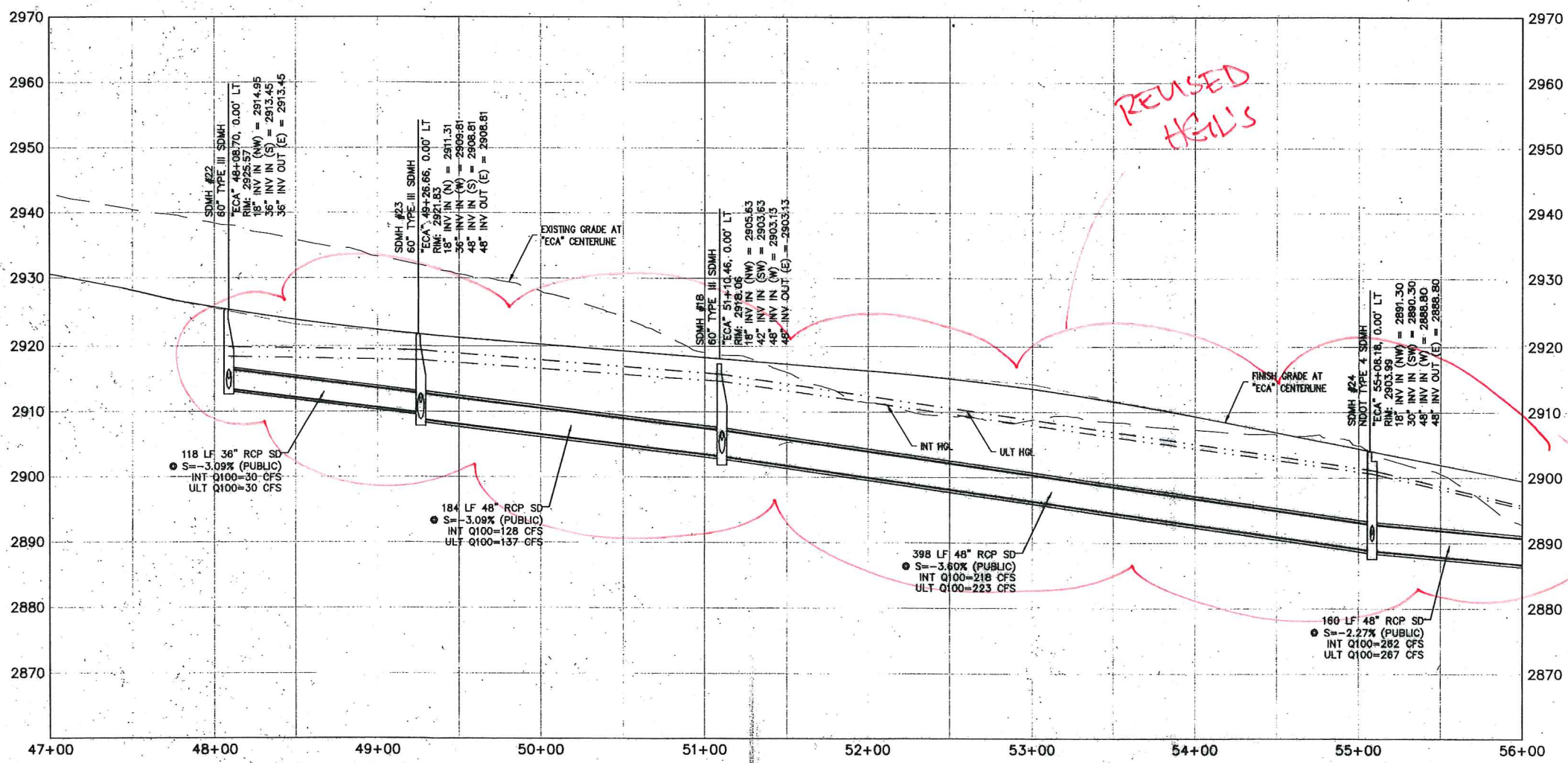
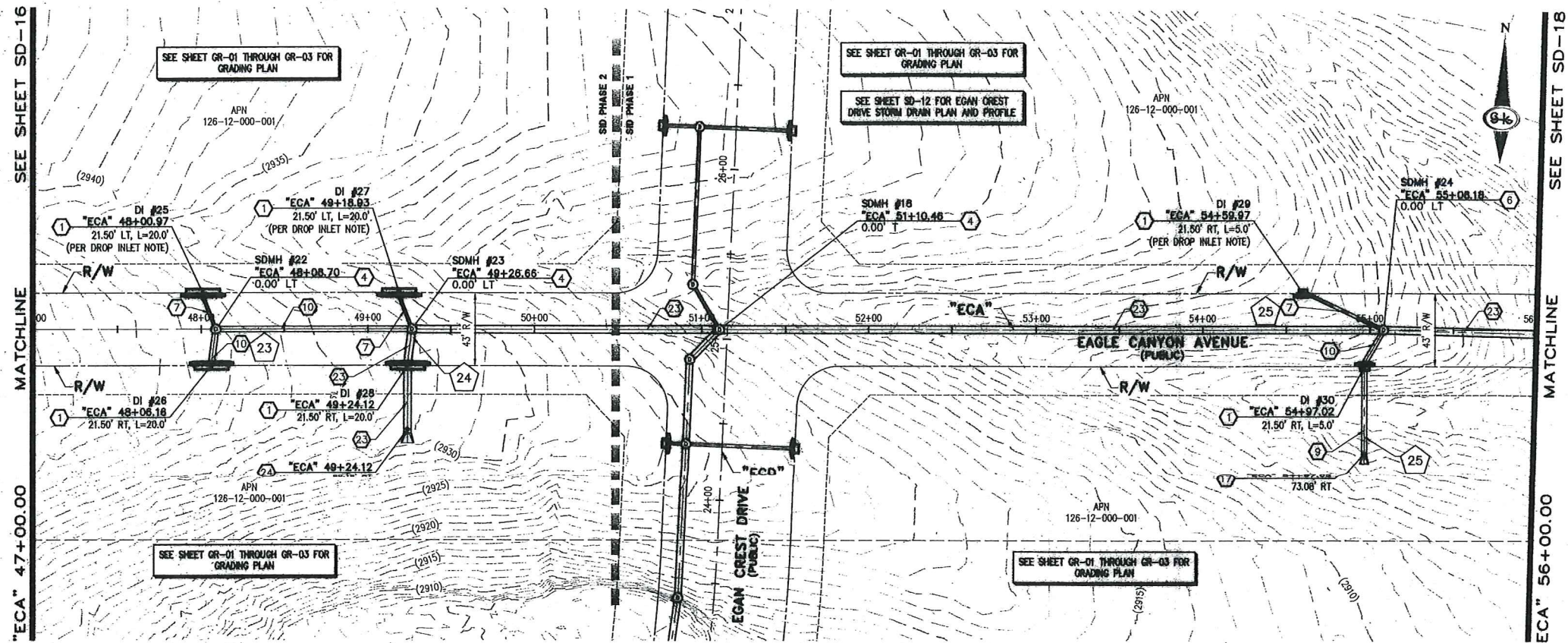
OLY1501-001



SD-13

SHEET 16 OF 32

11463875
107V-6750



- ### STORM DRAIN NOTES
- CONSTRUCT TYPE "CM2" DROP INLET (USDCCA STD. DWG. NO. 412.1)
 - REMOVE EXISTING LATERAL STUB AND CONSTRUCT RCB PLUG (SEE DETAIL 5, DRAWING SD-25)
 - CONSTRUCT 60" TYPE I MANHOLE (USDCCA STD. DWG. NO. 403.1)
 - CONSTRUCT 60" TYPE III MANHOLE (USDCCA STD. DWG. NO. 406.1)
 - CONSTRUCT 60" TYPE III MANHOLE WITH TYPE IA RISER (USDCCA STD. DWG. NO. 404.1 AND 408.1)
 - CONSTRUCT NDOT TYPE 4 MANHOLE (NDOT STD. PLAN R-4.3.2)
 - INSTALL 18" RCP OR WATER QUALITY C905 AS SHOWN ON PROFILES (USDCCA STD. DWG. NO. 503.2)
 - INSTALL 24" RCP OR WATER QUALITY C905 AS SHOWN ON PROFILES (USDCCA STD. DWG. NO. 503.2)
 - INSTALL 30" RCP (USDCCA STD. DWG. NO. 503.2)
 - INSTALL 36" RCP (USDCCA STD. DWG. NO. 503.2)
 - INSTALL 42" RCP (USDCCA STD. DWG. NO. 503.2)
 - INSTALL 54" RCP (USDCCA STD. DWG. NO. 503.2)
 - INSTALL 60" RCP (USDCCA STD. DWG. NO. 503.2)
 - INSTALL 66" RCP (USDCCA STD. DWG. NO. 503.2)
 - INSTALL 18" RCP END SECTION (NDOT STD. PLAN R-2.3.1)
 - INSTALL 24" RCP END SECTION (NDOT STD. PLAN R-2.3.1)
 - INSTALL 30" RCP END SECTION (NDOT STD. PLAN R-2.3.1)
 - INSTALL 36" RCP END SECTION (NDOT STD. PLAN R-2.3.1)
 - INSTALL 42" RCP END SECTION (NDOT STD. PLAN R-2.3.1)
 - PIPE PENETRATION (SEE DETAIL 4, DRAWING SD-25)
 - CONSTRUCT CONCRETE COLLAR (SEE DETAIL 2, DRAWING SD-25)
 - CONSTRUCT BRICK AND MORTAR PLUG (SEE DETAIL 1, DRAWING SD-75)
 - INSTALL 48" RCP (USDCCA STD. DWG. NO. 503.2)
 - INSTALL 48" RCP END SECTION (NDOT STD. PLAN R-2.3.1)
 - INSTALL DRIVEWAY (USDCCA STD. DWG. NO. 224)
 - CONSTRUCT TYPE "CM" DROP INLET (USDCCA STD. DWG. NO. 422)

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

APPROVED FOR CONSTRUCTION
 LVWD WILL HAVE TO BE PRESENT AND VIEW INSTALLATION OF STORM DRAIN THAT WILL BE INSTALLED THAT MAY AFFECT THE WATER MAINS

J. D. SHARI FOR J. D. SHARI 10/10/16
 DATE

LVWD ENGINEERING SERVICES MANAGER
 PROJECT NO. 124568

DROP-INLET NOTE
 WHERE 10 FEET PARALLEL SEPARATION IS NOT PRACTICABLE:
 CAST-IN-PLACE MONOLITHIC POUR WITH WATERSTOP BETWEEN SLAB AND WALLS. BASE, WALLS AND TOP TO BE CONSTRUCTED WITH WATERSTOPS, CENTER BULB, OR FLAT STRIP (WYLEX, GREENSTREAK PLASTIC PRODUCTS OR APPROVED EQUAL).

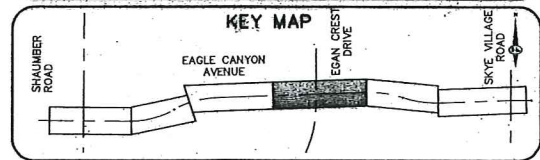
LEGEND
 1 STORM DRAIN LATERAL # (SEE SHEETS SD-20 THRU SD-24)

I CERTIFY THAT THIS GRADING PLAN IS IN CONFORMANCE WITH THE APPROVED TECHNICAL DRAINAGE STUDY 05-4739A ON FILE AT THE CITY OF LAS VEGAS FOR THE SUBJECT PROJECT

Jerry Slater, P.E. 10/10/16
 DATE

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

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



40 0 40 80
 SCALE FEET

FAST
 Call before you Dig
 1-800-227-2929

Call before you Dig
 1-800-227-2929

SD-17
 SHEET 20 OF 32
 107V-6750

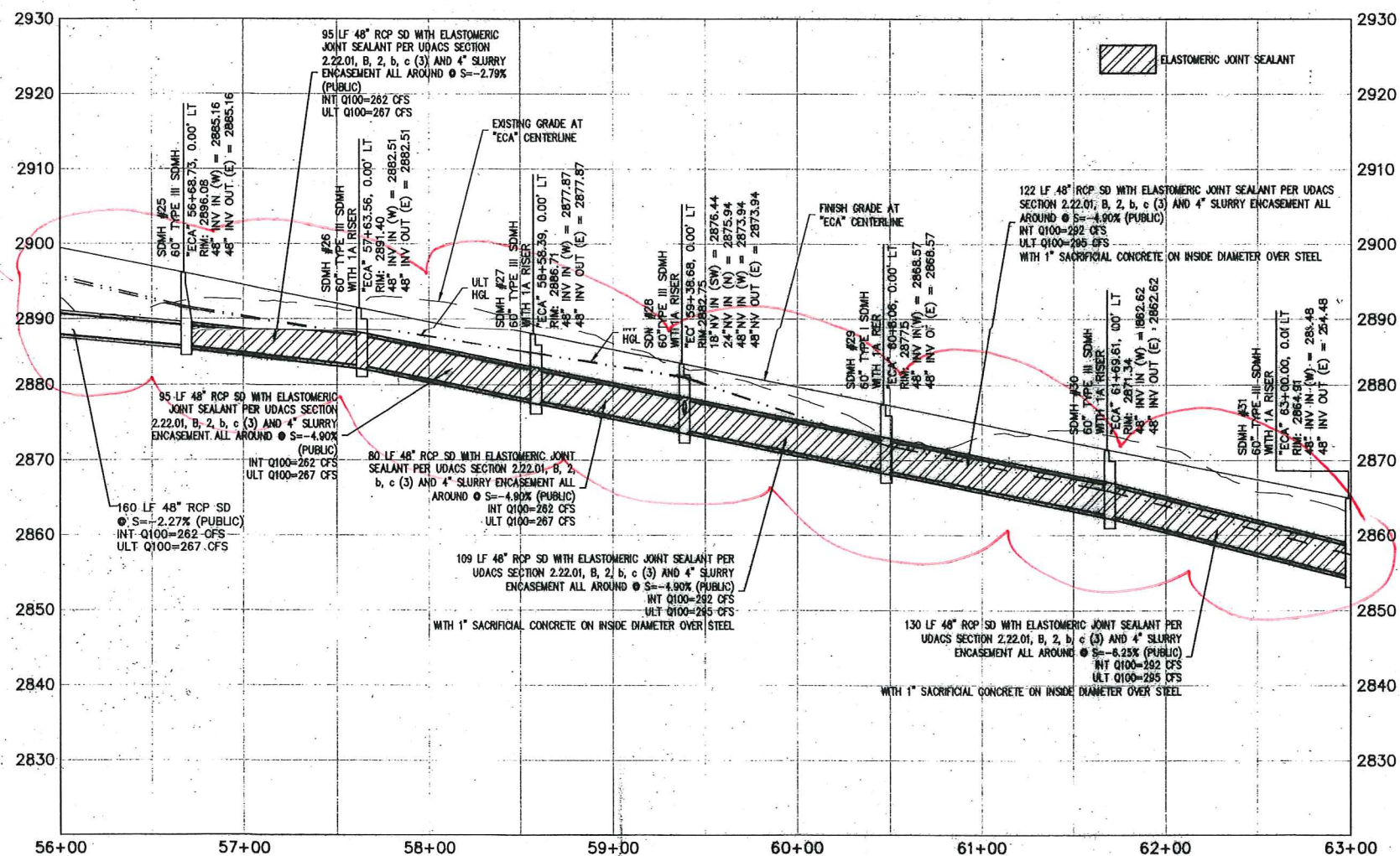
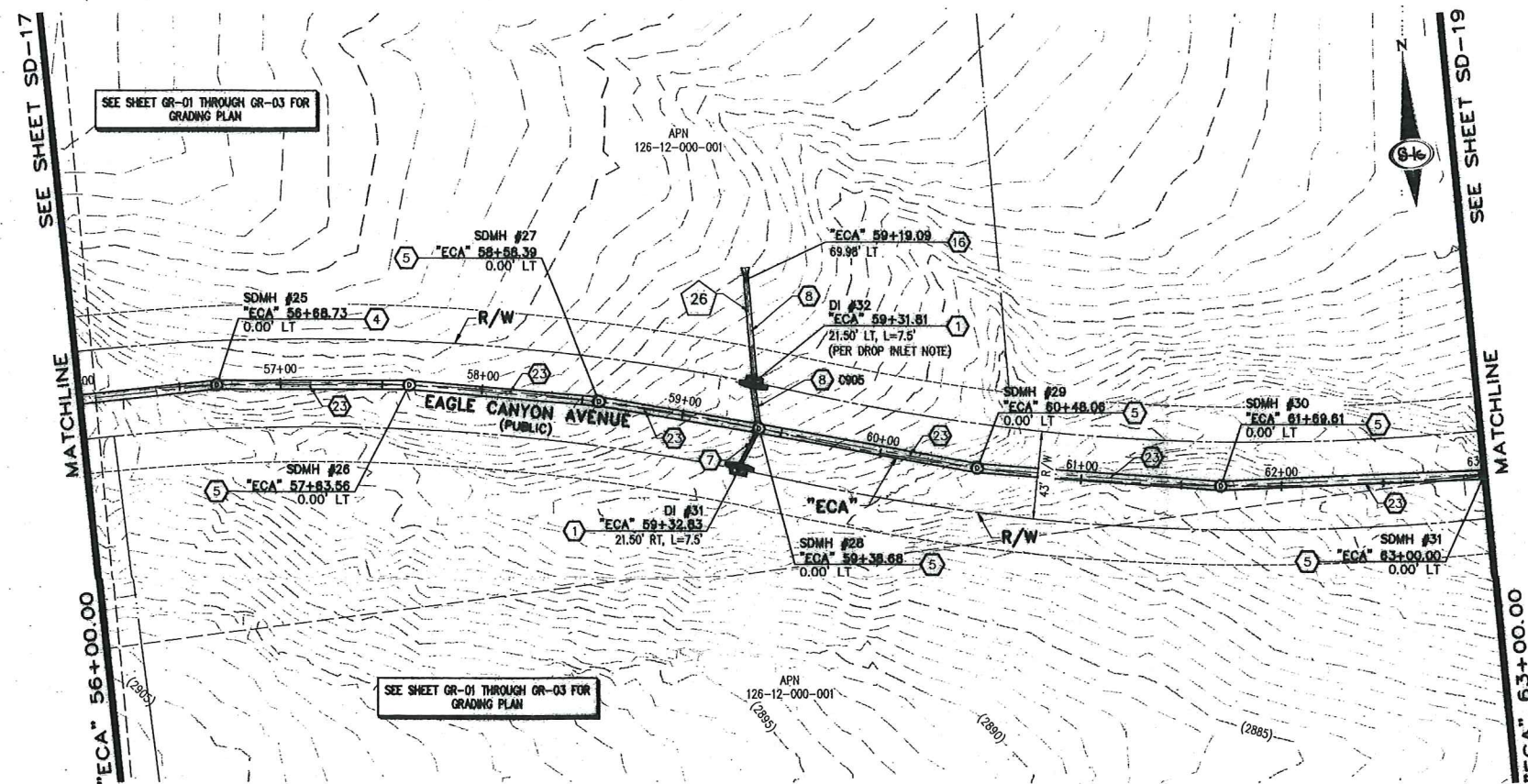
SLATER HANFAN GROUP
 CONSULTING ENGINEERS & PLANNERS
 5740 S. ARVILLE STREET #216, LAS VEGAS, NV 89118
 PHONE (702) 264-5390 FAX (702) 264-5390

NINETY-FIVE MANAGEMENT LLC

SKYE CANYON II PHASE 2 MASS GRADE
EAGLE CANYON AVENUE PLAN AND PROFILE
"ECA" 47+00.00 TO "ECA" 56+00.00

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

SD-17
 SHEET 20 OF 32
 107V-6750



- ## STORM DRAIN NOTES
- 1 CONSTRUCT TYPE "CM2" DROP INLET (USDOCCA STD. DWG. NO. 412.1)
 - 2 REMOVE EXISTING LATERAL STUB AND CONSTRUCT RCB PLUG
(SEE DETAIL 5, DRAWING SD-25)
 - 3 CONSTRUCT 60" TYPE I MANHOLE (USDOCCA STD. DWG. NO. 403.1)
 - 4 CONSTRUCT 80" TYPE III MANHOLE (USDOCCA STD. DWG. NO. 406.1)
 - 5 CONSTRUCT 60" TYPE III MANHOLE WITH TYPE IA RISER (USDOCCA STD. DWG. NO. 404.1 AND 406.1)
 - 6 CONSTRUCT NDOT TYPE 4 MANHOLE (NDOT STD. PLAN R-4.3.2)
 - 7 INSTALL 18" RCP OR WATER QUALITY C905 AS SHOWN ON PROFILES
(USDOCCA STD. DWG. NO. 503.2)
 - 8 INSTALL 24" RCP OR WATER QUALITY C905 AS SHOWN ON PROFILES
(USDOCCA STD. DWG. NO. 503.2)
 - 9 INSTALL 30" RCP (USDOCCA STD. DWG. NO. 503.2)
 - 10 INSTALL 36" RCP (USDOCCA STD. DWG. NO. 503.2)
 - 11 INSTALL 42" RCP (USDOCCA STD. DWG. NO. 503.2)
 - 12 INSTALL 54" RCP (USDOCCA STD. DWG. NO. 503.2)
 - 13 INSTALL 60" RCP (USDOCCA STD. DWG. NO. 503.2)
 - 14 INSTALL 66" RCP (USDOCCA STD. DWG. NO. 503.2)
 - 15 INSTALL 18" RCP END SECTION (NDOT STD. PLAN R-2.3.1)
 - 16 INSTALL 24" RCP END SECTION (NDOT STD. PLAN R-2.3.1)
 - 17 INSTALL 30" RCP END SECTION (NDOT STD. PLAN R-2.3.1)
 - 18 INSTALL 36" RCP END SECTION (NDOT STD. PLAN R-2.3.1)
 - 19 INSTALL 42" RCP END SECTION (NDOT STD. PLAN R-2.3.1)
 - 20 PIPE PENETRATION (SEE DETAIL 4, DRAWING SD-25)
 - 21 CONSTRUCT CONCRETE COLLAR (SEE DETAIL 2, DRAWING SD-25)
 - 22 CONSTRUCT BRICK AND MORTAR PLUG (SEE DETAIL 1, DRAWING SD-25)
 - 23 INSTALL 48" RCP (USDOCCA STD. DWG. NO. 503.2)
 - 24 INSTALL 48" RCP END SECTION (NDOT STD. PLAN R-2.3.1)
 - 25 INSTALL DRIVEWAY (USDOCCA STD. DWG. NO. 224)
 - 26 CONSTRUCT TYPE "CM" DROP INLET (USDOCCA STD. DWG. NO. 422)

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

APPROVED FOR CONSTRUCTION

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

4 DISHARI ER DSM 10/10/16

DATE

LVVWD ENGINEERING SERVICES MANAGER
PROJECT NO. 12456B

DROP INLET NOTE

WHERE 10 FEET PARALLEL SEPARATION IS NOT PRACTICABLE:

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

LEGEND

	STORM DRAIN LATERAL # (SEE SHEETS SD-20 THRU SD-24)
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I CERTIFY THAT THIS GRADING PLAN IS IN CONFORMANCE WITH THE APPROVED TECHNICAL DRAINAGE STUDY DS-4759A ON FILE AT THE CITY OF LAS VEGAS FOR THE SUBJECT PROJECT

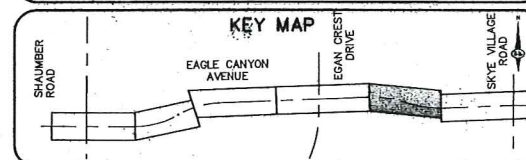
JERRY SLATER, P.E. #187 DATE 9-24

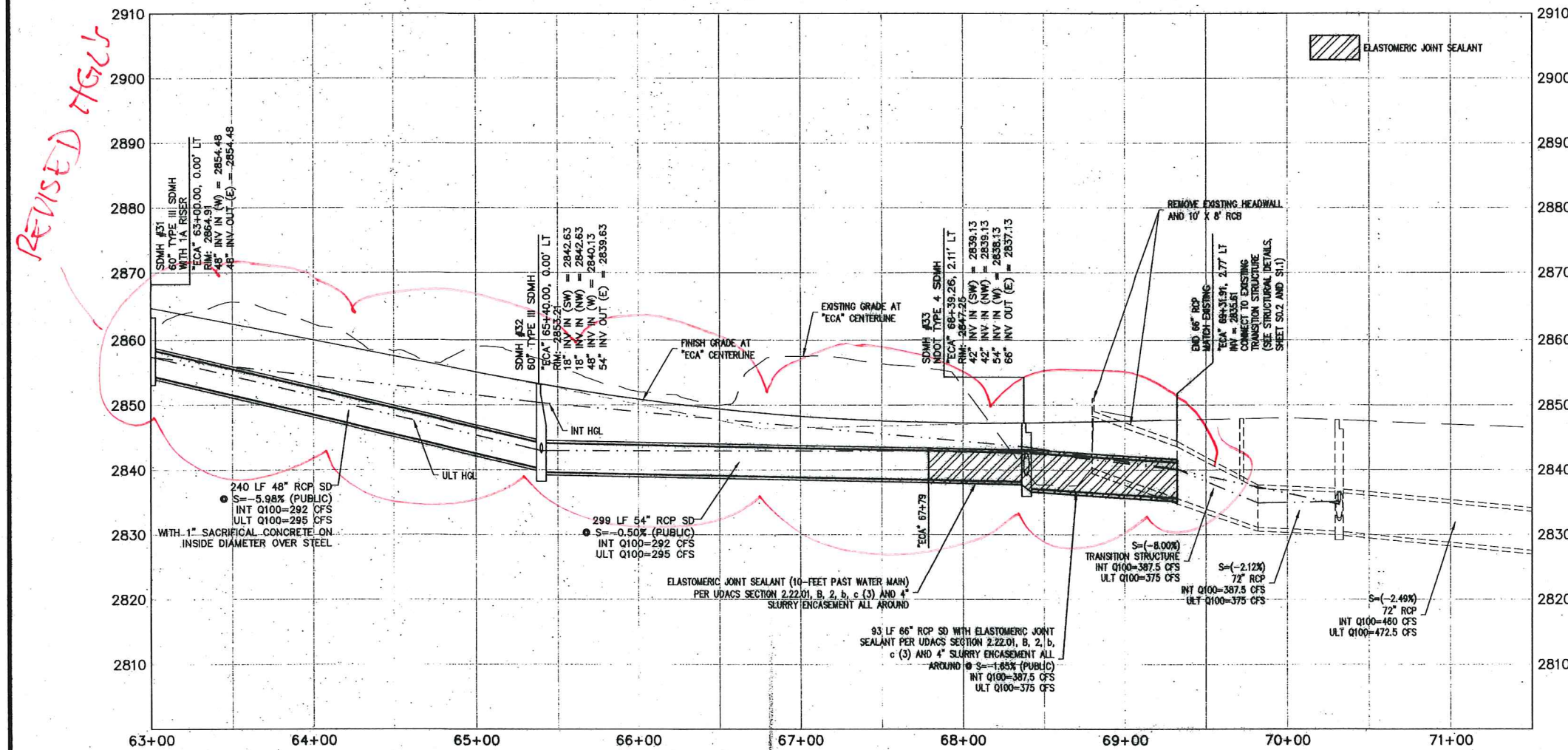
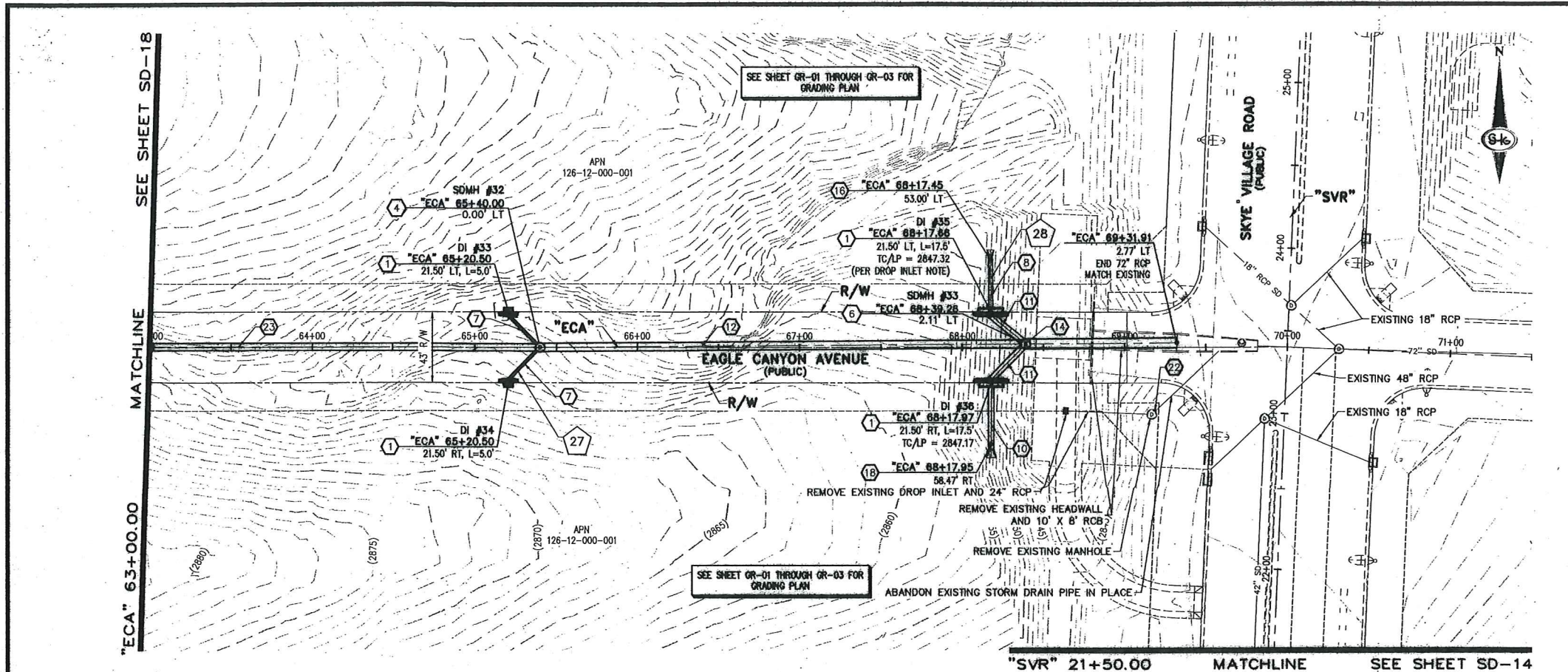
FLOOD ZONE

THE PROJECT SITE IS LOCATED WITHIN A FEMA DESIGNATED ZONE "X" (OUTSIDE THE 500-YEAR FLOOD PLAIN) ON THE FLOOD INSURANCE RATE MAP (FIRM) PANEL: 320003C1750E, DATED SEPTEMBER 27, 2002

NOTE:

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





STORM DRAIN NOTES

- CONSTRUCT TYPE "CM2" DROP INLET (USDCCA STD. DWG. NO. 412.1)
- REMOVE EXISTING LATERAL STUB AND CONSTRUCT RCB PLUG (SEE DETAIL 5, DRAWING SD-25)
- CONSTRUCT 60" TYPE I MANHOLE (USDCCA STD. DWG. NO. 403.1)
- CONSTRUCT 60" TYPE III MANHOLE (USDCCA STD. DWG. NO. 406.1)
- CONSTRUCT 60" TYPE III MANHOLE WITH TYPE IA RISER (USDCCA STD. DWG. NO. 404.1 AND 406.1)
- CONSTRUCT NDOT TYPE 4 MANHOLE (NDOT STD. PLAN R-4.3.2)
- INSTALL 18" RCP OR WATER QUALITY C905 AS SHOWN ON PROFILES (USDCCA STD. DWG. NO. 503.2)
- INSTALL 24" RCP OR WATER QUALITY C905 AS SHOWN ON PROFILES (USDCCA STD. DWG. NO. 503.2)
- INSTALL 30" RCP (USDCCA STD. DWG. NO. 503.2)
- INSTALL 36" RCP (USDCCA STD. DWG. NO. 503.2)
- INSTALL 42" RCP (USDCCA STD. DWG. NO. 503.2)
- INSTALL 54" RCP (USDCCA STD. DWG. NO. 503.2)
- INSTALL 60" RCP (USDCCA STD. DWG. NO. 503.2)
- INSTALL 66" RCP (USDCCA STD. DWG. NO. 503.2)
- INSTALL 18" RCP END SECTION (NDOT STD. PLAN R-2.3.1)
- INSTALL 24" RCP END SECTION (NDOT STD. PLAN R-2.3.1)
- INSTALL 30" RCP END SECTION (NDOT STD. PLAN R-2.3.1)
- INSTALL 36" RCP END SECTION (NDOT STD. PLAN R-2.3.1)
- INSTALL 42" RCP END SECTION (NDOT STD. PLAN R-2.3.1)
- PIPE PENETRATION (SEE DETAIL 4, DRAWING SD-25)
- CONSTRUCT CONCRETE COLLAR (SEE DETAIL 2, DRAWING SD-25)
- CONSTRUCT BRICK AND MORTAR PLUG (SEE DETAIL 1, DRAWING SD-25)
- INSTALL 48" RCP (USDCCA STD. DWG. NO. 503.2)
- INSTALL 48" RCP END SECTION (NDOT STD. PLAN R-2.3.1)
- INSTALL DRIVEWAY (USDCCA STD. DWG. NO. 224)
- CONSTRUCT TYPE "CM" DROP INLET (USDCCA STD. DWG. NO. 422)

NOTES

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

APPROVED FOR CONSTRUCTION

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

Jerry Slater 10/16/16
 LVVWD ENGINEERING SERVICES MANAGER
 PROJECT NO. 124568 DATE

DROP INLET NOTE

WHERE 10 FEET PARALLEL SEPARATION IS NOT PRACTICABLE:
 CAST-IN-PLACE MONOLITHIC POUR WITH WATERSTOP BETWEEN SLAB AND WALLS. BASE, WALLS AND TOP TO BE CONSTRUCTED WITH WATERSTOPS, CENTER BULB, OR FLAT STRIP (WYNLEX, GREENSTREAK PLASTIC PRODUCTS OR APPROVED EQUAL).

LEGEND

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

FLOOD ZONE

THE PROJECT SITE IS LOCATED WITHIN A FEMA DESIGNATED ZONE "X" (OUTSIDE THE 500-YEAR FLOOD PLAIN) ON THE FLOOD INSURANCE RATE MAP (FIRM) PANEL: 3003017506, DATED SEPTEMBER 27, 2002

NOTE:

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

KEY MAP

SCALE

40 0 40 80
 FEET

Call before you Dig

1-800-227-2829

FAST

Call before you Dig Under Ground. 1-702-488-8800

Call before you Dig

1-800-227-2829

SLATER HANFAN GROUP

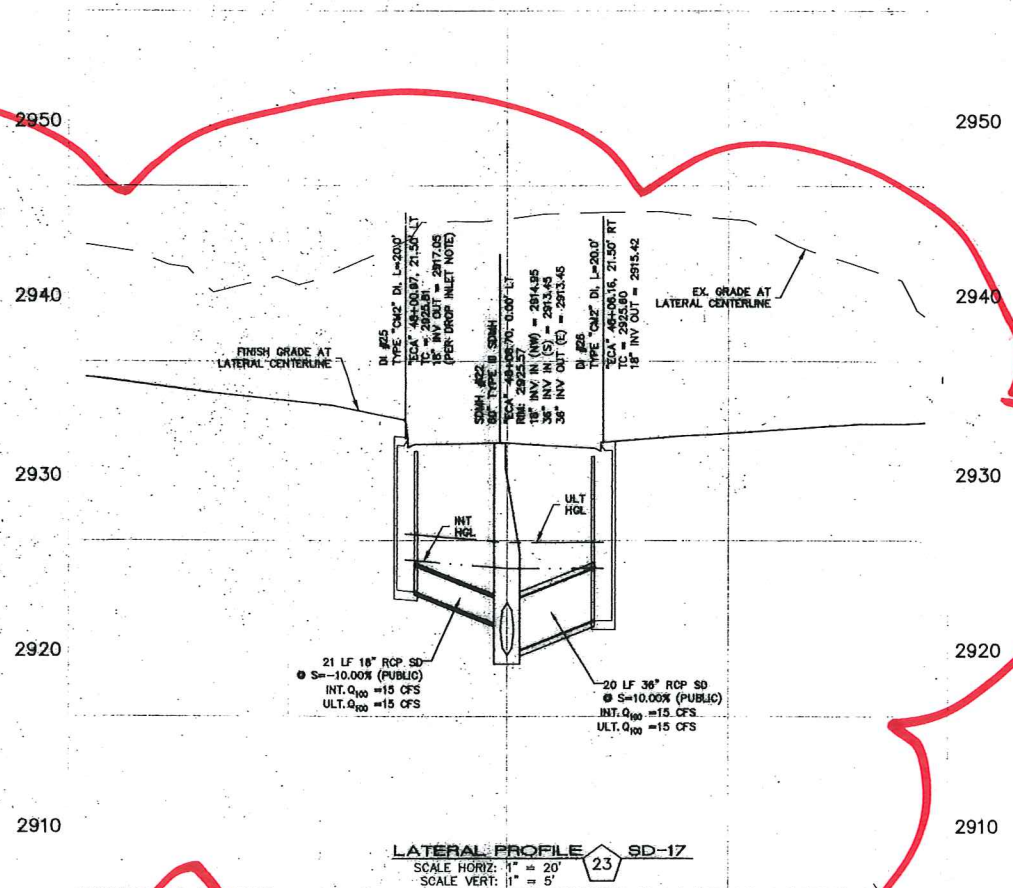
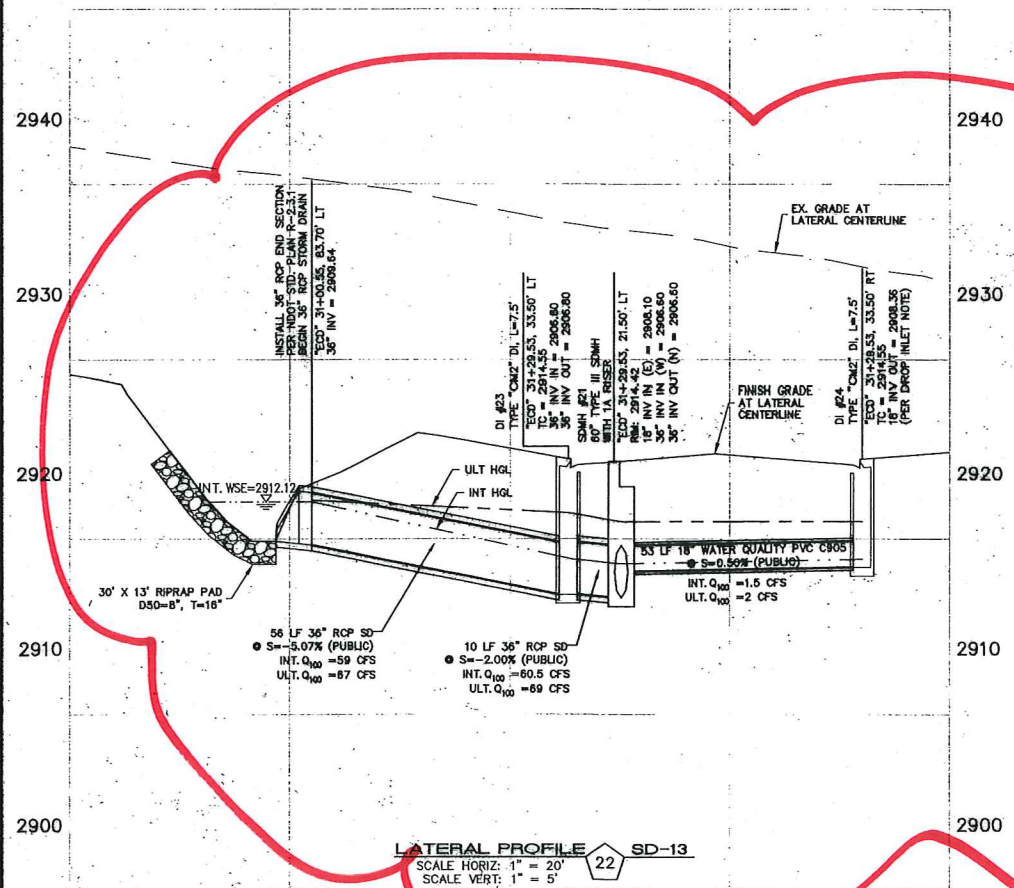
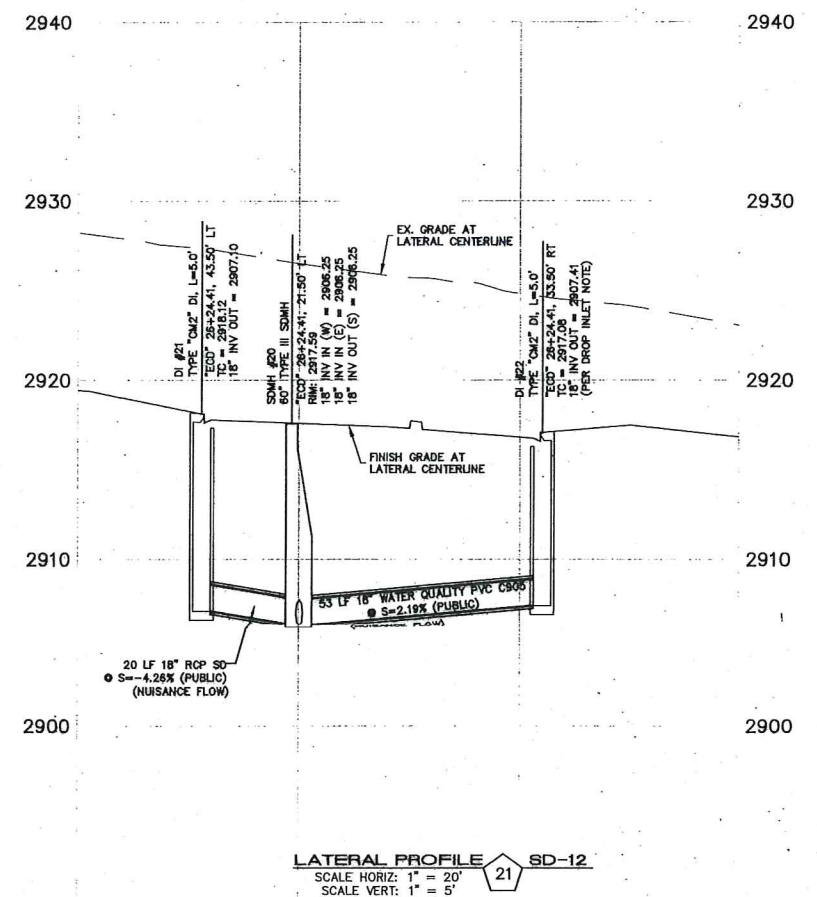
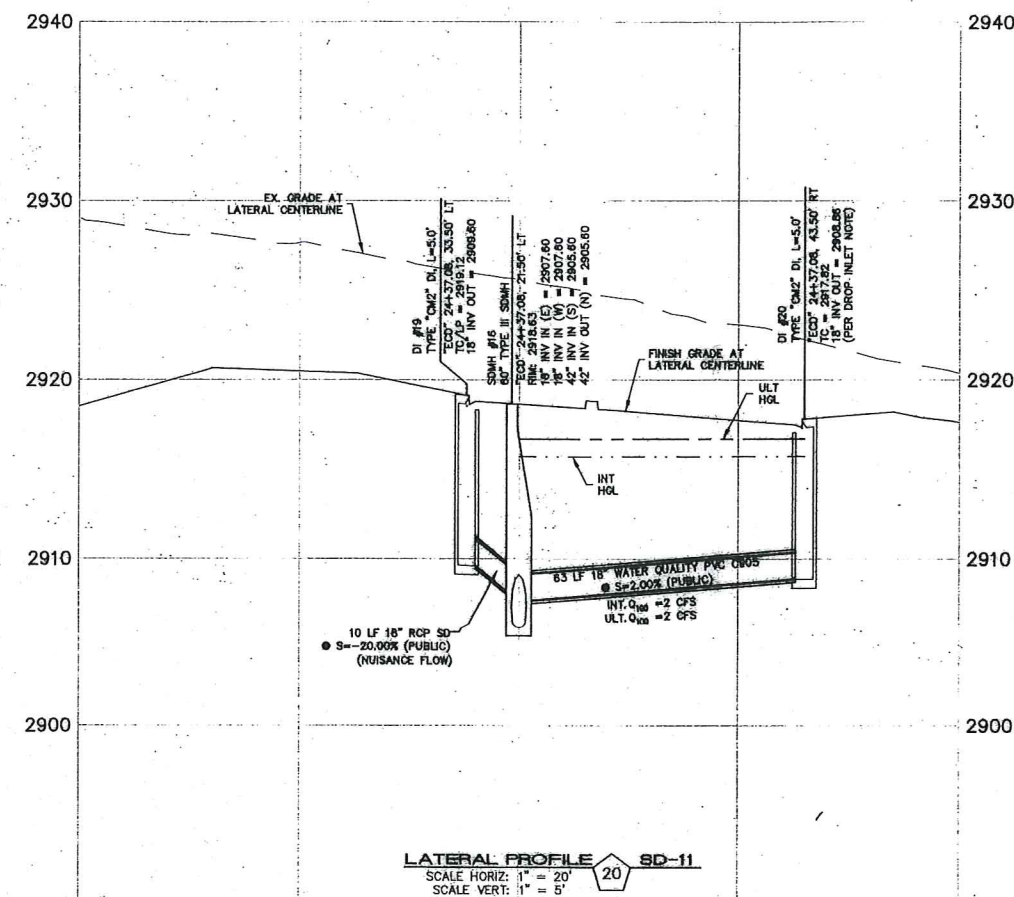
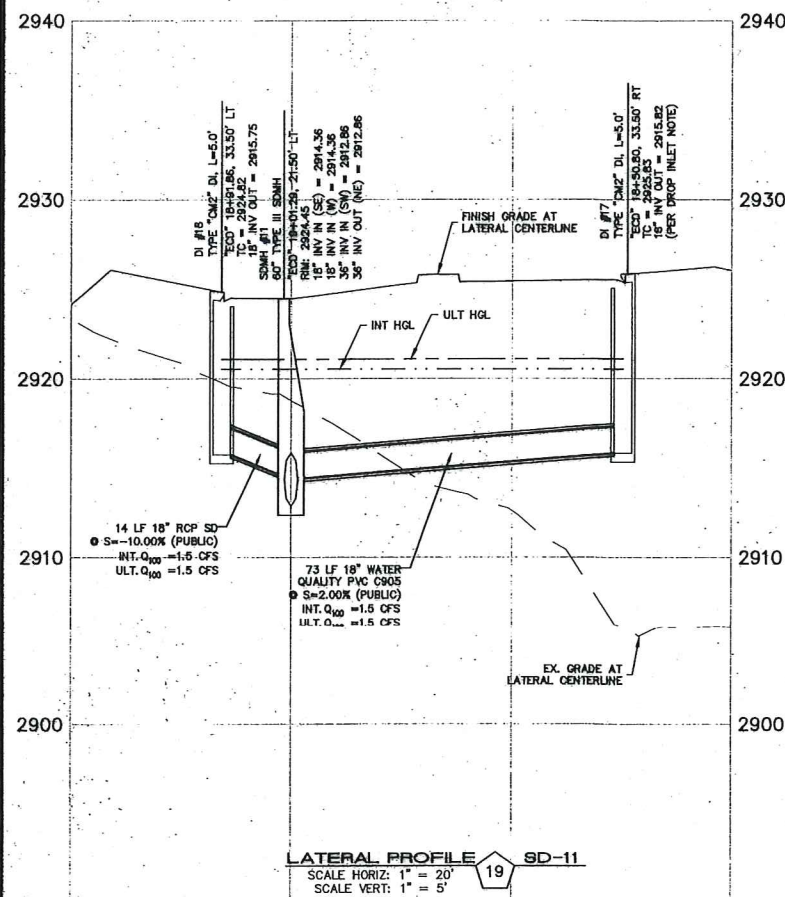
CONSULTING ENGINEERS & PLANNERS
 5740 S. ARVILLE STREET #216, LAS VEGAS, NV 89118
 PHONE (702) 264-5390 FAX (702) 264-5390

NINETY-FIVE MANAGEMENT LLC

SKYE CANYON II PHASE 2 MASS GRADE
 EAGLE CANYON AVENUE PLAN AND PROFILE
 "ECA" 63+00.00 TO "ECA" 71+50.00

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

SD-19
 SHEET 22 OF 32
 11463875
 10726750



REVISED

DROP INLET NOTE

WHERE 10 FEET PARALLEL SEPARATION IS NOT PRACTICABLE:
CAST-IN-PLACE MONOLITHIC POUR WITH WATERSTOP BETWEEN SLAB AND WALLS.
BASE, WALLS AND TOP TO BE CONSTRUCTED WITH WATERSTOPS, CENTER BULB,
OR FLAT STRIP (VYNLEX, GREENSTREAK PLASTIC PRODUCTS OR APPROVED EQUAL).

APPROVED FOR CONSTRUCTION
 TWO WILL HAVE TO BE PRESENT AND VIEW INSTALLATION OF STORM
 MAIN THAT WILL BE INSTALLED THAT MAY AFFECT THE WATER MAINS

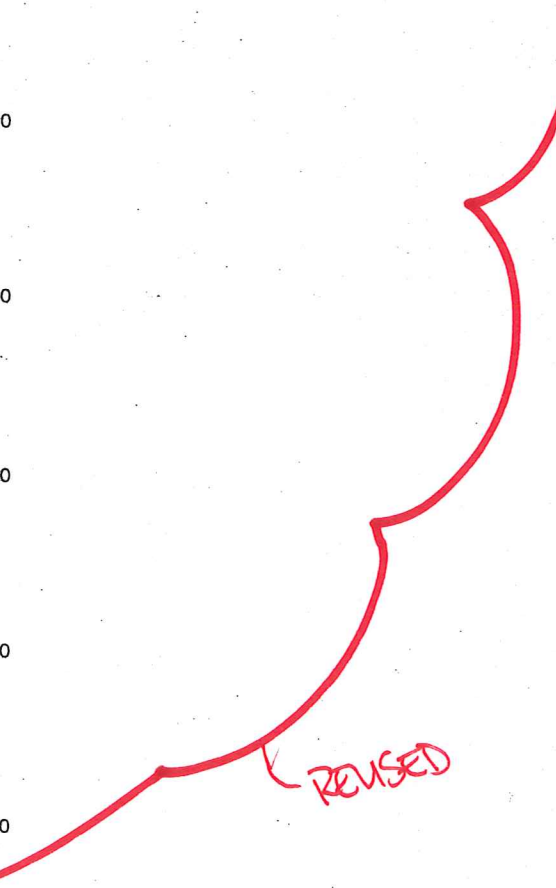
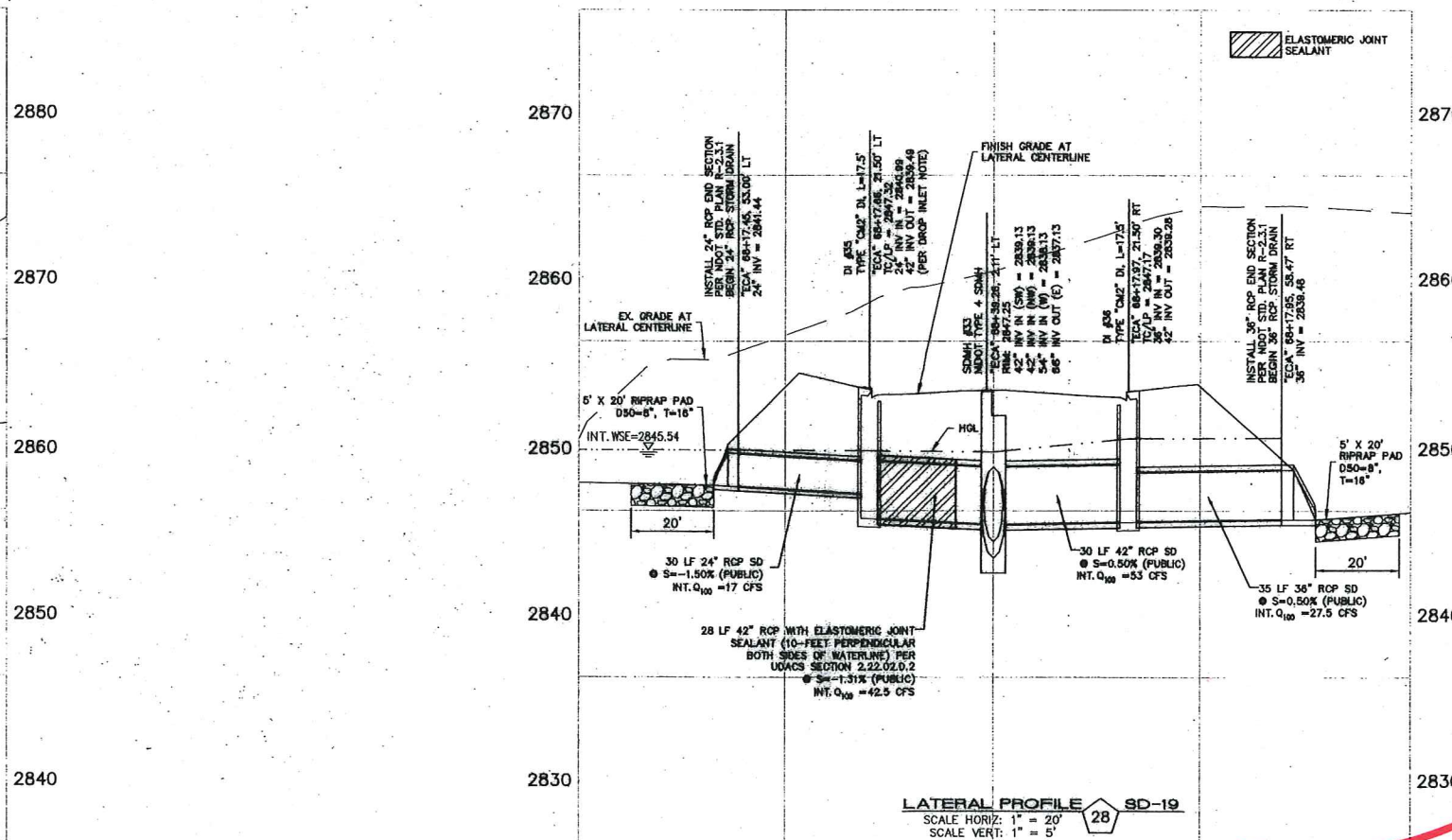
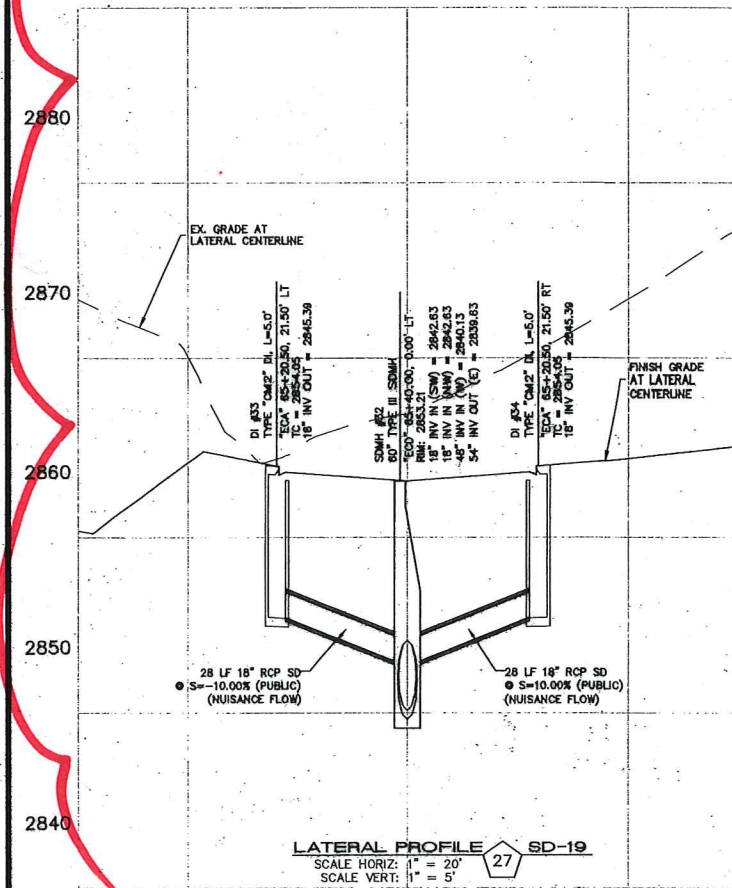
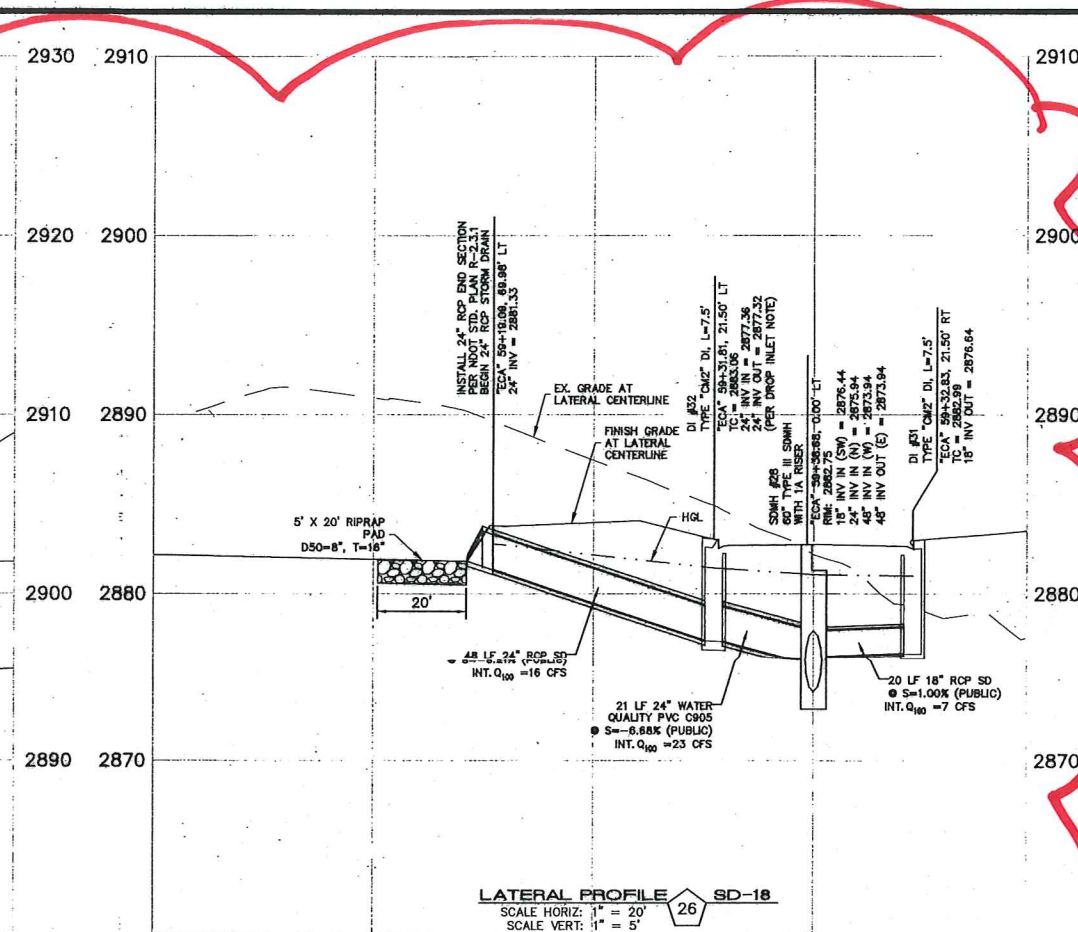
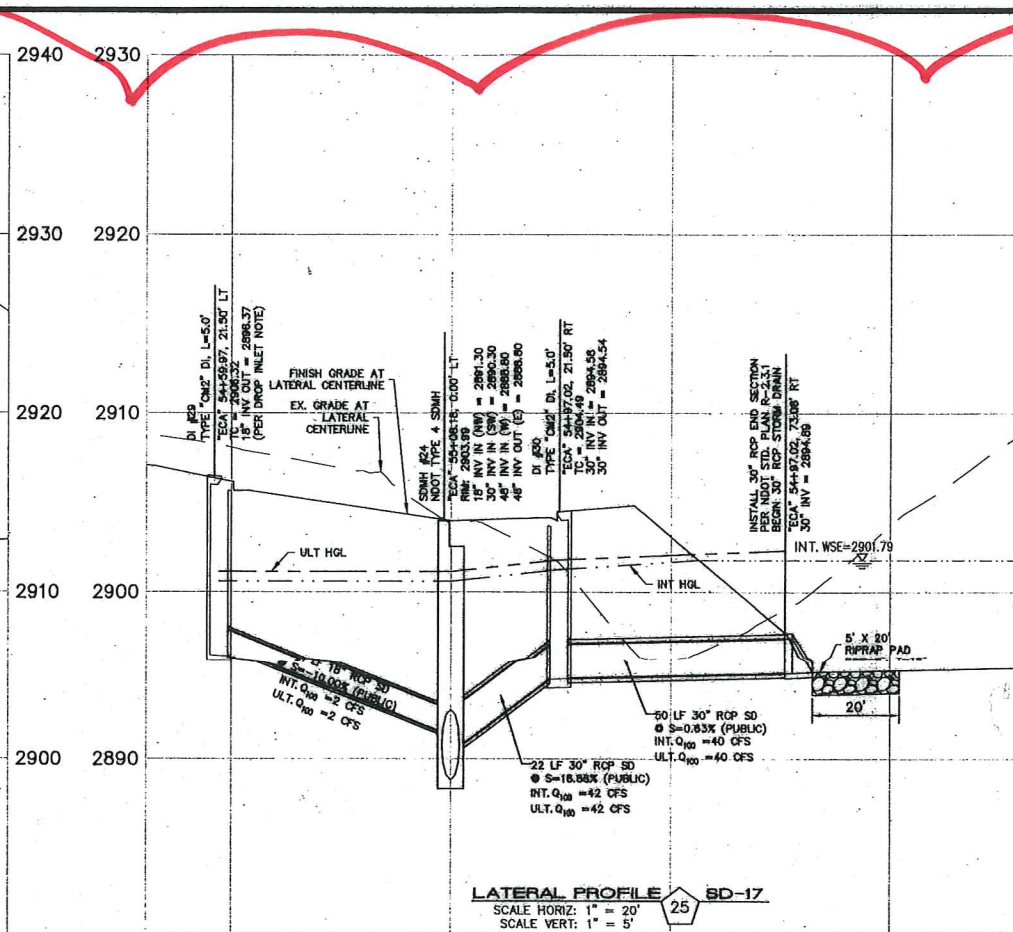
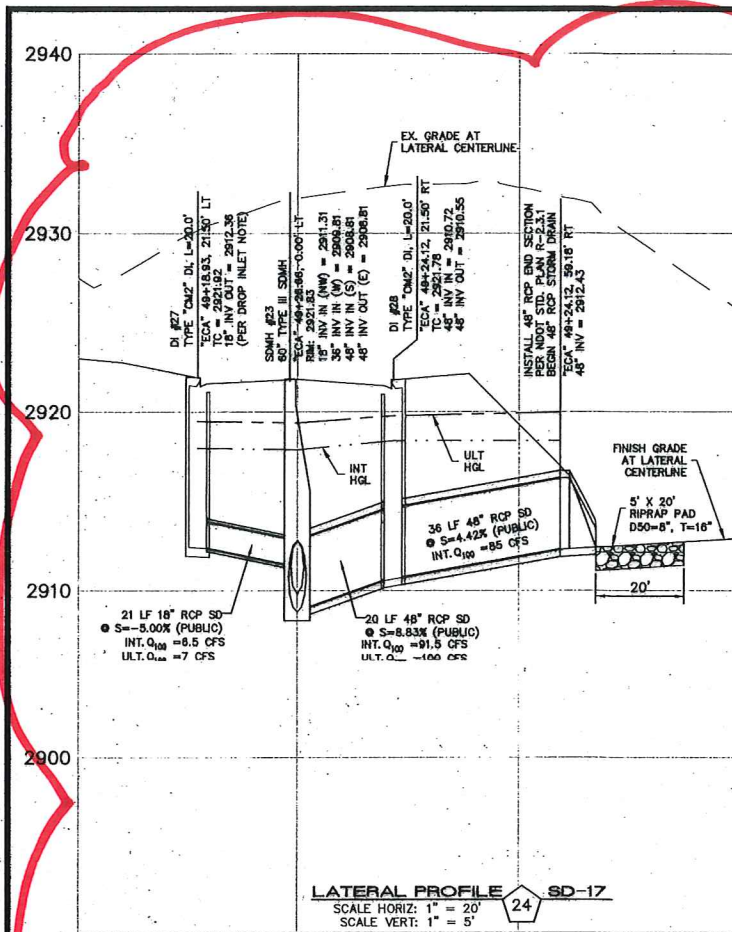
4, DISHARI FOR, 10/10/10
LVWD ENGINEERING SERVICES MANAGER DATE

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

NINETY-FIVE MANAGEMENT LLC
SKYE CANYON II PHASE 2 MASS GR2 ADP
STORM DRAIN LATERAL PROFILES

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

SD-23
SHEET 26 OF 32
14#63875
1078147512



DROP INLET NOTE
 WHERE 10 FEET PARALLEL SEPARATION IS NOT PRACTICABLE, CAST-IN-PLACE MONOLITHIC POUR WITH WATERSTOP BETWEEN SLAB AND WALLS. BASE, WALLS AND TOP TO BE CONSTRUCTED WITH WATERSTOPS, CENTER BULB, OR FLAT STRIP (VINYLEX, GREENSTREAK PLASTIC PRODUCTS OR APPROVED EQUAL).

APPROVED FOR CONSTRUCTION
 LVMD WILL HAVE TO BE PRESENT AND VIEW INSTALLATION OF STORM DRAIN THAT WILL BE INSTALLED THAT MAY AFFECT THE WATER MAINS

J. D. SHAR FOR JSM 10/10/16
 DATE

LVMD ENGINEERING SERVICES MANAGER
 PROJECT NO. 124568

SLATER HANIFAN GROUP
 CONSULTING ENGINEERS & PLANNERS
 5740 S. ARVILLE STREET #216, LAS VEGAS, NV 89118
 PHONE (702) 294-5300 FAX (702) 294-5399

NO.	DESCRIPTION	DATE	BY	APP.
1	ISSUED FOR PERMIT	8/3/16	JAS	
2	REVISED	10/10/16	JSM	

NINETY-FIVE MANAGEMENT LLC
 SKYE CANYON II PHASE 2 MASS GRADE
 STORM DRAIN LATERAL PROFILES

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

SD-24
 SHEET 27 OF 32
 10766750

APPENDIX G

Electronic Copy of Study (CD)

APPENDIX H

Grading Plan, Storm Drain Profile & Pertinent Detail Sheets