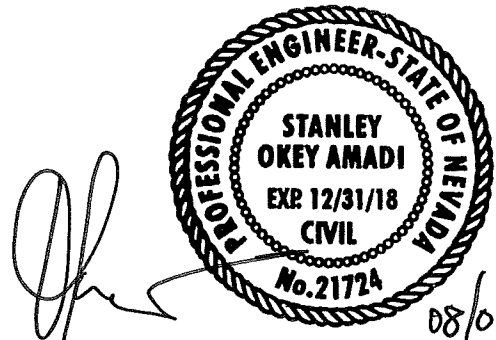


**TECHNICAL DRAINAGE STUDY
UPDATE #4 ADDENDUM
Skye Canyon Phase 2 Infrastructure**
City of Las Vegas, Nevada

Job No.: OLY1501.000
Date: July 2017

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

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



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.4 - Add Date: August 2017
 Location of Development: a) Descriptive (Cross Streets): North/South: Skye Village Road
 East/West: Grand Teton Drive
 b) Section: 12 Township: 19 South Range: 59 East
 c) APN: 126-12-310-001, 126-12-410-001, 126-12-310-002, 126-12-810-001, 126-12-710-002
126-12-710-003, 126-12-710-004, 126-12-810-002, 126-12-810-003, 126-12-810-004,
126-12-810-005

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
 *E-mail Address: samadi@shg-inc.com Fax No.: 702-284-5399
 Firm: Slater Hanifan Group
 Address: 5740 S. Arville Street, Suite 216; Las Vegas, NV 89118

Type of Land Development/Land Disturbance Process:

☐ Rezoning	☐ 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 acres +/-
6. Has the site drainage been evaluated in the past? ☒ Yes** ☐ No If yes, please identify documentation: Master Drainage Study for Skye Canyon (SHG, DS4420); Master Drainage Study for Kyle Canyon (GCW, DS4091)
Technical Drainage Study for Skye Canyon Phase 2 Infrastructure (SHG, DS4739) & TDS Updates 1 thru 3
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.



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



OLY1501.000

8/1/2017

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: Addendum to the Technical Drainage Study Update #4 for Skye Canyon Phase 2 Infrastructure (CLV # DS4739G)

Dear Mr. Sung:

The following are responses to comments contained in the July 11, 2017 review memorandum, regarding the above referenced project. A copy of the City of Las Vegas (CLV) comment letter has been provided in Appendix A of this submittal. The comments have been individually addressed as follows:

1. **Comment:** *Provide an exhibit or index map which clearly identifies all the Phase 2 Parcels (2.xx) and the discharge stubs in each parcel.*

Response: Noted. Please refer to Exhibit G in Appendix B identifying the Phase 2 parcels and their respective discharge stubs.

2. **Comment: Sheets SD-01, SD-02, SD-07 and SD-08:** *Show the line work of curb & gutter aligning with the relocated drop inlets clearly on Grand Teton Drive and Shaumber Road.*

Response: Acknowledged. Please refer to the revised plan sheets for the curb & gutter line work in Grand Teton Drive and Shaumber Road clearly depicting the alignments with the relocated drop inlets.

3. **Comment: Sheets SD-17 and SD-18:**

- *The "Matchline" between the two sheets is shadowing the relocated 36"-stub. Shift the "Matchline" for a better and clear view of the proposed relocated stub.*
- *The proposed connection of the relocated stub through two inlets, especially a lateral between two inlets will cause undue maintenance problems.*

Provide a storm drain manhole at the mainline in Eagle Canyon Avenue for the connection of the relocated 36"-stub.

Response:

- The Matchline between Sheets SD-17 and SD-18 has been shifted for a better and clearer view of the proposed relocated stub.
- The proposed connection of the relocated stub through two inlets was primarily discussed in the meeting of July 26, 2017, between CLV staff (Oh Sang Kwon & Albert

Sung) and SHG (Stanley Okey Amadi & Erick Mata). The CLV preferred design alternative of direct connection to the mainline in Eagle Canyon Avenue was discussed. Likewise, the design constraints to the direct connection including, high starting Hydraulic Grade Line (HGL) elevation in the downstream receiving mainline, inadequate clearance and potential crossing conflict with the existing sewer line in Eagle Canyon Avenue were raised and discussed. It was agreed that the proposed lateral stub relocation will be allowed and accepted as shown based on the following conditions:

- SHG will provide a hydraulic model for the direct connection to the mainline to prove that the flows will surcharge into the Parcel 2.27 site.
- Replace the first (nuisance) drop inlet with a manhole to avoid the inlet to inlet connection.
- Provide a construction note or specification on the plans for the contractor to rotate the access cone of the manhole and ensure that the rim and cover does not conflict with the curb and gutter.
- Show the existing sewer line in Eagle Canyon Avenue to clarify the clearances between the two storm drains and the sewer line.

Two sets of trial hydraulic models for the mainline (Eagle Canyon Avenue SD) and lateral (Parcel 2.27 SD) have been provided to demonstrate that a connection at any location upstream of SDMH #25 will result in backflow surcharge into Parcel 2.27. One set of models is for a connection to SDMH #24 at previously proposed stub location and the other is with a new manhole located at approximate Eagle Canyon Avenue station ECA 55+90.18. Both sets of models show that the flows will surcharge at the low point within Parcel 2.27 due to the significantly high HGLs in the Eagle Canyon Avenue mainline. Please refer to Appendix C for the trial mainline and lateral WSPGW models U-ECA.WSP and P4-L1.WSP respectively.

The plans have been revised to show a manhole in place of the nuisance drop inlet previously proposed. Sheet SD-18-EX has been included as an exhibit to show the existing sewer line and the lateral clearances with the mainline and lateral storm drains.

It was also suggested that a nuisance inlet be installed upstream of the Parcel 2.27 entrance driveway. However, the NDOT Type 4 manhole (SDMH #24) closest to the entrance has already been installed without a lateral to the south and will have to be removed and reconstructed in order to include a lateral for the nuisance inlet. Thus, the nuisance drop inlet has not been provided. It is noted that there is another nuisance inlet located upstream at the intersection of Eagle Canyon Avenue and Egan Crest Drive.

Note that the drop inlet (Facility P4C) which is now replaced with a manhole (SDMH #25A) was a nuisance inlet and was modeled as a junction structure in the WSPGW model previously provided. Therefore, replacing it with a manhole will not have any impact to the storm drain hydraulics. The Flood Control Facility Summary table on Exhibit F has been updated to show that Facility P4C is now a storm drain manhole instead of a drop inlet.

The following conditions are repeated until they are complete:

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

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

1. **Condition:** *Note that the Skye Canyon Master Drainage Study has not been approved in the current stage. The subject Skye Canyon Infrastructure Phase 2 drainage study is approved "At Risk" until the final approval of the Master Drainage Study. Any changes required by the Master Drainage Study to the Phase 2 area shall require a drainage study update to the Phase 2 Infrastructure Study and any required facility changes to the Phase 2 Infrastructure shall be provided at the developers' cost.*

Response: Acknowledged.

2. **Condition:** *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.*

Response: Noted. Construction of the Detention Basin is almost completed.

3. **Condition:** *Building Permits for onsite developments within Phase 2 will be issued subject to the construction and substantial completion of the Skye Canyon Detention Basin #1. The notice of Substantial Completion from the City of Las Vegas, Department of Public Works is required for the release of Occupancy Permits for any development within Phase 2.*

Response: Acknowledged.

4. **Condition:** *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.*

Response: Acknowledged.

5. **Condition:** *The impacts to existing downstream neighborhoods of the long-term discharge from the detention basin(s) and the Phase 2 developments without the associated regional outfall facilities is a major concern of both the City and the Clark County Regional Flood Control District. Flood Control understands that these interim impacts are addressed with Skye Canyon Detention Basin #1. The proposed interim impact solution was included as a part of the Skye Canyon Detention Basin #1 improvements until the overall Skye Canyon MPU facilities are completed.*

Response: Acknowledged.

6. **Condition:** *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.*

Response: Already addressed with the approved Phase 2 Infrastructure Study.

7. **Condition:** *The development of Parcel 2.23B, identified as Parcel WML9 on Exhibit E2, drains through the future park and onto Eagle Canyon (WC10A) near Station 41+00 on Sheet C-03. The roadway plans shall incorporate the proposed drainage facilities as the 60 cfs will impact the 17-foot sidewalk & amenity zone. Provide concrete low flow channel connection through the 17-foot sidewalk & amenity zone.*

Response: Already addressed with the approved Phase 2 Infrastructure Study.

8. **Condition:** *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.*

Response: Acknowledged.

9. **Condition:** *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.*

Response: Noted.

10. **Condition:** *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 storm water 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 ON2-1B discharging directly onto Hualapai Way without any interim collection. Revise to incorporate interim collection.*

Response: Already addressed with the approved Phase 2 Infrastructure Study.

11. **Condition:** *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.*

Response: Acknowledged.

12. **Comment:** *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.*

Response: Acknowledged.

13. **Comment:** *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.*

Response: Acknowledged.

14. **Condition:** *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.*

Response: This condition should no longer apply as the structural plans have been approved, permits have been issued and the improvements have been constructed.

15. **Condition:** *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.

Response: Acknowledged.

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

Response: Noted.

17. **Condition:** *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."*

Response: Acknowledged.

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

Response: Acknowledged.

19. **Condition:** *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.*

Response: Already addressed with the approved Phase 2 Infrastructure Study.

20. **Condition:** *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.*

Response: Already addressed with the approved Phase 2 Infrastructure Study.

21. **Condition:** *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.*

Response: Already addressed with the approved Phase 2 Infrastructure Study. This condition should no longer apply as the structural plans have been approved, permits have been issued and the improvements have been constructed.

We believe that the above responses and revisions on the improvement plans have satisfied your concerns as stipulated in the review memorandum. 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



Stanley Okey Amadi, P.E.
cc: Mark Failla, P.E., CFM – SHG
Jerrod Ratcliff – SHG
Jerry Slater, P.E. – SHG

APPENDIX

Appendix A: CLV Comment Letter

Appendix B: Exhibits

- Parcel & Discharge Stub Map
- Sheet SD-18-EX (for Utility Clearances)

Appendix C: Trial Storm Drain Hydraulic Models

Appendix D: CD of Electronic Files & Revised Improvement Plans

APPENDIX A

CLV Comment Letter

CITY OF LAS VEGAS		DATE:
INTER-OFFICE MEMORANDUM		July 11, 2017
TO: Land Development Services Department of Building & Safety		FROM: Albert Sung, P.E. Flood Control Project Engineer Department of Public Works
SUBJECT:	Drainage Study for: Skye Canyon – Phase 2 Infrastructure Update #4	COPIES TO: Slater Hanifan Group, Inc.
Cross Streets:	NWC of Grand Teton Blvd. & Hualapai Way	Section 12, LLC / Ninety Five Mgmt.
File Number:	F:\Depot\DSMemos\DS4739G.doc	Bart Anderson, P.E., DevCo
Parcel Number:	Portion of 126-12-000-001	CCRFCDD
Zoning Action:	TMP-58560	
FEMA Flood Zone	YES NO X	
Proposed Storm Drain	YES X NO	

HISTORY	DATE RECEIVED	DATE REVIEWED	COMMENTS	REVIEW FEES	FEES PAID Payment Trn #
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 & CCRFCDD	5/12/2016 & 5/16/2016	6/8/2016 & 6/21/2016	Conditional Approval	\$100.00	443735: \$100
6 th Submittal	12/15/2016 & 1/17/2017	1/19/2017	Conditional Approval	\$100.00	469104: \$100
7 th Submittal	6/19/2017	7/10/2017	See Comments Below	\$100.00	488195: \$100
			TOTAL FEES (LDDRS):	\$1,600.00	----

REMARKS:

7th Submittal: Update #4 for minor relocations of drop inlets and the discharge stub of Parcel 2.27

6th Submittal: Update #3 Revise storm drain system capture and collection points based upon Parcel development.

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

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

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

1. Provide an exhibit or index map which clearly identifies all the Phase 2 Parcels (2.xx) and the discharge stubs in each parcel.
2. **Sheets SD-01, SD-02, SD-07 and SD-08:** Show the line work of curb & gutter aligning with the relocated drop inlets clearly on *Grand Teton Drive* and *Shaumber Road*.
3. **Sheets SD-17 and SD-18:**
 - The "Matchline" between the two sheets is shadowing the relocated 36"-stub. Shift the "Matchline" for a better and clear view of the proposed relocated stub.
 - The proposed connection of the relocated stub through two inlets, especially a lateral between two inlets will cause undue maintenance problems.

Provide a storm drain manhole at the mainline in *Eagle Canyon Avenue* for the connection of the relocated 36"-stub.

The following conditions are repeated until they are complete:

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

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

1. Note that the ***Skye Canyon Master Drainage Study*** has not been approved in the current stage. The subject *Skye Canyon Infrastructure Phase 2* drainage study is approved "**At Risk**" until the final approval of the Master Drainage Study. Any changes required by the Master Drainage Study to the Phase 2 area shall require a drainage study update to the ***Phase 2 Infrastructure Study*** and any required facility changes to the Phase 2 Infrastructure shall be provided at the developers' cost.
2. The ***Skye Canyon Phase 2 Development*** is based on the sole protection of a planned ***Skye Canyon Detention Basin #1*** from major storm flood events. The Detention Basin #1 drainage study has been approved.
3. Building Permits for onsite developments within Phase 2 will be issued subject to the construction and substantial completion of the ***Skye Canyon Detention Basin #1***. The notice of Substantial Completion from the City of Las Vegas, Department of Public Works is required for the release of Occupancy Permits for any development within Phase 2.
4. The site is adjacent to or crosses an existing or proposed *Clark County Regional Flood Control District* (CCRFCD) master planned facility. CCRFCD concurrence has been provided for the Phase 2 Infrastructure.
5. The impacts to existing downstream neighborhoods of the long term discharge from the detention basin(s) and the Phase 2 developments without the associated regional outfall facilities is a major concern of both the City and the Clark County Regional Flood Control District. Flood Control understands that these interim impacts are addressed with *Skye Canyon Detention Basin #1*. The proposed interim impact solution was included as a part of the *Skye Canyon Detention Basin #1* improvements until the overall *Skye Canyon MPU* facilities are completed.
6. The drainage study for Phase 2 Infrastructure assumes that the project will be constructed in one phase. It was noted within this Addendum response that the developer desires to phase the construction of the improvements. If improvement plans are submitted to break the Phase 2 Infrastructure into separate phases, a drainage study update will be required for each phase addressing the interim condition.

7. The development of Parcel 2.23B, identified as Parcel WML9 on Exhibit E2, drains through the future park and onto Eagle Canyon (WC10A) near Station 41+00 on Sheet C-03. The roadway plans shall incorporate the proposed drainage facilities as the 60 cfs will impact the 17-foot sidewalk & amenity zone. Provide concrete low flow channel connection through the 17-foot sidewalk & amenity zone.
8. The provided Phase 2 Infrastructure plans only show the proposed drainage facilities. The complete improvement plans will require additional review for impacts with other needed infrastructure; i.e. sanitary sewer, water, gas, etc. Any changes to the proposed storm drain system shall require a drainage study update.
9. The Storm Drain Plans have been revised to accommodate the proposed cross fall street sections and include added nuisance inlets at low points within the intersections.
10. The plans show preliminary mass grading with collection facilities within the parcels to intercept the flows prior to entering the infrastructure roadway improvements. It was noted that the inlet collection system needs to incorporate stormwater quality (SWQ) features and Best Management Practices (BMP's) at these interim collection points. This information will be provided and shown on the SWPPP, a copy of which shall be provided to Flood Control prior to permits. Additionally, the mass grading plan (Sheet GR-03) shows sheet flow from Basin ON2-IB discharging directly onto Hualapai Way without any interim collection. Revise to incorporate interim collection.
11. All drainage facilities proposed in this **Phase 2 Infrastructure Study** are considered interim facilities and must be maintained by the Master Developer until the facilities are dedicated to and formally accepted by the *City of Las Vegas*.
12. Since the streets network and the associated storm drain facilities will eventually be accepted by the City, the engineer must coordinate with *City of Las Vegas Streets & Sanitation Department* for their review and approval prior to the final approval of the subject drainage study.
13. The provided WSPG Model shows that the storm drain in *Eagle Canyon Avenue* exceeds the maximum allowed velocity (25 fps) per the *CCRFCD Hydrologic & Hydraulic Design Manual*. A *Special Construction Note* has been added to the plan & profile sheets that call out the special construction requirement and the required special inspection for the additional sacrificial concrete.
14. Structural plans for the storm drain improvements must be submitted for review. Provide a soil report, structural calculations and specifications, wet stamped structural sets and a grading plan to the *City of Las Vegas Building Department* for processing (call *Building Department* to confirm their submittal requirements). The engineer must provide a copy of *Building Department* approval of the structures to *City Flood Control Section* prior to the final acceptance of the technical drainage study.
15. The project proposes to build temporary drainage berms/swales over the *Phase 2* site. Prior to final plan approval the developer must complete a **Maintenance and Liability Agreement** for the interim drainage improvements and post a minimum maintenance bond of \$50,000 or 50-percent of the construction cost for the improvements, whichever is greater. The engineer must submit an estimate of the quantities for construction the facility and an exhibit that adequately shows the location and limits of the drainage facility to *City Flood Control* for approval. Once the drainage study is conditionally approved, the engineer/developer should contact the *City's Land Development Section* (702-229-6371) to begin the agreement process.

In order for the maintenance bond to be released in the future, a drainage update/letter will be required to justify that the berms/swales are no longer necessary and can be removed.
16. Technical drainage studies are required for each of the future PODs. Final approval for the infrastructure study must be obtained prior to final approval of the impacted POD drainage studies.
17. A note on the Grading Plans has been provided that "*Property Owner is responsible to maintain the best management practices such as but not limited to the removal of accumulated sediment and debris and care of the vegetation.*"

18. A numbering system for the manholes and inlets has been provided. It was noted in the response that the project may be divided into additional phases.
19. Show the size of all the proposed riprap areas. The rip-rap pads are shown on the GR-Sheets and some of the SD-Sheets include the pad size. Add the pad size to the grading plans and revise all pertinent plans and callouts accordingly.
20. Revise the pipe penetration detail to include a concrete collar with dowelled rebar connections. The detail has not been provided at this time and was noted that it will be a part of the Structural Details.
21. Provide details for the transition structure modifications to accommodate the 66"-RCP connection and the removal of the existing facilities to allow construction of the proposed improvements. The detail has not been provided at this time and was noted that it will be a part of the Structural Details.

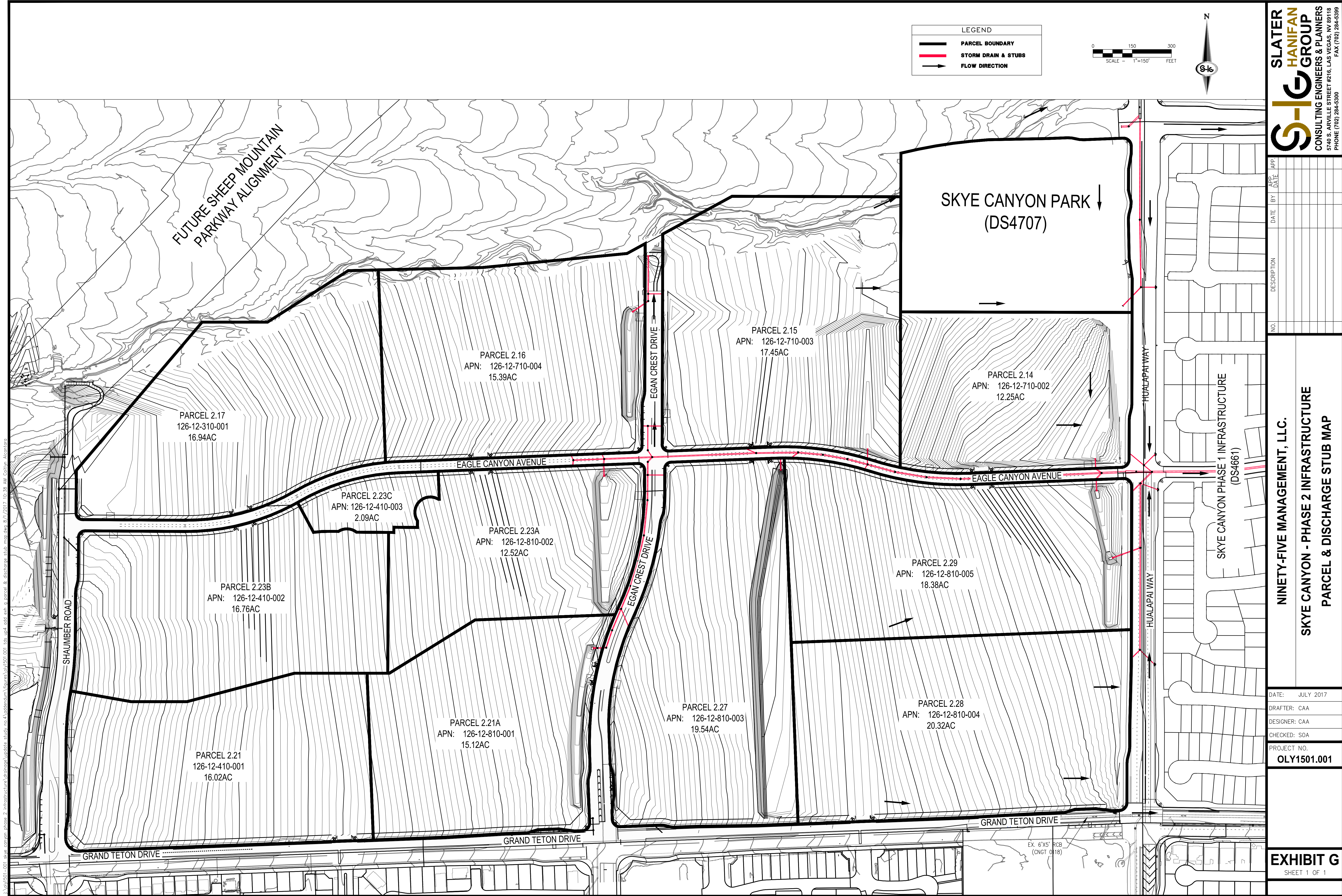
NOTE: Please be advised that all land surface area disturbances over 1 acre or any area adjacent to a water way must submit to the *Nevada Division of Environmental Protection* a "Notice of Intent" to discharge that certifies a stormwater pollution prevention plan has been developed and is maintained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

END OF REMARKS
AYS/PBJ

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

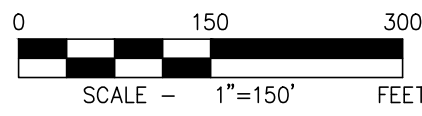
APPENDIX B

Exhibits



LEGEND

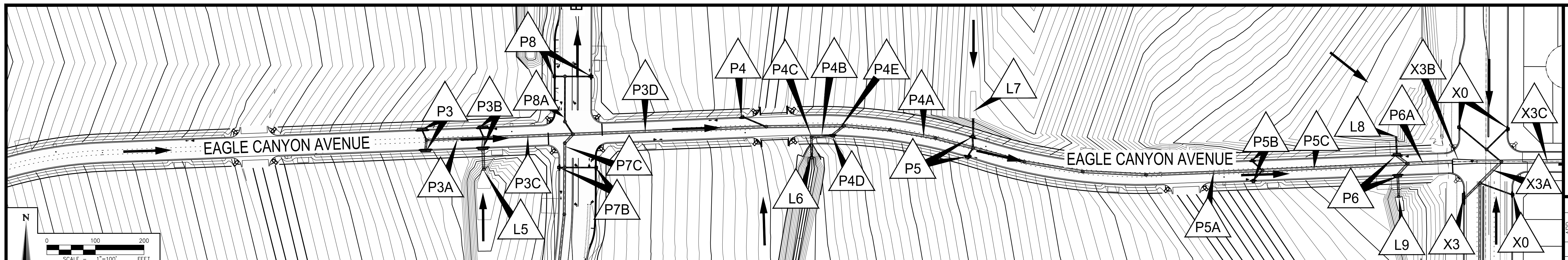
- PARCEL BOUNDARY
- STORM DRAIN & STUBS
- FLOW DIRECTION



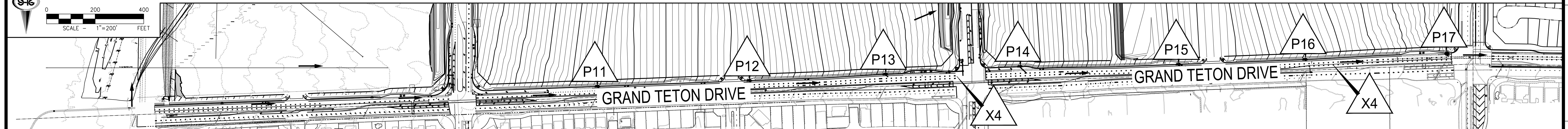
NO.	DESCRIPTION	DATE	BY	APP.	DATE

NINETY-FIVE MANAGEMENT, LLC.
SKYE CANYON - PHASE 2 INFRASTRUCTURE
PARCEL & DISCHARGE STUB MAP

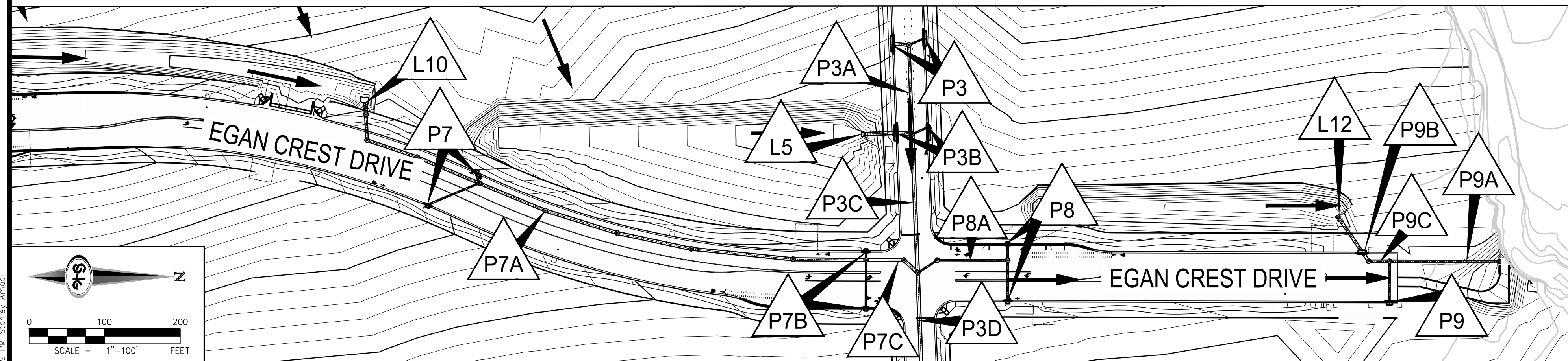
DATE:	JULY 2017
DRAFTER:	CAA
DESIGNER:	CAA
CHECKED:	SOA
PROJECT NO.	OLY1501.001



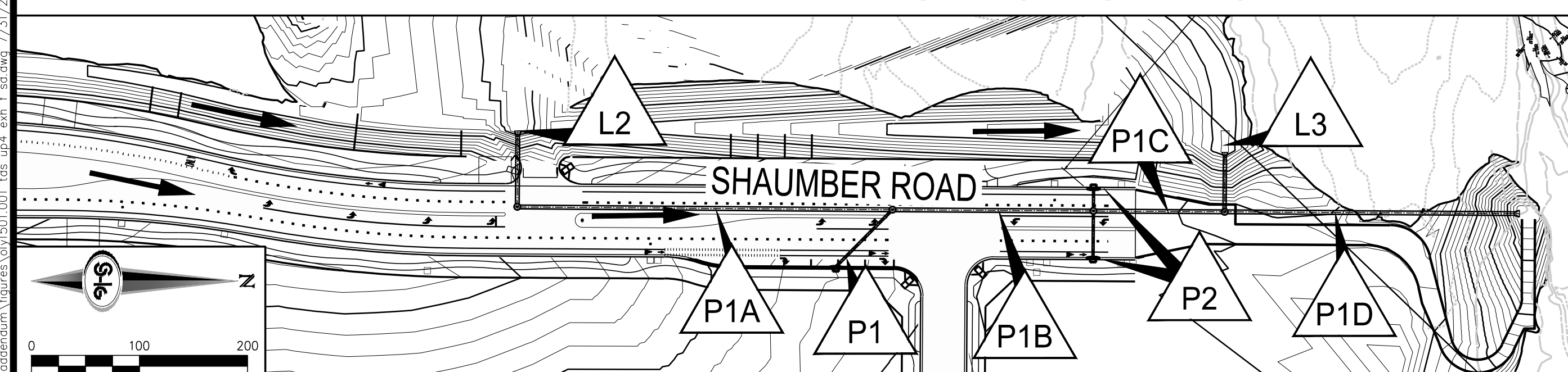
EAGLE CANYON ALIGNMENT



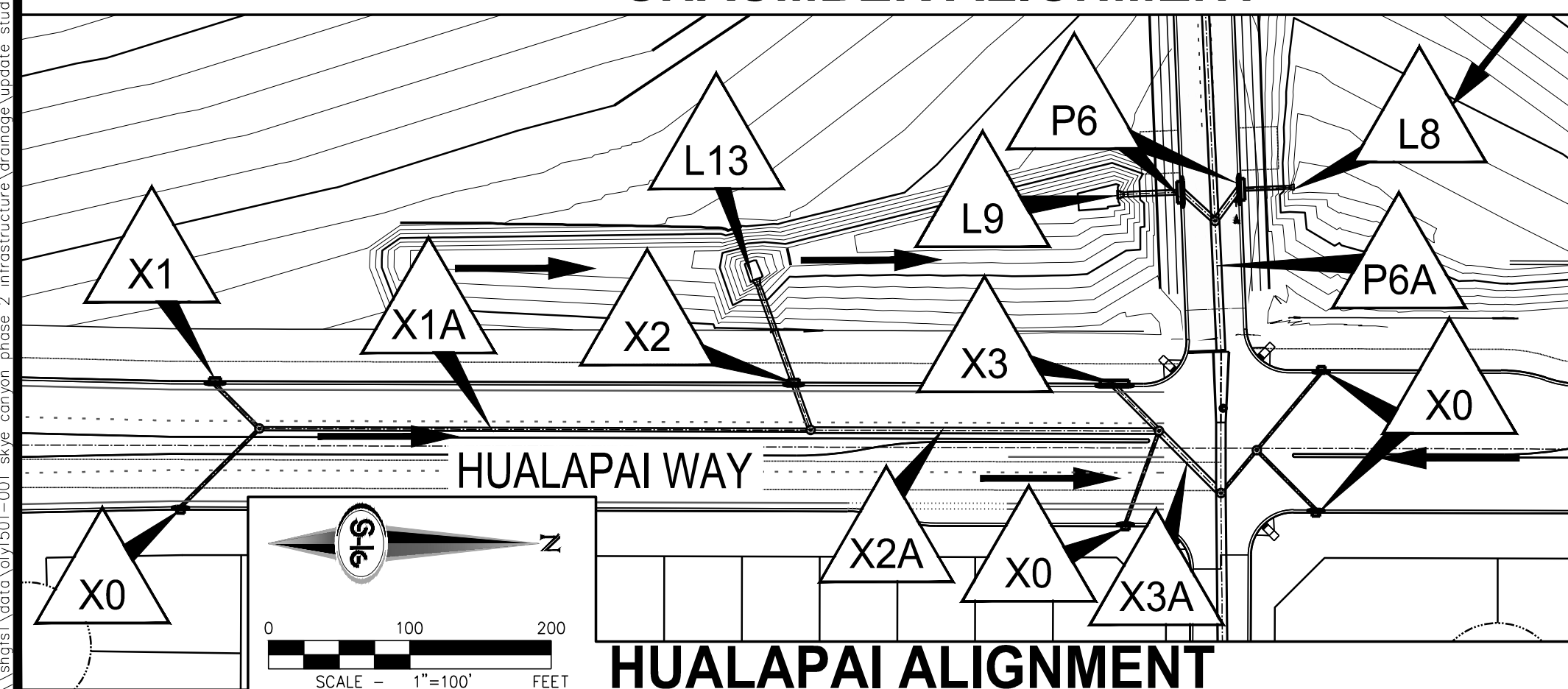
GRAND TETON ALIGNMENT



EGAN CREST ALIGNMENT



SHAUMBER ALIGNMENT



HUALAPAI ALIGNMENT

Flood Control Facility Summary				
Facility ID	Facility	Interim Q ₁₀₀ (cfs)	Ultimate Q ₁₀₀ (cfs)	Comment
X0	Existing 5-ft Type CM2 Dls	N/A	N/A	Provided for 10-yr Flows
X1	Existing 7.5-ft Type CM2 DI	16	16	18" RCP lateral
X1A	Existing 24" RCP	16	16	
X2	Existing 7.5-ft Type CM2 DI	13	13	36" RCP Lateral
X2A	Existing 36" RCP	56.5	46	
X3	Existing 20-ft Sump Drop Inlet	39	42.5	36" RCP Lateral
X3A	Existing 48" RCP	102	88.5	
X3B	Existing Transition Structure	387.5	391	
X3C	Existing 72" RCP	460	479.5	
X4	Existing 6' X 5' RCB	N/A	N/A	Grand Teton Alignment
P1	Proposed 5-ft Type CM2 DI	2	2	18" RCP lateral
P1A	Proposed 36" RCP	54	79	
P1B	Proposed 36" RCP	56	81	
P1C	Proposed 36" RCP	59	84	
P1D	Proposed 36" RCP	91	103	
P2	(2) Proposed 5-ft Type CM2 Sump Dls	6	6	18" RCP lateral (Q shown is total for both inlets)
P3	(2) Proposed 20-ft Type CM2 Dls	30	52	18" RCP North, 36" RCP South Lateral (Q shown is total for both inlets)
P3A	Proposed 36" RCP	30	52	18" RCP North, 48" RCP South Lateral
P3B	(2) Proposed 20-ft Type CM2 Dls	26	36	Q shown is total for both inlets
P3C	Proposed 48" RCP	128	124	
P3D	Proposed 48" RCP	218	210	
P4	(2) Proposed 5-ft Type CM2 Dls	8	6	18" RCP North, 30" RCP South Lateral (Q shown is total for both inlets)
P4A	Proposed 48" RCP	262	269	
P4B	Proposed 36" RCP	56	56	
P4C	Storm Drain Manhole	N/A	N/A	MH Cone Rotated to Avoid conflict with Curb
P4D	Proposed 7.5-ft Type CM2 DI	3	3	Inlet Grates to be replaced with Solid Plates
P4E	Proposed 36" RCP	60	63	
P5	(2) Proposed 7.5-ft Type CM2 Dls	14	8	24" RCP North, 18" RCP South Lateral
P5A	Proposed 48" RCP	292	289	
P5B	(2) Proposed 5-ft Type CM2 Nuisance Dls	Nuisance	10	Q shown is total for both inlets
P5C	Proposed 54" RCP	292	299	
P6	(2) Proposed 17.5-ft Type CM2 Sump Dls	51	41	42" RCP laterals (Q shown is total for both inlets)
P6A	Proposed 66" RCP	387.5	391	
P7	(2) Proposed 5-ft Type CM2 Dls	3	3	18" RCP laterals (Q shown is total for both inlets)
P7A	Proposed 36" to 42" RCP Transition	88	84	
P7B	(2) Proposed 5-ft Type CM2 Dls	2	2	18" RCP laterals (West Inlet Provided as Nuisance)
P7C	Proposed 42" RCP	90	86	
P8	(2) Proposed 5-ft Type CM2 Nuisance Dls	Nuisance	Nuisance	18" RCP laterals
P8A	Proposed 18" RCP	Nuisance	Nuisance	
P9	Proposed 7.5-ft Type CM2 Dls	2	2	18" RCP Lateral
P9A	Proposed 36" RCP	62	71	
P9B	Proposed 10-ft Type CM2 Dls	2	2	36" RCP Lateral
P9C	Proposed 36" RCP	62	71	
P11 thru P14	(4) Proposed 15-ft Type CM2 Dls	Varies	Varies	Tie into Facility X4
P15	Proposed 7.5-ft Type CM2 DI	2.0	2.0	Tie into Facility X4
P16	Proposed 10-ft Type CM2 DI	2.0	2.0	Tie into Facility X4
P17	Proposed 12.5-ft Type CM2 DI	2.0	2.0	Tie into Facility X4
L2	Proposed 36" RCP	54	79	
L3	Proposed 30" RCP	32	19	
L5	Proposed 48" RCP	85	36	
L6	Proposed 36" RCP	40	53	
L7	Proposed 24" RCP	16	12	
L8	Proposed 24" RCP	17	17	
L9	Proposed 36" RCP	27.5	34	
L10	Proposed 36" RCP	85	81	
L12	Proposed 36" RCP	59	67	
L13	Proposed 36" RCP	27.5	17.0	

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

APPENDIX C

Trail Storm Drain Hydraulic Models

0
T1 SKYE CANYON INFRASTRUCTURE - PHASE 2 (UPDATE NO.3)
T2 BY OLYMPIA COMPANIES
T3 EAGLE CANYON - TRUNK STORM DRAIN
SO 0613.002823.35 72 2829.26
R 0900.002830.52 72 .013 1
JX 0900.002830.52 72 48 .013 97.5 2832.52 45.00 1
R 0950.002831.58 72 .013 1
WE 0950.002831.58 72 .013 1
TS 1000.002835.61 66 .013 1
WX 1000.002835.61 66 .013 1
R 1093.002837.13 66 .013 1
JX 1093.002838.13 54 42 42.013 44.0 37.02839.132839.13 45.00 45.00 1
R 1389.502839.63 54 .013 1
JX 1394.502840.13 48 18 18.013 5.0 5.02842.632842.63 45.00 45.00 1
R 1632.002854.48 48 .013 5. 1
R 1762.002862.62 48 .013 5. 1
R 1883.002868.57 48 .013 5. 1
R 1992.002873.94 48 .013 5. 1
JX 1992.002873.94 48 18 24.013 5.0 21.02876.442875.94 75.00 75.00 1
R 2072.002877.87 48 .013 5. 1
R 2167.002882.51 48 .013 5. 1
R 2262.002885.16 48 .013 5. 1
R 2422.002888.80 48 .013 1
JX 2422.002888.80 48 36 18.013 56.0 3.02889.802891.30 90.00 45.00 1
R 2820.002903.13 48 .013 1
JX 2820.002903.13 48 42 .013 86.0 2903.63 45.00 60. 1
R 3004.002908.81 48 .013 1
JX 3004.002908.81 48 36 18.013 52.0 18.02909.812911.31 60.00 45.00 1
R 3024.002910.72 48 .013 1
JX 3024.002910.72 48 48 .013 18.0 2912.12 90.00 1
R 3060.002912.43 48 .013 1
SH 3060.002912.43 48
CD 18 4 1.5
CD 24 4 2.
CD 30 4 2.5
CD 36 4 3.
CD 42 4 3.5
CD 48 4 4.
CD 54 4 4.5
CD 60 4 5.
CD 66 4 5.5
CD 72 4 6.
CD 78 4 6.5
→

*Trial run for connection to approved stub location
@ Eagle Canyon Avenue Sta: ECA 54+59.97*

0
Q
→

36.0

U-ECA.WSQ

PAGE 1

[illegible]

F 0 5 1 5 P

PAGE NO 3

WATER SURFACE PROFILE - TITLE CARD LISTING

HEADING LINE NO 1 IS -

SKYF 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

RM DRAIN
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										
			U/S DATA	613.00	2823.35	72	W S ELEV 2829.26									
ELEMENT NO	2	IS	A REACH	STATION	INVERT	SECT										
			U/S DATA	900.00	2830.52	72	N				RADIUS	ANGLE	ANG PT	MAN H		
							0.013				0.00	0.00	0.00	1		
ELEMENT NO	3	IS	A JUNCTION	STATION	INVERT	SECT	LAT-1	LAT-2	N	Q3	Q4	INVERT-3	INVERT-4	PHI 3	PHI 4	
			U/S DATA	900.00	2830.52	72	48	0	0.013	97.5	0.0	2832.52	0.00	45.00	0.00	
THE ABOVE ELEMENT CONTAINED AN INVERT ELEV WHICH WAS NOT GREATER THAN THE PREVIOUS INVERT ELEV -WARNING																
ELEMENT NO	4	IS	A REACH	STATION	INVERT	SECT										
			U/S DATA	950.00	2831.58	72	N				RADIUS	ANGLE	ANG PT	MAN H		
							0.013				0.00	0.00	0.00	1		
ELEMENT NO	5	IS	A WALL ENTRANCE	STATION	INVERT	SECT										
			U/S DATA	950.00	2831.58	72	FP									
							0.013									
ELEMENT NO	6	IS	A TRANSITION	STATION	INVERT	SECT										
			U/S DATA	1000.00	2835.61	66	N									
							0.013									
ELEMENT NO	7	IS	A WALL EXIT	STATION	INVERT	SECT										
			U/S DATA	1000.00	2835.61	66										
ELEMENT NO	8	IS	A REACH	STATION	INVERT	SECT										
			U/S DATA	1093.00	2837.13	66	N				RADIUS	ANGLE	ANG PT	MAN H		
							0.013				0.00	0.00	0.00	1		
ELEMENT NO	9	IS	A JUNCTION	STATION	INVERT	SECT	LAT-1	LAT-2	N	Q3	Q4	INVERT-3	INVERT-4	PHI 3	PHI 4	
			U/S DATA	1093.00	2838.13	54	42	42	0.013	44.0	37.0	2839.13	2839.13	45.00	45.00	
ELEMENT NO	10	IS	A REACH	STATION	INVERT	SECT										
			U/S DATA	1389.50	2839.63	54	N				RADIUS	ANGLE	ANG PT	MAN H		
							0.013				0.00	0.00	0.00	1		
ELEMENT NO	11	IS	A JUNCTION	STATION	INVERT	SECT	LAT-1	LAT-2	N	Q3	Q4	INVERT-3	INVERT-4	PHI 3	PHI 4	
			U/S DATA	1394.50	2840.13	48	18	18	0.013	5.0	5.0	2842.63	2842.63	45.00	45.00	
PAGE NO 3																

WATER SURFACE PROFILE - ELEMENT CARD LISTING

ELEMENT NO	12	IS	A REACH U/S DATA	*	*	*							RADIUS	ANGLE	ANG	PT	MAN			
				STATION	INVERT	SECT	N						0.00	0.00	5.00	H				
				1632.00	2854.48	48	0.013										1			
ELEMENT NO	13	IS	A REACH U/S DATA	*	*	*							RADIUS	ANGLE	ANG	PT	MAN			
				STATION	INVERT	SECT	N						0.00	0.00	5.00	H				
				1762.00	2862.62	48	0.013										1			
ELEMENT NO	14	IS	A REACH U/S DATA	*	*	*							RADIUS	ANGLE	ANG	PT	MAN			
				STATION	INVERT	SECT	N						0.00	0.00	5.00	H				
				1883.00	2868.57	48	0.013										1			
ELEMENT NO	15	IS	A REACH U/S DATA	*	*	*							RADIUS	ANGLE	ANG	PT	MAN			
				STATION	INVERT	SECT	N						0.00	0.00	5.00	H				
				1992.00	2873.94	48	0.013										1			
ELEMENT NO	16	IS	A JUNCTION U/S DATA	*	*	*	*	*	*							RADIUS	ANGLE	ANG	PT	MAN
				STATION	INVERT	SECT	LAT-1	LAT-2	N	Q3	Q4	INVERT-3	INVERT-4	PHI 3	PHI 4					
				1992.00	2873.94	48	18	24	0.013	5.0	21.0	2876.44	2875.94	75.00	75.00					
THE ABOVE ELEMENT CONTAINED AN				INVERT ELEV	WHICH WAS	NOT	GREATER THAN THE PREVIOUS				INVERT ELEV	-WARNING								
THE ABOVE ELEMENT CONTAINED AN				INVERT ELEV	WHICH WAS	NOT	GREATER THAN THE PREVIOUS				INVERT ELEV	-WARNING								
ELEMENT NO	17	IS	A REACH U/S DATA	*	*	*							RADIUS	ANGLE	ANG	PT	MAN			
				STATION	INVERT	SECT	N						0.00	0.00	5.00	H				
				2072.00	2877.87	48	0.013										1			
ELEMENT NO	18	IS	A REACH U/S DATA	*	*	*							RADIUS	ANGLE	ANG	PT	MAN			
				STATION	INVERT	SECT	N						0.00	0.00	5.00	H				
				2167.00	2882.51	48	0.013										1			

U-ECA.OUT

ELEMENT NO	19 IS A REACH	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H				
	U/S DATA	2262.00	2885.16	48	0.013	0.00	0.00	5.00	1				
ELEMENT NO	20 IS A REACH	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H				
	U/S DATA	2422.00	2888.80	48	0.013	0.00	0.00	0.00	1				
ELEMENT NO	21 IS A JUNCTION	STATION	INVERT	SECT	LAT-1	LAT-2	N	Q3	Q4	INVERT-3	INVERT-4	PHI 3	PHI 4
	U/S DATA	2422.00	2888.80	48	36	18	0.013	56.0	3.0	2889.80	2891.30	90.00	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													

PAGE NO 4

WATER SURFACE PROFILE - ELEMENT CARD LISTING

ELEMENT NO	22 IS A REACH	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H				
	U/S DATA	2820.00	2903.13	48	0.013	0.00	0.00	0.00	1				
ELEMENT NO	23 IS A JUNCTION	STATION	INVERT	SECT	LAT-1	LAT-2	N	Q3	Q4	INVERT-3	INVERT-4	PHI 3	PHI 4
	U/S DATA	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	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H				
	U/S DATA	3004.00	2908.81	48	0.013	0.00	0.00	60.00	1				
ELEMENT NO	25 IS A JUNCTION	STATION	INVERT	SECT	LAT-1	LAT-2	N	Q3	Q4	INVERT-3	INVERT-4	PHI 3	PHI 4
	U/S DATA	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	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H				
	U/S DATA	3024.00	2910.72	48	0.013	0.00	0.00	0.00	1				
ELEMENT NO	27 IS A JUNCTION	STATION	INVERT	SECT	LAT-1	LAT-2	N	Q3	Q4	INVERT-3	INVERT-4	PHI 3	PHI 4
	U/S DATA	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	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H				
	U/S DATA	3060.00	2912.43	48	0.013	0.00	0.00	0.00	1				
ELEMENT NO	29 IS A SYSTEM HEADWORKS	STATION	INVERT	SECT									
	U/S DATA	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

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PAGE 1

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

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

613.00	2823.35	3.898	2827.248	483.5	24.87	9.603	2836.851	0.00	5.632	6.00	0.00	0.00	0	0.00
160.20	0.02498					.021943	3.52		3.778			0.00		
773.20	2827.35	4.009	2831.361	483.5	24.08	9.004	2840.365	0.00	5.632	6.00	0.00	0.00	0	0.00
126.80	0.02498					.019917	2.53		3.778			0.00		
900.00	2830.52	4.185	2834.705	483.5	22.96	8.185	2842.890	0.00	5.632	6.00	0.00	0.00	0	0.00
JUNCT STR	0.00000					.021408	0.00					0.00		
900.00	2830.52	3.307	2833.827	386.0	24.16	9.065	2842.892	0.00	5.267	6.00	0.00	0.00	0	0.00
50.00	0.02120					.024373	1.22		3.440			0.00		
950.00	2831.58	3.280	2834.860	386.0	24.41	9.250	2844.110	0.00	5.267	6.00	0.00	0.00	0	0.00
TRANS STR	0.08060					.018970	0.95					0.00		
1000.00	2835.61	4.502	2840.112	386.0	18.54	5.339	2845.451	0.00	5.153	5.50	0.00	0.00	0	0.00
WALL EXIT												0.00		
1000.00	2835.61	4.501	2840.111	386.0	18.55	5.342	2845.453	0.00	5.153	5.50	0.00	0.00	0	0.00
17.73	0.01634					.013118	0.23		4.076			0.00		
1017.73	2835.90	4.551	2840.451	386.0	18.36	5.233	2845.684	0.00	5.153	5.50	0.00	0.00	0	0.00
54.95	0.01634					.012472	0.69		4.076			0.00		
1072.68	2836.80	4.814	2841.612	386.0	17.50	4.758	2846.370	0.00	5.153	5.50	0.00	0.00	0	0.00
20.32	0.01634					.011689	0.24		4.076			0.00		
1093.00	2837.13	5.153	2842.283	386.0	16.69	4.324	2846.607	0.00	5.153	5.50	0.00	0.00	0	0.00
JUNCT STR	0.00000					.017737	0.00					0.00		
1093.00	2838.13	4.709	2842.839	305.0	19.18	5.711	2848.550	0.00	4.394	4.50	0.00	0.00	0	0.00
296.50	0.00506					.024056	7.13		4.500			0.00		
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WATER SURFACE PROFILE LISTING
SKYE CANYON INFRASTRUCTURE - PHASE 2 (UPDATE NO.3)
BY OLYMPIA COMPANIES
EAGLE CANYON - TRUNK STORM DRAIN

STATION	INVERT	DEPTH	W.S.	Q	VEL	VEL	ENERGY	SUPER	CRITICAL	HGT/	BASE/	ZL	NO	AVBPR
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Page 2

ELEV		OF FLOW	ELEV			HEAD	GRD. EL.	U-ECA. OUT ELEV	DEPTH		DIA	ID NO.	PIER				
L/ELEM	SO					SF AVE	HF			NORM DEPTH			ZR				

1389.50	2839.63	10.627	2850.257	305.0	19.18	5.711	2855.968	0.00	4.394		4.50	0.00	0.00	0	0.00		
JUNCT STR	0.10000												0.00				
1394.50	2840.13	2.833	2842.963	295.0	31.00	14.923	2857.886	0.00	3.966		4.00	0.00	0.00	0	0.00		
237.50	0.06042					.055376	13.15			2.795			0.00				
1632.00	2854.48	2.959	2857.439	295.0	29.59	13.600	2871.039	0.00	3.966		4.00	0.00	0.00	0	0.00		
70.89	0.06262					.050260	3.56			2.758			0.00				
1702.89	2858.92	3.070	2861.989	295.0	28.51	12.617	2874.606	0.00	3.966		4.00	0.00	0.00	0	0.00		
59.11	0.06262					.045821	2.71			2.758			0.00				
1762.00	2862.62	3.224	2865.844	295.0	27.18	11.470	2877.314	0.00	3.966		4.00	0.00	0.00	0	0.00		
12.42	0.04917					.043320	0.54			3.040			0.00				
1774.42	2863.23	3.237	2866.468	295.0	27.07	11.378	2877.846	0.00	3.966		4.00	0.00	0.00	0	0.00		
108.58	0.04917					.041294	4.48			3.040			0.00				
1883.00	2868.57	3.416	2871.986	295.0	25.81	10.343	2882.329	0.00	3.966		4.00	0.00	0.00	0	0.00		
63.29	0.04927					.038201	2.42			3.038			0.00				
1946.29	2871.69	3.622	2875.310	295.0	24.66	9.439	2884.749	0.00	3.966		4.00	0.00	0.00	0	0.00		
45.71	0.04927					.038015	1.74			3.038			0.00				
1992.00	2873.94	3.966	2877.906	295.0	23.51	8.580	2886.486	0.00	3.966		4.00	0.00	0.00	0	0.00		
JUNCT STR	0.00000					.037073	0.00						0.00				
1992.00	2873.94	6.776	2880.716	269.0	21.41	7.116	2887.832	0.00	3.951		4.00	0.00	0.00	0	0.00		
80.00	0.04913					.035070	2.81			2.820			0.00				
2072.00	2877.87	6.124	2883.994	269.0	21.41	7.116	2891.110	0.00	3.951		4.00	0.00	0.00	0	0.00		
95.00	0.04884					.035070	3.33			2.826			0.00				
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LICENSEE: SLATER HANIFAN GROUP

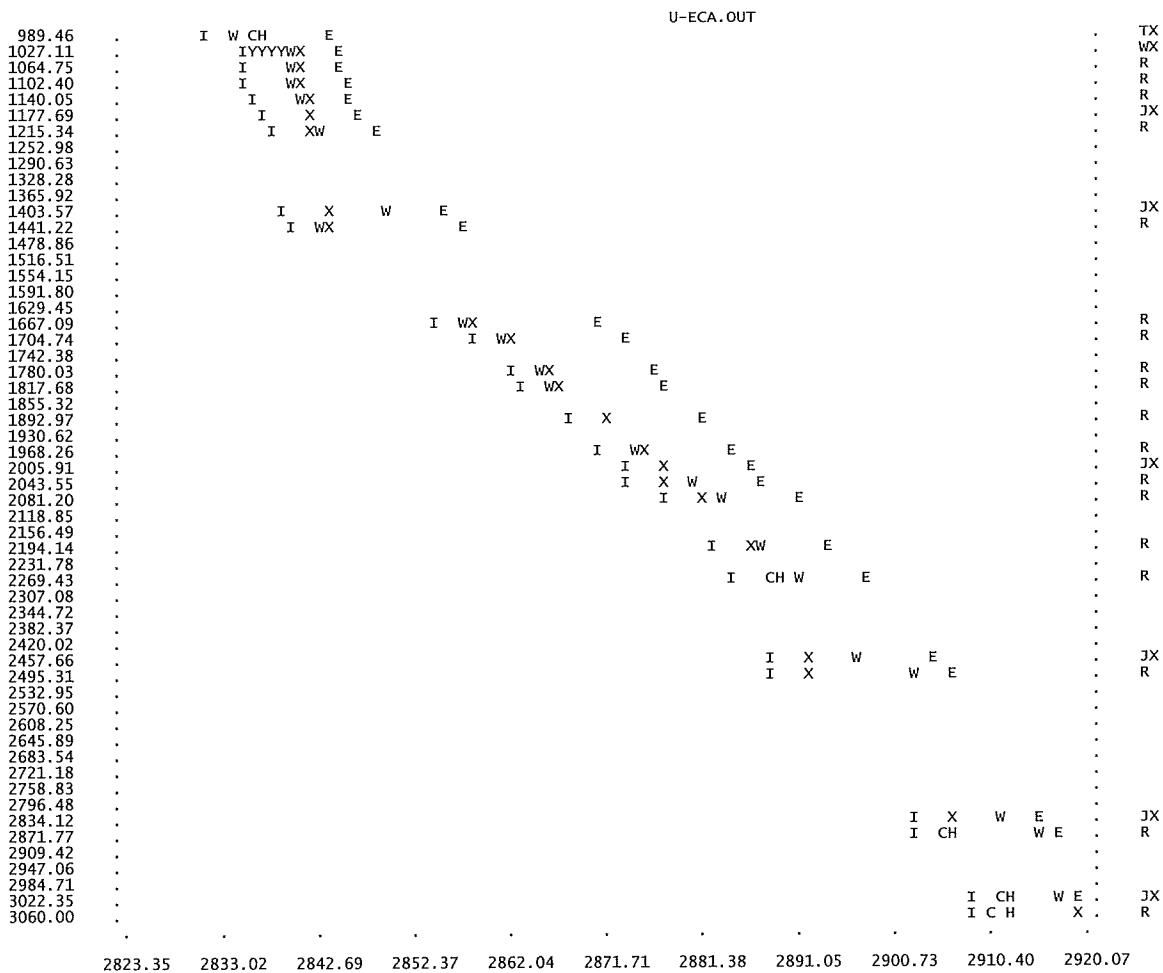
WATER SURFACE PROFILE LISTING
SKYE CANYON INFRASTRUCTURE - PHASE 2 (UPDATE NO.3)
BY OLYMPIA COMPANIES
EAGLE CANYON - TRUNK STORM DRAIN

PAGE 3

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							
2167.00	2882.51	5.289	2887.799	269.0	21.41	7.116	2894.915	0.00	3.951	4.00	0.00	0 0.00		
95.00	0.02789					.035070	3.33		4.000		0.00			
2262.00	2885.16	6.444	2891.604	269.0	21.41	7.116	2898.720	0.00	3.951	4.00	0.00	0 0.00		
160.00	0.02275					.035070	5.61		4.000		0.00			
2422.00	2888.80	8.771	2897.571	269.0	21.41	7.116	2904.687	0.00	3.951	4.00	0.00	0 0.00		
JUNCT STR	0.00000					.028221	0.00				0.00			
2422.00	2888.80	14.320	2903.120	210.0	16.71	4.337	2907.457	0.00	3.872	4.00	0.00	0 0.00		
398.00	0.03601					.021373	8.51		2.633		0.00			
2820.00	2903.13	8.713	2911.843	210.0	16.71	4.337	2916.180	0.00	3.872	4.00	0.00	0 0.00		
JUNCT STR	0.00000					.014412	0.00				0.00			
2820.00	2903.13	13.019	2916.149	124.0	9.87	1.512	2917.661	0.00	3.345	4.00	0.00	0 0.00		
184.00	0.03087					.007452	1.37		1.980		0.00			
3004.00	2908.81	9.085	2917.895	124.0	9.87	1.512	2919.407	0.00	3.345	4.00	0.00	0 0.00		
JUNCT STR	0.00000					.004432	0.00				0.00			
3004.00	2908.81	10.742	2919.552	54.0	4.30	0.287	2919.839	0.00	2.209	4.00	0.00	0 0.00		
20.00	0.09550					.001413	0.03		0.941		0.00			
3024.00	2910.72	8.875	2919.595	54.0	4.30	0.287	2919.882	0.00	2.209	4.00	0.00	0 0.00		
JUNCT STR	0.00000					.001020	0.00				0.00			
3024.00	2910.72	9.194	2919.914	36.0	2.86	0.127	2920.041	0.00	1.787	4.00	0.00	0 0.00		
36.00	0.04750					.000628	0.02		0.915		0.00			
3060.00	2912.43	7.513	2919.943	36.0	2.86	0.127	2920.070	0.00	1.787	4.00	0.00	0 0.00		

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

613.00	.I	WCH	E											R
650.65	.													
688.29	.													
725.94	.													
763.58	.													
801.23	.	I	WCH	E										R
838.88	.													
876.52	.													
914.17	.	I	W X	E										JX
951.82	.	I	W CH	E										R



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

0
 T1 SKYE CANYON INFRASTRUCTURE - PHASE 2 (UPDATE NO.3)
 T2 BY OLYMPIA COMPANIES
 T3 EAGLE CANYON LATERAL P4-L1
 SO 1000.002889.80 36 2903.12
 R 1030.002889.95 36 .013 1
 JX 1030.002889.95 36 36 .013 3.0 2889.95 90.00 1
 R 1160.002890.60 36 .013
 JX 1160.002891.10 30 30 .013 26.5 2891.10 45.00 1
 R 1195.002891.45 30 .013
 SH 1195.002891.45 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
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0
Q
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26.5

P4-L1.WSQ

PAGE 1

[illegible]

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-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 1000.00	* INVERT 2889.80	* SECT 36									W S ELEV 2903.12					
ELEMENT NO	2	IS A REACH U/S DATA	* STATION 1030.00	* INVERT 2889.95	* SECT 36		N 0.013							RADIUS 0.00	ANGLE 0.00	ANG PT 0.00	MAN H 1		
ELEMENT NO	3	IS A JUNCTION U/S DATA	* STATION 1030.00	* INVERT 2889.95	* SECT 36	* LAT-1 36	* LAT-2 0	N 0.013	* Q3 3.0	* Q4 0.0	* INVERT-3 2889.95	* INVERT-4 0.00	* PHI 3 90.00	* PHI 4 0.00					
THE ABOVE ELEMENT CONTAINED AN 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 1160.00	* INVERT 2890.60	* SECT 36		N 0.013							RADIUS 0.00	ANGLE 0.00	ANG PT 0.00	MAN H 1		
ELEMENT NO	5	IS A JUNCTION U/S DATA	* STATION 1160.00	* INVERT 2891.10	* SECT 30	* LAT-1 30	* LAT-2 0	N 0.013	* Q3 26.5	* Q4 0.0	* INVERT-3 2891.10	* INVERT-4 0.00	* PHI 3 45.00	* PHI 4 0.00					
ELEMENT NO	6	IS A REACH U/S DATA	* STATION 1195.00	* INVERT 2891.45	* SECT 30		N 0.013							RADIUS 0.00	ANGLE 0.00	ANG PT 0.00	MAN H 1		
ELEMENT NO	7	IS A SYSTEM HEADWORKS U/S DATA	* STATION 1195.00	* INVERT 2891.45	* SECT 30				*					W S ELEV 0.00					

1195.00 2891.45 30
NO EDIT ERRORS ENCOUNTERED-COMPUTATION IS NOW BEGINNING

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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 9
LICENSEE: SLATER HANIFAN GROUP                                F0515P

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F0515P

PAGE 1

WATER SURFACE PROFILE LISTING

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

BY OLYMPIA COMPANIES

EAGLE CANYON LATERAL P4-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			ZR			
1000.00	2889.80	13.320	2903.120	56.0	7.92	0.974	2904.094	0.00	2.427	3.00	0.00	0.00	0	0.00
30.00	0.00500					.007049	0.21			3.000		0.00		
1030.00	2889.95	13.430	2903.380	56.0	7.92	0.974	2904.354	0.00	2.427	3.00	0.00	0.00	0	0.00
JUNCT STR	0.00000					.006681	0.00					0.00		
1030.00	2889.95	13.633	2903.583	53.0	7.50	0.873	2904.456	0.00	2.366	3.00	0.00	0.00	0	0.00
130.00	0.00500					.006314	0.82			3.000		0.00		
1160.00	2890.60	13.848	2904.448	53.0	7.50	0.873	2905.321	0.00	2.366	3.00	0.00	0.00	0	0.00
JUNCT STR	0.00000					.005244	0.00					0.00		
1160.00	2891.10	14.142	2905.242	26.5	5.40	0.453	2905.695	0.00	1.755	2.50	0.00	0.00	0	0.00
35.00	0.01000					.004174	0.15			1.461		0.00		
1195.00	2891.45	13.961	2905.411	26.5	5.40	0.453	2905.864	0.00	1.755	2.50	0.00	0.00	0	0.00

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

SKYE CANTON INFRASTR
BY OLYMPIA COMPANIES

EAGLE CANYON LATERAL P4-L1

1000.00	.
1003.98	.
1007.96	.
1011.94	.
1015.92	.
1019.90	.
1023.88	.
1027.86	.

low point onsite is at $\pm 2900'$

[illegible]

1. GLOSSARY

1. I = INVERT ELEVATION
C = CRITICAL DEPTH
W = WATER SURFACE ELEVATION
H = HEIGHT OF CHANNEL
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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 - TRUNK STORM DRAIN
 SO 0613.002823.35 72 2829.26
 R 0900.002830.52 72 .013 1
 JX 0900.002830.52 72 48 .013 97.5 2832.52 45.00 1
 R 0950.002831.58 72 .013 1
 WE 0950.002831.58 72 .013 1
 TS 1000.002835.61 66 .013 1
 WX 1000.002835.61 66 .013 1
 R 1093.002837.13 66 .013 1
 JX 1093.002838.13 54 42 42.013 44.0 37.02839.132839.13 45.00 45.00 1
 R 1389.502839.63 54 .013 1
 JX 1394.502840.13 48 18 18.013 5.0 5.02842.632842.63 45.00 45.00 1
 R 1632.002854.48 48 .013 5. 1
 R 1762.002862.62 48 .013 5. 1
 R 1883.002868.57 48 .013 5. 1
 R 1992.002873.94 48 .013 5. 1
 JX 1992.002873.94 48 18 24.013 5.0 21.02876.442875.94 75.00 75.00 1
 R 2072.002877.87 48 .013 5. 1
 R 2167.002882.51 48 .013 5. 1
 R 2262.002885.16 48 .013 5. 1
 R 2332.002886.76 48 .013 1
 JX 2332.002886.76 48 36 .013 56.0 2886.26 45.00 1
 R 2422.002888.80 48 .013 1
 JX 2422.002888.80 48 18 .013 3.0 2891.30 45.00 1
 R 2820.002903.13 48 .013 1
 JX 2820.002903.13 48 42 .013 86.0 2903.63 45.00 1
 R 3004.002908.81 48 .013 60. 1
 JX 3004.002908.81 48 36 18.013 52.0 18.02909.812911.31 60.00 45.00 1
 R 3024.002910.72 48 .013 1
 JX 3024.002910.72 48 48 .013 18.0 2912.12 90.00 1
 R 3060.002912.43 48 .013 1
 SH 3060.002912.43 48
 CD 18 4 1.5
 CD 24 4 2.
 CD 30 4 2.5
 CD 36 4 3.
 CD 42 4 3.5
 CD 48 4 4.
 CD 54 4 4.5
 CD 60 4 5.
 CD 66 4 5.5
 CD 72 4 6.
 CD 78 4 6.5

Trial run for connection to another location directly across
 as suggested by CHV. Location is at approximate
 Eagle Canyon Avenue Sta: ECA 55+90.18

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Q
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36.0

DATE: 8/ 1/2017
TIME: 8:48

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 - TRUNK STORM DRAIN
F 0 5 1 5 P

PAGE NO 2

WATER SURFACE PROFILE - ELEMENT CARD LISTING

ELEMENT NO	IS	DESCRIPTION	STATION	INVERT	SECT	LAT-1	LAT-2	Q3	Q4	INVERT-3	INVERT-4	PHI 3	PHI 4	RADIUS	ANGLE	ANG PT	MAN H
1	A	SYSTEM OUTLET	613.00	2823.35	72												
2	A	REACH	900.00	2830.52	72			0.013						0.00	0.00	0.00	1
3	A	JUNCTION	900.00	2830.52	72	48	0	0.013	97.5	0.0	2832.52	0.00	45.00				
THE ABOVE ELEMENT CONTAINED AN INVERT ELEV WHICH WAS NOT GREATER THAN THE PREVIOUS INVERT ELEV -WARNING																	
4	A	REACH	950.00	2831.58	72			0.013						0.00	0.00	0.00	1
5	A	WALL ENTRANCE	950.00	2831.58	72												
6	A	TRANSITION	1000.00	2835.61	66			0.013									
7	A	WALL EXIT	1000.00	2835.61	66												
8	A	REACH	1093.00	2837.13	66			0.013						0.00	0.00	0.00	1
9	A	JUNCTION	1093.00	2838.13	54	42	42	0.013	44.0	37.0	2839.13	45.00	45.00				
10	A	REACH	1389.50	2839.63	54			0.013						0.00	0.00	0.00	1
11	A	JUNCTION	1394.50	2840.13	48	18	18	0.013	5.0	5.0	2842.63	45.00	45.00				
F 0 5 1 5 P																	

PAGE NO 3

WATER SURFACE PROFILE - ELEMENT CARD LISTING

ELEMENT NO	IS	DESCRIPTION	STATION	INVERT	SECT	LAT-1	LAT-2	Q3	Q4	INVERT-3	INVERT-4	PHI 3	PHI 4	RADIUS	ANGLE	ANG PT	MAN H
12	A	REACH	1632.00	2854.48	48			0.013						0.00	0.00	5.00	1
13	A	REACH	1762.00	2862.62	48			0.013						0.00	0.00	5.00	1
14	A	REACH	1883.00	2868.57	48			0.013						0.00	0.00	5.00	1
15	A	REACH	1992.00	2873.94	48			0.013						0.00	0.00	5.00	1
16	A	JUNCTION	1992.00	2873.94	48	18	24	0.013	5.0	21.0	2876.44	75.00	75.00				
THE ABOVE ELEMENT CONTAINED AN INVERT ELEV WHICH WAS NOT GREATER THAN THE PREVIOUS INVERT ELEV -WARNING																	
17	A	REACH	2072.00	2877.87	48			0.013						0.00	0.00	5.00	1
18	A	REACH	2167.00	2882.51	48			0.013						0.00	0.00	5.00	1

ELEMENT NO	19	IS A	REACH	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H				
			U/S DATA	2262.00	2885.16	48	0.013	0.00	0.00	5.00	1				
ELEMENT NO	20	IS A	REACH	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H				
			U/S DATA	2332.00	2886.76	48	0.013	0.00	0.00	0.00	1				
ELEMENT NO	21	IS A	JUNCTION	STATION	INVERT	SECT	LAT-1	LAT-2	N	Q3	Q4	INVERT-3	INVERT-4	PHI 3	PHI 4
			U/S DATA	2332.00	2886.76	48	36	0	0.013	56.0	0.0	2886.26	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	22	IS A	REACH U/S DATA	STATION	INVERT	SECT	LAT-1	LAT-2	N	Q3	Q4	INVERT-3	INVERT-4	PHI 3	PHI 4	ANG	PT	MAN
				2422.00	2888.80	48			0.013							0.00	0.00	1
THE ABOVE ELEMENT CONTAINED AN				INVERT ELEV	WHICH WAS NOT	GREAT	18	0	0.013	3.0	0.0	2891.30	0.00	45.00		0.00		
THE ABOVE ELEMENT CONTAINED AN				INVERT ELEV	WHICH WAS NOT	GREAT	18	0	0.013	3.0	0.0	2891.30	0.00	45.00		0.00		
ELEMENT NO	23	IS A	JUNCTION U/S DATA	STATION	INVERT	SECT	LAT-1	LAT-2	N	Q3	Q4	INVERT-3	INVERT-4	PHI 3	PHI 4	ANG	PT	MAN
				2422.00	2888.80	48			0.013							0.00	0.00	1
THE ABOVE ELEMENT CONTAINED AN				INVERT ELEV	WHICH WAS NOT	GREAT	18	0	0.013	3.0	0.0	2891.30	0.00	45.00		0.00		
THE ABOVE ELEMENT CONTAINED AN				INVERT ELEV	WHICH WAS NOT	GREAT	18	0	0.013	3.0	0.0	2891.30	0.00	45.00		0.00		
ELEMENT NO	24	IS A	REACH U/S DATA	STATION	INVERT	SECT	LAT-1	LAT-2	N	Q3	Q4	INVERT-3	INVERT-4	PHI 3	PHI 4	ANG	PT	MAN
				2820.00	2903.13	48			0.013							0.00	0.00	1
THE ABOVE ELEMENT CONTAINED AN				INVERT ELEV	WHICH WAS NOT	GREAT	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	GREAT	42	0	0.013	86.0	0.0	2903.63	0.00	45.00		0.00		
ELEMENT NO	25	IS A	JUNCTION U/S DATA	STATION	INVERT	SECT	LAT-1	LAT-2	N	Q3	Q4	INVERT-3	INVERT-4	PHI 3	PHI 4	ANG	PT	MAN
				2820.00	2903.13	48			0.013							0.00	0.00	1
THE ABOVE ELEMENT CONTAINED AN				INVERT ELEV	WHICH WAS NOT	GREAT	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	GREAT	42	0	0.013	86.0	0.0	2903.63	0.00	45.00		0.00		
ELEMENT NO	26	IS A	REACH U/S DATA	STATION	INVERT	SECT	LAT-1	LAT-2	N	Q3	Q4	INVERT-3	INVERT-4	PHI 3	PHI 4	ANG	PT	MAN
				3004.00	2908.81	48			0.013							0.00	0.00	1
THE ABOVE ELEMENT CONTAINED AN				INVERT ELEV	WHICH WAS NOT	GREAT	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	GREAT	36	18	0.013	52.0	18.0	2909.81	2911.31	60.00	45.00			
ELEMENT NO	27	IS A	JUNCTION U/S DATA	STATION	INVERT	SECT	LAT-1	LAT-2	N	Q3	Q4	INVERT-3	INVERT-4	PHI 3	PHI 4	ANG	PT	MAN
				3004.00	2908.81	48			0.013							0.00	0.00	1
THE ABOVE ELEMENT CONTAINED AN				INVERT ELEV	WHICH WAS NOT	GREAT	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	GREAT	36	18	0.013	52.0	18.0	2909.81	2911.31	60.00	45.00			
ELEMENT NO	28	IS A	REACH U/S DATA	STATION	INVERT	SECT	LAT-1	LAT-2	N	Q3	Q4	INVERT-3	INVERT-4	PHI 3	PHI 4	ANG	PT	MAN
				3024.00	2910.72	48			0.013							0.00	0.00	1
THE ABOVE ELEMENT CONTAINED AN				INVERT ELEV	WHICH WAS NOT	GREAT	48	0	0.013	18.0	0.							

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ELEMENT NO 30 IS A REACH * * *
U/S DATA STATION INVERT SECT N RADIUS ANGLE ANG PT MAN H
3060.00 2912.43 48 0.013 0.00 0.00 0.00 1

ELEMENT NO 31 IS A SYSTEM HEADWORKS * *
U/S DATA STATION INVERT SECT W 5 ELEV
3060.00 2912.43 48 0.00

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

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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	

613.00	2823.35	3.898	2827.248	483.5	24.87	9.603	2836.851	0.00	5.632		6.00	0.00	0.00	0	0.00
160.20	0.02498					.021943	3.52			3.778			0.00		
773.20	2827.35	4.009	2831.361	483.5	24.08	9.004	2840.365	0.00	5.632		6.00	0.00	0.00	0	0.00
126.80	0.02498					.019917	2.53			3.778			0.00		
900.00	2830.52	4.185	2834.705	483.5	22.96	8.185	2842.890	0.00	5.632		6.00	0.00	0.00	0	0.00
JUNCT STR	0.00000					.021408	0.00						0.00		
900.00	2830.52	3.307	2833.827	386.0	24.16	9.065	2842.892	0.00	5.267		6.00	0.00	0.00	0	0.00
50.00	0.02120					.024373	1.22			3.440			0.00		
950.00	2831.58	3.280	2834.860	386.0	24.41	9.250	2844.110	0.00	5.267		6.00	0.00	0.00	0	0.00
TRANS STR	0.08060					.018970	0.95						0.00		
1000.00	2835.61	4.502	2840.112	386.0	18.54	5.339	2845.451	0.00	5.153		5.50	0.00	0.00	0	0.00
WALL EXIT													0.00		
1000.00	2835.61	4.501	2840.111	386.0	18.55	5.342	2845.453	0.00	5.153		5.50	0.00	0.00	0	0.00
17.73	0.01634					.013118	0.23			4.076			0.00		
1017.73	2835.90	4.551	2840.451	386.0	18.36	5.233	2845.684	0.00	5.153		5.50	0.00	0.00	0	0.00
54.95	0.01634					.012472	0.69			4.076			0.00		
1072.68	2836.80	4.814	2841.612	386.0	17.50	4.758	2846.370	0.00	5.153		5.50	0.00	0.00	0	0.00
20.32	0.01634					.011689	0.24			4.076			0.00		
1093.00	2837.13	5.153	2842.283	386.0	16.69	4.324	2846.607	0.00	5.153		5.50	0.00	0.00	0	0.00

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JUNCT STR 0.00000 .017737 0.00 0.00
 1093.00 2838.13 4.709 2842.839 305.0 19.18 5.711 2848.550 0.00 4.394 4.50 0.00 0.00 0 0.00
 296.50 0.00506 .024056 7.13 4.500 0.00
 LICENSEE: SLATER HANIFAN GROUP F0515P PAGE 2

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 PIER	AVBPR
L/ELEM	SO					SF AVE	HF			NORM DEPTH		ZR		
1389.50	2839.63	10.627	2850.257	305.0	19.18	5.711	2855.968	0.00	4.394	4.50	0.00	0.00	0	0.00
JUNCT STR	0.10000											0.00		
1394.50	2840.13	2.833	2842.963	295.0	31.00	14.923	2857.886	0.00	3.966	4.00	0.00	0.00	0	0.00
237.50	0.06042					.055376	13.15			2.795		0.00		
1632.00	2854.48	2.959	2857.439	295.0	29.59	13.600	2871.039	0.00	3.966	4.00	0.00	0.00	0	0.00
70.89	0.06262					.050260	3.56			2.758		0.00		
1702.89	2858.92	3.070	2861.989	295.0	28.51	12.617	2874.606	0.00	3.966	4.00	0.00	0.00	0	0.00
59.11	0.06262					.045821	2.71			2.758		0.00		
1762.00	2862.62	3.224	2865.844	295.0	27.18	11.470	2877.314	0.00	3.966	4.00	0.00	0.00	0	0.00
12.42	0.04917					.043320	0.54			3.040		0.00		
1774.42	2863.23	3.237	2866.468	295.0	27.07	11.378	2877.846	0.00	3.966	4.00	0.00	0.00	0	0.00
108.58	0.04917					.041294	4.48			3.040		0.00		
1883.00	2868.57	3.416	2871.986	295.0	25.81	10.343	2882.329	0.00	3.966	4.00	0.00	0.00	0	0.00
63.29	0.04927					.038201	2.42			3.038		0.00		
1946.29	2871.69	3.622	2875.310	295.0	24.66	9.439	2884.749	0.00	3.966	4.00	0.00	0.00	0	0.00
45.71	0.04927					.038015	1.74			3.038		0.00		
1992.00	2873.94	3.966	2877.906	295.0	23.51	8.580	2886.486	0.00	3.966	4.00	0.00	0.00	0	0.00
JUNCT STR	0.00000					.037073	0.00					0.00		
1992.00	2873.94	6.776	2880.716	269.0	21.41	7.116	2887.832	0.00	3.951	4.00	0.00	0.00	0	0.00
80.00	0.04913					.035070	2.81			2.820		0.00		
2072.00	2877.87	6.124	2883.994	269.0	21.41	7.116	2891.110	0.00	3.951	4.00	0.00	0.00	0	0.00
95.00	0.04884					.035070	3.33			2.826		0.00		

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	NO PIER	AVBPR
L/ELEM	SO					SF AVE	HF			NORM DEPTH		ZR		
2167.00	2882.51	5.289	2887.799	269.0	21.41	7.116	2894.915	0.00	3.951	4.00	0.00	0.00	0	0.00
95.00	0.02789					.035070	3.33			4.000		0.00		
2262.00	2885.16	6.444	2891.604	269.0	21.41	7.116	2898.720	0.00	3.951	4.00	0.00	0.00	0	0.00
70.00	0.02286					.035070	2.45			4.000		0.00		
2332.00	2886.76	7.655	2894.415	269.0	21.41	7.116	2901.531	0.00	3.951	4.00	0.00	0.00	0	0.00
JUNCT STR	0.00000					.028529	0.00					0.00		
2332.00	2886.76	12.188	2898.948	213.0	16.95	4.461	2903.409	0.00	3.879	4.00	0.00	0.00	0	0.00
90.00	0.02267					.021988	1.98			3.224		0.00		
2422.00	2888.80	12.350	2901.150	213.0	16.95	4.461	2905.611	0.00	3.879	4.00	0.00	0.00	0	0.00
JUNCT STR	0.00000					.021680	0.00					0.00		
2422.00	2888.80	12.590	2901.390	210.0	16.71	4.337	2905.727	0.00	3.872	4.00	0.00	0.00	0	0.00
398.00	0.03601					.021373	8.51			2.633		0.00		
2820.00	2903.13	6.984	2910.114	210.0	16.71	4.337	2914.451	0.00	3.872	4.00	0.00	0.00	0	0.00
JUNCT STR	0.00000					.014412	0.00					0.00		
2820.00	2903.13	11.289	2914.419	124.0	9.87	1.512	2915.931	0.00	3.345	4.00	0.00	0.00	0	0.00
184.00	0.03087					.007452	1.37			1.980		0.00		
3004.00	2908.81	7.356	2916.166	124.0	9.87	1.512	2917.678	0.00	3.345	4.00	0.00	0.00	0	0.00
JUNCT STR	0.00000					.004432	0.00					0.00		
3004.00	2908.81	9.013	2917.823	54.0	4.30	0.287	2918.110	0.00	2.209	4.00	0.00	0.00	0	0.00
20.00	0.09550					.001413	0.03			0.941		0.00		
3024.00	2910.72	7.145	2917.865	54.0	4.30	0.287	2918.152	0.00	2.209	4.00	0.00	0.00	0	0.00
JUNCT STR	0.00000					.001020	0.00					0.00		

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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 PIER	AVBPR
L/ELEM	SO					SF AVE	HF			NORM DEPTH		ZR		
3024.00	2910.72	7.464	2918.184	36.0	2.86	0.127	2918.311	0.00	1.787	4.00	0.00	0.00	0	0.00
36.00	0.04750					.000628	0.02			0.915		0.00		
3060.00	2912.43	5.783	2918.213	36.0	2.86	0.127	2918.340	0.00	1.787	4.00	0.00	0.00	0	0.00

[illegible]

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

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

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T1 SKYE CANYON INFRASTRUCTURE - PHASE 2 (UPDATE NO.3)

T2 BY OLYMPIA COMPANIES

T3 EAGLE CANYON LATERAL P4-L1 THRU PARCEL 2.27

SO	1000.002888.26	36			2898.95			
R	1025.002888.94	36		.013			45.	1
JX	1025.002888.94	36	36	.013	3.0	2888.94	90.00	15.
R	1125.002891.67	36		.013				45.
R	1205.002893.86	36		.013				1
JX	1205.002894.36	36	30	.013	26.5	2894.36	90.00	
R	1255.002894.86	30		.013				1
SH	1255.002894.86	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

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Q
→

26.5

DATE: 8/ 1/2017
TIME: 8:56

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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														
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-L1 THRU PARCEL 2.27
F 0 5 1 5 P

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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	2888.26	36						2898.95				
ELEMENT NO	2	IS A REACH	STATION	INVERT	SECT						RADIUS	ANGLE	ANG PT	MAN H	
		U/S DATA	1025.00	2888.94	36	N 0.013					0.00	0.00	45.00	1	
ELEMENT NO	3	IS A JUNCTION	STATION	INVERT	SECT	LAT-1	LAT-2	N	Q3	Q4	INVERT-3	INVERT-4	PHI 3	PHI 4	
		U/S DATA	1025.00	2888.94	36	36	0	0.013	3.0	0.0	2888.94	0.00	90.00	0.00	
THE ABOVE ELEMENT CONTAINED AN INVERT ELEV WHICH WAS NOT GREATER THAN THE PREVIOUS INVERT ELEV -WARNING															
THE ABOVE ELEMENT CONTAINED AN INVERT ELEV WHICH WAS NOT GREATER THAN THE PREVIOUS INVERT ELEV -WARNING															
ELEMENT NO	4	IS A REACH	STATION	INVERT	SECT						RADIUS	ANGLE	ANG PT	MAN H	
		U/S DATA	1125.00	2891.67	36	N 0.013					0.00	0.00	15.00	1	
ELEMENT NO	5	IS A REACH	STATION	INVERT	SECT						RADIUS	ANGLE	ANG PT	MAN H	
		U/S DATA	1205.00	2893.86	36	N 0.013					0.00	0.00	45.00	1	
ELEMENT NO	6	IS A JUNCTION	STATION	INVERT	SECT	LAT-1	LAT-2	N	Q3	Q4	INVERT-3	INVERT-4	PHI 3	PHI 4	
		U/S DATA	1205.00	2894.36	36	30	0	0.013	26.5	0.0	2894.36	0.00	90.00	0.00	
WARNING - ADJACENT SECTIONS ARE NOT IDENTICAL - SEE SECTION NUMBERS AND CHANNEL DEFINITIONS															
ELEMENT NO	7	IS A REACH	STATION	INVERT	SECT						RADIUS	ANGLE	ANG PT	MAN H	
		U/S DATA	1255.00	2894.86	30	N 0.013					0.00	0.00	0.00	1	
ELEMENT NO	8	IS A SYSTEM HEADWORKS	STATION	INVERT	SECT						W S ELEV				
		U/S DATA	1255.00	2894.86	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 P

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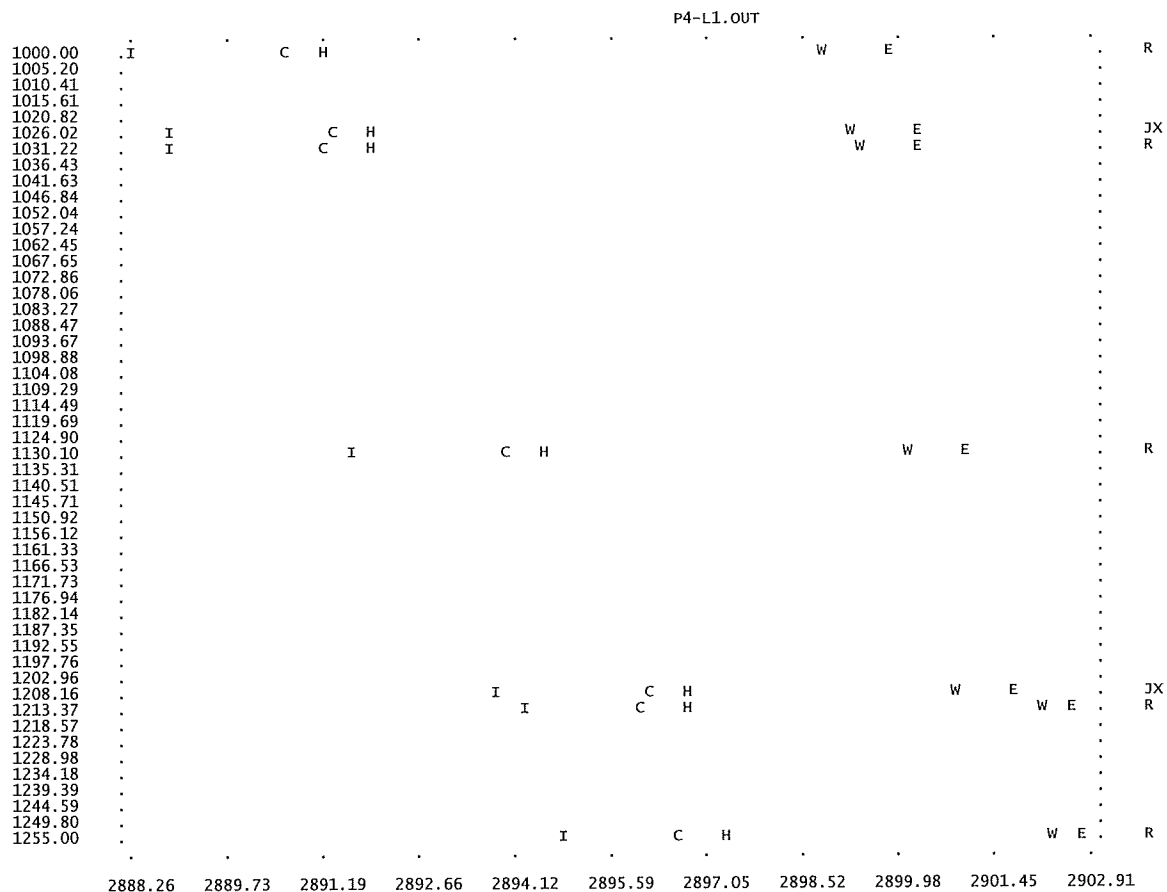
PAGE 1

WATER SURFACE PROFILE LISTING
SKYE CANYON INFRASTRUCTURE - PHASE 2 (UPDATE NO.3)
BY OLYMPIA COMPANIES
EAGLE CANYON LATERAL P4-L1 THRU PARCEL 2.27

STATION	INVERT ELEV	DEPTH OF FLOW	W.S. ELEV	Q	VEL	VEL HEAD	ENERGY GRD. EL.	SUPER ELEV	CRITICAL DEPTH	HGT/ DIA	BASE/ ID NO.	ZL	NO PIER	AVBPR
L/ELEM	SO	SF AVE HF NORM DEPTH ZR												
1000.00	2888.26	10.690	2898.950	56.0	7.92	0.974	2899.924	0.00	2.427	3.00	0.00	0.00	0	0.00
25.00	0.02720					.007049	0.18			1.515		0.00		
1025.00	2888.94	10.380	2899.320	56.0	7.92	0.974	2900.294	0.00	2.427	3.00	0.00	0.00	0	0.00
JUNCT STR	0.00000					.006681	0.00					0.00		
1025.00	2888.94	10.583	2899.523	53.0	7.50	0.873	2900.396	0.00	2.366	3.00	0.00	0.00	0	0.00
100.00	0.02730					.006314	0.63			1.465		0.00		
1125.00	2891.67	8.571	2900.241	53.0	7.50	0.873	2901.114	0.00	2.366	3.00	0.00	0.00	0	0.00
80.00	0.02737					.006314	0.51			1.464		0.00		
1205.00	2893.86	7.060	2900.920	53.0	7.50	0.873	2901.793	0.00	2.366	3.00	0.00	0.00	0	0.00
JUNCT STR	0.00000					.003947	0.00					0.00		
1205.00	2894.36	7.869	2902.229	26.5	5.40	0.453	2902.682	0.00	1.755	2.50	0.00	0.00	0	0.00
50.00	0.01000					.004174	0.21			1.461		0.00		
1255.00	2894.86	7.600	2902.460	26.5	5.40	0.453	2902.913	0.00	1.755	2.50	0.00	0.00	0	0.00

SKYE CANYON INFRASTRUCTURE - PHASE 2 (UPDATE NO.3)
BY OLYMPIA COMPANIES
EAGLE CANYON LATERAL P4-L1 THRU PARCEL 2.27

low point onsite is at ± 2900'



NOTES

1. GLOSSARY

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

APPENDIX D

CD of Electronic Files & Revised Improvement Plans