TECHNICAL DRAINAGE STUDY
ADDENDUM #1

Skye Canyon Infrastructure Phase 3A

City of Las Vegas, Nevada

Job No.: OLY1609.000
Date: April 2018

Prepared By:
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Prepared For:
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11411 Southern Highlands Parkway, Suite 300
Las Vegas, NV 89141
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Lant Leavitt, P.E.
NV Professional Engineer No. 18287

Assisted by: Erick Mata, E.I.

HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL

DRAINAGE STUDY INFORMATION FORM

Name of Development: Skye Canyon – Phase 3A Infrastructure (Addendum) Date: April 2018

Location of Development:
a) Descriptive (Cross Streets): North/South: Skye Village Road
East/West: Grand Canyon Drive
b) Section: 7 Township: 19 South Range: 60 East
c) APN: 125-07-201-007 and a portion of 125-07-101-009

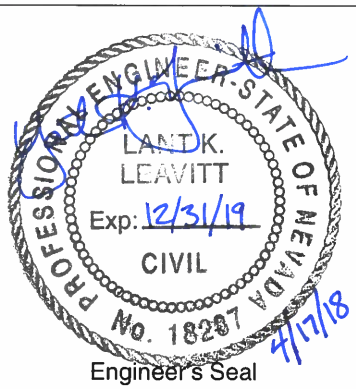
Name of Owner/Developer: M F Land, LLC / Ninety-Five Management, LLC
Telephone No.: 702-220-6565 Fax No.: 702-220-6566 E-mail Address: mbolduc@olympiacompanies.com
Address: 11411 Southern Highlands Parkway, Suite 300; Las Vegas, NV 89141

Contact Person – Name: Lant Leavitt, P.E. Telephone No.: 702-284-5300
*E-mail Address: lleavitt@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: 20 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: 1800 acre +/-
6. Has the site drainage been evaluated in the past? ☒ Yes** ☐ No If yes, please identify documentation: *Master Drainage Study for Skye Canyon Update #4* (SHG, DS4420)
7. If known, please briefly identify the proposed discharge point(s) of runoff from the site: Skye Village Road thru MOHU 0036, And Minor flows thru local facilities discharging to desert shrub east of the project site.
8. Briefly describe your proposed schedule for the subject project: ASAP Upon Substantial Completion of Detention Basin 2 Facilities Phase 3A – Roadway Infrastructure per this TDS; Future Phase 3A Residential Subdivisions to follow by separate TDS.



4/17/18

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

Revision	Date

Local Entity File No.

REFERENCE: ***SHG Job No. OLY1609.000***

STANDARD FORM 1

Updated 05/01/2008

SLATER HANIFAN GROUP
CONSULTING ENGINEERS & PLANNERS

OLY1609.000

April 17, 2018

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 No.1 to the Technical Drainage Study for Skye Canyon Infrastructure Phase 3A (CLV DS4931)

Dear Mr. Sung:

This letter is submitted in response to comments contained in the January 22, 2018 review memorandum, regarding the above referenced project. A copy of the City of Las Vegas (CLV) Department of Public Works comment letter has been provided in Appendix A.

The comments have been individually addressed as follows:

1. **Comment:** *The site is adjacent to or crosses an existing or proposed Clark County Regional Flood Control District (CCRFCD) master planned facility. Therefore, CCRFCD concurrence is required prior to final approval of the drainage study.*

   Response: Noted. The study will be submitted for concurrence to CCRFCD upon conditional approval from the city.

2. **Comment:** *The subject Skye Canyon Phase 3A Infrastructure Drainage Study will not be approved prior to the approval of the Skye Canyon Detention Basin 2 Technical Drainage Study.*

   Response: Acknowledged.

3. **Comment:** *Skye Canyon Phase 3A onsite developments are to be flood protected by Detention Basin 2. No occupancy permits within onsite Phase 3A will be issued prior to the substantial completion of Detention Basin 2.*

   Response: Noted.

4. **Comment:** *The future MPU facility within Skye Village Road north of the Skye Village/Grand Canyon/Iron Mountain intersection to the proposed MPU facility at the Kyle Canyon interchange area shall be substantially complete before occupancy of residential Units beyond Phase 3A, 3B and 3C. This includes residential development within Phases 4 & 6 and the development of Phase 5 as shown on the Development Phasing Exhibit dated 12/4/2017.*

   Response: Noted.

5. **Comment:** *The implementation of the CCRFCD Master Plan is being progressed with the recent bid opening of the NDOT US-95 facilities from the CC-215 interchange north to the Kyle Canyon interchange. Construction of the associated CCRFCD MPU facilities allows for the utilization of the existing MPU facilities constructed with Horse Interchange. The development of Phase 3A west of US-95 shall maximize the flow collection into this facility prior to allowing flows to cross US-95 using the existing culvert system. Provide an Updated Exhibit H showing the Ultimate Condition & connection to the existing US-95 facilities. The Ultimate Condition will have the west side of these culvert systems removed, no longer having flows cross US-95 as per the CCRFCD Master Plan.*

   Response: The ultimate condition for Phase 3A is per the Skye Canyon Master Drainage Study. A copy of the ultimate condition facility map is included in Appendix F. In addition, existing and ultimate US 95 facilities have been added to the Phase 3A Facilities Map. This map shows the ultimate connection to US 95 facilities and removal of west side culverts.

6. **Comment:** *The proposed interim discharge of Phase 3A impacts the proposed Detention Basin #2 outfall. Show the DB#2 improvements and incorporate the impact on the flow discharge to US-95.*

   Response: In the proposed condition, Detention Basin 2 discharge will reach the northwest corner of Phase 3A in an existing wash. Downstream of Phase 3A, a facility will be constructed with Detention Basin 2 to divert "long term discharge" to the existing US 95 MPU facility. This DB2 outfall facility consists of a sediment basin with drop inlets that discharge to a ditch. The ditch will convey flow south parallel to US 95 to the existing 5-ft x 5-ft RCB MPU facility. This DB2 outfall facility is now shown on the Phase 3A Facility Map as an existing facility, and the diverted flow is noted in the facility summary table.

7. **Comment:** *The Ultimate Development between Skye Village Rd. and US-95 shall convey all flows within the US- 95 MPU facility. The report shall include a comparison table showing the Ultimate flows being conveyed into the US-95 facility from Skye Canyon versus the design flows from the Horse Drive/US-95 project. The Local facility collection between Grand Canyon and Oso Blanca (west side of US-95) shall be included on the Ultimate Facility Exhibit to identify the necessary storm drain facilities needed to make the connection to the existing MPU facility.*

   Response: The Master Drainage Study (see facility map in Appendix F) proposes local conveyance facilities necessary to discharge flow to the existing MPU facility. In addition, these facilities are shown on the Phase 3A Facilities Map. A comparison table of Skye Canyon ultimate condition flow rates vs Horse Drive (Skye Canyon Park) Interchange design flows rates is below:

US 95 MPU Facility – Flow Comparison Table			
Location	Facility	Reference Study	
		Skye Canyon MDS Flow (cfs)	Horse Interchange Flow (cfs)
US 95 Near Brent Lane	5-ft x 5-ft RCB	301	329
US 95 Downstream of Brent Lane	10-ft x 6-ft RCB	648	653

8. **Comment:** *Review and revise the WSPG analysis to match the storm drain plans. Provide an Exhibit showing the stationing of the storm drain improvements versus the WSPG stationing.*

   Response: WSPGW summary tables have been provided for all main storm drain alignments in lieu of a WSPG exhibit. Due to minor adjustments some models were revised and re-provided as reference. Note that the re-analysis of the storm drain alignments generated either the same or lower HGL's than previously established, therefore all lateral analyses were excluded if the lateral remained unchanged since the previous submittal. Laterals U21, U29E and U31 were adjusted since the previous submittal and therefore re-assessed and provided in Appendix D for your reference.

9. **Comment:** *The future abandonment of Phase 3A storm drain improvements once the Ultimate MPU facilities are in place needs to be shown on an Exhibit. The City requires that facilities be removed from the roadway if they are no longer needed. These facilities will need included in the Maintenance Bond.*

   Response: Facilities to be removed in future are shown on the Facilities Map. They will be included in the Maintenance Bond.

10. **Comment:** *Flood Control understands that the new Skye Canyon Master Plan Amendment (MPA) is being included as a part of the 2018 MPU process. Any changes not incorporated in the 2018 MPU must be approved by City of Las Vegas and Clark County Regional Flood Control District (CCRFCD) and shall be adopted by the City of Las Vegas City Council prior to the final approval of the subject improvement plans.*

    Response: Noted.

11. **Comment:** *The Design Report for Moccasin Road CCRFCD Flood Control Facility (US95 / Kyle Canyon Road Interchange to CCRFCD Facility LVUP 1076/1077) must be conditionally approved (90% submittal) prior to the final approval of the subject improvement plans. Show the proposed interim structure near the Grand Canyon & Skye Village intersection on the Phase 3A improvement plans.*

Response: Rather than proposing an interim structure at Skye Village Road/Grand Canyon Drive, the Moccasin Regional Facility is proposing a "catcher mitt" collection facility at the US 95 frontage road to the northeast. The 30% Moccasin plans didn't show the catcher mitt extending far enough south to intercept flows from Skye Village Road/Grand Canyon Drive. However, the catcher mitt is being extended to the south with the next submittal and will intercept these flows. Extending the catcher mitt rather than constructing an interim facility at Skye Village Road/Grand Canyon Drive provides an additional benefit of intercepting runoff from the area between Skye Village Road and the catcher mitt extension.

12. **Comment:** *The subject Phase 3A Infrastructure Drainage Study addresses the included street improvements of Skye Village Road, Skye Park Drive, Street "E", Grand Canyon Drive, culvert crossings and storm drain systems with the streets. Technical drainage studies will be required for the future onsite parcels as they develop.*

    Response: Acknowledged. Future individual technical drainage studies will be provided with the development of each parcel.

13. **Comment:** *Since the streets network and the associated storm drain facilities will eventually be accepted by the City of Las Vegas, the engineer/developer must coordinate with City of Las Vegas Streets & Sanitation Department for their review and approval prior to the final approval of the improvement plans.*

    Response: Noted.

14. **Comment:** *The proposed transition structure of the RCA and the RCB near Station 46+09 on Skye Village Road needs a detailed hydraulic analysis due to the large flow increase in the system (483 cfs to 876 cfs). The size and layout of the transition structure needs further refinement.*

    Response: The previous design proposed the RCB to connect directly into the side of the RCA. Due to the large flow increase at this location, a more technical assessment of the area has been performed. The RCB layout has been revised to include a radius leading to a confluence with the RCA, followed by a transition structure. Hydraulic analysis of these revisions show the proposed storm drain meets CCRFCD manual criteria. See Appendix D for reference.

15. **Comment:** *The temporary termination of the Master Plan facility near the Iron Mountain/Grand Canyon intersection needs to include a 6-foot valley gutter from the end of the rip-rap to the RCA to allow for proper maintenance access to the facility. The proposed rip-rap channel impacts the existing LVVWD facilities and requires relocation of water district facilities. Review and revise accordingly.*

    Response: Noted. A 6-foot valley gutter from the end of rip rap to the RCA has been provided for maintenance access to the facility.

16. **Comment:** *Structural plans for the storm drain improvements must be submitted for review by Flood Control and the Building Department. 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 improvement plans.*

    Response: Noted.

17. **Comment:** *Provide connection details for lateral and main line structures connection the RCA's and RCB's as a part of the Structural details.*

    Response: Noted.

18. **Comment:** *The proposed RCA's provide the required 5-foot minimum stem wall height before the arch section.*

    Response: Noted.

19. **Comment:** *The project proposed to build temporary drainage facilities including drainage berms/swales over the Phase 3A site and along the west side of Skye Village Road. Prior to the final plans 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 facilities 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: Noted.

20. **Comment:** *Exhibit C: The exhibit shows the original 3-cell detention basins along the west boundary of the overall Skye Canyon Development. Revise the exhibit to reflect the updated version of 2-cell detention basins in the next submittal.*

    Response: Noted. Following Exhibit C1, the revised MPA facilities map has been provided to show the updated 2-cell detention basins. The revised MPU facilities map has been reincluded in Appendix B for your reference.

21. **Comment:** *Exhibit I and Exhibit G: Clearly label all the street names on both exhibits.*

Response: Noted. Additional street labels have been provided for Exhibit I and Exhibit G.

22. **Comment:** *Exhibit G: Clearly label all the flow diversion amounts for the interim condition before the MPU facilities are complete.*

    Response: Flow diversions (DIV1 and DIV2) have been clearly shown on Exhibit G for location and flow reference.

23. **Comment:** *Exhibit I: The storm drain sizes shown in Street "E" do not match the construction plans and the subject drainage study. Exhibit I shows one size of 42" (Facilities P33, P35 and P37) while the construction plans show 42" to 36" (with steeper slope). Review and revise accordingly.*

    Response: Exhibit I has been revised to accurately reflect the 42" RCP (Facility P33a) to the 36" RCP facilities (Facility P33b, P35 and P37). See Appendix B for the revised exhibit.

24. **Comment:** *Exhibit I: Show and identify an existing 60"-RCP along the north edge of the Smith's Center project.*

    Response: The existing facility has been identified as facility X7 and included in the Exhibit I summary tables.

25. **Comment:** *Exhibit I: Per the drainage study, Facility P31 should be a 60"-RCP while the Exhibit labels it as a 76"x48" HERCP. However, the storm drain downstream of P31 connecting to "MOHU 0036" is indeed 76"x48" HERCP. Review and revise accordingly.*

    Response: Facility P31 had been initially proposed as a 76"x48" HERCP. However, a technical analysis of the Phase 3B 3C area has determined that due to ultimate flow rates and extension of the storm drain alignment along Iron Mountain Road, facility P31 will have to be revised to an 8'x4' RCB lateral connection. Note that in addition to the revised lateral stub size, the connection is now proposed with a radius curve instead of an angle point. Additionally, the connection has a structural transition that will allow the confluence of both systems (Iron Mountain Road and Skye Village Road). Please see Appendix D for the revised WSPGW model of the area.

26. **Comment:** *Provide calculations that support the 10-year dry lane criteria for Skye Village Road and Grand Canyon Drive.*

    Response: Section 10YR has been modeled with a conservative flow rate (SVR1+SVR2) to show Skye Village Road meets all 10-yr criteria for a right of way greater than 80-ft. Sections GC1-GC3 meet all 10-yr criteria with 100-yr flow rates for a right of way of less than 80-ft. As a result, 10-yr flow rates for sections GC1-GC3 were determined not necessary for analysis.

27. **Comment:** *Provide maintenance access to all of the inlet and outlet structures. Reference the access on Sheets D-19 through D-24. Include a typical access road section.*

Response: Maintenance access is provided for all inlet and outlet structures. Access roads for maintenance are shown on plan view sheets. For minor onsite inlets/outlets, access is provided to edge of riprap. Along Skye Village Road and at the MPU facility outlet, access is provided directly to the culvert invert with a proposed concrete pad. Proposed concrete pads and access roads are shown on profile sheets D-19 through D-24 where they cross the profile alignment. Typical access road section is included on Sheet D-25. Note that widening of ditches to accommodate access is anticipated to reduce both flow velocity and depth. Therefore, original ditch hydraulic calculations are conservative and these have not been revised within the Facilities Map.

28. **Comment:** *The proposed rip-rap within NDOT control of access shall be Class 150 or Class 300 per NDOT standards. Review and revise accordingly.*

    Response: No riprap within NDOT control of access is proposed with Phase 3A. The Skye Canyon Detention Basin 2 project, which will be constructed prior to Phase 3A, is proposing riprap downstream of Phase 3A within NDOT right-of-way. This comment will be applied to the Detention Basin 2 project.

29. **Comment:** *The rip-rap sections need to be extended to a minimum depth of 1-foot above the normal depth.*

    Response: Riprap sections are extended 1-foot above normal depth. See profile sheets D-19 through D-24 showing water surface elevations and raised riprap elevation.

30. **Comment:** *Provide inlets at a maximum spacing of 660' along Skye Village Road and Grand Canyon Drive.*

    Response: Nominal inlets have been added per improvement plan comments. Also see Exhibit I in Appendix B for "NU" nuisance facility locations.

31. **Comment:** *Provide drop inlets upstream of the roadway cross fall transitions to collect flow before it spills across the intersections.*

    Response: Nominal drop inlets have been provided at the intersection of Grand Canyon Drive and Skye Park Drive as requested.

32. **Comment:** *Include utility crossings on the storm drain plans. Provide a complete set of Phase 3A improvement plans that include the Utility and Roadway plans for review.*

    Response: Existing and proposed utilities are included on storm drain plan and profile sheets. Full utility and roadway plans will be prepared following TDS approval.

33. **Comment:** *Skye Village Road Improvement Plans:*
    Sheets D-07, D-08, D-09 and D-11: Provide access paths down to the riprap pads for future maintenance.

Sheet D-11: Provide Construction # Hexagon 12 to a proposed 76"x48" HERCP between SDMH #20 and the regional facility on the plan.

Response: Access paths have been provided down to the riprap pads for Skye Village Road facilities. A separate Construction Hexagon is no longer necessary for the proposed 76"x48" HERCP because there is no longer a facility size change at this location.

34. **Comment:** *Skye Canyon Park Drive Improvement Plans:*
Sheet D-18: Provide access path down to the 72"-culvert headwall for maintenance purpose.

Response: Access path to 72" culvert headwall is provided. See Sheet D-07 and GR-02.

35. **Comment:** *Street "E" Improvement Plans:*
Sheet D-16: Finish the call-out numbering for the cradle detail to Detail 2, Sheet D-25.

Response: Cradle detail callout on Sheet D-16 revised.

36. **Comment:** *Skye Park Drive Improvement Plans:*

Sheet D-15: Provide a pair of nominal drop inlets on both sides of Skye Park Drive at approximately Station 104+00, prior to the cross-fall transition.

Response: Drop inlets provided in Skye Park Drive upstream of cross-fall transition as requested.

37. **Comment:** *Grand Canyon Drive Improvement Plans:*

Sheets D-01 and D-03: Provide access path to the riprap pads for maintenance. Sheet D-03: Provide a nominal drop inlet to the proximity of SDMH #6.

Sheet D-04: Provide a nominal drop inlet at approximately Station 71 to SDMH #28.

Sheet D-06: The storm drain HGL is shown above grade. The HGL is required to be at least 1-foot below street grade to meet manual requirements. The City requires hinged and grated manholes where the HGL is less than 18-inches below grade. Revise the design accordingly.

Response: Sheets D-01 and D-03: Access paths provided for maintenance. Sheet D-03: Provide a nominal drop inlet to the proximity of SDMH #6.

Sheet D-04: Nominal drop inlet provided at Station 71+50.

Sheet D-06: Facility in Iron Mountain Road has been upsized to an 8-ft x 4-ft RCB. Revised HGL is shown on profile and meets 18-inch requirement.

38. **Comment:** *Sheet D-25: 42"-RCP Cradle Detail needs separation between the 42" concrete cradle & the RCA. Consider using rigid foam layer with CLSM at the RCA to create a smooth pipe crossing.*

    Response: Rigid foam layer called out between RCA and concrete cradle. Will provide additional detail on foam material/thickness with structural plans after approval of TDS.

39. **Comment:** *Sheet GR-01: Show access path to the riprap pad for maintenance.*

    Response: Access path to riprap pad provided.

40. **Comment:** *The technical drainage study must be wet stamped and sealed by a Nevada registered civil engineer. Provide a sealed Standard Form 1 in the next submittal.*

    Response: Sealed Standard Form 1 provided.

The revised plan, profile and detail sheets adopting the revisions addressed in this letter have been included in Appendix E. 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, E.I.
Flood Control Division

cc: Lant Leavitt, P.E. – SHG
Mark Failla, P.E., CFM – SHG
Jerrod Ratcliffe, P.E. – SHG

APPENDIX

Appendix A CLV Comment Letter

Appendix B Revised Drainage Exhibits

Appendix C Hydraulic Computations

Appendix D Storm Drain Models
- Skye Village Road
  - Model "PSVR1"
  - Model "PSVR2"
  - Model "USVR"
  - Revised Laterals
- Grand Canyon Drive
  - Model "P203"
  - Model "U203"
- Street E
- Skye Park Drive

Appendix F *Master Drainage Study Update #4; SHG*
- Approval Letter
- Drainage Exhibits

Appendix E CD of Electronic Files & Revised Improvement Plans

APPENDIX A

CLV Comment Letter

CITY OF LAS VEGAS INTER-OFFICE MEMORANDUM			DATE: January 22, 2018
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 3A Infrastructure**		**COPIES TO:** Slater Hanifan Group
Cross Streets:	Skye Village Road & Grand Canyon Drive		M F Land LLC / Ninety-Five Management LLC
File Number:	F:\Depot\DSMemos\DS4931A.doc		Bart Anderson, P.E., DevCo
Parcel Number:	125-07-201-007 & Portion of 125-07-101-009		CCRFCD
Zoning Action:			
FEMA Flood Zone	YES	NO **X**	
Proposed Storm Drain	YES **X**	NO	

HISTORY	DATE RECEIVED	DATE REVIEWED	COMMENTS	REVIEW FEES	FEES PAID Payment Trn #
1st Submittal	11/6/2017	1/22/2018	See Comments Below	$400.00	491017: $400
			TOTAL FEES (LDDRS):	**$400.00**	**----**

REMARKS:

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

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

1. The site is adjacent to or crosses an existing or proposed *Clark County Regional Flood Control District* (CCRFCD) master planned facility. Therefore, CCRFCD concurrence is required prior to final approval of the drainage study.

2. The subject *Skye Canyon Phase 3A Infrastructure Drainage Study* will not be approved prior to the approval of the *Skye Canyon Detention Basin 2 Technical Drainage Study*.

3. *Skye Canyon Phase 3A* onsite developments are to be flood protected by *Detention Basin 2*. No occupancy permits within onsite *Phase 3A* will be issued prior to the substantial completion of *Detention Basin 2*.

4. The future MPU facility within Skye Village Road north of the Skye Village/Grand Canyon/Iron Mountain intersection to the proposed MPU facility at the Kyle Canyon interchange area shall be substantially complete before occupancy of residential Units beyond Phase 3A, 3B and 3C. This includes residential development within Phases 4 & 6 and the development of Phase 5 as shown on the Development Phasing Exhibit dated 12/4/2017.

5. The implementation of the CCRFCD Master Plan is being progressed with the recent bid opening of the NDOT US-95 facilities from the CC-215 interchange north to the Kyle Canyon interchange. Construction of the associated CCRFCD MPU facilities allows for the utilization of the existing MPU facilities constructed with the Horse Interchange. The development of Phase 3A west of US-95 shall

maximize the flow collection into this facility prior to allowing flows to cross US-95 using the existing culvert system. Provide an Updated Exhibit H showing the Ultimate Condition & connection to the existing US-95 facilities. The Ultimate Condition will have the west side of these culvert systems removed, no longer having flows cross US-95 as per the CCRFCD Master Plan.

6. The proposed interim discharge of Phase 3A impacts the proposed Detention Basin #2 outfall. Show the DB #2 improvements and incorporate the impact on the flow discharge to US-95.

7. The Ultimate Development between Skye Village Rd. and US-95 shall convey all flows within the US-95 MPU facility. The report shall include a comparison table showing the Ultimate flows being conveyed into the US-95 facility from Skye Canyon versus the design flows from the Horse Drive/US-95 project. The Local facility collection between Grand Canyon and Oso Blanca (west side of US-95) shall be included on the Ultimate Facility Exhibit to identify the necessary storm drain facilities needed to make the connection to the existing MPU facility.

8. Review and revise the WSPG analysis to match the storm drain plans. Provide an Exhibit showing the stationing of the storm drain improvements versus the WSPG stationing.

9. The future abandonment of Phase 3A storm drain improvements once the Ultimate MPU facilities are in place needs to be shown on an Exhibit. The City requires that facilities be removed from the roadway if they are no longer needed. These facilities will need included in the Maintenance Bond.

10. Flood Control understands that the new *Skye Canyon Master Plan Amendment* (MPA) is being included as a part of the 2018 MPU process. Any changes not incorporated in the 2018 MPU must be approved by *City of Las Vegas* and *Clark County Regional Flood Control District* (CCRFCD) and shall be adopted by the *City of Las Vegas City Council* prior to the final approval of the subject improvement plans.

11. The *Design Report for Moccasin Road CCRFCD Flood Control Facility (US95 / Kyle Canyon Road Interchange to CCRFCD Facility LVUP 1076/1077)* must be conditionally approved (90% submittal) prior to the final approval of the subject improvement plans. Show the proposed interim structure near the Grand Canyon & Skye Village intersection on the Phase 3A improvement plans.

12. The subject *Phase 3A Infrastructure Drainage Study* addresses the included street improvements of *Skye Village Road, Skye Park Drive, Street "E", Grand Canyon Drive*, culvert crossings and storm drain systems with the streets. Technical drainage studies will be required for the future onsite parcels as they develop.

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

14. The proposed transition structure of the RCA and the RCB near Station 46+09 on Skye Village Road needs a detailed hydraulic analysis due to the large flow increase in the system (483 cfs to 876 cfs). The size and layout of the transition structure needs further refinement.

15. The temporary termination of the Master Plan facility near the Iron Mountain/Grand Canyon intersection needs to include a 6-foot valley gutter from the end of the rip-rap to the RCA to allow for proper maintenance access to the facility. The proposed rip-rap channel impacts the existing LVVWD facilities and requires relocation of water district facilities. Review and revise accordingly.

16. Structural plans for the storm drain improvements must be submitted for review by Flood Control and the Building Department. 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 improvement plans.

17. Provide connection details for lateral and main line structures connection the RCA's and RCB's as a part of the Structural details.

18. The proposed RCA's provide the required 5-foot minimum stem wall height before the arch section.

19. The project proposed to build temporary drainage facilities including drainage berms/swales over the *Phase 3A* site and along the west side of *Skye Village Road.* Prior to the final plans 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 facilities 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.

20. **Exhibit C**: The exhibit shows the original 3-cell detention basins along the west boundary of the overall *Skye Canyon Development.* Revise the exhibit to reflect the updated version of 2-cell detention basins in the next submittal.

21. **Exhibit I and Exhibit G**: Clearly label all the street names on both exhibits.

22. **Exhibit G**: Clearly label all the flow diversion amounts for the interim condition before the MPU facilities are complete.

23. **Exhibit I**: The storm drain sizes shown in *Street "E"* do not match the construction plans and the subject drainage study. *Exhibit I* shows one size of 42" (Facilities P33, P35 and P37) while the construction plans show 42" to 36" (with steeper slope). Review and revise accordingly.

24. **Exhibit I**: Show and identify an existing 60"-RCP along the north edge of the *Smith's Center* project.

25. **Exhibit I:** Per the drainage study, Facility P31 should be a 60"-RCP while the *Exhibit* labels it as a 76"x48" HERCP. However, the storm drain downstream of P31 connecting to "*MOHU 0036*" is indeed 76"x48" HERCP. Review and revise accordingly.

26. Provide calculations that support the 10-year dry lane criteria for Skye Village Road and Grand Canyon Drive.

27. Provide maintenance access to all of the inlet and outlet structures. Reference the access on Sheets D-19 through D-24. Include a typical access road section.

28. The proposed rip-rap within NDOT control of access shall be Class 150 or Class 300 per NDOT standards. Review and revise accordingly.

29. The rip-rap sections need to be extended to a minimum depth of 1-foot above the normal depth.

30. Provide inlets at a maximum spacing of 660' along Skye Village Road and Grand Canyon Drive.

31. Provide drop inlets upstream of the roadway cross fall transitions to collect flow before it spills across the intersections.

32. Include utility crossings on the storm drain plans. Provide a complete set of Phase 3A improvement plans that include the Utility and Roadway plans for review.

33. **Skye Village Road Improvement Plans**:

Sheets D-07, D-08, D-09 and D-11: Provide access paths down to the riprap pads for future maintenance.
Sheet D-11: Provide Construction # Hexagon 12 to a proposed 76"x48" HERCP between SDMH #20 and the regional facility on the plan.

34. **Skye Canyon Park Drive Improvement Plans:**

Sheet D-18: Provide access path down to the 72"-culvert headwall for maintenance purpose.

35. **Street "E" Improvement Plans:**

Sheet D-16: Finish the call-out numbering for the cradle detail to Detail 2, Sheet D-25.

36. **Skye Park Drive Improvement Plans:**

Sheet D-15: Provide a pair of nominal drop inlets on both sides of *Skye Park Drive* at approximately Station 104+00, prior to the cross-fall transition.

37. **Grand Canyon Drive Improvement Plans:**

Sheets D-01 and D-03: Provide access path to the riprap pads for maintenance.

Sheet D-03: Provide a nominal drop inlet to the proximity of SDMH #6.

Sheet D-04: Provide a nominal drop inlet at approximately Station 71 to SDMH #28.

Sheet D-06: The storm drain HGL is shown above grade. The HGL is required to be at least 1-foot below street grade to meet manual requirements. The City requires hinged and grated manholes where the HGL is less than 18-inches below grade. Revise the design accordingly.

38. **Sheet D-25**: 42"-RCP Cradle Detail needs separation between the 42" concrete cradle & the RCA. Consider using rigid foam layer with CLSM at the RCA to create a smooth pipe crossing.

39. **Sheet GR-01**: Show access path to the riprap pad for maintenance.

40. The technical drainage study must be wet stamped and sealed by a Nevada registered civil engineer. Provide a sealed ***Standard Form 1*** in the next submittal.

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
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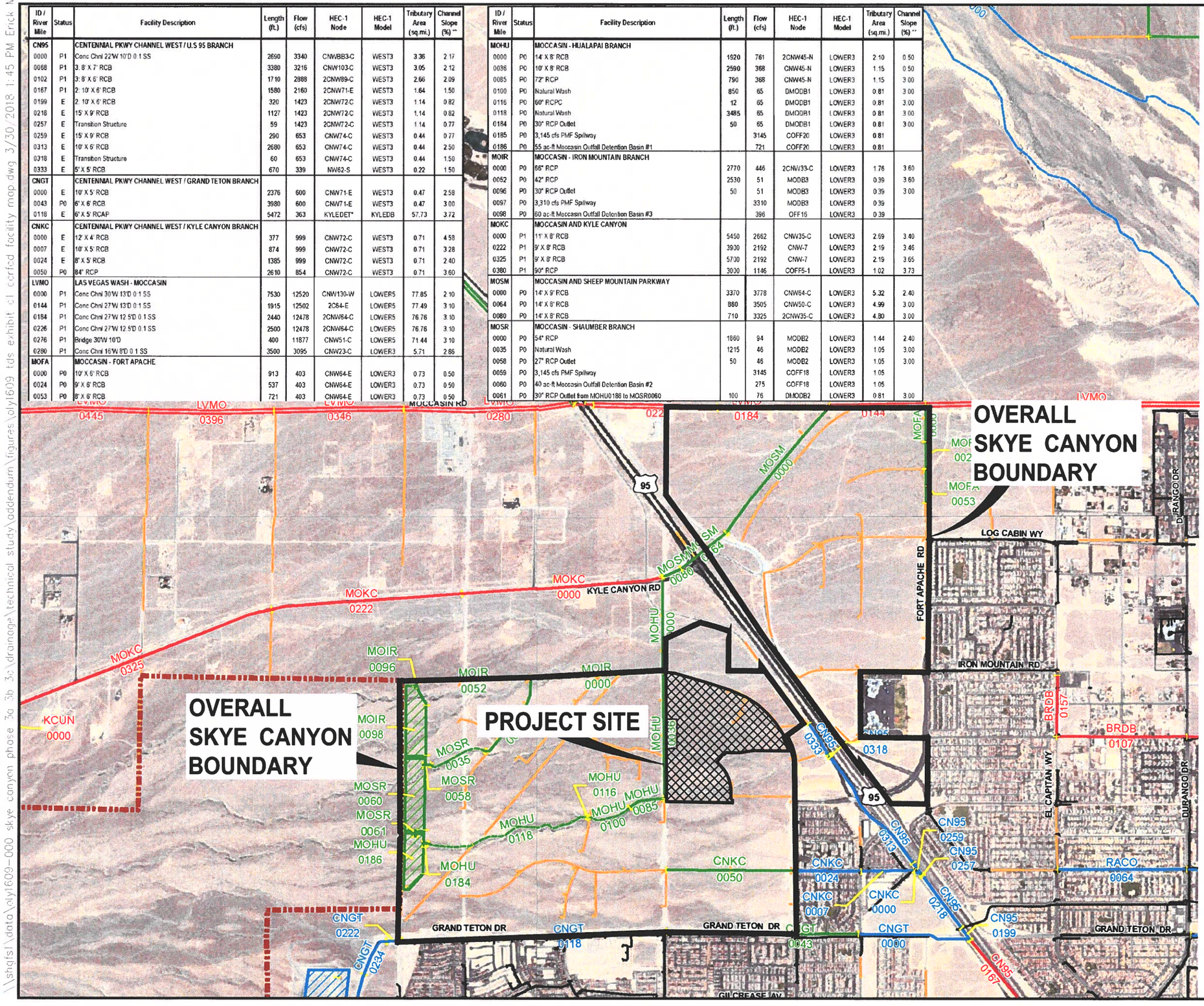
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AREA G-07

APPENDIX B

Revised Drainage Exhibits

ID / River Mile	Status	Facility Description	Length (ft.)	Flow (cfs)	HEC-1 Node	HEC-1 Model	Tributary Area (sq.mi.)	Channel Slope (%) **
CN95		**CENTENNIAL PKWY CHANNEL WEST / U.S 95 BRANCH**						
0000	P1	Conc Chnl 22'W 10'D 0.1 SS	2690	3340	CNWBB3-C	WEST3	3.36	2.17
0068	P1	3: 8' X 7' RCB	3380	3216	CNW103-C	WEST3	3.05	2.12
0102	P1	3: 8' X 6' RCB	1710	2888	2CNW89-C	WEST3	2.66	2.09
0167	P1	2: 10' X 6' RCB	1580	2160	2CNW71-E	WEST3	1.64	1.50
0199	E	2: 10' X 6' RCB	320	1423	2CNW72-C	WEST3	1.14	0.82
0218	E	15' X 9' RCB	1127	1423	2CNW72-C	WEST3	1.14	0.82
0257	E	Transition Structure	59	1423	2CNW72-C	WEST3	1.14	0.77
0259	E	15' X 9' RCB	290	653	CNW74-C	WEST3	0.44	0.77
0313	E	10' X 6' RCB	2680	653	CNW74-C	WEST3	0.44	2.50
0318	E	Transition Structure	60	653	CNW74-C	WEST3	0.44	1.50
0333	E	5' X 5' RCB	670	339	NW62-S	WEST3	0.22	1.50
CNGT		**CENTENNIAL PKWY CHANNEL WEST / GRAND TETON BRANCH**						
0000	E	10' X 5' RCB	2376	600	CNW71-E	WEST3	0.47	2.58
0043	P0	6' X 6' RCB	3980	600	CNW71-E	WEST3	0.47	3.00
0118	E	6' X 5' RCAP	5472	363	KYLEDET*	KYLEDB	57.73	3.72
CNKC		**CENTENNIAL PKWY CHANNEL WEST / KYLE CANYON BRANCH**						
0000	E	12' X 4' RCB	377	999	CNW72-C	WEST3	0.71	4.58
0007	E	10' X 5' RCB	874	999	CNW72-C	WEST3	0.71	3.28
0024	E	8' X 5' RCB	1385	999	CNW72-C	WEST3	0.71	2.40
0050	P0	84" RCP	2610	854	CNW72-C	WEST3	0.71	3.60
LVMO		**LAS VEGAS WASH - MOCCASIN**						
0000	P1	Conc Chnl 30'W 13'D 0.1 SS	7530	12520	CNW130-W	LOWER5	77.85	2.10
0144	P1	Conc Chnl 27'W 13'D 0.1 SS	1915	12502	2C64-E	LOWER5	77.49	3.10
0184	P1	Conc Chnl 27'W 12.5'D 0.1 SS	2440	12478	2CNW64-C	LOWER5	76.76	3.10
0226	P1	Conc Chnl 27'W 12.5'D 0.1 SS	2500	12478	2CNW64-C	LOWER5	76.76	3.10
0276	P1	Bridge 30'W 10'D	400	11877	CNW51-C	LOWER5	71.44	3.10
0280	P1	Conc Chnl 16'W 8'D 0.1 SS	3500	3095	CNW23-C	LOWER3	5.71	2.86
MOFA		**MOCCASIN - FORT APACHE**						
0000	P0	10' X 6' RCB	913	403	CNW64-E	LOWER3	0.73	0.50
0024	P0	9' X 6' RCB	537	403	CNW64-E	LOWER3	0.73	0.50
0053	P0	8' X 6' RCB	721	403	CNW64-E	LOWER3	0.73	0.50

ID / River Mile	Status	Facility Description	Length (ft.)	Flow (cfs)	HEC-1 Node	HEC-1 Model	Tributary Area (sq.mi.)	Channel Slope (%) **
MOHU		**MOCCASIN - HUALAPAI BRANCH**						
0000	P0	14' X 8' RCB	1920	761	2CNW45-N	LOWER3	2.10	0.50
0036	P0	10' X 8' RCB	2590	368	CNW45-N	LOWER3	1.15	0.50
0085	P0	72" RCP	790	368	CNW45-N	LOWER3	1.15	3.00
0100	P0	Natural Wash	850	65	DMODB1	LOWER3	0.81	3.00
0116	P0	60" RCPC	12	65	DMODB1	LOWER3	0.81	3.00
0118	P0	Natural Wash	3485	65	DMODB1	LOWER3	0.81	3.00
0184	P0	30" RCP Outlet	50	65	DMODB1	LOWER3	0.81	3.00
0185	P0	3,145 cfs PMF Spillway		3145	COFF20	LOWER3	0.81	
0186	P0	55 ac-ft Moccasin Outfall Detention Basin #1		721	COFF20	LOWER3	0.81	
MOIR		**MOCCASIN - IRON MOUNTAIN BRANCH**						
0000	P0	66" RCP	2770	446	2CNW33-C	LOWER3	1.76	3.60
0052	P0	42" RCP	2530	51	MODB3	LOWER3	0.39	3.60
0096	P0	30" RCP Outlet	50	51	MODB3	LOWER3	0.39	3.00
0097	P0	3,310 cfs PMF Spillway		3310	MODB3	LOWER3	0.39	
0098	P0	60 ac-ft Moccasin Outfall Detention Basin #3		396	OFF16	LOWER3	0.39	
MOKC		**MOCCASIN AND KYLE CANYON**						
0000	P1	11' X 8' RCB	5450	2662	CNW35-C	LOWER3	2.69	3.40
0222	P1	9' X 8' RCB	3930	2192	CNW-7	LOWER3	2.19	3.46
0325	P1	9' X 8' RCB	5730	2192	CNW-7	LOWER3	2.19	3.65
0380	P1	90" RCP	3030	1146	COFF5-1	LOWER3	1.02	3.73
MOSM		**MOCCASIN AND SHEEP MOUNTAIN PARKWAY**						
0000	P0	14' X 9' RCB	3370	3778	CNW64-C	LOWER3	5.32	2.40
0064	P0	14' X 8' RCB	880	3505	CNW50-C	LOWER3	4.99	3.00
0080	P0	14' X 8' RCB	710	3325	2CNW35-C	LOWER3	4.80	3.00
MOSR		**MOCCASIN - SHAUMBER BRANCH**						
0000	P0	54" RCP	1860	94	MODB2	LOWER3	1.44	2.40
0035	P0	Natural Wash	1215	46	MODB2	LOWER3	1.05	3.00
0058	P0	27" RCP Outlet	50	46	MODB2	LOWER3	1.05	3.00
0059	P0	3,145 cfs PMF Spillway		3145	COFF18	LOWER3	1.05	
0060	P0	40 ac-ft Moccasin Outfall Detention Basin #2		275	COFF18	LOWER3	1.05	
0061	P0	30" RCP Outlet from MOHU0186 to MOSR0060	100	76	DMODB2	LOWER3	0.81	3.00



REGIONAL FLOOD CONTROL DISTRICT

2013
LAS VEGAS VALLEY
FLOOD CONTROL
MASTER PLAN UPDATE

FIGURE F- 7
FIGURE F- 8
FIGURE F- 12
FIGURE F- 13
FLOOD CONTROL FACILITIES

LEGEND

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

Remove & Replace/Parallel Facilities

Category A	Category B
Channel	Channel
Stormdrain	Stormdrain

N

0 2000 4000
SCALE – 1"=2000' FEET

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

NO.	DESCRIPTION	DATE	BY	APP.	APP. DATE

NINETY-FIVE MANAGEMENT, LLC.

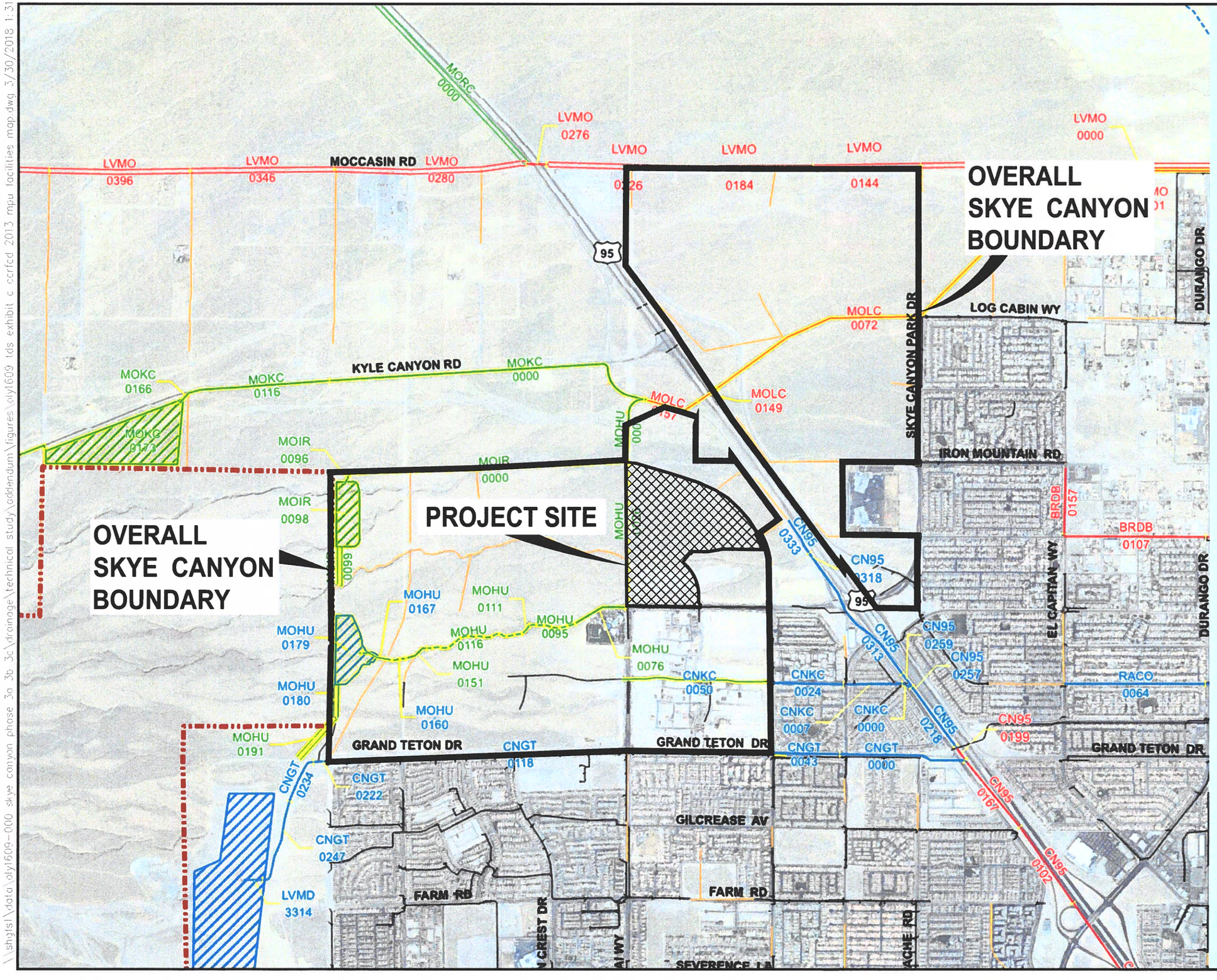
SKYE CANYON PHASE 3A INFRASTUCTURE
CCRFCD MPU FACILITIES MAP

DATE:	OCT 2017
DRAFTER:	ETM
DESIGNER:	ETM
CHECKED:	LKL
PROJECT NO.	OLY1609.000

EXHIBIT C1
SHEET 1 OF 1

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REGIONAL FLOOD CONTROL DISTRICT

2017
SKYE CANYON AMENDMENT TO
LAS VEGAS VALLEY
FLOOD CONTROL
MASTER PLAN UPDATE

FIGURE F-
FLOOD CONTROL FACILITIES

LEGEND

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

Remove & Replace/Parallel Facilities

Category A	Category B
Channel	Channel
Stormdrain	Stormdrain

N

0 1,000 2,000 4,000 6,000
Feet

Scale: 1 inch = 2,000 feet

US95 I-15 I-215

		1	2	3								
		4	5	6								
			7	8	9	10						
11	12	13	14	15	16	17						
		18	19	20	21	22	23					
		24	25	26	27	28						
		29	30	31	32	33	34					
		35	36	37	38	39	40					
		41	42	43	44	45	46					
		47	48	49	50	51	52					
		53	54	55	56							
		57	58	59								

SLATER HANIFAN GROUP

NO.	DESCRIPTION	DATE	BY	APP. DATE	APP.

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 PHASE 3A INFRASTRUCTURE
CCRFCD MPU AMENDMENT FACILITIES MAP

DATE:	APRIL 2018
DRAFTER:	ETM
DESIGNER:	ETM
CHECKED:	LKL
PROJECT NO.	OLY1609.000

EXHIBIT C2
SHEET 2 OF 3

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ID / River Mile	Status	Facility Description	Length (ft.)	Flow (cfs)	HEC-1 Node	HEC-1 Model	Tributary Area (sq.mi.)	Channel Slope (%) **
BCHU		BELTWAY CHANNEL - HUALAPAI						
0009	E	12' X 5' RCAP	855	591	CBA3-C	WEST3	0.84	1.11
0017	E	8' X 5' RCAP	1216	561	CBA3-C	WEST3	0.84	1.33
0040	E	66" RCP	60	222	DNW26-C	WEST3	0.51	1.04
0042	E	60" RCP	615	222	DNW26-C	WEST3	0.51	1.42
0054	E	54" RCP	770	222	DNW26-C	WEST3	0.51	1.23
BRDB		BRENT DRAINAGE SYSTEM						
0000	E	36" RCP with 18" Orifice Plate	2170	37	BRDB	WEST3	2.48	0.40
0031	E	45,080 cfs PMF Spillway		45080	CBRDB	WEST3	2.48	
0032	E	450 ac-ft South Environmental Enhancement Area		1907	CBRDB	WEST3	2.48	
0033	E	Energy Dissipator	100	922	CNW113-C	WEST3	1.47	
0043	P1	8' x 7' RCB	2920	922	CNW113-C	WEST3	1.47	2.10
0107	P1	8' X 7' RCB	2660	922	CNW113-C	WEST3	1.47	2.40
0157	P1	12' X 7' RCB	1260	609	CNW86-C	WEST3	0.84	0.25
CN95		CENTENNIAL PKWY CHANNEL WEST / U.S 95 BRANCH						
0000	P1	Conc Chnl 22'W 10'D 0.1 SS	2690	3340	CNW883-C	WEST3	3.36	2.17
0068	P1	3: 8' X 7' RCB	3380	3216	CNW103-C	WEST3	3.05	2.12
0102	P1	3: 8' X 6' RCB	3710	3663	2CNW69-C	WEST3	2.63	2.09
0167	P1	2: 10' X 6' RCB	1580	1887	2CNW71-E	WEST3	1.61	1.50
0199	E	2: 10' X 6' RCB	320	1313	2CNW72-C	WEST3	1.13	0.82
0218	E	15' X 9' RCB	1127	1313	2CNW72-C	WEST3	1.13	0.82
0257	E	Transition Structure	59	1313	2CNW72-C	WEST3	1.13	0.77
0259	E	15' X 9' RCB	293	524	CNW74-C	WEST3	0.40	0.77
0313	E	10' X 6' RCB	2680	524	CNW74-C	WEST3	0.40	2.50
0318	E	Transition Structure	60	524	CNW74-C	WEST3	0.40	1.50
0333	E	5' X 5' RCB	670	265	NW62-S	WEST3	0.16	1.60
CNGT		CENTENNIAL PKWY CHANNEL WEST / GRAND TETON BRANCH						
0000	E	16' X 5' RCB	2376	600	CNW71-E	WEST3	0.47	2.58
0043	PD	6' X 6' RCB	3680	590	CNW71-E	WEST3	0.47	3.00
0118	E	6' X 5' RCAP	5472	363	KYLEDET	KYLEDB	57.73	3.72
CNKC		CENTENNIAL PKWY CHANNEL WEST / KYLE CANYON BRANCH						
0000	E	12' X 4' RCB	377	999	CNW72-C	WEST3	0.71	4.58
0007	E	16' X 5' RCB	874	999	CNW72-C	WEST3	0.71	3.28
0024	E	8' X 5' RCB	1385	999	CNW72-C	WEST3	0.71	2.40
0050	E	72" RCP	356	2795	NW45-S	WEST3	0.31	3.60
CNWE		CENTENNIAL PKWY CHANNEL WEST						
0150	E	Conc Chnl 40'W 9.5'D 0.1 SS	2279	4233	CNW3B3-C	WEST3	5.64	0.42
0173	E	3: 18' X 8' RCBC @ Torrey Pines	200	4233	CNW3B3-C	WEST3	5.64	0.42
0176	E	Conc Chnl 40'W 9'D 0.1 SS	150	4233	CNW3B3-C	WEST3	5.64	0.41
0189	E	Conc Chnl 36'W 10'D 0.1 SS	1200	4067	CNW2D4-C	WEST3	5.15	0.62
0200	E	Conc Chnl 36'W 9'D 0.1 SS	2470	4067	CNW2D4-C	WEST3	5.15	1.00
0226	E	2: 18' X 8.5' RCBC @ Rio Vista	100	4067	CNW2D4-C	WEST3	5.15	0.51
0241	E	Conc Chnl 36'W 9.5'D 0.1 SS	405	3951	CNW2D3-C	WEST3	4.65	0.51
0251	E	Conc Chnl 36'W 9'D 0.1 SS	575	3951	CNW2D3-C	WEST3	4.65	0.51
0271	E	Conc Chnl 32'W 10'D 0.1 SS	229	3951	CNW2D3-C	WEST3	4.65	0.51
0274	E	32' X 10' RCBC @ Tenaya	142	3951	CNW2D3-C	WEST3	4.65	0.51
0277	E	Conc Chnl 32'W 9'D 0.1 SS	579	3951	CNW2D3-C	WEST3	4.65	0.64
0287	E	Conc Chnl 13'W 10'D 2:1 SS	605	3593	CNW2B2-C	WEST3	3.84	1.19
0301	P2	Conc Chnl 32'W 10'D 0.1 SS	235	3593	CNW2B2-C	WEST3	3.84	1.19
0304	P2	32' X 10' RCB	3259	3593	CNW2B2-C	WEST3	3.84	1.79
0314	E	22' X 7' RCB	765	3593	CNW2B2-C	WEST3	3.84	1.79
0325	P1	32' X 10' RCB	2980	3593	CNW2B2-C	WEST3	3.84	1.75
EKBU		ELKHORN SPRINGS AND BUFFALO						
0000	E	60" RCP	1046	375	NW134-C	WEST3	0.46	1.00
EKDB		ELKHORN SPRINGS DETENTION BASIN						
0000	E	Grass Chnl 15'W 5.8'D 3.5:1 SS	2575	238	CNW156-C	WEST3	1.41	0.39
0025	E	4' X 3' RCB	150	120	ELKBASIN	WEST3	0.84	0.50
0026	E	48" RCP	1270	120	ELKBASIN	WEST3	0.84	1.23
0049	E	60" RCP	1095	120	ELKBASIN	WEST3	0.84	0.13
0070	E	48 ac-ft Elkhorn Springs Detention Basin		609	CNW133-C	WEST3	0.84	

ID / River Mile	Status	Facility Description	Length (ft.)	Flow (cfs)	HEC-1 Node	HEC-1 Model	Tributary Area (sq.mi.)	Channel Slope (%) **
EKHU		ELKHORN AND HUALAPAI						
0000	E	6' X 5' RCB Overflow Structure	48	638	CNW26-C	WEST3	0.51	0.91
0001	E	6' X 5' RCAP	72	638	CNW26-C	WEST3	0.51	0.91
0003	E	6' X 4' RCAP	950	638	CNW26-C	WEST3	0.51	3.61
0020	E	6' X 5' RCAP	150	638	CNW26-C	WEST3	0.51	3.61
0023	E	8' X 5' RCAP	1200	638	CNW26-C	WEST3	0.51	0.99
GOEC		GOWAN NORTH - EL CAPITAN BRANCH						
0176	IP1	78" RCP	1320	383	CCPFR-C	ALLGOW3	0.46	1.15
GONO		GOWAN NORTH SYSTEM						
0511	IP1	7' X 6' RCB	1320	546	CCPHW-C	ALLGOW3	0.60	1.14
LVMD		LAS VEGAS WASH - MIDDLE						
2490	E	2: 13' X 7' RCB	2555	2276	CNW188-C	CWEST3	4.69	0.40
2507	E	2: 13' X 9' RCB	2831	2276	CNW188-C	CWEST3	4.69	0.36
2525	E	24' X 8' RCB	1145	1913	CNW158-C	CWEST3	3.91	0.40
2550	E	24' X 8' RCB	1445	1664	CD161-C	CWEST3	3.41	0.40
2574	E	24' X 8' RCB	1430	1664	CD161-C	CWEST3	3.41	0.40
2599	E	Conc Chnl 24'W 7'D 2:1 SS	1577	1565	CNW162-C	CWEST3	3.08	0.50
2632	E	18' X 5' RCB	1560	968	CNW138-C	WEST3	1.16	0.46
2661	E	18' X 5' RCB	2640	968	CNW138-C	WEST3	1.16	0.46
2711	E	18' X 5' RCB	1320	968	CNW138-C	WEST3	1.16	1.54
2737	E	18' X 5' RCB	1320	816	CNW139-C	WEST3	0.93	2.22
2763	E	6' X 5' RCB	1320	816	CNW139-C	WEST3	0.93	1.79
2789	E	6' X 5' RCB	1470	816	CNW139-C	WEST3	0.93	2.17
MOHU		MOCCASIN - HUALAPAI BRANCH						
0000	P0	10' X 8' RCB	1380	876	2CNW33-C	LOWER3	2.08	0.50
0026	P0	9' X 6' RCB	2645	544	CNW45-N	LOWER3	1.25	0.50
0076	P0	60" RCP	1000	281	CNW45-E	LOWER3	1.03	3.00
0095	P0	Natural Wash	895	281	CNW45-C	LOWER3	1.03	3.00
0111	P0	78" RCPC	225	281	CNW45-C	LOWER3	1.03	3.00
0116	P0	Natural Wash	1855	281	CNW45-C	LOWER3	1.03	3.00
MOIR		MOCCASIN - IRON MOUNTAIN BRANCH						
0000	P0	60" RCP	5300	373	CNW33-C	LOWER3	0.63	3.60
MOKC		MOCCASIN AND KYLE CANYON						
0000	P0	9' X 6' RCB	6140	1326	CNW35-C	LOWER3	2.59	3.40
MOLC		MOCCASIN AND LOG CABIN BRANCH						
0000	P1	14' X 9' RCB	3790	3085	CNW162-C	LOWER3	6.26	1.86
0072	P1	13' X 8' RCB	4050	2895	2CNW64	LOWER3	6.06	2.50
0449	P1	13' X 8' RCB	520	2088	CNW62-N	LOWER3	4.88	2.00
0457	P1	10' X 8' RCB	1060	2088	CNW62-N	LOWER3	4.88	3.00
MSNV		MOUNTAIN SPA/VISTA RANCH						
0000	IE	6: 12' X 5' RCBC @ Grand Teton	273	679	CNW163-C	CWEST3	1.67	0.40
0005	IE	Grass Chnl 100'W 4.5'D 10:1 SS	6325	679	CNW163-C	CWEST3	1.67	0.40
0125	IE	Grass Chnl 100'W 4.5'D 10:1 SS	1300	116	CNW147E	WEST3	1.54	0.40
RACO		RACEL STREET COLLECTOR						
0000	IE	96" RCP Baffled Energy Dissipator	54	428	CNW111S	WEST3	0.55	4.20
0001	IE	78" RCP	3245	428	CNW111S	WEST3	0.55	2.45
0064	IE	78" RCP	2650	349	DNW111S	WEST3	0.44	2.09
RCBC		RANCHO ROAD SYSTEM - BELTWAY CHANNEL						
0000	IE	8' X 5' RCB	1062	222	FADB	WEST3	1.60	1.04
0002	IE	54" RCP Outlet with 41" Orifice	503	222	FADB	WEST3	1.60	2.38
0003	IE	2,341 cfs PMF Spillway		2341	FADBIN	WEST3	1.60	
0004	IE	76 ac-ft Fort Apache Detention Basin		1255	FADBIN	WEST3	1.60	
0007	IE	Energy Dissipator	100	1255	FADBIN	WEST3	1.60	
0009	IE	12' X 8' RCBC @ Fort Apache Detention Basin	133	1255	FADBIN	WEST3	1.60	1.79
0012	IE	Conc Chnl 12'W 6'-7"D 0.1 SS	1937	1255	FADBIN	WEST3	1.60	3.15
0048	IE	12' X 6' RCBC @ Grand Canyon	149	1040	CDM1A1	WEST3	1.32	3.15
0051	IE	Conc Chnl 12'W 6'-8"D 0.1 SS	2650	1040	CDM1A1	WEST3	1.32	3.44
0096	IE	1: 10' X 6' and 1: 6' X 6' RCBC @ Hualapai Way	190	1040	CDM1A1	WEST3	1.32	1.93
0100	E	Conc Chnl 12'W 5.5'D 0.1 SS	2065	596	CDM1A1	WEST3	0.48	2.68
0140	IE	Conc Chnl 10'W 5'D 0.1 SS	2155	508	CDM1A1	WEST3	0.48	1.65

ID / River Mile	Status	Facility Description	Length (ft.)	Flow (cfs)	HEC-1 Node	HEC-1 Model	Tributary Area (sq.mi.)	Channel Slope (%) **
RCHB		RANCHO ROAD SYSTEM - BELTWAY						
0034	E	Conc Chnl 21'W 8'D 0.1 SS	1000	2631	CNW1C-W	WEST3	4.68	1.19
0053	E	2: 12' X 8' RCBC @ South Ramp Connector	85	2304	CDW1C1	WEST3	4.31	1.40
0054	E	Conc Chnl 21'W 8'D 0.1 SS	437	2304	CDW1C1	WEST3	4.31	1.51
0062	E	Transition Structure	130	2304	CDW1C1	WEST3	4.31	1.51
0065	E	24' X 7' RCB	480	2304	CDW1C1	WEST3	4.31	0.30
0074	E	24' X 6' RCB	50	2226	CNWBC6-C	WEST3	4.17	0.30
0075	E	20' X 6' RCBC @ Beltway	428	2226	CNWBC6-C	WEST3	4.17	2.81
0083	P1	20' X 6' RCB	950	2226	CNWBC6-C	WEST3	4.17	2.49
0101	P1	Conc Chnl 20'W 7'D 0.1 SS	580	2226	CNWBC6-C	WEST3	4.17	2.36
0120	E	20' X 6' RCBC @ Grand Montecito	920	2226	CNWBC6-C	WEST3	4.17	1.00
0122	P1	Conc Chnl 16'-20'W 6'D 0.1 SS	350	2226	CNWBC6-C	WEST3	4.17	1.84
0130	P1	Conc Chnl 16'W 6'D 0.1 SS	1012	2226	CNWBC6-C	WEST3	4.17	2.67
0145	P1	Conc Chnl 16'W 6'-7"D 0.1 SS	87	1888	CNWBC3	WEST3	3.75	2.27
0151	P1	Conc Chnl 15'W 7'D 0.1 SS	1255	1888	CNWBC3	WEST3	3.75	2.65
0171	E	16' X 6' RCBC @ El Capitan Way	234	1888	CNWBC3	WEST3	3.75	1.75
0175	E	Conc Chnl 14'W 7'D 0.1 SS	1220	1888	CNWBC3	WEST3	3.75	2.93
0198	E	Conc Chnl 14'W 7'D 0.1 SS	225	1402	CNWBA6-C	WEST3	3.61	2.93
0227	E	12' X 6' RCB	1865	1402	CNWBA6-C	WEST3	3.61	1.02
0250	E	12' X 6' RCB	3260	1402	CNWBA6-C	WEST3	3.61	1.00
0275	P1	7' X 6' RCB	2650	973	CNW68-C	WEST3	1.75	3.30
0295	P1	7' X 6' RCB	2875	973	CNW68-C	WEST3	1.75	3.30
TSDB		TULE SPRINGS DRAINAGE SYSTEM						
0000	E	2: 10' X 4' RCBC @ Echo Grande	100	26	TULEDB	WEST3	1.35	1.04
0002	E	36" RCP with 22" Orifice Plate	320	26	TULEDB	WEST3	1.35	0.33
0010	E	15,010 cfs PMF Spillway		14013	GTULEDB	WEST3	1.35	
0011	E	117 ac-ft North Environmental Enhancement Area		804	CTULEDB	WEST3	1.35	
0012	E	Energy Dissipator	260	376	CNW148-C	WEST3	0.52	
0023	P1	84" RCP	1320	376	CNW148-C	WEST3	0.52	0.60
0069	P1	78" RCP	2640	376	CNW148-C	WEST3	0.52	1.03

* The HEC-1 node shown identifies the controlling concentration point for the associated facility and is located upstream of this facility due to decreasing peak flow with increasing tributary area caused by storm distribution transitions, depth area reduction factors, or attenuation of flow from routing.

** As-built or design slopes were used when available. All other slopes are based on existing topography. The user should verify the facility slope listed prior to performing any facility specific analysis.

* For parallel facilities, the existing facility flow equals its normal depth capacity, and the proposed parallel facility flow equals the remaining flow (i.e., HEC-1 Node flow = existing facility normal depth capacity + proposed parallel facility flow)

REGIONAL FLOOD CONTROL DISTRICT

SLATER GROUP

2013 LAS VEGAS VALLEY FLOOD CONTROL MASTER PLAN UPDATE

FACILITY INVENTORY FIGURE F - 13

LEGEND

ID (Facility Identifier) AABB
Parent Stream Name
Stream Name
River Mile 0000
Distance Above Confluence with Parent Stream (Miles)
Miles in Hundredths

Existing Facility ..... E
Proposed or Modified Facility ..... P
Contingency Level
Category B P0
Master Plan P1
Preliminary Design P2
Design P3

Bottom Width ..... W
Depth ..... D
Side Slope, H:V ..... SS

Construction Features

Cast in Place Concrete Pipe ..... CIPCP
Corrugated Metal Arch Pipe Culvert ..... CMAP
Corrugated Metal Pipe Culvert ..... CMPC
High Density Polyethylene ..... HDPE
Horizontal Elliptical Reinforced Concrete Pipe ..... HERCP
Reinforced Concrete Arch Pipe ..... RCAP
Reinforced Concrete Arch Culvert ..... RCAC
Reinforced Concrete Box ..... RCB
Reinforced Concrete Box Culvert ..... RCBC
Reinforced Concrete Pipe ..... RCP
Reinforced Concrete Pipe Culvert ..... RCPC
Storm Sewer Pipe ..... SSP

NO.	DESCRIPTION	DATE	BY	APP. DATE	APP.

SLATER HANIFAN GROUP
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NINETY-FIVE MANAGEMENT, LLC.

SKYE CANYON PHASE 3A INFRASTRUCTURE
CCRFCD MPU AMENDMENT FACILITIES SUMMARY

DATE: APRIL 2018
DRAFTER: ETM
DESIGNER: ETM
CHECKED: LKL
PROJECT NO. OLY1609.000

EXHIBIT C3
SHEET 3 OF 3

LEGEND

- BASIN BOUNDARY
- PRORATE BOUNDARY
- ID — BASIN ID
- ID — PRORATE BASIN ID
- ID — CONCENTRATION POINT ID
- FLOW DIRECTION
- ID — FLOWMASTER SECTION

N

0 150 300
SCALE – 1"=150' FEET

Proposed Condition Flow Rate Summary

Basin/Concentration Point ID	Area (ac)	Q_{100} (cfs)	Q_{10} (cfs)
Basins			
2.02	17.8	53	26
2.03	17.5	52	26
2.04a	1.4	3	1
2.04b	1.3	3	1
2.05a	13.5	40	19
2.05b	7.4	21	10
2.06	19.9	61	30
STR1	2.6	10	5
STR2	1.6	6	3
STR3	2.2	8	4
STR4	1.9	6	3
SVR1	2.7	10	5
SVR2	6.4	20	10
OFF1	141.0	280	108
OFF2	18.6	45	18
OFF3	96.0	185	71
OFF4	39.0	80	31
OFF5	88.8	179	69
OFF11	18.7	38	15
OFF12	8.2	21	8
Referenced Basins			
[3]WSPD0	0.6	2	1
[3]WSPD3	1.4	5	2
[3]WGRC1A	1.4	4	2
[3]WGC3	28.4	89	42
[4]WPF4	5.7	19	9
[4]WSHA4	1.4	6	3

[3]Referenced from the "Smith's" Study.
[4]Referenced from the "Master Drainage Study Update No.4".

Proposed Condition Flow Rate Summary

Concentration Points Basin/Concentration Point ID	Area (mi^2)	Q_{100} (cfs)	Q_{10} (cfs)
CP1 Q = [1]RDB2 + OFF1 + OFF2 + OFF3 - DIV2 + OFF4 - DIV1 + SVR1 + SVR2	1.5	521	240
CP2a Q = 2.05b + STR1 + 2.04a + DIV2	<0.1	95	38
CP3 Q = CP8 + [5]PARK + DIV1	1.1	422	211
CP3a Q = CP3 + 2.06	1.2	458	226
CP4 Q = STR2 + STR3 + 2.03 + 2.04b	<0.1	68	33
CP5 Q = CP4 + 2.02 + STR4	<0.1	127	62
CP6 Q = [1]RDB1 + [4]WC20 + [4]WPF4 + [4]WSHA4	0.9	156	100
CP7 Q = CP6 + [4]WL4A + [4]ONTD	1.0	208	122
CP8 Q = CP7 + OFF5	1.1	366	189
DBN Q = OUTFLOW	<0.1	87	34
WC9a Q = CP5a + DBN + [3]WSPD3 + [3]WGC3 + [3]WSPD0	1.2	588	285
CP10 Q = CP1 + 2.05A + OFF11	1.5	588	271
CP11 Q = CP12 + CP5	<0.1	148	70
CP12 Q = WC9a + [4]WC7 + [4]WGRC1A	1.3	697	330
Refrenced Concentration Points			
[1]RDB1	0.9	71	57
[2]RDB2	1.0	85	64
[4]WC20	0.1	86	40
[5]PARK	<0.1	36	13
[3]WC7	0.1	121	51

[1]Referenced from the "DB1" Study.
[2]Referenced from the "DB2" Study.
[3]Referenced from the "Smith's" Study.
[4]Referenced from the "Master Drainage Study Update No.4".
[5]Referenced from the "Park" Study.
[6]Referenced from the "Parcel 2.16" Study.

Prorated Flow Summary

Basin ID	Q_{100} (cfs)	Area (acres)	100-yr Unit Flow (cfs/acre)
2.02	53	17.84	3.0
Subbasin ID	**Q_{100} (cfs)**	**Area (acres)**	**100-yr Unit Flow (cfs/acre)**
2.02a	43	14.39	3.0
2.02b	10	3.45	3.0
TOTAL	***53***	***17.84***	

Proposed Condition 100-Year Street Flow Summary

Section ID	Q_{100} (cfs)	Slope (%)	Depth (ft)	Velocity (fps)	DxV
1 (Q = 1/2 (SVR1))	5	0.58	0.35	1.96	0.7
2 (Q = 1/2 (SVR1) + Facility P18 Bypass)	7	0.58	0.38	2.14	0.8
3 (Q = 1/2 (SVR2) + Facility P20 Bypass)	13	0.58	0.46	2.38	1.1
4 (Q = 1/2 (SVR2) + Facility P23 Bypass)	17	0.58	0.51	2.43	1.2
5 (Q = STR2)	5	3.24	0.3	4.01	1.2
		1.56	0.33	2.94	1.0
6 (Q = 2.05b + STR1-Half Street Capacity)	9	2.3	0.42	4.44	1.9
*6 (Half Street Capacity)	22	2.3	0.56	4.78	2.7
*GC1 (Q = STR2 + STR3)	14	2.73	0.46	5.15	2.4
*GC2 (Q = STR2 + STR3 + 1/3 (STR4))	16	1.48	0.53	4.03	2.1
*GC3 (Q = Facility P5 Bypass + 2/3 (STR4))	15	1.48	0.52	4.0	2.1

Proposed Condition 10-Year Street Flow Summary

Section ID	Q_{10} (cfs)	Slope (%)	Depth (ft)	Velocity (fps)	DxV	Dry Lane (ft)
10YR (Q = SVR1 +SVR2)	15	0.58	0.48	2.4	1.2	21.5

Conservative Flow Utilized to represent the Entire Skye Village Road Alignment.

SEE EXHIBIT F FOR EXTENTS OF OFFSITE BASINS

CP1 · 4 · 10YR · GRAND CANYON DRIVE · STR3 · OFF11 · CP10 · OFF1 · 5 · GC1 · CP4 · 2.05a · STR2 · GC2 · STR4 · SVR2 · SKYE PARK DRIVE · 2.03 · OFF12 · CP11 · 3 · a · OFF2 · 2.04b · SKYE VILLAGE ROAD · 158 CFS · 2.02 · CP5 · 2.05b · 2.04a · b · GC3 · GRAND CANYON DRIVE · STR1 · CP2a · DIV2 · STREET E · 70 CFS · OFF3 · 6 · DBN · *WSPD0 · 2 · CP12 · WC9a · SKYE CANYON PHASE 3 (SMITH'S CENTER) SHG OLY1602.000 CLV# DS4796 · *WSPD3 · 1 · *WGRC1A · SVR1 · OFF4 · 2.06 · *WGC3 · 40 CFS · DIV1 · CP3a · CP3 · 40 CFS · OFF5 · CP8 · *PARK · SKYE CANYON PARK DRIVE · SKYE CANYON PHASE 1 INFRASTRUCTURE SHG OLY1401.001 CLV# DS4661 · *WC7 · SKYE CANYON PARK SHG OLY1401.003 CLV# DS4707

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NO.	DESCRIPTION	DATE	BY	APP. DATE	APP.

NINETY-FIVE MANAGEMENT, LLC.

SKYE CANYON PHASE 3A INFRASTRUCTURE

PROPOSED CONDITION DRAINAGE MAP

DATE: APRIL 2018
DRAFTER: ETM
DESIGNER: ETM
CHECKED: LL
PROJECT NO. OLY1609.000

EXHIBIT G
SHEET 1 OF 1

\\shfs1\data\oly1609-000 skye canyon phase 3a, 3b, 3c\drainage\technical study\addendum\figures\oly1609 tds exhibit g proposed condition drainage map.dwg 4/2/2018 9:05 AM Erick Mota

LEGEND

- BASIN BOUNDARY
- PRORATE BOUNDARY
- 000 — PRORATE ID
- ID — BASIN ID
- ID — CONCENTRATION POINT ID
- FLOW DIRECTION
- ID — FACILITY ID
- EXISTING SD FACILITIES
- PROPOSED SD FACILITIES
- TO BE REMOVED IN ULTIMATE CONDITION
- FUTURE SD FACILITIES
- PROPOSED DITCHES
- ID — DITCH LABELS
- CULVERT TO BE REVISED IN ULTIMATE CONDITION

N

0 150 300

SCALE – 1"=150' FEET

Prorated Flow Summary

Basin ID	Q_{100} (cfs)	Area (acres)	100-yr Unit Flow (cfs/acre)
OFF1	280	141.00	2.0
OFF3	185	96.00	1.9
OFF4	80	39.00	2.1
2.05a	40	13.50	3.0
2.03	52	17.50	3.0
2.02	53	17.8	3.0

Subbasin ID	Q_{100} (cfs)	Area (acres)	100-yr Unit Flow (cfs/acre)
OFF1A	27	13.4	2.0
OFF1B	253	127.6	2.0
TOTAL	***280***	***141.0***	
OFF3A	1	0.7	1.9
OFF3B	173	90.0	1.9
OFF3C	10	5.3	1.9
TOTAL	***185***	***96.0***	
OFF4A	5	2.6	2.1
OFF4B	75	36.4	2.1
TOTAL	***80***	***39.0***	
2.05a-A	2	0.7	3.0
2.05a-B	5	1.7	3.0
2.05a-C	33	11.1	3.0
TOTAL	***40***	***13.5***	
2.03A	9	2.9	3.0
2.03B	31	10.5	3.0
2.03C	12	4.1	3.0
TOTAL	***52***	***17.5***	
2.02A	9	2.9	3.0
2.02B	3	1.1	3.0
2.02C	31	10.4	3.0
2.02D	10	3.4	3.0
TOTAL	***53***	***17.8***	

Recommended Flood Control Facility Summary

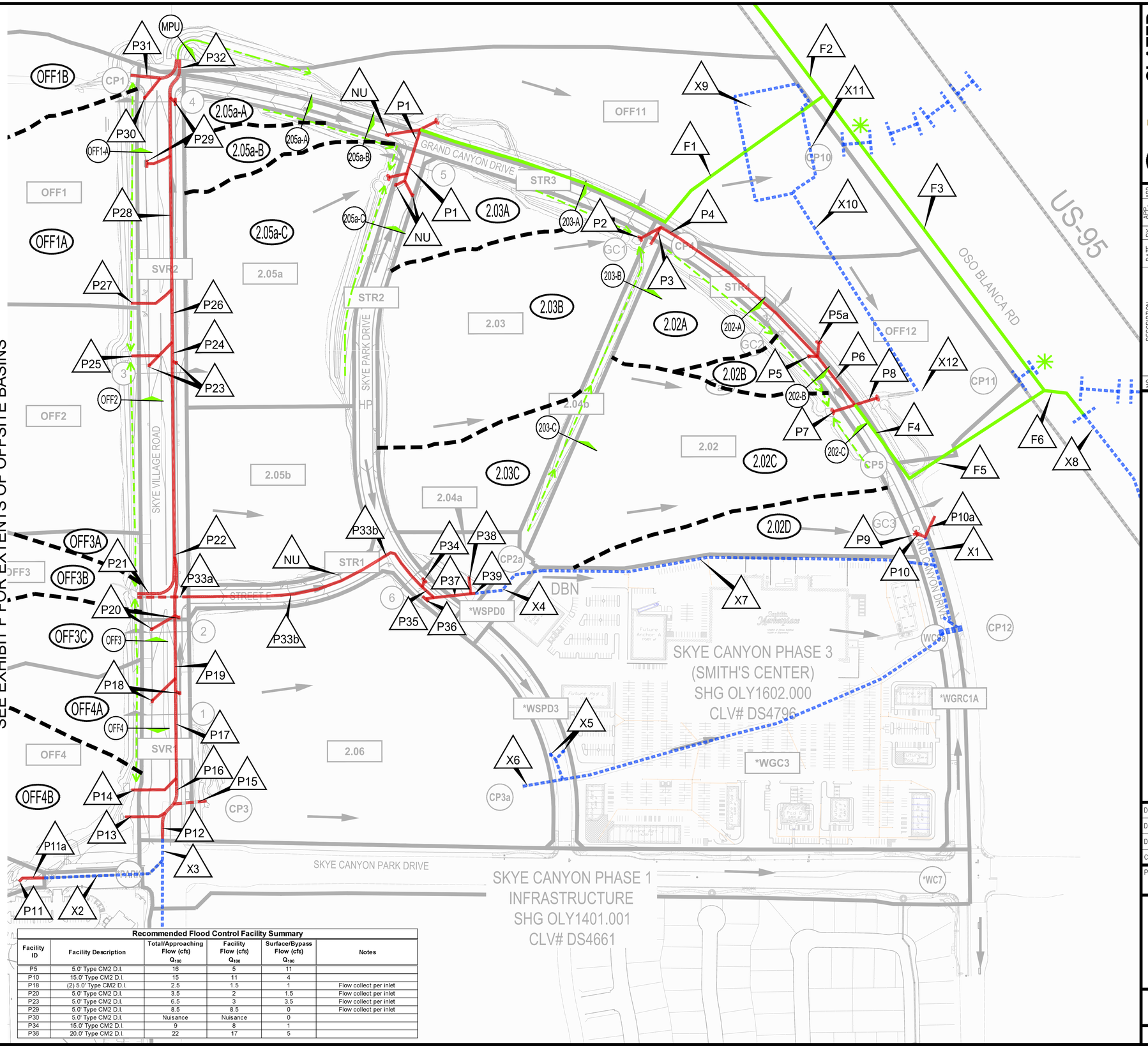
Facility ID	Facility Description	$Q_{PROPOSED}$ (cfs)	$Q_{ULTIMATE}$ (cfs)	Notes
X1	Existing 66" RCP	11	**32**	
X2	Existing 60" RCP	319	**359**	
X3	Existing 8'x5' RCB	335	**412**	Ties into Facility P12
X4	Existing 54" RCP	**98**	28	
X5	(2) Existing 12.0' Type CM2 D.I.	N/A	**52**	26 cfs/ drop inlet with 24" laterals
X6	Existing 60" RCP	**458**	433	
X7	Existing 60" RCP	98	**260**	
X8	Existing 5' x 5' RCB	160	**301**	
X9	DB2 Sediment Basin	**588**	N/A	
X10	DB2 Sediment Basin Discharge Ditch	**85**	N/A	
X11	DB2 Sediment Basin Spillway	**503**	N/A	CP10 - 85CFS
X12	Beginning of Existing Wash	**233**	N/A	CP11 + 85CFS
P1	Proposed 30" RCP	**40**	40	To collect basin 2.05a Flow
P2	Proposed 30" RCP	**55**	52	
P3	Proposed 18" RCP	N/A	**3**	Capped Stub for Future Park Flow
P4	Proposed 30" RCP	**55**	55	
P5	Proposed 5.0' Type CM2 D.I.	**5**	5	w/ 18" Lateral
P5a	Proposed 18" RCP	N/A	**5**	Capped Stub for Future Drop Inlet
P6	Proposed 36" RCP	60	**65**	
P7	Proposed 36" RCP	53	**53**	Assumes all Parcel 2.02 flow is conservatively collected at Facility P7
P8	Proposed 42" RCP	113	**118**	
P9	Proposed 18" RCP	10	**10**	Capped Stub for Future Parcel Flow
P10	Proposed 15.0' Type CM2 D.I.	11	**11**	w/ 24" Lateral
P10a	Proposed 18" RCP	N/A	**11**	Capped Stub for Future Drop Inlet
P11	Proposed 72" RCP	**366**	N/A	Interim Improved Inlet
P11a	Proposed 60" RCP	**366**	359	
P12	Proposed 8'x7' RCA	382	**412**	
P13	Proposed 30" RCP	**40**	29.5	
P14	Proposed 30" RCP	**40**	29.5	
P15	Proposed 72" RCP	**422**	N/A	To be removed in ultimate condition
P16	Proposed 8'x7' RCA	N/A	**445.5**	Alignment is plugged and provided for future use only
P17	Proposed 8'x7' RCA	40	**479**	
P18	(2) Proposed 5.0' Type CM2 D.I.	4	**4**	2 cfs/ drop inlet with 18" laterals
P19	Proposed 8'x7' RCA	44	**483**	
P20	(2) Proposed 5.0' Type CM2 D.I.	4	**4**	2 cfs/ drop inlet with 18" laterals
P21	Proposed 6'x6' RCB	156	**359**	
P22	Proposed 10'x9' RCA	204	**876**	
P23	(2) Proposed 5.0' Type CM2 D.I.	6	**6**	3 cfs/ drop inlet with 18" laterals
P24	Proposed 10'x9' RCA	207	**879**	
P25	Proposed 42" RCP	45	**69**	
P26	Proposed 10'x9' RCA	255	**932**	
P27	Proposed 36" RCP	N/A	**51**	Capped Stub for Future Parcel Flow
P28	Proposed 10'x9' RCA	255	**983**	
P29	(2) Proposed 20.0' Type CM2 D.I.	17	**17**	8.5 cfs/ drop inlet with 18" laterals
P30	Proposed 5.0' Type CM2 D.I.	Nuisance	Nuisance	
P31	Proposed 8'x4' RCB	364	**398**	
P32	Proposed 10'x9' RCA	521	**1325**	
P33a	Proposed 42" RCP	**70**	N/A	To be removed in ultimate condition
P33b	Proposed 36" RCP	**70**	Nuisance	
P34	Proposed 15.0' Type CM2 D.I.	**8**	8	w/ 18" Lateral
P35	Proposed 36" RCP	**78**	8	
P36	Proposed 20.0' Type CM2 D.I.	**17**	17	w/ 24" Lateral
P37	Proposed 36" RCP	**95**	25	
P38	Proposed 18" RCP	**3**	3	
P39	Proposed 54" RCP	**98**	28	
*F1	Future 36" RCP	N/A	**73**	
*F2	Future 18" RCP	N/A	**10**	
*F3	Future 36" RCP	N/A	**75**	
*F4	Future 36" RCP	N/A	**56**	
*F5	Future 42" RCP	N/A	**170**	
*F6	Future 60" RCP	N/A	**301**	Connects to Existing Regional Facility
NU	Facility has been provided for collection and conveyence of nuisance flow only.			

'X' - Depicts an Existing Facility
'P' - Depicts a Proposed Facility
'F' - Depicts a Future Facility
*Flow summarized adopted from the Skye Canyon Master Drainage Study Update.

Interim Ditch Section Summary

Section ID	Section Description	Q_{100} (cfs)	Slope (%)	Depth (ft)	Velocity (fps)
OFF1-A (Q = OFF1A)	Earthen Trapezoidal-Ditch w/ 3:1 Side Slopes and Min 1.5-ft Deep	27.0	1.10	0.82	4.43
OFF2 (Q = OFF2)	Earthen Trapezoidal-Ditch w/ 3:1 Side Slopes and Min 1.5-ft Deep	45.0	0.90	1.13	4.77
OFF3 (Q = OFF3C)	Earthen V-Ditch w/ 3:1 Side Slopes and Min 1.5-ft Deep	10.0	1.70	0.88	4.32
OFF4 (Q = OFF4A)	Earthen V-Ditch w/ 3:1 Side Slopes and Min 1.5-ft Deep	5.0	0.50	0.85	2.30
205a-A (Q = 2.05a-A)	Earthen V-Ditch w/ 3:1 Side Slopes and Min 1-ft Deep	2.0	5.00	0.39	4.33
205a-B (Q = 2.05a-B)	Earthen V-Ditch w/ 3:1 Side Slopes and Min 1-ft Deep	7.0	2.70	0.70	4.71
205a-C (Q = 2.05a-C)	Earthen V-Ditch w/ 3:1 Side Slopes and Min 2-ft Deep	33.0	1.00	1.52	4.77
203-A (Q = 2.03A)	Earthen V-Ditch w/ 3:1 Side Slopes and Min 1-ft Deep	9.0	1.50	0.86	4.02
203-B (Q = 2.03B)	Earthen V-Ditch w/ 3:1 Side Slopes and Min 2-ft Deep	43.0	0.50	1.91	3.93
203-C (Q = 2.03C)	Earthen V-Ditch w/ 3:1 Side Slopes and Min 1.5-ft Deep	12.0	1.50	0.96	4.32
202-A (Q = 2.02A)	Earthen V-Ditch w/ 3:1 Side Slopes and Min 1-ft Deep	9.0	2.50	0.79	4.87
202-B (Q = 2.02B)	Earthen V-Ditch w/ 3:1 Side Slopes and Min 1-ft Deep	12.0	2.00	0.91	4.81
202-C (Q = 2.02C)	Earthen V-Ditch w/ 3:1 Side Slopes and Min 2-ft Deep	31.0	0.50	1.69	3.62
MPU (Riprap) (Q = CP1)	Trapezoidal Ditch; 3:1 SS, 18-ft Base and Min 4-ft Deep w/ 8" Riprap	521.0	0.50	3.50	5.21
MPU (Earthen) (Q = CP1)	Earthen Trapezoidal Ditch; 3:1 SS, 45-ft Base and Min 3-ft Deep	521.0	0.25	2.04	5.00

SEE EXHIBIT F FOR EXTENTS OF OFFSITE BASINS



Recommended Flood Control Facility Summary

Facility ID	Facility Description	Total/Approaching Flow (cfs) Q_{100}	Facility Flow (cfs) Q_{100}	Surface/Bypass Flow (cfs) Q_{100}	Notes
P5	5.0' Type CM2 D.I.	16	5	11	
P10	15.0' Type CM2 D.I.	15	11	4	
P18	(2) 5.0' Type CM2 D.I.	2.5	1.5	1	Flow collect per inlet
P20	5.0' Type CM2 D.I.	3.5	2	1.5	Flow collect per inlet
P23	5.0' Type CM2 D.I.	6.5	3	3.5	Flow collect per inlet
P29	5.0' Type CM2 D.I.	8.5	8.5	0	Flow collect per inlet
P30	5.0' Type CM2 D.I.	Nuisance	Nuisance	0	
P34	15.0' Type CM2 D.I.	9	8	1	
P36	20.0' Type CM2 D.I.	22	17	5	

SLATER HANIFAN GROUP
CONSULTING ENGINEERS & PLANNERS
5740 S. ARVILLE STREET #216, LAS VEGAS, NV 89118
PHONE (702) 234-5300 FAX (702) 234-5399

NO.	DESCRIPTION	DATE	BY	APP. DATE	APP.

NINETY-FIVE MANAGEMENT, LLC.

SKYE CANYON PHASE 3A INFRASTUCTURE
FACILITIES MAP

DATE: APRIL 2018
DRAFTER: ETM
DESIGNER: ETM
CHECKED: LL
PROJECT NO. OLY1609.000

EXHIBIT I
SHEET 1 OF 1

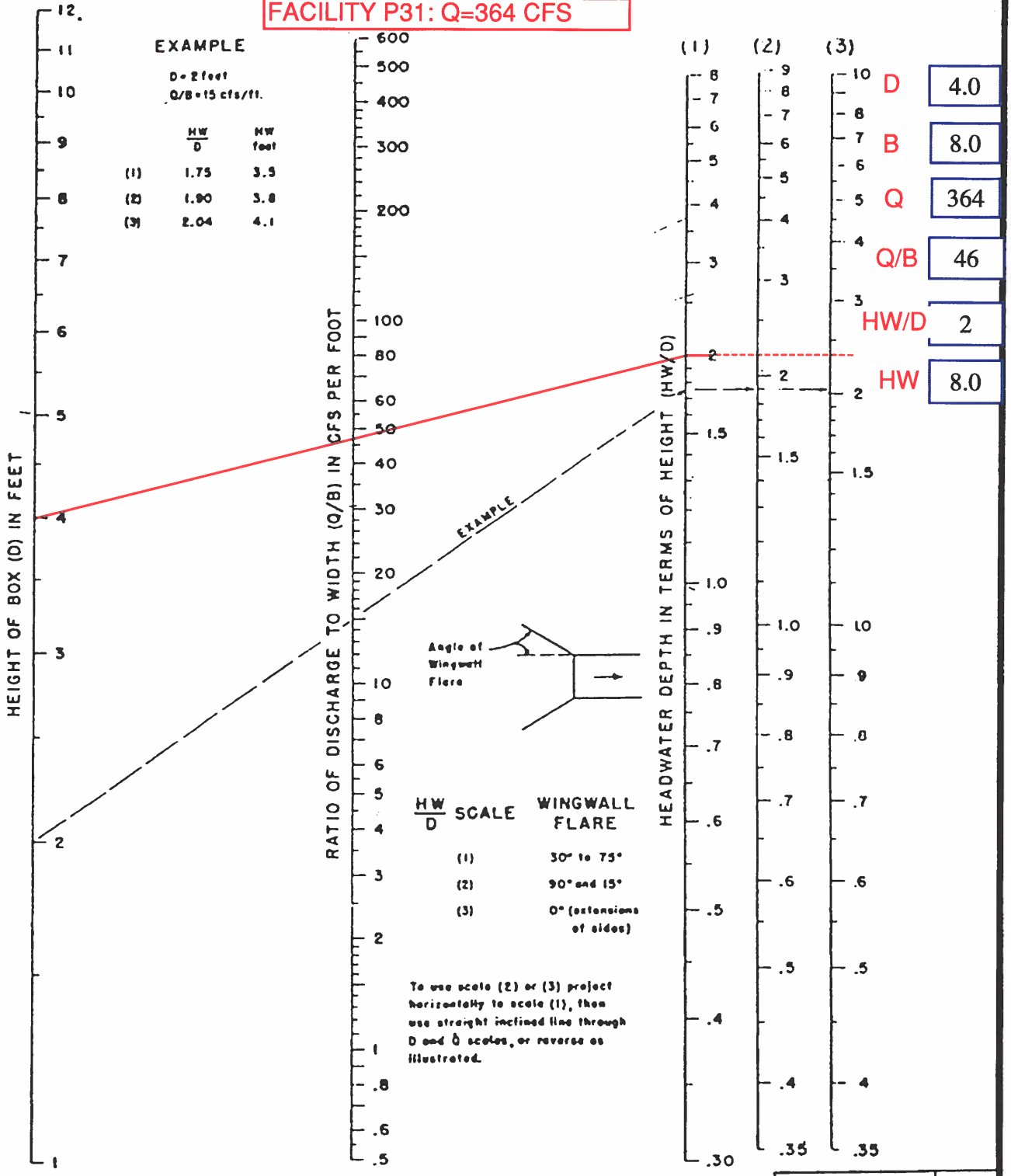
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APPENDIX C

Hydraulic Computations

NOMOGRAPH – INLET CONTROL BOX CULVERT

FACILITY P31: Q=364 CFS



Revision	Date

WRC ENGINEERING

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

FIGURE 1004

APPENDIX D

Storm Drain Models

Skye Village Road

Model "PSVR1"

Proposed Condition WSPG Summary
Skye Village Road - PSVR1 Model

WSPG Station	Plan Station	Storm Drain Dimension	Invert Elevation (ft)	Q_{100} (cfs)	WSE (ft)	Velocity (ft/s)	FG Elevation	HGL Check[1]
3338.34	38+98.51	72" RCP	2830.25	422	2833.89	23.50	N/A	N/A
3442.34	38+89.89	72" RCP	2835.43	422	2840.86	15.69	2853.23	OK
3448.40	38+89.89	72" RCP	2835.45	422	2844.46	7.93	2853.27	OK
3457.10	38+82.92	8'x 7' RCA	2835.47	422	2844.54	7.93	2853.32	OK
3475.10	38+70.17	8'x 7' RCA	2835.56	422	2844.59	7.93	2853.65	OK
3485.53	38+58.	8'x 7' RCA	2835.64	422	2844.68	7.93	2853.74	OK
3485.53	38+58.	8'x 7' RCA	2835.64	382	2844.86	7.18	2853.74	OK
3521.47	38+28.5	8'x 7' RCA	2835.79	382	2845.04	7.18	2853.99	OK
3564.47	37+85.2	8'x 7' RCA	2836.01	382	2845.14	7.18	2854.35	OK
3574.47	37+75.2	Transition	2836.06	382	2844.87	9.55	2854.42	OK
3648.47	37+00.3	5' x 8' RCB	2836.81	382	2845.54	9.55	2855.00	OK
3648.47	37+00.3	5' x 8' RCB	2836.81	366	2840.93	21.14	2855.00	OK
3703.97	N/A	60" RCP	2838.47	366	2842.73	20.55	2856.00	OK
3739.41	N/A	60" RCP	2839.49	366	2845.91	18.64	2856.00	OK
4044.33	N/A	60" RCP	2846.84	366	2854.20	18.64	2860.50	OK
4121.33	N/A	60" RCP	2848.69	366	2857.04	18.64	2861.00	OK
4121.33	N/A	60" RCP	2848.69	366	2857.04	18.64	2861.00	OK

1 - 'HGL Check' reflects the minimum 1-ft below finished grade.

```
T1 SKYE CANYON INFRASTRUCTURE - PHASE 3A
T2 BY OLYMPIA COMPANIES
T3 SKYE VILLAGE ROAD MAINLINE (SOUTH ALIGNMENT)
SO   3338.3402830.250 72      .015                2836.250
R    3442.3402835.430 72      .015                                        -47.00
TS   3448.4002835.450  2      .015
R    3457.1002835.470  2      .015                                   8.308
R    3475.1002835.560  2      .015
R    3485.5302835.640  2      .015                                  -9.960
JX   3485.5302835.640  2 30   .015   40.000         2835.640          27.0
R    3521.4702835.790  2      .015                                 -34.320
R    3564.4702836.010  2      .015
TS   3574.4702836.060  8      .015
R    3648.4702836.810  8      .015                                        45.00 1
JX   3648.4702836.810 60 30   .015   16.000         2836.810          00.0
R    3703.9702838.470 60      .015                                        45.00 1
R    3739.4102839.490 60      .015                                              1
R    4044.3302846.840 60      .015                                              1
R    4121.3302848.690 60      .015                                        -46.00
SH   4121.3302848.690 60      .015
CD   6  3   0    .000   6.000    6.000  .000  .000   .00
CD   8  3   0    .000   5.000    8.000  .000  .000   .00
CD  18  4   1    .000   1.500     .000  .000  .000   .00
CD  24  4   1    .000   2.000     .000  .000  .000   .00
CD  30  4   1    .000   2.500     .000  .000  .000   .00
CD  36  4   1    .000   3.000     .000  .000  .000   .00
CD  42  4   1    .000   3.500     .000  .000  .000   .00
CD  48  4   1    .000   4.000     .000  .000  .000   .00
CD  54  4   1    .000   4.500     .000  .000  .000   .00
CD  60  4   1    .000   5.000     .000  .000  .000   .00
CD  66  4   1    .000   5.500     .000  .000  .000   .00
CD  72  4   1    .000   6.000     .000  .000  .000   .00
CD   1  6   0      0.0      0.0     0.0     0.0      0.0    0.0
CD   2  6   0      0.0      0.0     0.0     0.0      0.0    0.0
CD   3  6   0      0.0      0.0     0.0     0.0      0.0    0.0
PTS  121   .000   .000 10.000   .000 10.000   .010 10.000  5.500  9.490  6.870
PTS       9.000  7.280  8.500  7.500  8.000  7.630  7.520  7.740  7.000  7.840
PTS       6.000  7.960  5.000  8.000  4.000  7.960  3.000  7.840  2.480  7.740
PTS       2.000  7.630  1.500  7.500  1.000  7.280   .510  6.870   .000  5.500
PTS        .000   .010
PTS  221   .000   .000  8.000   .000  8.000   .010  8.000  5.000  7.900  5.570
PTS       7.700  5.950  7.500  6.190  7.250  6.390  7.000  6.530  6.000  6.800
PTS       5.000  6.950  4.000  7.000  3.000  6.950  2.000  6.800  1.000  6.530
PTS        .750  6.390   .500  6.190   .300  5.950   .100  5.570   .000  5.000
PTS        .000   .010
PTS  321   .000   .000  8.000   .000  8.000   .010  8.000  3.000  7.900  3.570
PTS       7.700  3.950  7.500  4.190  7.250  4.390  7.000  4.530  6.000  4.800
PTS       5.000  4.950  4.000  5.000  3.000  4.950  2.000  4.800  1.000  4.530
PTS        .750  4.390   .500  4.190   .300  3.950   .100  3.570   .000  3.000
PTS        .000   .010
Q           366.000   .0
```

FILE: PSVR1.WSW W S P G W - EDIT LISTING - Version 14.10 Date: 3-29-2018 Time: 9:51: 8

WATER SURFACE PROFILE - CHANNEL DEFINITION LISTING

CARD CODE	SECT NO	CHN TYPE	NO OF PIER/PIP	AVE PIER WIDTH	HEIGHT 1 DIAMETER	BASE WIDTH	ZL	ZR	INV DROP	Y(1)	Y(2)	Y(3)	Y(4)	Y(5)	Y(6)	Y(7)	Y(8)	Y(9)	Y(10)
CD	6	3	0	.000	6.000	6.000	.000	.000	.00										
CD	8	3	0	.000	5.000	8.000	.000	.000	.00										
CD	18	4	1		1.500														
CD	24	4	1		2.000														
CD	30	4	1		2.500														
CD	36	4	1		3.000														
CD	42	4	1		3.500														
CD	48	4	1		4.000														
CD	54	4	1		4.500														
CD	60	4	1		5.000														
CD	66	4	1		5.500														
CD	72	4	1		6.000														
CD	1	6	0	.000															
CD	2	6	0	.000															
CD	3	6	0	.000															

FILE: W S P G W - EDIT LISTING - Version 14.10 Date: 3-29-2018 Time: 9:51: 8

WATER SURFACE PROFILE - CROSS SECTION POINT LISTING

CARD CODE	SECT NO	NO OF POINTS	X(1) , Y(1) X(8) , Y(8)	X(2) , Y(2) X(9) , Y(9)	X(3) , Y(3) X(10) ,Y(10)	X(4) , Y(4) X(11) ,Y(11)	X(5) , Y(5) X(N) , Y(N)	X(6) , Y(6) X(N+1),Y(N+1)	X(7) , Y(7) X(35) ,Y(35)						
PTS	1	21	.000	.000	10.000	.000	10.000	.010	10.000	5.500	9.490	6.870	9.000	7.280	8.500	7.500
PTS			8.000	7.630	7.520	7.740	7.000	7.840	6.000	7.960	5.000	8.000	4.000	7.960	3.000	7.840
PTS			2.480	7.740	2.000	7.630	1.500	7.500	1.000	7.280	.510	6.870	.000	5.500	.000	.010
PTS	2	21	.000	.000	8.000	.000	8.000	.010	8.000	5.000	7.900	5.570	7.700	5.950	7.500	6.190
PTS			7.250	6.390	7.000	6.530	6.000	6.800	5.000	6.950	4.000	7.000	3.000	6.950	2.000	6.800
PTS			1.000	6.530	.750	6.390	.500	6.190	.300	5.950	.100	5.570	.000	5.000	.000	.010
PTS	3	21	.000	.000	8.000	.000	8.000	.010	8.000	3.000	7.900	3.570	7.700	3.950	7.500	4.190
PTS			7.250	4.390	7.000	4.530	6.000	4.800	5.000	4.950	4.000	5.000	3.000	4.950	2.000	4.800
PTS			1.000	4.530	.750	4.390	.500	4.190	.300	3.950	.100	3.570	.000	3.000	.000	.010

W S P G W

WATER SURFACE PROFILE - TITLE CARD LISTING

HEADING LINE NO 1 IS -

SKYE CANYON INFRASTRUCTURE - PHASE 3A

HEADING LINE NO 2 IS -

BY OLYMPIA COMPANIES

HEADING LINE NO 3 IS -

SKYE VILLAGE ROAD MAINLINE (SOUTH ALIGNMENT)

W S P G W

WATER SURFACE PROFILE - ELEMENT CARD LISTING

ELEMENT NO 1 IS A SYSTEM OUTLET * * *

	U/S DATA	STATION	INVERT	SECT	W S ELEV
		3338.340	2830.250	72	2836.250

ELEMENT NO 2 IS A REACH * * *

	U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
		3442.340	2835.430	72	.015	.000	.000	-47.000	0

ELEMENT NO 3 IS A TRANSITION * * *

	U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE
		3448.400	2835.450	2	.015	.000	.000

ELEMENT NO 4 IS A REACH * * *

	U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
		3457.100	2835.470	2	.015	60.001	8.308	.000	0

ELEMENT NO 5 IS A REACH * * *

	U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
		3475.100	2835.560	2	.015	.000	.000	.000	0

ELEMENT NO 6 IS A REACH * * *

	U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
		3485.530	2835.640	2	.015	59.999	-9.960	.000	0

ELEMENT NO 7 IS A JUNCTION * * * * * * *

	U/S DATA	STATION	INVERT	SECT	LAT-1	LAT-2	N	Q3	Q4	INVERT-3	INVERT-4	PHI 3	PHI 4
		3485.530	2835.640	2	30	0	.015	40.000	.000	2835.640	.000	27.000	.000

RADIUS	ANGLE
.000	.000

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

```
 ELEMENT NO   8 IS A REACH              *          *     *
                    U/S DATA   STATION    INVERT  SECT               N                          RADIUS    ANGLE     ANG PT  MAN H
                               3521.470 2835.790    2               .015                         60.000  -34.320      .000     0
 ELEMENT NO   9 IS A REACH              *          *     *
                    U/S DATA   STATION    INVERT  SECT               N                          RADIUS    ANGLE     ANG PT  MAN H
                               3564.470 2836.010    2               .015                          .000     .000      .000     0
 ELEMENT NO  10 IS A TRANSITION         *          *     *
                    U/S DATA   STATION    INVERT  SECT               N                          RADIUS   ANGLE
                               3574.470 2836.060    8               .015                          .000     .000
 ELEMENT NO  11 IS A REACH              *          *     *
                    U/S DATA   STATION    INVERT  SECT               N                          RADIUS    ANGLE     ANG PT  MAN H
                               3648.470 2836.810    8               .015                          .000     .000    45.000     1
                                                 W S P G W                                                                 PAGE NO   3
                          WATER SURFACE PROFILE - ELEMENT CARD LISTING
 ELEMENT NO  12 IS A JUNCTION           *          *     *     *                *                   *                *
                    U/S DATA   STATION    INVERT  SECT LAT-1 LAT-2   N      Q3        Q4     INVERT-3 INVERT-4  PHI 3  PHI 4
                               3648.470 2836.810   60    30     0   .015    16.000       .000  2836.810      .000    .000     .000
                                                                                                RADIUS    ANGLE
                                                                                                 .000     .000
THE ABOVE ELEMENT CONTAINED AN INVERT ELEV WHICH WAS NOT GREATER THAN THE PREVIOUS INVERT ELEV -WARNING
THE ABOVE ELEMENT CONTAINED AN INVERT ELEV WHICH WAS NOT GREATER THAN THE PREVIOUS INVERT ELEV -WARNING
 ELEMENT NO  13 IS A REACH              *          *     *
                    U/S DATA   STATION    INVERT  SECT               N                          RADIUS    ANGLE     ANG PT  MAN H
                               3703.970 2838.470   60               .015                          .000     .000    45.000     1
 ELEMENT NO  14 IS A REACH              *          *     *
                    U/S DATA   STATION    INVERT  SECT               N                          RADIUS    ANGLE     ANG PT  MAN H
                               3739.410 2839.490   60               .015                          .000     .000      .000     1
 ELEMENT NO  15 IS A REACH              *          *     *
                    U/S DATA   STATION    INVERT  SECT               N                          RADIUS    ANGLE     ANG PT  MAN H
                               4044.330 2846.840   60               .015                          .000     .000      .000     1
 ELEMENT NO  16 IS A REACH              *          *     *
                    U/S DATA   STATION    INVERT  SECT               N                          RADIUS    ANGLE     ANG PT  MAN H
                               4121.330 2848.690   60               .015                          .000     .000   -46.000     0
 ELEMENT NO  17 IS A SYSTEM HEADWORKS                  *                    *
                    U/S DATA   STATION    INVERT  SECT                                    W S ELEV
                               4121.330 2848.690   60                                       .000
```

Program Package Serial Number: 7189

WATER SURFACE PROFILE LISTING Date: 3-29-2018 Time: 9:51:13

SKYE CANYON INFRASTRUCTURE - PHASE 3A

BY OLYMPIA COMPANIES

SKYE VILLAGE ROAD MAINLINE (SOUTH ALIGNMENT)

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
3338.340	2830.250	3.642	2833.892	422.00	23.50	8.58	2842.47	.00	5.43	5.86	6.000	.000	.00	1 .0
14.096	.0498					.0275	.39	3.64	2.37	3.05	.015	.00	.00	PIPE
3352.436	2830.952	3.713	2834.665	422.00	22.97	8.19	2842.86	.00	5.43	5.83	6.000	.000	.00	1 .0
23.940	.0498					.0252	.60	3.71	2.28	3.05	.015	.00	.00	PIPE
3376.376	2832.145	3.868	2836.012	422.00	21.90	7.45	2843.46	.00	5.43	5.74	6.000	.000	.00	1 .0
18.634	.0498					.0223	.42	3.87	2.11	3.05	.015	.00	.00	PIPE
3395.010	2833.073	4.033	2837.105	422.00	20.88	6.77	2843.88	.00	5.43	5.63	6.000	.000	.00	1 .0
14.643	.0498					.0199	.29	4.03	1.94	3.05	.015	.00	.00	PIPE
3409.653	2833.802	4.210	2838.012	422.00	19.91	6.15	2844.17	.00	5.43	5.49	6.000	.000	.00	1 .0
11.475	.0498					.0177	.20	4.21	1.79	3.05	.015	.00	.00	PIPE
3421.128	2834.373	4.402	2838.775	422.00	18.98	5.60	2844.37	.00	5.43	5.30	6.000	.000	.00	1 .0
8.831	.0498					.0159	.14	4.40	1.63	3.05	.015	.00	.00	PIPE
3429.959	2834.813	4.611	2839.424	422.00	18.10	5.09	2844.51	.00	5.43	5.06	6.000	.000	.00	1 .0
6.490	.0498					.0143	.09	4.61	1.49	3.05	.015	.00	.00	PIPE
3436.449	2835.136	4.843	2839.979	422.00	17.26	4.62	2844.60	.00	5.43	4.73	6.000	.000	.00	1 .0
4.233	.0498					.0130	.06	4.84	1.34	3.05	.015	.00	.00	PIPE
3440.683	2835.347	5.108	2840.455	422.00	16.45	4.20	2844.66	.00	5.43	4.27	6.000	.000	.00	1 .0
1.657	.0498					.0120	.02	5.11	1.18	3.05	.015	.00	.00	PIPE

Program Package Serial Number: 7189

WATER SURFACE PROFILE LISTING Date: 3-29-2018 Time: 9:51:13

SKYE CANYON INFRASTRUCTURE - PHASE 3A

BY OLYMPIA COMPANIES

SKYE VILLAGE ROAD MAINLINE (SOUTH ALIGNMENT)

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
3442.340	2835.430	5.428	2840.858	422.00	15.69	3.82	2844.68	.00	5.43	3.52	6.000	.000	.00	1 .0
TRANS STR	.0033					.0027	.02	5.43	1.00		.015	.00	.00	PIPE

3448.400	2835.450	9.006	2844.456	422.00	7.93	.98	2845.43	.00	4.42	.00				2		0	.0	
8.700	.0023					.0027	.02	.00	.00	6.300	.015							IR-COV
3457.100	2835.470	9.069	2844.539	422.00	7.93	.98	2845.52	.00	4.42	.00				2		0	.0	
18.000	.0050					.0027	.05	9.07	.00	4.549	.015							IR-COV
3475.100	2835.560	9.027	2844.587	422.00	7.93	.98	2845.56	.00	4.42	.00				2		0	.0	
10.430	.0077					.0027	.03	.00	.00	3.875	.015							IR-COV
3485.530	2835.640	9.041	2844.681	422.00	7.93	.98	2845.66	.00	4.42	.00				2		0	.0	
JUNCT STR	.0000					.0022	.00	.00	.00		.015							IR-COV

---------- WARNING - Junction Analysis - Irregular Channel----------

3485.530	2835.640	9.224	2844.864	382.00	7.18	.80	2845.67	.00	4.14	.00				2		0	.0	
35.940	.0042					.0022	.08	.00	.00	4.517	.015							IR-COV
3521.470	2835.790	9.253	2845.043	382.00	7.18	.80	2845.84	.00	4.14	.00				2		0	.0	
43.000	.0051					.0022	.10	9.25	.00	4.183	.015							IR-COV
3564.470	2836.010	9.129	2845.139	382.00	7.18	.80	2845.94	.00	4.14	.00				2		0	.0	
TRANS STR	.0050					.0022	.02	9.13	.00		.015							IR-COV

Program Package Serial Number: 7189

WATER SURFACE PROFILE LISTING Date: 3-29-2018 Time: 9:51:13

SKYE CANYON INFRASTRUCTURE - PHASE 3A
BY OLYMPIA COMPANIES
SKYE VILLAGE ROAD MAINLINE (SOUTH ALIGNMENT)

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
3574.470	2836.060	8.809	2844.869	382.00	9.55	1.42	2846.28	.00	4.14	8.00	5.000	8.000	.00	0 .0
74.000	.0101					.0052	.39	8.81	.75	3.25	.015	.00	.00	BOX
3648.470	2836.810	8.727	2845.537	382.00	9.55	1.42	2846.95	.00	4.14	8.00	5.000	8.000	.00	0 .0
JUNCT STR	.0000							8.73	.75		.015	.00	.00	BOX
3648.470	2836.810	4.120	2840.930	366.00	21.14	6.94	2847.87	.00	4.84	3.81	5.000	.000	.00	1 .0
55.500	.0299					.0254	1.41	4.12	1.75	3.84	.015	.00	.00	PIPE
3703.970	2838.470	4.257	2842.727	366.00	20.55	6.55	2849.28	.00	4.84	3.56	5.000	.000	.00	1 .0
HYDRAULIC DROP														
3703.970	2838.470	6.237	2844.707	366.00	18.64	5.40	2850.10	.00	4.84	.00	5.000	.000	.00	1 .0
35.440	.0288					.0263	.93	6.24	.00	3.91	.015	.00	.00	PIPE
3739.410	2839.490	6.418	2845.908	366.00	18.64	5.40	2851.30	.00	4.84	.00	5.000	.000	.00	1 .0

```
                                                                                                                PSVR1
  304.920    .0241                                                  .0263     8.02     6.42     .00    4.33    .015       .00   .00  PIPE
         |         |         |         |         |                    |        |        |        |       |        |      |      |
 4044.330  2846.840    7.355  2854.195    366.00   18.64    5.40  2859.59     .00    4.84     .00    5.000     .000   .00   1   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-     -|-
    77.000    .0240                                                  .0263     2.02     7.36     .00    4.34    .015       .00   .00  PIPE
         |         |         |         |         |                    |        |        |        |       |        |      |      |
 4121.330  2848.690    8.349  2857.039    366.00   18.64    5.40  2862.43     .00    4.84     .00    5.000     .000   .00   1   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-     -|-      -|-      -|-     -|-     -|-     -|-
```

SKYE CANYON INFRASTRUCTURE - PHASE 3A

BY OLYMPIA COMPANIES

SKYE VILLAGE ROAD MAINLINE (SOUTH ALIGNMENT)

```
3338.34   .I         W    C H                E                                                .   R
3354.32   . I         W     CH                E                                               .   R
3370.30   .                                                                                    .
3386.28   .    I          W    C H              E                                              .   R
3402.26   .       I           W   C H            E                                            .   R
3418.24   .          I           W  C H           E                                           .   R
3434.22   .           I           W  C H          E                                           .   R
3450.20   .            I           W  CH          E                                           .   R
3466.18   .             I            W CH         E                                           .   R
3482.15   .             I             WC H        E                                           .   R
3498.13   .              I             W H        E                                           .   TX
3514.11   .              I           C      H     W  E                                        .   R
3530.09   .              I           C      H     W  E                                        .   R
3546.07   .              I            C      H    W  E                                        .   R
```

```
3562.05   .              I           C      H    W  E                          .   JX
3578.03   .              I          C       H     W E                          .   R
3594.01   .               I          C      H     W  E                         .   R
3609.99   .               I          C       H     W E                         .   TX
3625.97   .                I         C  H          W   E                       .   R
3641.95   .                                                                    .
3657.93   .                  I          C H          W   E                     .   JX
3673.91   .                  I          W H               E                    .   R
3689.89   .                                                                    .
3705.87   .                     I          W CH              E                 .   R
3721.85   .                     I            CH  W             E               .   R
3737.82   .                                                                    .
3753.80   .                        I            CH   W             E          .   R
3769.78   .                                                                    .
3785.76   .                                                                    .
3801.74   .                                                                    .
3817.72   .                                                                    .
3833.70   .                                                                    .
3849.68   .                                                                    .
3865.66   .                                                                    .
3881.64   .                                                                    .
```

```
   3897.62    .                                                                                                .
   3913.60    .                                                                                                .
   3929.58    .                                                                                                .
   3945.56    .                                                                                                .
   3961.54    .                                                                                                .
   3977.52    .                                                                                                .
   3993.49    .                                                                                                .
   4009.47    .                                                                                                .
   4025.45    .                                                                                                .
   4041.43    .                                                                                                .
   4057.41    .                                          I             CH      W               E         .    R
   4073.39    .                                                                                                .
   4089.37    .                                                                                                .
   4105.35    .                                                                                                .
   4121.33    .                                                 I             H         W             E .    R

            2830.250  2833.469  2836.687  2839.906  2843.124  2846.343  2849.561  2852.780  2855.998  2859.217  2862.434
```

N O T E S
1. GLOSSARY
   I = INVERT ELEVATION
   C = CRITICAL DEPTH
   W = WATER SURFACE ELEVATION
   S = SUPER-ELEVATION
   H = HEIGHT OF CHANNEL
   E = ENERGY GRADE LINE
   X = CURVES CROSSING OVER
   B = BRIDGE ENTRANCE OR EXIT
   Y = WALL ENTRANCE OR EXIT
2. STATIONS FOR POINTS AT A JUMP MAY NOT BE PLOTTED EXACTLY

Model "PSVR2"

Proposed Condition WSPG Summary
Skye Village Road - PSVR2 Model

WSPG Station	Plan Station	Storm Drain Dimension	Invert Elevation (ft)	Q_{100} (cfs)	WSE (ft)	Velocity (ft/s)	FG Elevation	HGL Check[1]
993.07	63+35.32	10'x 9' RCA	2824.89	272	2833.89	3.18	2835.93	OK
1028.07	63+00.36	10'x 9' RCA	2825.03	272	2833.90	3.19	2838.49	OK
1069.07	62+63.62	10'x 9' RCA	2825.20	272	2833.91	3.22	2838.84	OK
1110.07	62+26.89	10'x 9' RCA	2825.36	264	2833.92	3.15	2838.64	OK
1110.07	62+26.89	10'x 9' RCA	2825.36	264	2833.92	3.15	2838.64	OK
1320.07	60+16.6	10'x 9' RCA	2826.20	264	2833.95	3.43	2839.87	OK
1320.07	60+16.6	10'x 9' RCA	2826.20	255	2833.97	3.31	2839.87	OK
1762.57	55+75.47	10'x 9' RCA	2827.97	255	2834.01	4.22	2842.44	OK
1762.57	55+75.47	10'x 9' RCA	2827.97	255	2834.01	4.22	2842.44	OK
1935.07	54+02.47	10'x 9' RCA	2828.66	255	2834.04	4.74	2843.45	OK
1935.07	54+02.47	10'x 9' RCA	2828.66	207	2834.19	3.75	2843.45	OK
1995.07	53+41.82	10'x 9' RCA	2828.90	207	2834.19	3.91	2843.80	OK
1995.07	53+41.82	10'x 9' RCA	2828.90	204	2834.21	3.84	2843.80	OK
2635.07	47+01.51	10'x 9' RCA	2831.46	204	2834.30	7.18	2847.53	OK
2670.07	46+66.51	Transition	2831.58	204	2835.06	3.91	2847.74	OK
2700.07	46+36.51	Confluence Structure	2831.68	204	2835.06	4.02	2847.91	OK
2700.07	46+36.51	8'x 7' RCA	2831.68	48	2835.27	1.67	2847.91	OK
2725.07	46+11.11	8'x 7' RCA	2831.80	48	2835.27	1.73	2848.06	OK
2742.07	45+94.05	8'x 7' RCA	2831.89	48	2835.27	1.78	2848.16	OK
2759.07	45+77.	8'x 7' RCA	2831.98	48	2835.27	1.82	2848.26	OK
2829.07	45+06.25	8'x 7' RCA	2832.33	48	2835.27	2.04	2848.67	OK
2829.07	45+06.25	8'x 7' RCA	2832.33	44	2835.29	1.86	2848.67	OK
3035.39	42+99.93	8'x 7' RCA	2833.36	44	2835.28	2.86	2849.88	OK
3035.39	42+99.93	8'x 7' RCA	2833.36	42	2835.30	2.70	2849.88	OK
3077.93	42+57.39	8'x 7' RCA	2833.57	42	2835.30	3.04	2850.12	OK
3077.93	42+57.39	8'x 7' RCA	2833.57	40	2835.33	2.85	2850.12	OK
3363.04	39+72.28	8'x 7' RCA	2835.00	40	2835.27	18.86	2851.79	OK
3363.04	39+71.28	30" RCP	2835.00	40	2836.20	17.12	2851.79	OK
3413.04	39+37.03	30" RCP	2837.99	40	2839.22	16.72	2853.24	OK
3523.04	39+37.03	30" RCP	2844.61	40	2846.74	8.98	N/A	N/A
3523.04	39+37.03	30" RCP	2844.61	40	2846.74	8.98	N/A	N/A

1 - 'HGL Check' reflects the minimum 1-ft below finished grade.

```
T1 SKYE CANYON INFRASTRUCTURE - PHASE 3A
T2 BY OLYMPIA COMPANIES
T3 SKYE VILLAGE ROAD MAINLINE (NORTH ALIGNMENT)
SO    993.0702824.890  3      .015                2833.890
R    1028.0702825.030  3      .015
R    1069.0702825.200  3      .015                                  46.983    .000 0
R    1110.0702825.360  3      .015                                 -46.983    .000 0
JX   1110.0702825.360  3 18   .015    8.500         2826.440          45.0
R    1320.0702826.200  3      .015
JX   1320.0702826.200  3 18   .015    8.500         2826.200          60.0
R    1762.5702827.970  3      .015
JX   1762.5702827.970  3      .015
R    1935.0702828.660  3      .015
JX   1935.0702828.660  3 42   .015   48.000         2828.660          45.0
R    1995.0702828.900  3      .015
JX   1995.0702828.900  3 18   .015    3.0           2828.90           60.0
R    2635.0702831.460  3      .015
TS   2670.0702831.580  9      .015
TS   2700.0702831.680  8      .015
JX   2700.0702831.680  2  6   .015  156.0           2831.68           00.0
R    2725.0702831.800  2      .015
R    2742.0702831.890  2      .015                                  19.481    .000 0
R    2759.0702831.980  2      .015                                 -19.481    .000 0
R    2829.0702832.330  2      .015
JX   2829.0702832.330  2 18 18.015    2.0      2.0  2732.30 2732.30  60.0 60.0
R    3035.3902833.360  2      .015
JX   3035.3902833.360  2 18   .015    2.000         2833.360          46.0
R    3077.9302833.570  2      .015
JX   3077.9302833.570  2 18   .015    2.000         2833.570          60.0
R    3363.0402835.000  2      .015                                       45.00
JX   3363.0402835.000 30      .015
R    3413.0402837.990 30      .015                                       45.00
R    3523.0402844.610 30      .015
SH   3523.0402844.610 30      .015
CD   6  3   0    .000   6.000    6.000  .000  .000   .00
CD   8  3   0    .000   7.000   15.000  .000  .000   .00
CD   9  3   0    .000   9.000   15.000  .000  .000   .00
CD  18  4   1    .000   1.500     .000  .000  .000   .00
CD  24  4   1    .000   2.000     .000  .000  .000   .00
CD  30  4   1    .000   2.500     .000  .000  .000   .00
CD  36  4   1    .000   3.000     .000  .000  .000   .00
CD  42  4   1    .000   3.500     .000  .000  .000   .00
CD  48  4   1    .000   4.000     .000  .000  .000   .00
CD  54  4   1    .000   4.500     .000  .000  .000   .00
CD  60  4   1    .000   5.000     .000  .000  .000   .00
CD  72  4   1    .000   6.000     .000  .000  .000   .00
CD   1  6   0      0.0      0.0     0.0     0.0      0.0    0.0
CD   2  6   0      0.0      0.0     0.0     0.0      0.0    0.0
CD   3  6   0      0.0      0.0     0.0     0.0      0.0    0.0
PTS  121   .000   .000 10.000   .000 10.000   .010 10.000  5.500  9.490  6.870
PTS       9.000  7.280  8.500  7.500  8.000  7.630  7.520  7.740  7.000  7.840
PTS       6.000  7.960  5.000  8.000  4.000  7.960  3.000  7.840  2.480  7.740
PTS       2.000  7.630  1.500  7.500  1.000  7.280   .510  6.870   .000  5.500
PTS        .000   .010
PTS  221   .000   .000  8.000   .000  8.000   .010  8.000  5.000  7.900  5.570
PTS       7.700  5.950  7.500  6.190  7.250  6.390  7.000  6.530  6.000  6.800
PTS       5.000  6.950  4.000  7.000  3.000  6.950  2.000  6.800  1.000  6.530
PTS        .750  6.390   .500  6.190   .300  5.950   .100  5.570   .000  5.000
PTS        .000   .010
PTS  321   .000   .000 10.000   .000 10.000   .010 10.000  6.500  9.490  7.870
PTS       9.000  8.280  8.500  8.500  8.000  8.630  7.520  8.740  7.000  8.840
PTS       6.000  8.960  5.000  9.000  4.000  8.960  3.000  8.840  2.480  8.740
PTS       2.000  8.630  1.500  8.500  1.000  8.280   .510  7.870   .000  6.500
PTS        .000   .010
Q           40.000   .0
```

FILE: PSVR2.WSW W S P G W - EDIT LISTING - Version 14.10 Date: 3-22-2018 Time: 9:55:12

WATER SURFACE PROFILE - CHANNEL DEFINITION LISTING

CARD CODE	SECT NO	CHN TYPE	NO OF PIER/PIP	AVE PIER WIDTH	HEIGHT 1 DIAMETER	BASE WIDTH	ZL	ZR	INV DROP	Y(1)	Y(2)	Y(3)	Y(4)	Y(5)	Y(6)	Y(7)	Y(8)	Y(9)	Y(10)
CD	6	3	0	.000	6.000	6.000	.000	.000	.00										
CD	8	3	0	.000	7.000	15.000	.000	.000	.00										
CD	9	3	0	.000	9.000	15.000	.000	.000	.00										
CD	18	4	1		1.500														
CD	24	4	1		2.000														
CD	30	4	1		2.500														
CD	36	4	1		3.000														
CD	42	4	1		3.500														
CD	48	4	1		4.000														
CD	54	4	1		4.500														
CD	60	4	1		5.000														
CD	72	4	1		6.000														
CD	1	6	0	.000															
CD	2	6	0	.000															
CD	3	6	0	.000															

FILE: W S P G W - EDIT LISTING - Version 14.10 Date: 3-22-2018 Time: 9:55:12

WATER SURFACE PROFILE - CROSS SECTION POINT LISTING

CARD CODE	SECT NO	NO OF POINTS	X(1) , Y(1)	X(2) , Y(2)	X(3) , Y(3)	X(4) , Y(4)	X(5) , Y(5)	X(6) , Y(6)	X(7) , Y(7)
			X(8) , Y(8)	X(9) , Y(9)	X(10) ,Y(10)	X(11) ,Y(11)	X(N) , Y(N)	X(N+1),Y(N+1)	X(35) ,Y(35)
PTS	1	21	.000 .000	10.000 .000	10.000 .010	10.000 5.500	9.490 6.870	9.000 7.280	8.500 7.500
PTS			8.000 7.630	7.520 7.740	7.000 7.840	6.000 7.960	5.000 8.000	4.000 7.960	3.000 7.840
PTS			2.480 7.740	2.000 7.630	1.500 7.500	1.000 7.280	.510 6.870	.000 5.500	.000 .010
PTS	2	21	.000 .000	8.000 .000	8.000 .010	8.000 5.000	7.900 5.570	7.700 5.950	7.500 6.190
PTS			7.250 6.390	7.000 6.530	6.000 6.800	5.000 6.950	4.000 7.000	3.000 6.950	2.000 6.800
PTS			1.000 6.530	.750 6.390	.500 6.190	.300 5.950	.100 5.570	.000 5.000	.000 .010
PTS	3	21	.000 .000	10.000 .000	10.000 .010	10.000 6.500	9.490 7.870	9.000 8.280	8.500 8.500
PTS			8.000 8.630	7.520 8.740	7.000 8.840	6.000 8.960	5.000 9.000	4.000 8.960	3.000 8.840
PTS			2.480 8.740	2.000 8.630	1.500 8.500	1.000 8.280	.510 7.870	.000 6.500	.000 .010

W S P G W

WATER SURFACE PROFILE - TITLE CARD LISTING

HEADING LINE NO 1 IS -

SKYE CANYON INFRASTRUCTURE - PHASE 3A

HEADING LINE NO 2 IS -

BY OLYMPIA COMPANIES

HEADING LINE NO 3 IS -

SKYE VILLAGE ROAD MAINLINE (NORTH ALIGNMENT)

W S P G W

WATER SURFACE PROFILE - ELEMENT CARD LISTING

ELEMENT NO 1 IS A SYSTEM OUTLET * * *

U/S DATA	STATION	INVERT	SECT	W S ELEV
	993.070	2824.890	3	2833.890

ELEMENT NO 2 IS A REACH * * *

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	1028.070	2825.030	3	.015	.000	.000	.000	0

ELEMENT NO 3 IS A REACH * * *

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	1069.070	2825.200	3	.015	50.000	46.983	.000	0

ELEMENT NO 4 IS A REACH * * *

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	1110.070	2825.360	3	.015	50.000	-46.983	.000	0

ELEMENT NO 5 IS A JUNCTION * * * * * * * *

U/S DATA	STATION	INVERT	SECT	LAT-1	LAT-2	N	Q3	Q4	INVERT-3	INVERT-4	PHI 3	PHI 4
	1110.070	2825.360	3	18	0	.015	8.500	.000	2826.440	.000	45.000	.000

RADIUS	ANGLE
.000	.000

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

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

ELEMENT NO 6 IS A REACH * * *

```
                  U/S DATA   STATION    INVERT  SECT              N                          RADIUS    ANGLE     ANG PT  MAN H
                             1320.070 2826.200    3              .015                           .000     .000      .000     0
 ELEMENT NO   7 IS A JUNCTION          *         *     *     *                  *                  *                *
                  U/S DATA   STATION    INVERT  SECT LAT-1 LAT-2   N      Q3        Q4     INVERT-3 INVERT-4  PHI 3  PHI 4
                             1320.070 2826.200    3    18     0   .015     8.500      .000  2826.200      .000  60.000     .000
                                                                                           RADIUS    ANGLE
                                                                                             .000    .000
THE ABOVE ELEMENT CONTAINED AN INVERT ELEV WHICH WAS NOT GREATER THAN THE PREVIOUS INVERT ELEV -WARNING
THE ABOVE ELEMENT CONTAINED AN INVERT ELEV WHICH WAS NOT GREATER THAN THE PREVIOUS INVERT ELEV -WARNING
 ELEMENT NO   8 IS A REACH             *         *     *
                  U/S DATA   STATION    INVERT  SECT              N                          RADIUS    ANGLE     ANG PT  MAN H
                             1762.570 2827.970    3              .015                           .000     .000      .000     0
 ELEMENT NO   9 IS A JUNCTION          *         *     *     *                  *                  *                *
                  U/S DATA   STATION    INVERT  SECT LAT-1 LAT-2   N      Q3        Q4     INVERT-3 INVERT-4  PHI 3  PHI 4
                             1762.570 2827.970    3     0     0   .015      .000      .000      .000      .000    .000     .000
                                                                                           RADIUS    ANGLE
                                                                                             .000    .000
THE ABOVE ELEMENT CONTAINED AN INVERT ELEV WHICH WAS NOT GREATER THAN THE PREVIOUS INVERT ELEV -WARNING
THE ABOVE ELEMENT CONTAINED AN INVERT ELEV WHICH WAS NOT GREATER THAN THE PREVIOUS INVERT ELEV -WARNING
                                        W S P G W                                                                  PAGE NO   3
                        WATER SURFACE PROFILE - ELEMENT CARD LISTING
 ELEMENT NO  10 IS A REACH             *         *     *
                  U/S DATA   STATION    INVERT  SECT              N                          RADIUS    ANGLE     ANG PT  MAN H
                             1935.070 2828.660    3              .015                           .000     .000      .000     0
 ELEMENT NO  11 IS A JUNCTION          *         *     *     *                  *                  *                *
                  U/S DATA   STATION    INVERT  SECT LAT-1 LAT-2   N      Q3        Q4     INVERT-3 INVERT-4  PHI 3  PHI 4
                             1935.070 2828.660    3    42     0   .015    48.000      .000  2828.660      .000  45.000     .000
                                                                                           RADIUS    ANGLE
                                                                                             .000    .000
THE ABOVE ELEMENT CONTAINED AN INVERT ELEV WHICH WAS NOT GREATER THAN THE PREVIOUS INVERT ELEV -WARNING
THE ABOVE ELEMENT CONTAINED AN INVERT ELEV WHICH WAS NOT GREATER THAN THE PREVIOUS INVERT ELEV -WARNING
 ELEMENT NO  12 IS A REACH             *         *     *
                  U/S DATA   STATION    INVERT  SECT              N                          RADIUS    ANGLE     ANG PT  MAN H
                             1995.070 2828.900    3              .015                           .000     .000      .000     0
 ELEMENT NO  13 IS A JUNCTION          *         *     *     *                  *                  *                *
                  U/S DATA   STATION    INVERT  SECT LAT-1 LAT-2   N      Q3        Q4     INVERT-3 INVERT-4  PHI 3  PHI 4
                             1995.070 2828.900    3    18     0   .015     3.000      .000  2828.900      .000  60.000     .000
                                                                                           RADIUS    ANGLE
                                                                                             .000    .000
THE ABOVE ELEMENT CONTAINED AN INVERT ELEV WHICH WAS NOT GREATER THAN THE PREVIOUS INVERT ELEV -WARNING
THE ABOVE ELEMENT CONTAINED AN INVERT ELEV WHICH WAS NOT GREATER THAN THE PREVIOUS INVERT ELEV -WARNING
 ELEMENT NO  14 IS A REACH             *         *     *
                  U/S DATA   STATION    INVERT  SECT              N                          RADIUS    ANGLE     ANG PT  MAN H
                             2635.070 2831.460    3              .015                           .000     .000      .000     0
 ELEMENT NO  15 IS A TRANSITION        *         *     *
                  U/S DATA   STATION    INVERT  SECT              N                          RADIUS   ANGLE
                             2670.070 2831.580    9              .015                           .000     .000
 ELEMENT NO  16 IS A TRANSITION        *         *     *
                  U/S DATA   STATION    INVERT  SECT              N                          RADIUS   ANGLE
                             2700.070 2831.680    8              .015                           .000     .000
 ELEMENT NO  17 IS A JUNCTION          *         *     *     *                  *                  *                *
                  U/S DATA   STATION    INVERT  SECT LAT-1 LAT-2   N      Q3        Q4     INVERT-3 INVERT-4  PHI 3  PHI 4
                             2700.070 2831.680    2     6     0   .015   156.000      .000  2831.680      .000    .000     .000
                                                                                           RADIUS    ANGLE
                                                                                             .000    .000
THE ABOVE ELEMENT CONTAINED AN INVERT ELEV WHICH WAS NOT GREATER THAN THE PREVIOUS INVERT ELEV -WARNING
THE ABOVE ELEMENT CONTAINED AN INVERT ELEV WHICH WAS NOT GREATER THAN THE PREVIOUS INVERT ELEV -WARNING
                                        W S P G W                                                                  PAGE NO   4
                        WATER SURFACE PROFILE - ELEMENT CARD LISTING
 ELEMENT NO  18 IS A REACH             *         *     *
                  U/S DATA   STATION    INVERT  SECT              N                          RADIUS    ANGLE     ANG PT  MAN H
                             2725.070 2831.800    2              .015                           .000     .000      .000     0
 ELEMENT NO  19 IS A REACH             *         *     *
                  U/S DATA   STATION    INVERT  SECT              N                          RADIUS    ANGLE     ANG PT  MAN H
```

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                                                                                                    PSVR2
                          2742.070 2831.890    2               .015                        49.999   19.481      .000     0
 ELEMENT NO  20 IS A REACH            *         *     *
                   U/S DATA   STATION    INVERT  SECT             N                          RADIUS    ANGLE     ANG PT  MAN H
                          2759.070 2831.980    2               .015                        49.999  -19.481      .000     0
 ELEMENT NO  21 IS A REACH            *         *     *
                   U/S DATA   STATION    INVERT  SECT             N                          RADIUS    ANGLE     ANG PT  MAN H
                          2829.070 2832.330    2               .015                         .000     .000      .000     0
 ELEMENT NO  22 IS A JUNCTION         *         *     *     *             *                    *                 *
                   U/S DATA   STATION    INVERT  SECT LAT-1 LAT-2   N      Q3        Q4     INVERT-3 INVERT-4  PHI 3  PHI 4
                          2829.070 2832.330    2    18    18   .015     2.000     2.000  2732.300  2732.300  60.000   60.000
                                                                                          RADIUS    ANGLE
                                                                                           .000     .000
THE ABOVE ELEMENT CONTAINED AN INVERT ELEV WHICH WAS NOT GREATER THAN THE PREVIOUS INVERT ELEV -WARNING
THE ABOVE ELEMENT CONTAINED AN INVERT ELEV WHICH WAS NOT GREATER THAN THE PREVIOUS INVERT ELEV -WARNING
 ELEMENT NO  23 IS A REACH            *         *     *
                   U/S DATA   STATION    INVERT  SECT             N                          RADIUS    ANGLE     ANG PT  MAN H
                          3035.390 2833.360    2               .015                         .000     .000      .000     0
 ELEMENT NO  24 IS A JUNCTION         *         *     *     *             *                    *                 *
                   U/S DATA   STATION    INVERT  SECT LAT-1 LAT-2   N      Q3        Q4     INVERT-3 INVERT-4  PHI 3  PHI 4
                          3035.390 2833.360    2    18     0   .015     2.000      .000  2833.360      .000  46.000     .000
                                                                                          RADIUS    ANGLE
                                                                                           .000     .000
THE ABOVE ELEMENT CONTAINED AN INVERT ELEV WHICH WAS NOT GREATER THAN THE PREVIOUS INVERT ELEV -WARNING
THE ABOVE ELEMENT CONTAINED AN INVERT ELEV WHICH WAS NOT GREATER THAN THE PREVIOUS INVERT ELEV -WARNING
 ELEMENT NO  25 IS A REACH            *         *     *
                   U/S DATA   STATION    INVERT  SECT             N                          RADIUS    ANGLE     ANG PT  MAN H
                          3077.930 2833.570    2               .015                         .000     .000      .000     0
 ELEMENT NO  26 IS A JUNCTION         *         *     *     *             *                    *                 *
                   U/S DATA   STATION    INVERT  SECT LAT-1 LAT-2   N      Q3        Q4     INVERT-3 INVERT-4  PHI 3  PHI 4
                          3077.930 2833.570    2    18     0   .015     2.000      .000  2833.570      .000  60.000     .000
                                                                                          RADIUS    ANGLE
                                                                                           .000     .000
THE ABOVE ELEMENT CONTAINED AN INVERT ELEV WHICH WAS NOT GREATER THAN THE PREVIOUS INVERT ELEV -WARNING
THE ABOVE ELEMENT CONTAINED AN INVERT ELEV WHICH WAS NOT GREATER THAN THE PREVIOUS INVERT ELEV -WARNING
                                        W S P G W                                                                  PAGE NO   5
                      WATER SURFACE PROFILE - ELEMENT CARD LISTING
 ELEMENT NO  27 IS A REACH            *         *     *
                   U/S DATA   STATION    INVERT  SECT             N                          RADIUS    ANGLE     ANG PT  MAN H
                          3363.040 2835.000    2               .015                         .000     .000    45.000     0
 ELEMENT NO  28 IS A JUNCTION         *         *     *     *             *                    *                 *
                   U/S DATA   STATION    INVERT  SECT LAT-1 LAT-2   N      Q3        Q4     INVERT-3 INVERT-4  PHI 3  PHI 4
                          3363.040 2835.000   30     0     0   .015      .000      .000      .000      .000     .000     .000
                                                                                          RADIUS    ANGLE
                                                                                           .000     .000
THE ABOVE ELEMENT CONTAINED AN INVERT ELEV WHICH WAS NOT GREATER THAN THE PREVIOUS INVERT ELEV -WARNING
THE ABOVE ELEMENT CONTAINED AN INVERT ELEV WHICH WAS NOT GREATER THAN THE PREVIOUS INVERT ELEV -WARNING
 ELEMENT NO  29 IS A REACH            *         *     *
                   U/S DATA   STATION    INVERT  SECT             N                          RADIUS    ANGLE     ANG PT  MAN H
                          3413.040 2837.990   30               .015                         .000     .000    45.000     0
 ELEMENT NO  30 IS A REACH            *         *     *
                   U/S DATA   STATION    INVERT  SECT             N                          RADIUS    ANGLE     ANG PT  MAN H
                          3523.040 2844.610   30               .015                         .000     .000      .000     0
 ELEMENT NO  31 IS A SYSTEM HEADWORKS                 *                     *
                   U/S DATA   STATION    INVERT  SECT                                 W S ELEV
                          3523.040 2844.610   30                                        .000
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Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
993.070	2824.890	9.000	2833.890	272.00	3.18	.16	2834.05	.00	2.84	.00		3		0 .0
.000	.0040					.0003	.00	9.00	.00	2.896	.015			IR-COV
993.070	2824.890	9.000	2833.890	272.00	3.18	.16	2834.05	.00	2.84	.00		3		0 .0
35.000	.0040					.0003	.01	9.00	.00	2.896	.015			IR-COV
1028.070	2825.030	8.868	2833.898	272.00	3.19	.16	2834.06	.01	2.84	3.53		3		0 .0
41.000	.0041					.0003	.01	8.88	.11	2.861	.015			IR-COV
1069.070	2825.200	8.707	2833.907	272.00	3.22	.16	2834.07	.02	2.84	5.32		3		0 .0
41.000	.0039					.0003	.01	8.73	.14	2.921	.015			IR-COV
JUNCT STR	.0000					.0002	.00	8.55	.16		.015			IR-COV

WARNING - Junction Analysis - Irregular Channel

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
1110.070	2825.360	8.564	2833.924	263.50	3.15	.15	2834.08	.00	2.78	6.51		3		0 .0
130.032	.0040					.0002	.03	8.56	.16	2.833	.015			IR-COV
1240.102	2825.880	8.061	2833.942	263.50	3.31	.17	2834.11	.00	2.78	8.52		3		0 .0
79.968	.0040					.0003	.02	8.06	.19	2.833	.015			IR-COV
1320.070	2826.200	7.751	2833.951	263.50	3.43	.18	2834.13	.00	2.78	9.07		3		0 .0
JUNCT STR	.0000					.0003	.00	7.75	.21		.015			IR-COV

WARNING - Junction Analysis - Irregular Channel

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
1320.070	2826.200	7.766	2833.966	255.00	3.31	.17	2834.14	.00	2.72	9.06		3		0 .0
100.027	.0040					.0003	.03	7.77	.20	2.769	.015			IR-COV
1420.097	2826.600	7.376	2833.976	255.00	3.47	.19	2834.16	.00	2.72	9.35		3		0 .0
92.590	.0040					.0003	.03	7.38	.22	2.769	.015			IR-COV
1512.688	2826.970	7.016	2833.986	255.00	3.64	.21	2834.19	.00	2.72	9.62		3		0 .0
85.964	.0040					.0003	.03	7.02	.24	2.769	.015			IR-COV
1598.652	2827.314	6.681	2833.995	255.00	3.82	.23	2834.22	.00	2.72	9.87		3		0 .0

| | | |

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  60.342    .0040                                  .0005      .03     5.06     .32   2.372    .015                IR-COV
       |         |         |         |         |         |         |        |        |        |        |        |       |
2118.619  2829.394    4.823  2834.218    204.00     4.23      .28  2834.50     .00    2.35    10.00                3        0   .0
       -|-       -|-      -|-       -|-       -|-      -|-     -|-       -|-     -|-      -|-       -|-     -|-     -|-     |-
  57.624    .0040                                  .0006      .03     4.82     .34   2.372    .015                IR-COV
       |         |         |         |         |         |         |        |        |        |        |        |       |
2176.243  2829.625    4.599  2834.224    204.00     4.44      .31  2834.53     .00    2.35    10.00                3        0   .0
       -|-       -|-      -|-       -|-       -|-      -|-     -|-       -|-     -|-      -|-       -|-     -|-     -|-     |-
  55.093    .0040                                  .0006      .03     4.60     .36   2.372    .015                IR-COV
       |         |         |         |         |         |         |        |        |        |        |        |       |
2231.335  2829.845    4.385  2834.230    204.00     4.65      .34  2834.57     .00    2.35    10.00                3        0   .0
       -|-       -|-      -|-       -|-       -|-      -|-     -|-       -|-     -|-      -|-       -|-     -|-     -|-     |-
  52.599    .0040                                  .0007      .04     4.38     .39   2.372    .015                IR-COV
       |         |         |         |         |         |         |        |        |        |        |        |       |
2283.935  2830.056    4.181  2834.236    204.00     4.88      .37  2834.61     .00    2.35    10.00                3        0   .0
       -|-       -|-      -|-       -|-       -|-      -|-     -|-       -|-     -|-      -|-       -|-     -|-     -|-     |-
  50.300    .0040                                  .0008      .04     4.18     .42   2.372    .015                IR-COV
       |         |         |         |         |         |         |        |        |        |        |        |       |
2334.235  2830.257    3.986  2834.243    204.00     5.12      .41  2834.65     .00    2.35    10.00                3        0   .0
       -|-       -|-      -|-       -|-       -|-      -|-     -|-       -|-     -|-      -|-       -|-     -|-     -|-     |-
  48.070    .0040                                  .0009      .04     3.99     .45   2.372    .015                IR-COV
       |         |         |         |         |         |         |        |        |        |        |        |       |
2382.305  2830.449    3.801  2834.250    204.00     5.37      .45  2834.70     .00    2.35    10.00                3        0   .0
       -|-       -|-      -|-       -|-       -|-      -|-     -|-       -|-     -|-      -|-       -|-     -|-     -|-     |-
  45.983    .0040                                  .0011      .05     3.80     .49   2.372    .015                IR-COV
       |         |         |         |         |         |         |        |        |        |        |        |       |
2428.288  2830.633    3.624  2834.257    204.00     5.63      .49  2834.75     .00    2.35    10.00                3        0   .0
       -|-       -|-      -|-       -|-       -|-      -|-     -|-       -|-     -|-      -|-       -|-     -|-     -|-     |-
  43.972    .0040                                  .0012      .05     3.62     .52   2.372    .015                IR-COV
       |         |         |         |         |         |         |        |        |        |        |        |       |
2472.260  2830.809    3.455  2834.264    204.00     5.90      .54  2834.81     .00    2.35    10.00                3        0   .0
       -|-       -|-      -|-       -|-       -|-      -|-     -|-       -|-     -|-      -|-       -|-     -|-     -|-     |-
  42.121    .0040                                  .0014      .06     3.46     .56   2.372    .015                IR-COV
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Program Package Serial Number: 7189

WATER SURFACE PROFILE LISTING Date: 3-22-2018 Time: 9:55:15

SKYE CANYON INFRASTRUCTURE - PHASE 3A
BY OLYMPIA COMPANIES
SKYE VILLAGE ROAD MAINLINE (NORTH ALIGNMENT)

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********************************************************************************************************************************** ********
        | Invert  |  Depth |  Water  |    Q    |  Vel     Vel  |  Energy | Super |Critical|Flow Top|Height/|Base Wt|      |No Wth
 Station |  Elev   |  (FT)  |  Elev   |  (CFS)  | (FPS)    Head |  Grd.El.|  Elev | Depth  | Width  |Dia.-FT|or I.D.|  ZL  |Prs/Pip
       -|-      -|-      -|-       -|-       -|-     -|-      -|-     -|-      -|-      -|-      -|-     -|-    -|-
 L/Elem  |Ch Slope |        |         |         |         SF Ave|    HF   |SE Dpth|Froude N|Norm Dp |  "N"  | X-Fall|  ZR  |Type Ch
*********|*********|********|*********|*********|*******|*******|*********|*******|********|********|*******|*******|******|*******
        |         |        |         |         |       |       |         |       |        |        |       |       |      |
2514.381  2830.977    3.294  2834.271    204.00     6.19      .60  2834.87     .00    2.35    10.00                3        0   .0
       -|-       -|-      -|-       -|-       -|-      -|-     -|-       -|-     -|-      -|-       -|-     -|-     -|-     |-
  40.366    .0040                                  .0016      .06     3.29     .60   2.372    .015                IR-COV
       |         |         |         |         |         |         |        |        |        |        |        |       |
2554.747  2831.139    3.141  2834.280    204.00     6.49      .65  2834.93     .00    2.35    10.00                3        0   .0
       -|-       -|-      -|-       -|-       -|-      -|-     -|-       -|-     -|-      -|-       -|-     -|-     -|-     |-
  38.774    .0040                                  .0018      .07     3.14     .65   2.372    .015                IR-COV
       |         |         |         |         |         |         |        |        |        |        |        |       |
2593.521  2831.294    2.995  2834.289    204.00     6.81      .72  2835.01     .00    2.35    10.00                3        0   .0
       -|-       -|-      -|-       -|-       -|-      -|-     -|-       -|-     -|-      -|-       -|-     -|-     -|-     |-
  37.336    .0040                                  .0020      .08     2.99     .69   2.372    .015                IR-COV
       |         |         |         |         |         |         |        |        |        |        |        |       |
2630.856  2831.443    2.855  2834.299    204.00     7.14      .79  2835.09     .00    2.35    10.00                3        0   .0
       -|-       -|-      -|-       -|-       -|-      -|-     -|-       -|-     -|-      -|-       -|-     -|-     -|-     |-
   4.214    .0040                                  .0023      .01     2.86     .75   2.372    .015                IR-COV
       |         |         |         |         |         |         |        |        |        |        |        |       |
2635.070  2831.460    2.840  2834.300    204.00     7.18      .80  2835.10     .00    2.35    10.00                3        0   .0
       -|-       -|-      -|-       -|-       -|-      -|-     -|-       -|-     -|-      -|-       -|-     -|-     -|-     |-
TRANS STR   .0034                                  .0005      .02     2.84     .75            .015                IR-COV
       |         |         |         |         |         |         |        |        |        |        |        |       |
2670.070  2831.580    3.475  2835.055    204.00     3.91      .24  2835.29     .00    1.79    15.00    9.000   15.000   .00  0   .0
       -|-       -|-      -|-       -|-       -|-      -|-     -|-       -|-     -|-      -|-       -|-     -|-     -|-     |-
TRANS STR   .0033                                  .0005      .01     3.48     .37            .015      .00   .00  BOX
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Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
2700.070	2831.680	3.380	2835.060	204.00	4.02	.25	2835.31	.00	1.79	15.00	7.000	15.000	.00	0 .0
JUNCT STR	.0000					.0001	.00	3.38	.39		.015	.00	.00	BOX

---------- WARNING - Junction Analysis - Change in Channel Type ----------

2700.070	2831.680	3.588	2835.268	48.00	1.67	.04	2835.31	.00	1.04	8.00		2		0 .0
25.000	.0048					.0001	.00	3.59	.16	1.009	.015			IR-COV

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
2725.070	2831.800	3.469	2835.269	48.00	1.73	.05	2835.32	.02	1.04	8.00		2		0 .0
17.000	.0053					.0001	.00	3.49	.16	.978	.015			IR-COV
2742.070	2831.890	3.379	2835.269	48.00	1.78	.05	2835.32	.02	1.04	8.00		2		0 .0
17.000	.0053					.0001	.00	3.40	.17	.977	.015			IR-COV
2759.070	2831.980	3.289	2835.269	48.00	1.82	.05	2835.32	.00	1.04	8.00		2		0 .0
30.573	.0050					.0002	.01	3.29	.18	.996	.015			IR-COV
2789.644	2832.133	3.136	2835.268	48.00	1.91	.06	2835.33	.00	1.04	8.00		2		0 .0
29.152	.0050					.0002	.01	3.14	.19	.996	.015			IR-COV
2818.796	2832.279	2.990	2835.268	48.00	2.01	.06	2835.33	.00	1.04	8.00		2		0 .0
10.274	.0050					.0002	.00	2.99	.20	.996	.015			IR-COV
2829.070	2832.330	2.938	2835.268	48.00	2.04	.06	2835.33	.00	1.04	8.00		2		0 .0
JUNCT STR	.0000					.0002	.00	2.94	.21		.015			IR-COV

---------- WARNING - Junction Analysis - Irregular Channel----------

2829.070	2832.330	2.956	2835.286	44.00	1.86	.05	2835.34	.00	.98	8.00		2		0 .0
27.520	.0050					.0002	.01	2.96	.19	.942	.015			IR-COV
2856.590	2832.468	2.818	2835.286	44.00	1.95	.06	2835.34	.00	.98	8.00		2		0 .0
26.191	.0050					.0002	.01	2.82	.20	.942	.015			IR-COV

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
2882.781	2832.598	2.687	2835.286	44.00	2.05	.07	2835.35	.00	.98	8.00		2		0 .0

| | | |

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
3109.042	2833.726	1.597	2835.323	40.00	3.13	.15	2835.48	.00	.92	8.00		2	0	.0
14.359	.0050					.0009	.01	1.60	.44	.884	.015			IR-COV

Program Package Serial Number: 7189

WATER SURFACE PROFILE LISTING Date: 3-22-2018 Time: 9:55:15

SKYE CANYON INFRASTRUCTURE - PHASE 3A
BY OLYMPIA COMPANIES
SKYE VILLAGE ROAD MAINLINE (NORTH ALIGNMENT)

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
3123.401	2833.798	1.522	2835.321	40.00	3.28	.17	2835.49	.00	.92	8.00		2	0	.0
13.590	.0050					.0010	.01	1.52	.47	.884	.015			IR-COV
3136.991	2833.866	1.452	2835.318	40.00	3.44	.18	2835.50	.00	.92	8.00		2	0	.0
12.877	.0050					.0012	.02	1.45	.50	.884	.015			IR-COV
3149.868	2833.931	1.384	2835.315	40.00	3.61	.20	2835.52	.00	.92	8.00		2	0	.0
12.139	.0050					.0014	.02	1.38	.54	.884	.015			IR-COV
3162.007	2833.992	1.320	2835.311	40.00	3.79	.22	2835.53	.00	.92	8.00		2	0	.0
11.424	.0050					.0016	.02	1.32	.58	.884	.015			IR-COV
3173.430	2834.049	1.258	2835.307	40.00	3.97	.25	2835.55	.00	.92	8.00		2	0	.0
10.725	.0050					.0018	.02	1.26	.62	.884	.015			IR-COV
3184.155	2834.103	1.200	2835.302	40.00	4.17	.27	2835.57	.00	.92	8.00		2	0	.0
9.966	.0050					.0021	.02	1.20	.67	.884	.015			IR-COV
3194.121	2834.153	1.144	2835.297	40.00	4.37	.30	2835.59	.00	.92	8.00		2	0	.0
9.185	.0050					.0025	.02	1.14	.72	.884	.015			IR-COV
3203.306	2834.199	1.091	2835.290	40.00	4.58	.33	2835.62	.00	.92	8.00		2	0	.0
8.338	.0050					.0028	.02	1.09	.77	.884	.015			IR-COV
3211.644	2834.241	1.040	2835.281	40.00	4.81	.36	2835.64	.00	.92	8.00		2	0	.0
7.212	.0050					.0033	.02	1.04	.83	.884	.015			IR-COV

Program Package Serial Number: 7189

WATER SURFACE PROFILE LISTING Date: 3-22-2018 Time: 9:55:15

SKYE CANYON INFRASTRUCTURE - PHASE 3A
BY OLYMPIA COMPANIES
SKYE VILLAGE ROAD MAINLINE (NORTH ALIGNMENT)

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
3218.856	2834.277	.991	2835.268	40.00	5.04	.39	2835.66	.00	.92	8.00		2	0	.0

```
   3.323    .0050                                  .0038      .01      .99     .89    .884    .015                IR-COV
       |        |        |        |        |        |        |        |       |       |       |       |       |      |
 3222.179  2834.293     .945  2835.239     40.00    5.29     .43  2835.67     .00     .92    8.00                2        0   .0
       -|-      -|-      -|-      -|-      -|-      -|-      -|-      -|-     -|-     -|-     -|-     -|-     -|-     -|-     |-
HYDRAULIC JUMP
       |        |        |        |        |        |        |        |       |       |       |       |       |      |
 3222.179  2834.293     .873  2835.166     40.00    5.73     .51  2835.68     .00     .92    8.00                2        0   .0
       -|-      -|-      -|-      -|-      -|-      -|-      -|-      -|-     -|-     -|-     -|-     -|-     -|-     -|-     |-
  16.492    .0050                                  .0056      .09      .87    1.08    .884    .015                IR-COV
       |        |        |        |        |        |        |        |       |       |       |       |       |      |
 3238.671  2834.376     .832  2835.208     40.00    6.01     .56  2835.77     .00     .92    8.00                2        0   .0
       -|-      -|-      -|-      -|-      -|-      -|-      -|-      -|-     -|-     -|-     -|-     -|-     -|-     -|-     |-
  11.476    .0050                                  .0065      .07      .83    1.16    .884    .015                IR-COV
       |        |        |        |        |        |        |        |       |       |       |       |       |      |
 3250.147  2834.434     .794  2835.227     40.00    6.30     .62  2835.84     .00     .92    8.00                2        0   .0
       -|-      -|-      -|-      -|-      -|-      -|-      -|-      -|-     -|-     -|-     -|-     -|-     -|-     -|-     |-
   9.647    .0050                                  .0076      .07      .79    1.25    .884    .015                IR-COV
       |        |        |        |        |        |        |        |       |       |       |       |       |      |
 3259.794  2834.482     .757  2835.239     40.00    6.61     .68  2835.92     .00     .92    8.00                2        0   .0
       -|-      -|-      -|-      -|-      -|-      -|-      -|-      -|-     -|-     -|-     -|-     -|-     -|-     -|-     |-
   8.653    .0050                                  .0088      .08      .76    1.34    .884    .015                IR-COV
       |        |        |        |        |        |        |        |       |       |       |       |       |      |
 3268.447  2834.526     .721  2835.247     40.00    6.93     .75  2835.99     .00     .92    8.00                2        0   .0
       -|-      -|-      -|-      -|-      -|-      -|-      -|-      -|-     -|-     -|-     -|-     -|-     -|-     -|-     |-
   7.930    .0050                                  .0102      .08      .72    1.44    .884    .015                IR-COV
       |        |        |        |        |        |        |        |       |       |       |       |       |      |
 3276.377  2834.565     .688  2835.253     40.00    7.27     .82  2836.07     .00     .92    8.00                2        0   .0
       -|-      -|-      -|-      -|-      -|-      -|-      -|-      -|-     -|-     -|-     -|-     -|-     -|-     -|-     |-
   7.332    .0050                                  .0118      .09      .69    1.54    .884    .015                IR-COV
       |        |        |        |        |        |        |        |       |       |       |       |       |      |
 3283.708  2834.602     .656  2835.258     40.00    7.62     .90  2836.16     .00     .92    8.00                2        0   .0
       -|-      -|-      -|-      -|-      -|-      -|-      -|-      -|-     -|-     -|-     -|-     -|-     -|-     -|-     |-
   6.824    .0050                                  .0138      .09      .66    1.66    .884    .015                IR-COV
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Program Package Serial Number: 7189

WATER SURFACE PROFILE LISTING Date: 3-22-2018 Time: 9:55:15

SKYE CANYON INFRASTRUCTURE - PHASE 3A
BY OLYMPIA COMPANIES
SKYE VILLAGE ROAD MAINLINE (NORTH ALIGNMENT)

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**********************************************************************************************************************************************
         | Invert  |  Depth |  Water  |    Q    |  Vel     Vel  |  Energy | Super |Critical|Flow Top|Height/|Base Wt|      |No Wth
 Station |  Elev   |  (FT)  |  Elev   |  (CFS)  | (FPS)    Head |  Grd.El.|  Elev | Depth  | Width  |Dia.-FT|or I.D.|  ZL  |Prs/Pip
       -|-      -|-      -|-      -|-      -|-     -|-     -|-     -|-     -|-     -|-     -|-     -|-     -|-    -|
 L/Elem  |Ch Slope |        |         |         |        SF Ave|    HF   |SE Dpth|Froude N|Norm Dp |  "N"  | X-Fall|  ZR  |Type Ch
*********|*********|********|*********|*********|*******|*******|*********|*******|********|********|*******|*******|******|*******
         |         |        |         |         |       |       |         |       |        |        |       |       |      |
 3290.533  2834.636     .625  2835.262     40.00    8.00     .99  2836.25     .00     .92    8.00                2        0   .0
       -|-      -|-      -|-      -|-      -|-      -|-      -|-      -|-     -|-     -|-     -|-     -|-     -|-     -|-     |-
    6.396    .0050                                  .0160      .10      .63    1.78    .884    .015                IR-COV
         |        |        |        |        |        |        |        |       |       |       |       |       |      |
 3296.929  2834.668     .596  2835.265     40.00    8.39    1.09  2836.36     .00     .92    8.00                2        0   .0
       -|-      -|-      -|-      -|-      -|-      -|-      -|-      -|-     -|-     -|-     -|-     -|-     -|-     -|-     |-
    6.006    .0050                                  .0186      .11      .60    1.91    .884    .015                IR-COV
         |        |        |        |        |        |        |        |       |       |       |       |       |      |
 3302.935  2834.698     .568  2835.267     40.00    8.80    1.20  2836.47     .00     .92    8.00                2        0   .0
       -|-      -|-      -|-      -|-      -|-      -|-      -|-      -|-     -|-     -|-     -|-     -|-     -|-     -|-     |-
    5.640    .0050                                  .0216      .12      .57    2.06    .884    .015                IR-COV
         |        |        |        |        |        |        |        |       |       |       |       |       |      |
 3308.575  2834.727     .542  2835.269     40.00    9.23    1.32  2836.59     .00     .92    8.00                2        0   .0
       -|-      -|-      -|-      -|-      -|-      -|-      -|-      -|-     -|-     -|-     -|-     -|-     -|-     -|-     |-
    5.313    .0050                                  .0251      .13      .54    2.21    .884    .015                IR-COV
         |        |        |        |        |        |        |        |       |       |       |       |       |      |
 3313.888  2834.753     .517  2835.270     40.00    9.68    1.45  2836.72     .00     .92    8.00                2        0   .0
       -|-      -|-      -|-      -|-      -|-      -|-      -|-      -|-     -|-     -|-     -|-     -|-     -|-     -|-     |-
    5.005    .0050                                  .0293      .15      .52    2.37    .884    .015                IR-COV
         |        |        |        |        |        |        |        |       |       |       |       |       |      |
 3318.893  2834.779     .493  2835.271     40.00   10.15    1.60  2836.87     .00     .92    8.00                2        0   .0
       -|-      -|-      -|-      -|-      -|-      -|-      -|-      -|-     -|-     -|-     -|-     -|-     -|-     -|-     |-
    4.713    .0050                                  .0341      .16      .49    2.55    .884    .015                IR-COV
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3323.606	2834.802	.470	2835.272	40.00	10.64	1.76	2837.03	.00	.92	8.00			2	0	.0
4.448	.0050					.0397	.18	.47	2.74	.884	.015			IR-COV	
3328.054	2834.824	.448	2835.272	40.00	11.16	1.93	2837.21	.00	.92	8.00			2	0	.0
4.191	.0050					.0462	.19	.45	2.94	.884	.015			IR-COV	
3332.245	2834.845	.427	2835.272	40.00	11.71	2.13	2837.40	.00	.92	8.00			2	0	.0
3.955	.0050					.0538	.21	.43	3.16	.884	.015			IR-COV	

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
3336.200	2834.865	.407	2835.272	40.00	12.28	2.34	2837.61	.00	.92	8.00			2	0	.0
3.728	.0050					.0627	.23	.41	3.39	.884	.015			IR-COV	
3339.928	2834.884	.388	2835.272	40.00	12.88	2.58	2837.85	.00	.92	8.00			2	0	.0
3.517	.0050					.0731	.26	.39	3.64	.884	.015			IR-COV	
3343.445	2834.902	.370	2835.272	40.00	13.51	2.83	2838.10	.00	.92	8.00			2	0	.0
3.317	.0050					.0852	.28	.37	3.91	.884	.015			IR-COV	
3346.762	2834.918	.353	2835.271	40.00	14.17	3.12	2838.39	.00	.92	8.00			2	0	.0
3.128	.0050					.0994	.31	.35	4.20	.884	.015			IR-COV	
3349.890	2834.934	.337	2835.270	40.00	14.86	3.43	2838.70	.00	.92	8.00			2	0	.0
2.949	.0050					.1159	.34	.34	4.51	.884	.015			IR-COV	
3352.839	2834.949	.321	2835.270	40.00	15.58	3.77	2839.04	.00	.92	8.00			2	0	.0
2.781	.0050					.1352	.38	.32	4.85	.884	.015			IR-COV	
3355.620	2834.963	.306	2835.269	40.00	16.34	4.15	2839.42	.00	.92	8.00			2	0	.0
2.621	.0050					.1578	.41	.31	5.21	.884	.015			IR-COV	
3358.241	2834.976	.292	2835.267	40.00	17.14	4.56	2839.83	.00	.92	8.00			2	0	.0
2.471	.0050					.1842	.46	.29	5.59	.884	.015			IR-COV	
3360.712	2834.988	.278	2835.266	40.00	17.98	5.02	2840.28	.00	.92	8.00			2	0	.0
2.328	.0050					.2150	.50	.28	6.01	.884	.015			IR-COV	

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip

L/Elem	Ch Slope				SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
3363.040	2835.000	.265	2835.265	40.00	18.86	5.52	2840.79	.00	.92	8.00		2	0 .0
JUNCT STR	.0000				.1447	.00	.27	6.45		.015			IR-COV

---------- WARNING - Junction Analysis - Irregular Channel----------
---------- WARNING - Junction Analysis - Change in Channel Type ----------

3363.040	2835.000	1.203	2836.203	40.00	17.12	4.55	2840.75	.00	2.13	2.50	2.500	.000	.00 1 .0
50.000	.0598				.0560	2.80	1.20	3.12	1.19	.015	.00	.00	PIPE
3413.040	2837.990	1.225	2839.215	40.00	16.72	4.34	2843.56	.00	2.13	2.50	2.500	.000	.00 1 .0
2.472	.0602				.0541	.13	1.22	3.01	1.19	.015	.00	.00	PIPE
3415.511	2838.139	1.227	2839.365	40.00	16.70	4.33	2843.69	.00	2.13	2.50	2.500	.000	.00 1 .0
36.927	.0602				.0508	1.88	1.23	3.01	1.19	.015	.00	.00	PIPE
3452.438	2840.361	1.273	2841.635	40.00	15.92	3.93	2845.57	.00	2.13	2.50	2.500	.000	.00 1 .0
19.997	.0602				.0447	.89	1.27	2.80	1.19	.015	.00	.00	PIPE
3472.436	2841.565	1.322	2842.887	40.00	15.18	3.58	2846.46	.00	2.13	2.50	2.500	.000	.00 1 .0
13.201	.0602				.0395	.52	1.32	2.60	1.19	.015	.00	.00	PIPE
3485.637	2842.359	1.374	2843.733	40.00	14.47	3.25	2846.99	.00	2.13	2.49	2.500	.000	.00 1 .0
9.514	.0602				.0348	.33	1.37	2.42	1.19	.015	.00	.00	PIPE

Program Package Serial Number: 7189

WATER SURFACE PROFILE LISTING Date: 3-22-2018 Time: 9:55:15

SKYE CANYON INFRASTRUCTURE - PHASE 3A
BY OLYMPIA COMPANIES
SKYE VILLAGE ROAD MAINLINE (NORTH ALIGNMENT)

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope				SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch	
3495.151	2842.932	1.428	2844.360	40.00	13.80	2.96	2847.32	.00	2.13	2.47	2.500	.000	.00	1 .0
7.187	.0602				.0308	.22	1.43	2.25	1.19	.015	.00	.00	PIPE	
3502.337	2843.365	1.486	2844.850	40.00	13.16	2.69	2847.54	.00	2.13	2.46	2.500	.000	.00	1 .0
5.572	.0602				.0272	.15	1.49	2.08	1.19	.015	.00	.00	PIPE	
3507.909	2843.700	1.547	2845.246	40.00	12.54	2.44	2847.69	.00	2.13	2.43	2.500	.000	.00	1 .0
4.368	.0602				.0241	.11	1.55	1.93	1.19	.015	.00	.00	PIPE	
3512.277	2843.963	1.611	2845.574	40.00	11.96	2.22	2847.79	.00	2.13	2.39	2.500	.000	.00	1 .0
3.434	.0602				.0214	.07	1.61	1.78	1.19	.015	.00	.00	PIPE	
3515.711	2844.169	1.680	2845.849	40.00	11.40	2.02	2847.87	.00	2.13	2.35	2.500	.000	.00	1 .0
2.667	.0602				.0191	.05	1.68	1.64	1.19	.015	.00	.00	PIPE	
3518.378	2844.330	1.754	2846.084	40.00	10.87	1.84	2847.92	.00	2.13	2.29	2.500	.000	.00	1 .0
2.017	.0602				.0170	.03	1.75	1.51	1.19	.015	.00	.00	PIPE	

3520.395	2844.451	1.834	2846.285	40.00	10.37	1.67	2847.95	.00	2.13	2.21	2.500	.000	.00	1	.0
1.438	.0602					.0152	.02	1.83	1.38	1.19	.015	.00	.00	PIPE	
3521.833	2844.538	1.921	2846.458	40.00	9.88	1.52	2847.98	.00	2.13	2.11	2.500	.000	.00	1	.0
.889	.0602					.0137	.01	1.92	1.26	1.19	.015	.00	.00	PIPE	
3522.722	2844.591	2.017	2846.608	40.00	9.42	1.38	2847.99	.00	2.13	1.97	2.500	.000	.00	1	.0
.318	.0602					.0125	.00	2.02	1.13	1.19	.015	.00	.00	PIPE	

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
3523.040	2844.610	2.129	2846.739	40.00	8.98	1.25	2847.99	.00	2.13	1.78	2.500	.000	.00	1	.0

SKYE CANYON INFRASTRUCTURE - PHASE 3A

BY OLYMPIA COMPANIES

SKYE VILLAGE ROAD MAINLINE (NORTH ALIGNMENT)

993.07	.I	C	HE		.	R
1004.22	.I	C	HE		.	R
1015.36	.				.	
1026.51	.				.	
1037.65	.I	C	WH		.	R
1048.80	.				.	
1059.94	.				.	
1071.09	. I	C	WH		.	R
1082.23	.				.	

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1093.38   .                                                                .
1104.52   .                                                                .
1115.67   . I          C                   WH                            .   R
1126.81   .                                                                .
1137.96   .                                                                .
1149.10   .                                                                .
1160.25   .                                                                .
1171.39   .                                                                .
1182.54   .                                                                .
1193.68   .                                                                .
1204.83   .                                                                .
1215.97   .                                                                .
1227.12   .                                                                .
1238.27   .                                                                .
1249.41   .   I          C                   W  H                          .   R
1260.56   .                                                                .
1271.70   .                                                                .
1282.85   .                                                                .
1293.99   .                                                                .
1305.14   .                                                                .
1316.28   .                                                                .
1327.43   .    I         C                   WE  H                         .   JX
1338.57   .    I         C                   WE  H                         .   R
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1349.72 . .

1360.86 . .

1372.01 . .

1383.15 . .

1394.30 . .

1405.44 . .

1416.59 . .

1427.73 . I C WE H . R

1438.88 . .

1450.02 . .

1461.17 . .

1472.32 . .

1483.46 . .

1494.61 . .

1505.75 . .

1516.90 . I C WE H . R

1528.04 . .

1539.19 . .

1550.33 . .

1561.48 . .

1572.62 . .

1583.77 . .

1594.91 . .

1606.06	.		I		C	WE	H	.	R
1617.20	.							.	
1628.35	.							.	
1639.49	.							.	
1650.64	.							.	
1661.78	.							.	
1672.93	.							.	
1684.08	.		I		C	WE	H	.	R
1695.22	.							.	
1706.37	.							.	
1717.51	.							.	
1728.66	.							.	
1739.80	.							.	
1750.95	.							.	
1762.09	.		I		C	WE	H	.	R
1773.24	.		I		C	WE	H	.	R
1784.38	.							.	
1795.53	.							.	
1806.67	.							.	
1817.82	.							.	
1828.96	.							.	
1840.11	.		I		C	WE	H	.	R
1851.25	.							.	

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1862.40   .                                                                .
1873.54   .                                                                .
1884.69   .                                                                .
1895.83   .                                                                .
1906.98   .              I          C          W E          H              .   R
1918.13   .                                                                .
1929.27   .                                                                .
1940.42   .              I          C          W E          H              .   JX
1951.56   .              I          C          WE           H              .   R
1962.71   .                                                                .
1973.85   .                                                                .
1985.00   .                                                                .
1996.14   .              I          C          WE           H              .   JX
2007.29   .              I          C          WE           H              .   R
2018.43   .                                                                .
2029.58   .                                                                .
2040.72   .                                                                .
2051.87   .                                                                .
2063.01   .              I          C          WE           H              .   R
2074.16   .                                                                .
2085.30   .                                                                .
2096.45   .                                                                .
2107.59   .                                                                .
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2118.74	.		I		C		WE		H	. R
2129.88	.									.
2141.03	.									.
2152.18	.									.
2163.32	.									.
2174.47	.									.
2185.61	.		I		C		WE		H	. R
2196.76	.									.
2207.90	.									.
2219.05	.									.
2230.19	.									.
2241.34	.		I		C		WE		H	. R
2252.48	.									.
2263.63	.									.
2274.77	.									.
2285.92	.		I		C		W E		H	. R
2297.06	.									.
2308.21	.									.
2319.35	.									.
2330.50	.									.
2341.64	.		I		C		W E		H	. R
2352.79	.									.
2363.93	.									.

2375.08 . .

2386.23 . I C W E H . R

2397.37 . .

2408.52 . .

2419.66 . .

2430.81 . I C W E H . R

2441.95 . .

2453.10 . .

2464.24 . .

2475.39 . I C W E H . R

2486.53 . .

2497.68 . .

2508.82 . .

2519.97 . I C W E H . R

2531.11 . .

2542.26 . .

2553.40 . .

2564.55 . I C W E H . R

2575.69 . .

2586.84 . .

2597.98 . I C W E H . R

2609.13 . .

2620.28 . .

| | | |

| | | |

3144.10	.	I C W	H	.	R	
3155.25	.	I C W	H	.	R	
3166.39	.	I C WE	H	.	R	
3177.54	.	I C WE	H	.	R	
3188.68	.	I C WE	H	.	R	
3199.83	.	I C WE	H	.	R	
3210.97	.	I CWE	H	.	R	
3222.12	.	I CWE	H	.	R	
3233.26	.	I W E	H	.	R	
3244.41	.	I W E	H	.	R	
3255.55	.	I W E	H	.	R	
3266.70	.	I W E	H	.	R	
3277.84	.	I WC E	H	.	R	
3288.99	.	I WC E	H	.	R	
3300.14	.	I WC E	H	.	R	
3311.28	.	I WC E	H	.	R	
3322.43	.	I WC E	H	.	R	
3333.57	.	I W C E	H	.	R	
3344.72	.	I W C E	H	.	R	
3355.86	.	I W C E	H	.	R	
3367.01	.	I W C E	H	.	R	
3378.15	.	I W C E	H	.	R	
3389.30	.	I W C E	H	.	R	

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   3400.44    .                                  I W C    E                  H                       .    R

   3411.59    .                                  I W C     E                 H                       .    R

   3422.73    .                                   IW C      E                H                       .    R

   3433.88    .                                   IW  C      E               H                       .    R

   3445.02    .                                   IW  C       E              H                       .    R

   3456.17    .                                   IW  C        E             H                       .    R

   3467.31    .                                   IW  C         E            H                       .    R

   3478.46    .                                   IW  C          E           H                       .    R

   3489.60    .                                   IW  C           E          H                       .    R

   3500.75    .                                   IW  C            E         H                       .    R

   3511.89    .                                   IW  C             E        H                       .    R

   3523.04    .                                   IW  C               E      H                       .    R

            2824.890  2827.200  2829.510  2831.820  2834.130  2836.440  2838.750  2841.060  2843.370  2845.680  2847.991
```

N O T E S
1. GLOSSARY
   I = INVERT ELEVATION
   C = CRITICAL DEPTH
   W = WATER SURFACE ELEVATION
   S = SUPER-ELEVATION
   H = HEIGHT OF CHANNEL
   E = ENERGY GRADE LINE
   X = CURVES CROSSING OVER
   B = BRIDGE ENTRANCE OR EXIT
   Y = WALL ENTRANCE OR EXIT
2. STATIONS FOR POINTS AT A JUMP MAY NOT BE PLOTTED EXACTLY

Model "USVR"

Ultimate Condition WSPG Summary
Skye Village Road - USVR Model

WSPG Station	Plan Station	Storm Drain Dimension	Invert Elevation (ft)	Q_{100} (cfs)	WSE (ft)	Velocity (ft/s)	FG Elevation	HGL Check[1]
823.07	N/A	12'x 9' RCA	2824.25	1325	2833.25	13.02	2837.47	OK
903.07	N/A	12'x 9' RCA	2824.57	1325	2833.63	13.02	2837.87	OK
953.07	N/A	Transition	2824.77	1325	2835.73	8.18	2838.12	OK
993.07	63+35.32	Confluence Structure	2824.89	1325	2835.80	8.18	2838.32	OK
993.07	63+35.32	18' x 9' RCB	2824.89	1000	2834.84	11.70	2838.32	OK
1028.07	63+00.36	10'x 9' RCA	2825.03	1000	2834.99	11.70	2838.49	OK
1069.07	62+63.62	10'x 9' RCA	2825.20	1000	2835.48	11.70	2838.84	OK
1110.07	62+26.89	10'x 9' RCA	2825.36	1000	2835.96	11.70	2838.65	OK
1110.07	62+26.89	10'x 9' RCA	2825.36	1000	2836.02	11.61	2838.65	OK
1320.07	60+16.6	10'x 9' RCA	2826.20	992	2836.91	11.61	2839.87	OK
1320.07	60+16.6	10'x 9' RCA	2826.20	983	2836.98	11.51	2839.87	OK
1762.57	55+75.47	10'x 9' RCA	2827.97	983	2838.82	11.51	2842.44	OK
1762.57	55+75.47	10'x 9' RCA	2827.97	932	2839.14	10.91	2842.44	OK
1935.07	54+02.47	10'x 9' RCA	2828.66	932	2839.79	10.91	2843.45	OK
1935.07	54+02.47	10'x 9' RCA	2828.66	879	2840.12	10.29	2843.45	OK
1995.07	53+41.82	10'x 9' RCA	2828.90	879	2840.32	10.29	2843.80	OK
1995.07	53+41.82	10'x 9' RCA	2828.90	876	2840.34	10.25	2843.80	OK
2635.07	47+01.51	10'x 9' RCA	2831.46	876	2842.46	10.25	2847.53	OK
2670.07	46+66.51	Transition	2831.58	876	2843.76	6.49	2847.74	OK
2700.07	46+36.51	Confluence Structure	2831.68	876	2843.46	8.34	2847.91	OK
2700.07	46+36.51	15' x 7' RCB	2831.68	487	2843.24	9.16	2847.91	OK
2725.07	46+11.11	8'x 7' RCA	2831.80	487	2843.33	9.16	2848.06	OK
2742.07	45+94.05	8'x 7' RCA	2831.89	487	2843.52	9.16	2848.16	OK
2759.07	45+77.	8'x 7' RCA	2831.98	487	2843.70	9.16	2848.26	OK
2829.07	45+06.25	8'x 7' RCA	2832.33	487	2843.95	9.16	2848.67	OK
2829.07	45+06.25	8'x 7' RCA	2832.33	483	2843.99	9.08	2848.67	OK
3035.39	42+99.93	8'x 7' RCA	2833.36	483	2844.73	9.08	2849.88	OK
3035.39	42+99.93	8'x 7' RCA	2833.36	481	2844.75	9.04	2849.88	OK
3077.93	42+57.39	8'x 7' RCA	2833.57	481	2844.90	9.04	2850.12	OK
3077.93	42+57.39	8'x 7' RCA	2833.57	479	2844.92	9.00	2850.12	OK
3363.04	39+72.28	8'x 7' RCA	2835.00	479	2845.92	9.00	2851.79	OK
3363.04	39+72.28	8'x 7' RCA	2835.00	446	2846.16	8.38	2851.79	OK
3409.98	39+25.34	8'x 7' RCA	2835.23	446	2846.31	8.38	2852.72	OK
3457.10	38+82.92	8'x 7' RCA	2835.47	446	2846.60	8.38	2853.32	OK
3475.10	38+70.17	8'x 7' RCA	2835.56	446	2846.66	8.38	2853.65	OK

3485.53	38+58.	8'x 7' RCA	2835.64	446	2846.76	8.38	2853.74	OK
3485.53	38+58.	8'x 7' RCA	2835.64	412	2846.96	7.75	2853.74	OK
3521.47	38+28.5	8'x 7' RCA	2835.79	412	2847.17	7.75	2853.99	OK
3564.47	37+85.2	8'x 7' RCA	2836.01	412	2847.28	7.75	2854.35	OK
3574.47	37+75.2	Transition	2836.06	412	2846.96	10.30	2854.42	OK
3648.47	37+00.3	5' x 8' RCB	2836.81	412	2847.66	10.30	2855.00	OK
3648.47	37+00.3	5' x 8' RCB	2836.81	359	2844.65	18.28	2855.00	OK
3703.97	N/A	60" RCP	2838.47	359	2847.08	18.28	2856.00	OK
3739.41	N/A	60" RCP	2839.49	359	2848.24	18.28	2856.00	OK
4044.33	N/A	60" RCP	2846.84	359	2856.21	18.28	2860.50	OK
4121.33	N/A	60" RCP	2848.69	359	2858.95	18.28	2861.00	OK
4121.33	N/A	60" RCP	2848.69	359	2858.95	18.28	2861.00	OK

1 - 'HGL Check' reflects the minimum 1-ft below finished grade.

FG assumed at a constant slope of 0.58% downstream of the proposed facilities

```
T1 SKYE CANYON INFRASTRUCTURE - PHASE 3A
T2 BY OLYMPIA COMPANIES
T3 SKYE VILLAGE ROAD MAINLINE (ULTIMATE CONDITION)
SO    823.0702824.250 11      .015                2833.250
R     903.0702824.570 11      .015
TS    953.0702824.770  5      .015
R     993.0702824.890  5      .015
JX    993.0702824.890  3  6   .015  325.000         2824.890          00.0
R    1028.0702825.030  3      .015
R    1069.0702825.200  3      .015                                  46.983    .000 0
R    1110.0702825.360  3      .015                                 -46.983    .000 0
JX   1110.0702825.360  3 18   .015    8.500         2826.440          45.0
R    1320.0702826.200  3      .015
JX   1320.0702826.200  3 18   .015    8.500         2826.200          60.0
R    1762.5702827.970  3      .015
JX   1762.5702827.970  3 36   .015   51.000         2827.970          45.0
R    1935.0702828.660  3      .015
JX   1935.0702828.660  3 42   .015   53.000         2828.660          45.0
R    1995.0702828.900  3      .015
JX   1995.0702828.900  3 18   .015    3.0           2828.90           60.0
R    2635.0702831.460  3      .015
TS   2670.0702831.580  9      .015
TS   2700.0702831.680  8      .015
JX   2700.0702831.680  2  6   .015  389.0           2831.68           00.0
R    2725.0702831.800  2      .015
R    2742.0702831.890  2      .015                                  19.481    .000 0
R    2759.0702831.980  2      .015                                 -19.481    .000 0
R    2829.0702832.330  2      .015
JX   2829.0702832.330  2 18 18.015    2.0      2.0  2732.30 2732.30  60.0 60.0
R    3035.3902833.360  2      .015
JX   3035.3902833.360  2 18   .015    2.000         2833.360          46.0
R    3077.9302833.570  2      .015
JX   3077.9302833.570  2 18   .015    2.000         2833.570          60.0
R    3363.0402835.000  2      .015
JX   3363.0402835.000  2 30   .015   33.500         2835.000          45.0
R    3409.9802835.230  2      .015
R    3457.1002835.470  2      .015                                  44.996    .000 0
R    3475.1002835.560  2      .015
R    3485.5302835.640  2      .015                                  -9.960    .000 0
JX   3485.5302835.640  2 30   .015   33.500         2835.640          27.0
R    3521.4702835.790  2      .015                                 -34.320    .000 0
R    3564.4702836.010  2      .015
TS   3574.4702836.060 10      .015
R    3648.4702836.810 10      .015                                      45.00
JX   3648.4702836.810 60 30   .015   53.000         2836.810          00.0
R    3703.9702838.470 60      .015                                     45.00 1
R    3739.4102839.490 60      .015                                           1
R    4044.3302846.840 60      .015                                           1
R    4121.3302848.690 60      .015                                    -46.00
SH   4121.3302848.690 60      .015
CD   5  3   0    .000   9.000   18.000  .000  .000   .00
CD   6  3   0    .000   6.000    6.000  .000  .000   .00
CD   7  3   0    .000   4.000    8.000  .000  .000   .00
CD   8  3   0    .000   7.000   15.000  .000  .000   .00
CD   9  3   0    .000   9.000   15.000  .000  .000   .00
CD  10  3   0    .000   5.000    8.000  .000  .000   .00
CD  18  4   1    .000   1.500     .000  .000  .000   .00
CD  24  4   1    .000   2.000     .000  .000  .000   .00
CD  30  4   1    .000   2.500     .000  .000  .000   .00
CD  36  4   1    .000   3.000     .000  .000  .000   .00
CD  42  4   1    .000   3.500     .000  .000  .000   .00
CD  48  4   1    .000   4.000     .000  .000  .000   .00
CD  54  4   1    .000   4.500     .000  .000  .000   .00
CD  60  4   1    .000   5.000     .000  .000  .000   .00
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CD  72  4   1    .000   6.000     .000  .000  .000   .00
CD   1  6   0      0.0     0.0      0.0     0.0    0.0    0.0
CD   2  6   0      0.0     0.0      0.0     0.0    0.0    0.0
CD   3  6   0      0.0     0.0      0.0     0.0    0.0    0.0
CD   4  6   0      0.0     0.0      0.0     0.0    0.0    0.0
CD  11  6   0      0.0     0.0      0.0     0.0    0.0    0.0
PTS  121   .000   .000 10.000   .000 10.000   .010 10.000  5.500  9.490  6.870
PTS       9.000  7.280  8.500  7.500  8.000  7.630  7.520  7.740  7.000  7.840
PTS       6.000  7.960  5.000  8.000  4.000  7.960  3.000  7.840  2.480  7.740
PTS       2.000  7.630  1.500  7.500  1.000  7.280   .510  6.870   .000  5.500
PTS        .000   .010
PTS  221   .000   .000  8.000   .000  8.000   .010  8.000  5.000  7.900  5.570
PTS       7.700  5.950  7.500  6.190  7.250  6.390  7.000  6.530  6.000  6.800
PTS       5.000  6.950  4.000  7.000  3.000  6.950  2.000  6.800  1.000  6.530
PTS        .750  6.390   .500  6.190   .300  5.950   .100  5.570   .000  5.000
PTS        .000   .010
PTS  321  0.000  0.000 10.000  0.000 10.000  0.010 10.000  6.500  9.490  7.870
PTS       9.000  8.280  8.500  8.500  8.000  8.630  7.520  8.740  7.000  8.840
PTS       6.000  8.960  5.000  9.000  4.000  8.960  3.000  8.840  2.480  8.740
PTS       2.000  8.630  1.500  8.500  1.000  8.280  0.510  7.870  0.000  6.500
PTS       0.000  0.010
PTS  421  0.000  0.000  8.000  0.000  8.000  0.010  8.000  6.000  7.900  6.570
PTS       7.700  6.950  7.500  7.190  7.250  7.390  7.000  7.530  6.000  7.800
PTS       5.000  7.950  4.000  8.000  3.000  7.950  2.000  7.800  1.000  7.530
PTS       0.750  7.390  0.500  7.190  0.300  6.950  0.100  6.570  0.000  6.000
PTS       0.000  0.010
PTS 1121  0.000  0.000 12.000  0.000 12.000  5.990 11.790  7.000 11.480  7.530
PTS      11.000  8.000 10.480  8.300 10.000  8.460  9.000  8.700  8.000  8.870
PTS       7.000  8.970  6.000  9.000  5.000  8.970  4.000  8.870  3.000  8.700
PTS       2.000  8.460  1.520  8.300  1.000  8.000  0.520  7.530  0.210  7.000
PTS       0.000  6.010
Q           359.000   .0
```

FILE: USVR.WSW W S P G W - EDIT LISTING - Version 14.10 Date: 3-29-2018 Time: 9: 7: 7

WATER SURFACE PROFILE - CHANNEL DEFINITION LISTING

CARD CODE	SECT NO	CHN TYPE	NO OF PIER/PIP	AVE PIER WIDTH	HEIGHT 1 DIAMETER	BASE WIDTH	ZL	ZR	INV DROP	Y(1)	Y(2)	Y(3)	Y(4)	Y(5)	Y(6)	Y(7)	Y(8)	Y(9)	Y(10)
CD	5	3	0	.000	9.000	18.000	.000	.000	.00										
CD	6	3	0	.000	6.000	6.000	.000	.000	.00										
CD	7	3	0	.000	4.000	8.000	.000	.000	.00										
CD	8	3	0	.000	7.000	15.000	.000	.000	.00										
CD	9	3	0	.000	9.000	15.000	.000	.000	.00										
CD	10	3	0	.000	5.000	8.000	.000	.000	.00										
CD	18	4	1		1.500														
CD	24	4	1		2.000														
CD	30	4	1		2.500														
CD	36	4	1		3.000														
CD	42	4	1		3.500														
CD	48	4	1		4.000														
CD	54	4	1		4.500														
CD	60	4	1		5.000														
CD	72	4	1		6.000														
CD	1	6	0	.000															
CD	2	6	0	.000															
CD	3	6	0	.000															
CD	4	6	0	.000															
CD	11	6	0	.000															

FILE: W S P G W - EDIT LISTING - Version 14.10 Date: 3-29-2018 Time: 9: 7: 7

WATER SURFACE PROFILE - CROSS SECTION POINT LISTING

CARD CODE	SECT NO	NO OF POINTS	X(1) , Y(1) X(8) , Y(8)	X(2) , Y(2) X(9) , Y(9)	X(3) , Y(3) X(10) ,Y(10)	X(4) , Y(4) X(11) ,Y(11)	X(5) , Y(5) X(N) , Y(N)	X(6) , Y(6) X(N+1),Y(N+1)	X(7) , Y(7) X(35) ,Y(35)					
PTS	1	21	.000	.000	10.000	.000	10.000	.010	10.000	5.500	9.490	6.870	9.000	7.280	8.500	7.500
PTS			8.000	7.630	7.520	7.740	7.000	7.840	6.000	7.960	5.000	8.000	4.000	7.960	3.000	7.840
PTS			2.480	7.740	2.000	7.630	1.500	7.500	1.000	7.280	.510	6.870	.000	5.500	.000	.010
PTS	2	21	.000	.000	8.000	.000	8.000	.010	8.000	5.000	7.900	5.570	7.700	5.950	7.500	6.190
PTS			7.250	6.390	7.000	6.530	6.000	6.800	5.000	6.950	4.000	7.000	3.000	6.950	2.000	6.800
PTS			1.000	6.530	.750	6.390	.500	6.190	.300	5.950	.100	5.570	.000	5.000	.000	.010
PTS	3	21	.000	.000	10.000	.000	10.000	.010	10.000	6.500	9.490	7.870	9.000	8.280	8.500	8.500
PTS			8.000	8.630	7.520	8.740	7.000	8.840	6.000	8.960	5.000	9.000	4.000	8.960	3.000	8.840
PTS			2.480	8.740	2.000	8.630	1.500	8.500	1.000	8.280	.510	7.870	.000	6.500	.000	.010
PTS	4	21	.000	.000	8.000	.000	8.000	.010	8.000	6.000	7.900	6.570	7.700	6.950	7.500	7.190
PTS			7.250	7.390	7.000	7.530	6.000	7.800	5.000	7.950	4.000	8.000	3.000	7.950	2.000	7.800
PTS			1.000	7.530	.750	7.390	.500	7.190	.300	6.950	.100	6.570	.000	6.000	.000	.010
PTS	11	21	.000	.000	12.000	.000	12.000	5.990	11.790	7.000	11.480	7.530	11.000	8.000	10.480	8.300
PTS			10.000	8.460	9.000	8.700	8.000	8.870	7.000	8.970	6.000	9.000	5.000	8.970	4.000	8.870
PTS			3.000	8.700	2.000	8.460	1.520	8.300	1.000	8.000	.520	7.530	.210	7.000	.000	6.010

W S P G W

WATER SURFACE PROFILE - TITLE CARD LISTING

HEADING LINE NO 1 IS -

SKYE CANYON INFRASTRUCTURE - PHASE 3A

HEADING LINE NO 2 IS -

BY OLYMPIA COMPANIES

HEADING LINE NO 3 IS -

SKYE VILLAGE ROAD MAINLINE (ULTIMATE CONDITION)

W S P G W

WATER SURFACE PROFILE - ELEMENT CARD LISTING

ELEMENT NO 1 IS A SYSTEM OUTLET * *

U/S DATA	STATION	INVERT	SECT	W S ELEV
	823.070	2824.250	11	2833.250

ELEMENT NO 2 IS A REACH * *

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	903.070	2824.570	11	.015	.000	.000	.000	0

ELEMENT NO 3 IS A TRANSITION * *

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE
	953.070	2824.770	5	.015	.000	.000

ELEMENT NO 4 IS A REACH * *

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	993.070	2824.890	5	.015	.000	.000	.000	0

ELEMENT NO 5 IS A JUNCTION * * * * * *

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

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                                                                                                    USVR
                              993.070 2824.890    3     6     0   .015   325.000      .000  2824.890      .000    .000     .000
                                                                                                  RADIUS    ANGLE
                                                                                                    .000    .000
THE ABOVE ELEMENT CONTAINED AN INVERT ELEV WHICH WAS NOT GREATER THAN THE PREVIOUS INVERT ELEV -WARNING
THE ABOVE ELEMENT CONTAINED AN INVERT ELEV WHICH WAS NOT GREATER THAN THE PREVIOUS INVERT ELEV -WARNING
 ELEMENT NO   6 IS A REACH            *         *     *
                     U/S DATA   STATION    INVERT  SECT               N                           RADIUS    ANGLE     ANG PT  MAN H
                                1028.070 2825.030    3               .015                            .000     .000      .000     0
 ELEMENT NO   7 IS A REACH            *         *     *
                     U/S DATA   STATION    INVERT  SECT               N                           RADIUS    ANGLE     ANG PT  MAN H
                                1069.070 2825.200    3               .015                          50.000   46.983      .000     0
 ELEMENT NO   8 IS A REACH            *         *     *
                     U/S DATA   STATION    INVERT  SECT               N                           RADIUS    ANGLE     ANG PT  MAN H
                                1110.070 2825.360    3               .015                          50.000  -46.983      .000     0
 ELEMENT NO   9 IS A JUNCTION         *         *     *     *                 *                       *                 *
                     U/S DATA   STATION    INVERT  SECT LAT-1 LAT-2   N      Q3        Q4     INVERT-3 INVERT-4  PHI 3  PHI 4
                                1110.070 2825.360    3    18     0   .015     8.500      .000  2826.440      .000  45.000     .000
                                                                                                  RADIUS    ANGLE
                                                                                                    .000    .000
THE ABOVE ELEMENT CONTAINED AN INVERT ELEV WHICH WAS NOT GREATER THAN THE PREVIOUS INVERT ELEV -WARNING
THE ABOVE ELEMENT CONTAINED AN INVERT ELEV WHICH WAS NOT GREATER THAN THE PREVIOUS INVERT ELEV -WARNING
                                          W S P G W                                                                 PAGE NO   3
                          WATER SURFACE PROFILE - ELEMENT CARD LISTING
 ELEMENT NO  10 IS A REACH            *         *     *
                     U/S DATA   STATION    INVERT  SECT               N                           RADIUS    ANGLE     ANG PT  MAN H
                                1320.070 2826.200    3               .015                            .000     .000      .000     0
 ELEMENT NO  11 IS A JUNCTION         *         *     *     *                 *                       *                 *
                     U/S DATA   STATION    INVERT  SECT LAT-1 LAT-2   N      Q3        Q4     INVERT-3 INVERT-4  PHI 3  PHI 4
                                1320.070 2826.200    3    18     0   .015     8.500      .000  2826.200      .000  60.000     .000
                                                                                                  RADIUS    ANGLE
                                                                                                    .000    .000
THE ABOVE ELEMENT CONTAINED AN INVERT ELEV WHICH WAS NOT GREATER THAN THE PREVIOUS INVERT ELEV -WARNING
THE ABOVE ELEMENT CONTAINED AN INVERT ELEV WHICH WAS NOT GREATER THAN THE PREVIOUS INVERT ELEV -WARNING
 ELEMENT NO  12 IS A REACH            *         *     *
                     U/S DATA   STATION    INVERT  SECT               N                           RADIUS    ANGLE     ANG PT  MAN H
                                1762.570 2827.970    3               .015                            .000     .000      .000     0
 ELEMENT NO  13 IS A JUNCTION         *         *     *     *                 *                       *                 *
                     U/S DATA   STATION    INVERT  SECT LAT-1 LAT-2   N      Q3        Q4     INVERT-3 INVERT-4  PHI 3  PHI 4
                                1762.570 2827.970    3    36     0   .015    51.000      .000  2827.970      .000  45.000     .000
                                                                                                  RADIUS    ANGLE
                                                                                                    .000    .000
THE ABOVE ELEMENT CONTAINED AN INVERT ELEV WHICH WAS NOT GREATER THAN THE PREVIOUS INVERT ELEV -WARNING
THE ABOVE ELEMENT CONTAINED AN INVERT ELEV WHICH WAS NOT GREATER THAN THE PREVIOUS INVERT ELEV -WARNING
 ELEMENT NO  14 IS A REACH            *         *     *
                     U/S DATA   STATION    INVERT  SECT               N                           RADIUS    ANGLE     ANG PT  MAN H
                                1935.070 2828.660    3               .015                            .000     .000      .000     0
 ELEMENT NO  15 IS A JUNCTION         *         *     *     *                 *                       *                 *
                     U/S DATA   STATION    INVERT  SECT LAT-1 LAT-2   N      Q3        Q4     INVERT-3 INVERT-4  PHI 3  PHI 4
                                1935.070 2828.660    3    42     0   .015    53.000      .000  2828.660      .000  45.000     .000
                                                                                                  RADIUS    ANGLE
                                                                                                    .000    .000
THE ABOVE ELEMENT CONTAINED AN INVERT ELEV WHICH WAS NOT GREATER THAN THE PREVIOUS INVERT ELEV -WARNING
THE ABOVE ELEMENT CONTAINED AN INVERT ELEV WHICH WAS NOT GREATER THAN THE PREVIOUS INVERT ELEV -WARNING
 ELEMENT NO  16 IS A REACH            *         *     *
                     U/S DATA   STATION    INVERT  SECT               N                           RADIUS    ANGLE     ANG PT  MAN H
                                1995.070 2828.900    3               .015                            .000     .000      .000     0
                                          W S P G W                                                                 PAGE NO   4
                          WATER SURFACE PROFILE - ELEMENT CARD LISTING
 ELEMENT NO  17 IS A JUNCTION         *         *     *     *                 *                       *                 *
                     U/S DATA   STATION    INVERT  SECT LAT-1 LAT-2   N      Q3        Q4     INVERT-3 INVERT-4  PHI 3  PHI 4
                                1995.070 2828.900    3    18     0   .015     3.000      .000  2828.900      .000  60.000     .000
                                                                                                  RADIUS    ANGLE
                                                                                                    .000    .000
THE ABOVE ELEMENT CONTAINED AN INVERT ELEV WHICH WAS NOT GREATER THAN THE PREVIOUS INVERT ELEV -WARNING
THE ABOVE ELEMENT CONTAINED AN INVERT ELEV WHICH WAS NOT GREATER THAN THE PREVIOUS INVERT ELEV -WARNING
 ELEMENT NO  18 IS A REACH            *         *     *
                     U/S DATA   STATION    INVERT  SECT               N                           RADIUS    ANGLE     ANG PT  MAN H
                                2635.070 2831.460    3               .015                            .000     .000      .000     0
 ELEMENT NO  19 IS A TRANSITION       *         *     *
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                                                                                                    USVR
                  U/S DATA   STATION    INVERT  SECT               N                               RADIUS   ANGLE
                             2670.070 2831.580    9               .015                               .000     .000
 ELEMENT NO  20 IS A TRANSITION        *         *     *
                  U/S DATA   STATION    INVERT  SECT               N                               RADIUS   ANGLE
                             2700.070 2831.680    8               .015                               .000     .000
 ELEMENT NO  21 IS A JUNCTION          *         *     *     *               *                         *              *
                  U/S DATA   STATION    INVERT  SECT LAT-1 LAT-2   N      Q3        Q4     INVERT-3 INVERT-4  PHI 3  PHI 4
                             2700.070 2831.680    2     6     0   .015   389.000      .000  2831.680      .000    .000     .000
                                                                                               RADIUS    ANGLE
                                                                                                 .000    .000
THE ABOVE ELEMENT CONTAINED AN INVERT ELEV WHICH WAS NOT GREATER THAN THE PREVIOUS INVERT ELEV -WARNING
THE ABOVE ELEMENT CONTAINED AN INVERT ELEV WHICH WAS NOT GREATER THAN THE PREVIOUS INVERT ELEV -WARNING
 ELEMENT NO  22 IS A REACH             *         *     *
                  U/S DATA   STATION    INVERT  SECT               N                               RADIUS    ANGLE     ANG PT  MAN H
                             2725.070 2831.800    2               .015                               .000     .000      .000     0
 ELEMENT NO  23 IS A REACH             *         *     *
                  U/S DATA   STATION    INVERT  SECT               N                               RADIUS    ANGLE     ANG PT  MAN H
                             2742.070 2831.890    2               .015                             49.999   19.481      .000     0
 ELEMENT NO  24 IS A REACH             *         *     *
                  U/S DATA   STATION    INVERT  SECT               N                               RADIUS    ANGLE     ANG PT  MAN H
                             2759.070 2831.980    2               .015                             49.999  -19.481      .000     0
 ELEMENT NO  25 IS A REACH             *         *     *
                  U/S DATA   STATION    INVERT  SECT               N                               RADIUS    ANGLE     ANG PT  MAN H
                             2829.070 2832.330    2               .015                               .000     .000      .000     0
                                                W S P G W                                                                  PAGE NO   5
                          WATER SURFACE PROFILE - ELEMENT CARD LISTING
 ELEMENT NO  26 IS A JUNCTION          *         *     *     *               *                         *              *
                  U/S DATA   STATION    INVERT  SECT LAT-1 LAT-2   N      Q3        Q4     INVERT-3 INVERT-4  PHI 3  PHI 4
                             2829.070 2832.330    2    18    18   .015     2.000     2.000  2732.300  2732.300  60.000   60.000
                                                                                               RADIUS    ANGLE
                                                                                                 .000    .000
THE ABOVE ELEMENT CONTAINED AN INVERT ELEV WHICH WAS NOT GREATER THAN THE PREVIOUS INVERT ELEV -WARNING
THE ABOVE ELEMENT CONTAINED AN INVERT ELEV WHICH WAS NOT GREATER THAN THE PREVIOUS INVERT ELEV -WARNING
 ELEMENT NO  27 IS A REACH             *         *     *
                  U/S DATA   STATION    INVERT  SECT               N                               RADIUS    ANGLE     ANG PT  MAN H
                             3035.390 2833.360    2               .015                               .000     .000      .000     0
 ELEMENT NO  28 IS A JUNCTION          *         *     *     *               *                         *              *
                  U/S DATA   STATION    INVERT  SECT LAT-1 LAT-2   N      Q3        Q4     INVERT-3 INVERT-4  PHI 3  PHI 4
                             3035.390 2833.360    2    18     0   .015     2.000      .000  2833.360      .000  46.000     .000
                                                                                               RADIUS    ANGLE
                                                                                                 .000    .000
THE ABOVE ELEMENT CONTAINED AN INVERT ELEV WHICH WAS NOT GREATER THAN THE PREVIOUS INVERT ELEV -WARNING
THE ABOVE ELEMENT CONTAINED AN INVERT ELEV WHICH WAS NOT GREATER THAN THE PREVIOUS INVERT ELEV -WARNING
 ELEMENT NO  29 IS A REACH             *         *     *
                  U/S DATA   STATION    INVERT  SECT               N                               RADIUS    ANGLE     ANG PT  MAN H
                             3077.930 2833.570    2               .015                               .000     .000      .000     0
 ELEMENT NO  30 IS A JUNCTION          *         *     *     *               *                         *              *
                  U/S DATA   STATION    INVERT  SECT LAT-1 LAT-2   N      Q3        Q4     INVERT-3 INVERT-4  PHI 3  PHI 4
                             3077.930 2833.570    2    18     0   .015     2.000      .000  2833.570      .000  60.000     .000
                                                                                               RADIUS    ANGLE
                                                                                                 .000    .000
THE ABOVE ELEMENT CONTAINED AN INVERT ELEV WHICH WAS NOT GREATER THAN THE PREVIOUS INVERT ELEV -WARNING
THE ABOVE ELEMENT CONTAINED AN INVERT ELEV WHICH WAS NOT GREATER THAN THE PREVIOUS INVERT ELEV -WARNING
 ELEMENT NO  31 IS A REACH             *         *     *
                  U/S DATA   STATION    INVERT  SECT               N                               RADIUS    ANGLE     ANG PT  MAN H
                             3363.040 2835.000    2               .015                               .000     .000      .000     0
 ELEMENT NO  32 IS A JUNCTION          *         *     *     *               *                         *              *
                  U/S DATA   STATION    INVERT  SECT LAT-1 LAT-2   N      Q3        Q4     INVERT-3 INVERT-4  PHI 3  PHI 4
                             3363.040 2835.000    2    30     0   .015    33.500      .000  2835.000      .000  45.000     .000
                                                                                               RADIUS    ANGLE
                                                                                                 .000    .000
THE ABOVE ELEMENT CONTAINED AN INVERT ELEV WHICH WAS NOT GREATER THAN THE PREVIOUS INVERT ELEV -WARNING
THE ABOVE ELEMENT CONTAINED AN INVERT ELEV WHICH WAS NOT GREATER THAN THE PREVIOUS INVERT ELEV -WARNING
                                                W S P G W                                                                  PAGE NO   6
                          WATER SURFACE PROFILE - ELEMENT CARD LISTING
 ELEMENT NO  33 IS A REACH             *         *     *
                  U/S DATA   STATION    INVERT  SECT               N                               RADIUS    ANGLE     ANG PT  MAN H
                             3409.980 2835.230    2               .015                               .000     .000      .000     0
 ELEMENT NO  34 IS A REACH             *         *     *
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                                                                                                    USVR
                    U/S DATA   STATION    INVERT  SECT               N                             RADIUS    ANGLE     ANG PT  MAN H
                               3457.100 2835.470    2               .015                           60.001   44.996      .000     0
 ELEMENT NO  35 IS A REACH              *         *     *
                    U/S DATA   STATION    INVERT  SECT               N                             RADIUS    ANGLE     ANG PT  MAN H
                               3475.100 2835.560    2               .015                            .000     .000      .000     0
 ELEMENT NO  36 IS A REACH              *         *     *
                    U/S DATA   STATION    INVERT  SECT               N                             RADIUS    ANGLE     ANG PT  MAN H
                               3485.530 2835.640    2               .015                           59.999   -9.960      .000     0
 ELEMENT NO  37 IS A JUNCTION           *         *     *     *               *                       *               *
                    U/S DATA   STATION    INVERT  SECT LAT-1 LAT-2   N      Q3        Q4     INVERT-3 INVERT-4  PHI 3  PHI 4
                               3485.530 2835.640    2    30     0   .015    33.500      .000  2835.640      .000  27.000     .000
                                                                                                  RADIUS    ANGLE
                                                                                                    .000    .000

THE ABOVE ELEMENT CONTAINED AN INVERT ELEV WHICH WAS NOT GREATER THAN THE PREVIOUS INVERT ELEV -WARNING
THE ABOVE ELEMENT CONTAINED AN INVERT ELEV WHICH WAS NOT GREATER THAN THE PREVIOUS INVERT ELEV -WARNING
 ELEMENT NO  38 IS A REACH              *         *     *
                    U/S DATA   STATION    INVERT  SECT               N                             RADIUS    ANGLE     ANG PT  MAN H
                               3521.470 2835.790    2               .015                           60.000  -34.320      .000     0
 ELEMENT NO  39 IS A REACH              *         *     *
                    U/S DATA   STATION    INVERT  SECT               N                             RADIUS    ANGLE     ANG PT  MAN H
                               3564.470 2836.010    2               .015                            .000     .000      .000     0
 ELEMENT NO  40 IS A TRANSITION         *         *     *
                    U/S DATA   STATION    INVERT  SECT               N                             RADIUS   ANGLE
                               3574.470 2836.060   10               .015                            .000     .000
 ELEMENT NO  41 IS A REACH              *         *     *
                    U/S DATA   STATION    INVERT  SECT               N                             RADIUS    ANGLE     ANG PT  MAN H
                               3648.470 2836.810   10               .015                            .000     .000    45.000     0
 ELEMENT NO  42 IS A JUNCTION           *         *     *     *               *                       *               *
                    U/S DATA   STATION    INVERT  SECT LAT-1 LAT-2   N      Q3        Q4     INVERT-3 INVERT-4  PHI 3  PHI 4
                               3648.470 2836.810   60    30     0   .015    53.000      .000  2836.810      .000    .000     .000
                                                                                                  RADIUS    ANGLE
                                                                                                    .000    .000

THE ABOVE ELEMENT CONTAINED AN INVERT ELEV WHICH WAS NOT GREATER THAN THE PREVIOUS INVERT ELEV -WARNING
THE ABOVE ELEMENT CONTAINED AN INVERT ELEV WHICH WAS NOT GREATER THAN THE PREVIOUS INVERT ELEV -WARNING
                                        W S P G W                                                                   PAGE NO   7
                         WATER SURFACE PROFILE - ELEMENT CARD LISTING
 ELEMENT NO  43 IS A REACH              *         *     *
                    U/S DATA   STATION    INVERT  SECT               N                             RADIUS    ANGLE     ANG PT  MAN H
                               3703.970 2838.470   60               .015                            .000     .000    45.000     1
 ELEMENT NO  44 IS A REACH              *         *     *
                    U/S DATA   STATION    INVERT  SECT               N                             RADIUS    ANGLE     ANG PT  MAN H
                               3739.410 2839.490   60               .015                            .000     .000      .000     1
 ELEMENT NO  45 IS A REACH              *         *     *
                    U/S DATA   STATION    INVERT  SECT               N                             RADIUS    ANGLE     ANG PT  MAN H
                               4044.330 2846.840   60               .015                            .000     .000      .000     1
 ELEMENT NO  46 IS A REACH              *         *     *
                    U/S DATA   STATION    INVERT  SECT               N                             RADIUS    ANGLE     ANG PT  MAN H
                               4121.330 2848.690   60               .015                            .000     .000   -46.000     0
 ELEMENT NO  47 IS A SYSTEM HEADWORKS                 *                     *
                    U/S DATA   STATION    INVERT  SECT                                      W S ELEV
                               4121.330 2848.690   60                                         .000
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Program Package Serial Number: 7189

WATER SURFACE PROFILE LISTING Date: 3-29-2018 Time: 9: 7:10

SKYE CANYON INFRASTRUCTURE - PHASE 3A

BY OLYMPIA COMPANIES

SKYE VILLAGE ROAD MAINLINE (ULTIMATE CONDITION)

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
823.070	2824.250	9.000	2833.250	1325.00	13.02	2.63	2835.88	.00	7.14	.00		11		0 .0
80.000	.0040					.0048	.38	9.00	.00	8.070	.015			IR-COV
903.070	2824.570	9.064	2833.634	1325.00	13.02	2.63	2836.27	.00	7.14	.00		11		0 .0
TRANS STR	.0040					.0016	.08	9.06	.00		.015			IR-COV
953.070	2824.770	10.962	2835.732	1325.00	8.18	1.04	2836.77	.00	5.52	18.00	9.000	18.000	.00	0 .0
40.000	.0030					.0016	.06	10.96	.48	5.84	.015	.00	.00	BOX
993.070	2824.890	10.905	2835.795	1325.00	8.18	1.04	2836.83	.00	5.52	18.00	9.000	18.000	.00	0 .0
JUNCT STR	.0000					.0016	.00	10.91	.48		.015	.00	.00	BOX

---------- WARNING - Junction Analysis - Change in Channel Type ----------

993.070	2824.890	9.951	2834.841	1000.00	11.70	2.13	2836.97	.00	6.74	.00		3		0 .0
35.000	.0040					.0043	.15	9.95	.00	7.734	.015			IR-COV
1028.070	2825.030	9.962	2834.992	1000.00	11.70	2.13	2837.12	.00	6.74	.00		3		0 .0
41.000	.0041					.0043	.18	.00	.00	7.614	.015			IR-COV
1069.070	2825.200	10.276	2835.476	1000.00	11.70	2.13	2837.60	.00	6.74	.00		3		0 .0
41.000	.0039					.0043	.18	.00	.00	7.822	.015			IR-COV
1110.070	2825.360	10.600	2835.960	1000.00	11.70	2.13	2838.09	.00	6.74	.00		3		0 .0
JUNCT STR	.0000					.0042	.00	10.60	.00		.015			IR-COV

---------- WARNING - Junction Analysis - Irregular Channel----------

Program Package Serial Number: 7189

WATER SURFACE PROFILE LISTING Date: 3-29-2018 Time: 9: 7:10

SKYE CANYON INFRASTRUCTURE - PHASE 3A

BY OLYMPIA COMPANIES

SKYE VILLAGE ROAD MAINLINE (ULTIMATE CONDITION)

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
1110.070	2825.360	10.661	2836.021	991.50	11.61	2.09	2838.11	.00	6.70	.00		3		0 .0
210.000	.0040					.0042	.89	10.66	.00	7.679	.015			IR-COV
1320.070	2826.200	10.711	2836.911	991.50	11.61	2.09	2839.00	.00	6.70	.00		3		0 .0

JUNCT STR	.0000					.0042	.00	10.71	.00		.015							IR-COV
					WARNING - Junction Analysis - Irregular Channel													
1320.070	2826.200	10.775	2836.975	983.00	11.51	2.06	2839.03	.00	6.67	.00					3		0	.0
442.500	.0040					.0042	1.84	10.78	.00	7.618	.015							IR-COV
1762.570	2827.970	10.848	2838.818	983.00	11.51	2.06	2840.87	.00	6.67	.00					3		0	.0
JUNCT STR	.0000					.0037	.00	10.85	.00		.015							IR-COV
					WARNING - Junction Analysis - Irregular Channel													
1762.570	2827.970	11.169	2839.139	932.00	10.91	1.85	2840.99	.00	6.46	.00					3		0	.0
172.500	.0040					.0037	.65	11.17	.00	7.269	.015							IR-COV
1935.070	2828.660	11.125	2839.785	932.00	10.91	1.85	2841.63	.00	6.46	.00					3		0	.0
JUNCT STR	.0000					.0033	.00	11.12	.00		.015							IR-COV
					WARNING - Junction Analysis - Irregular Channel													

Program Package Serial Number: 7189

WATER SURFACE PROFILE LISTING Date: 3-29-2018 Time: 9: 7:10

SKYE CANYON INFRASTRUCTURE - PHASE 3A

BY OLYMPIA COMPANIES

SKYE VILLAGE ROAD MAINLINE (ULTIMATE CONDITION)

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope				SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch	
1935.070	2828.660	11.458	2840.118	879.00	10.29	1.64	2841.76	.00	6.22	.00			3	0 .0
60.000	.0040					.0033	.20	11.46	.00	6.917	.015			IR-COV
1995.070	2828.900	11.418	2840.318	879.00	10.29	1.64	2841.96	.00	6.22	.00			3	0 .0
JUNCT STR	.0000					.0033	.00	11.42	.00		.015			IR-COV
					WARNING - Junction Analysis - Irregular Channel									
1995.070	2828.900	11.439	2840.339	876.00	10.25	1.63	2841.97	.00	6.20	.00			3	0 .0
640.000	.0040					.0033	2.12	11.44	.00	6.897	.015			IR-COV
2635.070	2831.460	10.996	2842.456	876.00	10.25	1.63	2844.09	.00	6.20	.00			3	0 .0
TRANS STR	.0034					.0011	.04	11.00	.00		.015			IR-COV
2670.070	2831.580	12.176	2843.756	876.00	6.49	.65	2844.41	.00	4.73	15.00	9.000	15.000	.00	0 .0
TRANS STR	.0033					.0011	.03	12.18	.38		.015	.00	.00	BOX
2700.070	2831.680	11.784	2843.464	876.00	8.34	1.08	2844.54	.00	4.73	15.00	7.000	15.000	.00	0 .0
JUNCT STR	.0000					.0022	.00	11.78	.56		.015	.00	.00	BOX
					WARNING - Junction Analysis - Change in Channel Type									

Program Package Serial Number: 7189

WATER SURFACE PROFILE LISTING Date: 3-29-2018 Time: 9: 7:10

SKYE CANYON INFRASTRUCTURE - PHASE 3A

BY OLYMPIA COMPANIES

SKYE VILLAGE ROAD MAINLINE (ULTIMATE CONDITION)

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
2700.070	2831.680	11.563	2843.243	487.00	9.16	1.30	2844.54	.00	4.87	.00		2		0 .0
25.000	.0048					.0036	.09	11.56	.00	5.160	.015			IR-COV
2725.070	2831.800	11.534	2843.334	487.00	9.16	1.30	2844.64	.00	4.87	.00		2		0 .0
17.000	.0053					.0036	.06	.00	.00	4.972	.015			IR-COV
2742.070	2831.890	11.627	2843.516	487.00	9.16	1.30	2844.82	.00	4.87	.00		2		0 .0
17.000	.0053					.0036	.06	.00	.00	4.967	.015			IR-COV
2759.070	2831.980	11.719	2843.699	487.00	9.16	1.30	2845.00	.00	4.87	.00		2		0 .0
70.000	.0050					.0036	.25	11.72	.00	5.079	.015			IR-COV
2829.070	2832.330	11.622	2843.952	487.00	9.16	1.30	2845.25	.00	4.87	.00		2		0 .0
JUNCT STR	.0000					.0036	.00	11.62	.00		.015			IR-COV

---------- WARNING - Junction Analysis - Irregular Channel----------

2829.070	2832.330	11.664	2843.994	483.00	9.08	1.28	2845.27	.00	4.84	.00		2		0 .0
206.320	.0050					.0036	.73	11.66	.00	5.050	.015			IR-COV
3035.390	2833.360	11.368	2844.729	483.00	9.08	1.28	2846.01	.00	4.84	.00		2		0 .0
JUNCT STR	.0000					.0035	.00	11.37	.00		.015			IR-COV

---------- WARNING - Junction Analysis - Irregular Channel----------

Program Package Serial Number: 7189

WATER SURFACE PROFILE LISTING Date: 3-29-2018 Time: 9: 7:10

SKYE CANYON INFRASTRUCTURE - PHASE 3A

BY OLYMPIA COMPANIES

SKYE VILLAGE ROAD MAINLINE (ULTIMATE CONDITION)

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
3035.390	2833.360	11.389	2844.749	481.00	9.04	1.27	2846.02	.00	4.82	.00		2		0 .0
42.540	.0049					.0035	.15	11.39	.00	5.057	.015			IR-COV
3077.930	2833.570	11.329	2844.899	481.00	9.04	1.27	2846.17	.00	4.82	.00		2		0 .0
JUNCT STR	.0000					.0035	.00	11.33	.00		.015			IR-COV

---------- WARNING - Junction Analysis - Irregular Channel----------

3077.930	2833.570	11.349	2844.919	479.00	9.00	1.26	2846.18	.00	4.81	.00		2		0 .0
285.110	.0050					.0035	1.00	11.35	.00	5.009	.015			IR-COV
3363.040	2835.000	10.918	2845.918	479.00	9.00	1.26	2847.18	.00	4.81	.00		2		0 .0

```
JUNCT STR   .0000                                  .0030      .00   10.92     .00            .015                  IR-COV
                    -------------------- WARNING - Junction Analysis - Irregular Channel--------------------
 3363.040  2835.000   11.164  2846.164    445.50    8.38    1.09  2847.25     .00    4.58      .00                2         0   .0
   46.940    .0049                                  .0030      .14    11.16     .00   4.780    .015                  IR-COV
 3409.980  2835.230   11.076  2846.306    445.50    8.38    1.09  2847.40     .00    4.58      .00                2         0   .0
   47.120    .0051                                  .0030      .14     .00     .00   4.710    .015                  IR-COV
 3457.100  2835.470   11.133  2846.603    445.50    8.38    1.09  2847.69     .00    4.58      .00                2         0   .0
   18.000    .0050                                  .0030      .05    11.13     .00   4.741    .015                  IR-COV
```


Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
3475.100	2835.560	11.098	2846.657	445.50	8.38	1.09	2847.75	.00	4.58	.00			2	0 .0
10.430	.0077					.0030	.03	.00	.00	4.036	.015			IR-COV
3485.530	2835.640	11.122	2846.761	445.50	8.38	1.09	2847.85	.00	4.58	.00			2	0 .0
JUNCT STR	.0000					.0026	.00	.00	.00		.015			IR-COV
			-------------------- WARNING - Junction Analysis - Irregular Channel--------------------											
3485.530	2835.640	11.318	2846.958	412.00	7.75	.93	2847.89	.00	4.35	.00			2	0 .0
35.940	.0042					.0026	.09	.00	.00	4.786	.015			IR-COV
3521.470	2835.790	11.376	2847.166	412.00	7.75	.93	2848.10	.00	4.35	.00			2	0 .0
43.000	.0051					.0026	.11	11.38	.00	4.430	.015			IR-COV
3564.470	2836.010	11.268	2847.278	412.00	7.75	.93	2848.21	.00	4.35	.00			2	0 .0
TRANS STR	.0050					.0026	.03	11.27	.00		.015			IR-COV
3574.470	2836.060	10.903	2846.963	412.00	10.30	1.65	2848.61	.00	4.35	8.00	5.000	8.000	.00	0 .0
74.000	.0101					.0061	.45	10.90	.81	3.43	.015	.00	.00	BOX
3648.470	2836.810	10.848	2847.658	412.00	10.30	1.65	2849.31	.00	4.35	8.00	5.000	8.000	.00	0 .0
JUNCT STR	.0000					.0157	.00	10.85	.81		.015	.00	.00	BOX

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                    -------------------- WARNING - Junction Analysis - Change in Channel Type ---------------
```

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	USVR Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
3648.470	2836.810	7.835	2844.646	359.00	18.28	5.19	2849.84	.00	4.83	.00	5.000	.000	.00	1 .0
55.500	.0299					.0253	1.40	7.84	.00	3.78	.015	.00	.00	PIPE
3703.970	2838.470	8.610	2847.080	359.00	18.28	5.19	2852.27	.00	4.83	.00	5.000	.000	.00	1 .0
35.440	.0288					.0253	.90	8.61	.00	3.84	.015	.00	.00	PIPE
3739.410	2839.490	8.746	2848.236	359.00	18.28	5.19	2853.43	.00	4.83	.00	5.000	.000	.00	1 .0
304.920	.0241					.0253	7.71	8.75	.00	4.22	.015	.00	.00	PIPE
4044.330	2846.840	9.369	2856.209	359.00	18.28	5.19	2861.40	.00	4.83	.00	5.000	.000	.00	1 .0
77.000	.0240					.0253	1.95	9.37	.00	4.23	.015	.00	.00	PIPE
4121.330	2848.690	10.255	2858.945	359.00	18.28	5.19	2864.14	.00	4.83	.00	5.000	.000	.00	1 .0

SKYE CANYON INFRASTRUCTURE - PHASE 3A

BY OLYMPIA COMPANIES

SKYE VILLAGE ROAD MAINLINE (ULTIMATE CONDITION)

```
   823.07    .I              C    H      E                                        .    R

   859.31    .                                                                    .

   895.56    .                                                                    .

   931.80    .I               C    H      E                                       .    TX

   968.05    . I            C       H    W  E                                    .    R

  1004.29    . I            C        H   W  E                                    .    JX

  1040.54    . I              C     H W    E                                      .    R

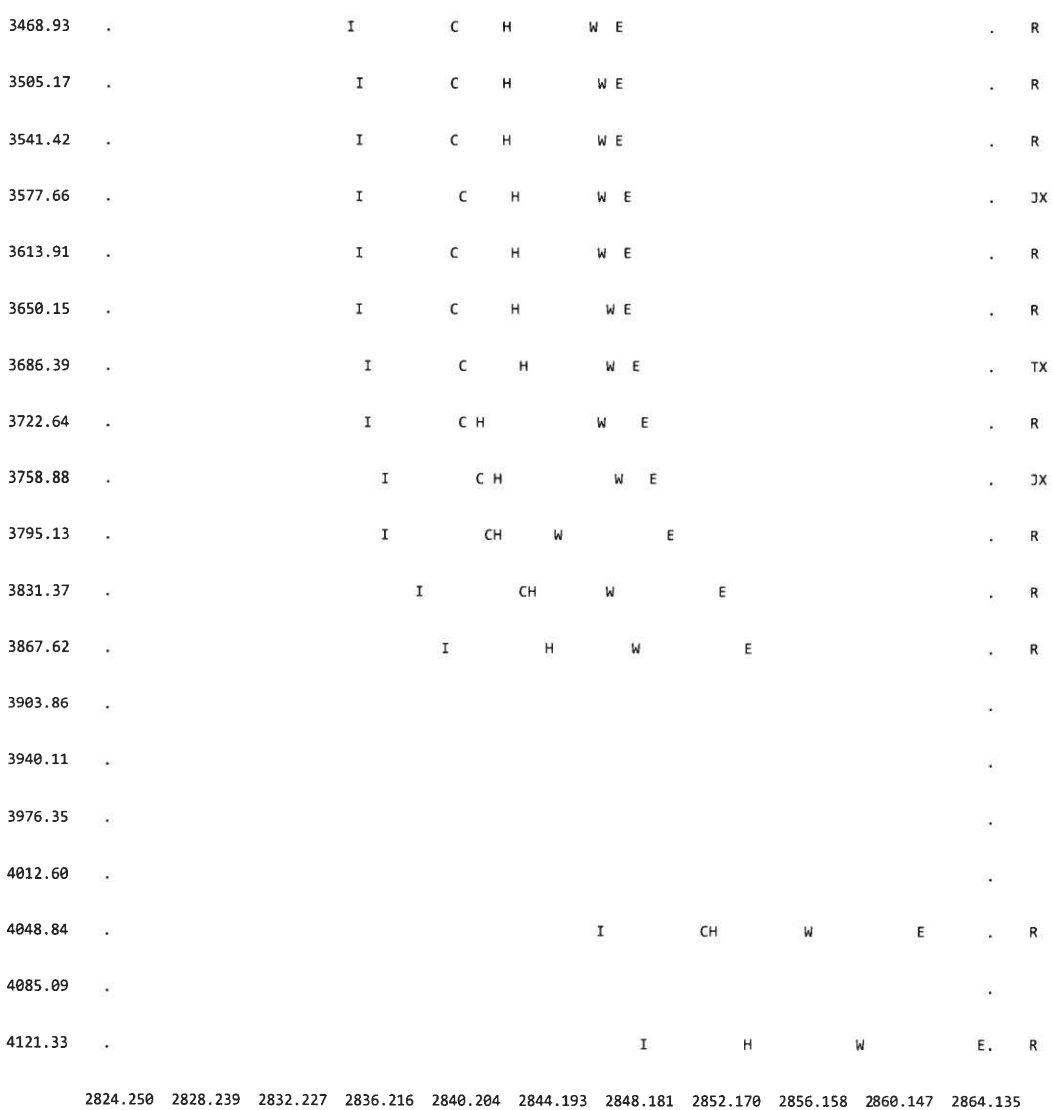
  1076.78    . I              C     H W     E                                     .    R

  1113.03    .  I              C    H   W    E                                    .    R
```

```
1149.27   . I             C    H  W   E                          .   JX
1185.52   . I             C    H  W   E                          .   R
1221.76   .                                                      .
1258.01   .                                                      .
1294.25   .                                                      .
1330.49   .   I             C    H  W   E                       .   JX
1366.74   .   I             C    H  W    E                      .   R
1402.98   .                                                      .
1439.23   .                                                      .
1475.47   .                                                      .
1511.72   .                                                      .
1547.96   .                                                      .
1584.21   .                                                      .
1620.45   .                                                      .
1656.70   .                                                      .
1692.94   .                                                      .
1729.19   .                                                      .
1765.43   .       I             C   H   W   E                  .   JX
1801.67   .       I             C    H    W  E                  .   R
1837.92   .                                                      .
1874.16   .                                                      .
```

1910.41	.											.	
1946.65	.		I			C		H		W	E	.	JX
1982.90	.		I			C		H		W	E	.	R
2019.14	.		I			C		H		W	E	.	JX
2055.39	.		I			C		H		W	E	.	R
2091.63	.											.	
2127.88	.											.	
2164.12	.											.	
2200.37	.											.	
2236.61	.											.	
2272.85	.											.	
2309.10	.											.	
2345.34	.											.	
2381.59	.											.	
2417.83	.											.	
2454.08	.											.	
2490.32	.											.	
2526.57	.											.	
2562.81	.											.	
2599.06	.											.	
2635.30	.			I			C		H		W	E	.	TX

| | | |


3468.93 . I C H W E . R
3505.17 . I C H W E . R
3541.42 . I C H W E . R
3577.66 . I C H W E . JX
3613.91 . I C H W E . R
3650.15 . I C H W E . R
3686.39 . I C H W E . TX
3722.64 . I C H W E . R
3758.88 . I C H W E . JX
3795.13 . I CH W E . R
3831.37 . I CH W E . R
3867.62 . I H W E . R
3903.86 .
3940.11 .
3976.35 .
4012.60 .
4048.84 . I CH W E . R
4085.09 .
4121.33 . I H W E. R
2824.250 2828.239 2832.227 2836.216 2840.204 2844.193 2848.181 2852.170 2856.158 2860.147 2864.135

N O T E S

1. GLOSSARY
   - I = INVERT ELEVATION
   - C = CRITICAL DEPTH
   - W = WATER SURFACE ELEVATION
   - S = SUPER-ELEVATION
   - H = HEIGHT OF CHANNEL
   - E = ENERGY GRADE LINE
   - X = CURVES CROSSING OVER
   - B = BRIDGE ENTRANCE OR EXIT
   - Y = WALL ENTRANCE OR EXIT
2. STATIONS FOR POINTS AT A JUMP MAY NOT BE PLOTTED EXACTLY

Revised Laterals

Ultimate Condition WSPG Summary
Skye Village Road Lateral - U21 Model

WSPG Station	Plan Station	Storm Drain Dimension	Invert Elevation (ft)	Q_{100} (cfs)	WSE (ft)	Velocity (ft/s)	FG Elevation	HGL Check[1]
1000.00	46+36.51	6'x 6' RCB	2831.68	359	2843.46	9.97	2848.65	OK
1042.00	45+98.24	6'x 6' RCB	2834.12	359	2843.86	9.97	2849.39	OK
1086.00	45+81.51	6'x 6' RCB	2837.07	359	2839.73	22.50	2849.06	OK
1152.00	45+76.49	6'x 6' RCB	2841.47	359	2846.28	12.44	N/A	N/A
1152.00	45+76.49	6'x 6' RCB	2841.47	359	2846.28	12.44	N/A	N/A

1 - 'HGL Check' reflects the minimum 1-ft below finished grade.

```
T1 SKYE CANYON INFRASTRUCTURE - PHASE 3A
T2 BY OLYMPIA COMPANIES
T3 SKYE VILLAGE ROAD MAINLINE LATERAL (FACILITY U21)
SO   1000.0002831.680  6      .013                2843.460
R    1042.0002834.120  6      .013                                  43.753    .000 0
R    1086.0002837.070  6      .013                                  45.837    .000 0
R    1152.0002841.470  6      .013
SH   1152.0002841.470  6      .013
CD   6  3   0    .000   6.000    6.000  .000  .000   .00
CD   8  3   0    .000   8.000    5.000  .000  .000   .00
CD  18  4   1    .000   1.500     .000  .000  .000   .00
CD  24  4   1    .000   2.000     .000  .000  .000   .00
CD  30  4   1    .000   2.500     .000  .000  .000   .00
CD  36  4   1    .000   3.000     .000  .000  .000   .00
CD  42  4   1    .000   3.500     .000  .000  .000   .00
CD  48  4   1    .000   4.000     .000  .000  .000   .00
CD  54  4   1    .000   4.500     .000  .000  .000   .00
CD  60  4   1    .000   5.000     .000  .000  .000   .00
CD  72  4   1    .000   6.000     .000  .000  .000   .00
CD   1  6   0      0.0      0.0     0.0     0.0      0.0    0.0
CD   2  6   0      0.0      0.0     0.0     0.0      0.0    0.0
CD   3  6   0      0.0      0.0     0.0     0.0      0.0    0.0
PTS  121   .000   .000 10.000   .000 10.000   .010 10.000  5.500  9.490  6.870
PTS       9.000  7.280  8.500  7.500  8.000  7.630  7.520  7.740  7.000  7.840
PTS       6.000  7.960  5.000  8.000  4.000  7.960  3.000  7.840  2.480  7.740
PTS       2.000  7.630  1.500  7.500  1.000  7.280   .510  6.870   .000  5.500
PTS        .000   .010
PTS  221   .000   .000  8.000   .000  8.000   .010  8.000  5.000  7.900  5.570
PTS       7.700  5.950  7.500  6.190  7.250  6.390  7.000  6.530  6.000  6.800
PTS       5.000  6.950  4.000  7.000  3.000  6.950  2.000  6.800  1.000  6.530
PTS        .750  6.390   .500  6.190   .300  5.950   .100  5.570   .000  5.000
PTS        .000   .010
PTS  321   .000   .000 10.000   .000 10.000   .010 10.000  6.500  9.490  7.870
PTS       9.000  8.280  8.500  8.500  8.000  8.630  7.520  8.740  7.000  8.840
PTS       6.000  8.960  5.000  9.000  4.000  8.960  3.000  8.840  2.480  8.740
PTS       2.000  8.630  1.500  8.500  1.000  8.280   .510  7.870   .000  6.500
PTS        .000   .010
Q           359.000   .0
```

FILE: U21.WSW W S P G W - EDIT LISTING - Version 14.10 Date: 3-29-2018 Time:10:53: 1

WATER SURFACE PROFILE - CHANNEL DEFINITION LISTING PAGE 1

CARD CODE	SECT NO	CHN TYPE	NO OF PIER/PIP	AVE PIER WIDTH	HEIGHT 1 DIAMETER	BASE WIDTH	ZL	ZR	INV DROP	Y(1)	Y(2)	Y(3)	Y(4)	Y(5)	Y(6)	Y(7)	Y(8)	Y(9)	Y(10)
CD	6	3	0	.000	6.000	6.000	.000	.000	.00										
CD	8	3	0	.000	8.000	5.000	.000	.000	.00										
CD	18	4	1		1.500														
CD	24	4	1		2.000														
CD	30	4	1		2.500														
CD	36	4	1		3.000														
CD	42	4	1		3.500														
CD	48	4	1		4.000														
CD	54	4	1		4.500														
CD	60	4	1		5.000														
CD	72	4	1		6.000														
CD	1	6	0	.000															
CD	2	6	0	.000															
CD	3	6	0	.000															

FILE: W S P G W - EDIT LISTING - Version 14.10 Date: 3-29-2018 Time:10:53: 1

WATER SURFACE PROFILE - CROSS SECTION POINT LISTING PAGE 2

CARD CODE	SECT NO	NO OF POINTS	X(1) , Y(1) X(8) , Y(8)	X(2) , Y(2) X(9) , Y(9)	X(3) , Y(3) X(10) ,Y(10)	X(4) , Y(4) X(11) ,Y(11)	X(5) , Y(5) X(N) , Y(N)	X(6) , Y(6) X(N+1),Y(N+1)	X(7) , Y(7) X(35) ,Y(35)					
PTS	1	21	.000	.000	10.000	.000	10.000	.010	10.000	5.500	9.490	6.870	9.000	7.280	8.500	7.500
PTS			8.000	7.630	7.520	7.740	7.000	7.840	6.000	7.960	5.000	8.000	4.000	7.960	3.000	7.840
PTS			2.480	7.740	2.000	7.630	1.500	7.500	1.000	7.280	.510	6.870	.000	5.500	.000	.010
PTS	2	21	.000	.000	8.000	.000	8.000	.010	8.000	5.000	7.900	5.570	7.700	5.950	7.500	6.190
PTS			7.250	6.390	7.000	6.530	6.000	6.800	5.000	6.950	4.000	7.000	3.000	6.950	2.000	6.800
PTS			1.000	6.530	.750	6.390	.500	6.190	.300	5.950	.100	5.570	.000	5.000	.000	.010
PTS	3	21	.000	.000	10.000	.000	10.000	.010	10.000	6.500	9.490	7.870	9.000	8.280	8.500	8.500
PTS			8.000	8.630	7.520	8.740	7.000	8.840	6.000	8.960	5.000	9.000	4.000	8.960	3.000	8.840
PTS			2.480	8.740	2.000	8.630	1.500	8.500	1.000	8.280	.510	7.870	.000	6.500	.000	.010

W S P G W PAGE NO 1

WATER SURFACE PROFILE - TITLE CARD LISTING

HEADING LINE NO 1 IS -

SKYE CANYON INFRASTRUCTURE - PHASE 3A

HEADING LINE NO 2 IS -

BY OLYMPIA COMPANIES

HEADING LINE NO 3 IS -

SKYE VILLAGE ROAD MAINLINE LATERAL (FACILITY U21)

W S P G W PAGE NO 2

WATER SURFACE PROFILE - ELEMENT CARD LISTING

ELEMENT NO 1 IS A SYSTEM OUTLET * *

U/S DATA	STATION	INVERT	SECT	W S ELEV
	1000.000	2831.680	6	2843.460

ELEMENT NO 2 IS A REACH * *

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	1042.000	2834.120	6	.013	55.000	43.753	.000	0

ELEMENT NO 3 IS A REACH * *

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	1086.000	2837.070	6	.013	55.000	45.837	.000	0

ELEMENT NO 4 IS A REACH * *

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	1152.000	2841.470	6	.013	.000	.000	.000	0

ELEMENT NO 5 IS A SYSTEM HEADWORKS * *

U/S DATA	STATION	INVERT	SECT	W S ELEV
	1152.000	2841.470	6	.000

Program Package Serial Number: 7189

WATER SURFACE PROFILE LISTING Date: 3-29-2018 Time:10:53: 7

SKYE CANYON INFRASTRUCTURE - PHASE 3A

BY OLYMPIA COMPANIES

SKYE VILLAGE ROAD MAINLINE LATERAL (FACILITY U21)

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head / SF Ave	Energy Grd.El. / HF	Super Elev / SE Dpth	Critical Depth / Froude N	Flow Top Width / Norm Dp	Height/Dia.-FT / "N"	Base Wt or I.D. / X-Fall	ZL / ZR	No Wth Prs/Pip / Type Ch
1000.000	2831.680	11.780	2843.460	359.00	9.97	1.54	2845.00	.00	4.81	6.00	6.000	6.000	.00	0 .0
42.000	.0581					.0044	.19	.00	.72	1.94	.013	.00	.00	BOX
1042.000	2834.120	9.741	2843.862	359.00	9.97	1.54	2845.41	.00	4.81	6.00	6.000	6.000	.00	0 .0
37.430	.0670					.0044	.17	.00	.72	1.85	.013	.00	.00	BOX
1079.430	2836.630	7.585	2844.214	359.00	9.97	1.54	2845.76	.00	4.81	6.00	6.000	6.000	.00	0 .0
HYDRAULIC JUMP														
1079.430	2836.630	2.607	2839.237	359.00	22.95	8.18	2847.41	1.78	4.81	6.00	6.000	6.000	.00	0 .0
6.570	.0670					.0252	.17	4.39	2.50	1.85	.013	.00	.00	BOX
1086.000	2837.070	2.659	2839.729	359.00	22.50	7.86	2847.59	.00	4.81	6.00	6.000	6.000	.00	0 .0
6.099	.0667					.0239	.15	2.66	2.43	1.85	.013	.00	.00	BOX
1092.099	2837.477	2.713	2840.190	359.00	22.05	7.55	2847.74	.00	4.81	6.00	6.000	6.000	.00	0 .0
12.351	.0667					.0218	.27	2.71	2.36	1.85	.013	.00	.00	BOX
1104.450	2838.300	2.846	2841.146	359.00	21.02	6.86	2848.01	.00	4.81	6.00	6.000	6.000	.00	0 .0
10.219	.0667					.0192	.20	2.85	2.20	1.85	.013	.00	.00	BOX
1114.669	2838.981	2.985	2841.966	359.00	20.05	6.24	2848.21	.00	4.81	6.00	6.000	6.000	.00	0 .0
8.472	.0667					.0169	.14	2.98	2.04	1.85	.013	.00	.00	BOX
1123.140	2839.546	3.130	2842.677	359.00	19.11	5.67	2848.35	.00	4.81	6.00	6.000	6.000	.00	0 .0
7.010	.0667					.0149	.10	3.13	1.90	1.85	.013	.00	.00	BOX

Program Package Serial Number: 7189

WATER SURFACE PROFILE LISTING Date: 3-29-2018 Time:10:53: 7

SKYE CANYON INFRASTRUCTURE - PHASE 3A

BY OLYMPIA COMPANIES

SKYE VILLAGE ROAD MAINLINE LATERAL (FACILITY U21)

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head / SF Ave	Energy Grd.El. / HF	Super Elev / SE Dpth	Critical Depth / Froude N	Flow Top Width / Norm Dp	Height/Dia.-FT / "N"	Base Wt or I.D. / X-Fall	ZL / ZR	No Wth Prs/Pip / Type Ch
1130.150	2840.013	3.283	2843.297	359.00	18.22	5.16	2848.45	.00	4.81	6.00	6.000	6.000	.00	0 .0
5.764	.0667					.0131	.08	3.28	1.77	1.85	.013	.00	.00	BOX

1135.914	2840.398	3.444	2843.841	359.00	17.38	4.69	2848.53	.00	4.81	6.00	6.000	6.000	.00	0	.0		
4.687	.0667					.0116	.05	3.44	1.65	1.85	.013	.00	.00	BOX			
1140.601	2840.710	3.612	2844.322	359.00	16.57	4.26	2848.58	.00	4.81	6.00	6.000	6.000	.00	0	.0		
3.742	.0667					.0102	.04	3.61	1.54	1.85	.013	.00	.00	BOX			
1144.344	2840.960	3.788	2844.748	359.00	15.80	3.87	2848.62	.00	4.81	6.00	6.000	6.000	.00	0	.0		
2.905	.0667					.0091	.03	3.79	1.43	1.85	.013	.00	.00	BOX			
1147.248	2841.153	3.973	2845.126	359.00	15.06	3.52	2848.65	.00	4.81	6.00	6.000	6.000	.00	0	.0		
2.153	.0667					.0080	.02	3.97	1.33	1.85	.013	.00	.00	BOX			
1149.401	2841.297	4.167	2845.464	359.00	14.36	3.20	2848.67	.00	4.81	6.00	6.000	6.000	.00	0	.0		
1.472	.0667					.0071	.01	4.17	1.24	1.85	.013	.00	.00	BOX			
1150.874	2841.395	4.370	2845.765	359.00	13.69	2.91	2848.68	.00	4.81	6.00	6.000	6.000	.00	0	.0		
.850	.0667					.0063	.01	4.37	1.15	1.85	.013	.00	.00	BOX			
1151.724	2841.452	4.583	2846.035	359.00	13.05	2.65	2848.68	.00	4.81	6.00	6.000	6.000	.00	0	.0		
.276	.0667					.0056	.00	4.58	1.07	1.85	.013	.00	.00	BOX			
1152.000	2841.470	4.808	2846.278	359.00	12.44	2.40	2848.68	.00	4.81	6.00	6.000	6.000	.00	0	.0		

SKYE CANYON INFRASTRUCTURE - PHASE 3A

BY OLYMPIA COMPANIES

SKYE VILLAGE ROAD MAINLINE LATERAL (FACILITY U21)

1000.00 .I C H W E . R

1003.10 .

1006.20 .

1009.31 .

1012.41 .

1015.51 .

1018.61 . .

1021.71 . .

1024.82 . .

1027.92 . .

1031.02 . .

1034.12 . .

1037.22 . .

1040.33 . .

1043.43 . I C H W E . R

1046.53 . .

1049.63 . .

1052.73 . .

1055.84 . .

1058.94 . .

1062.04 . .

1065.14 . .

1068.24 . .

1071.35 . .

1074.45 . .

1077.55 . .

1080.65 . I C H W E . R

1083.76 . I W S C H E . R

```
1086.86   .                          I          W        C    H                   E     .   R
1089.96   .                                                                              .
1093.06   .                            I          W        C    H                   E     .   R
1096.16   .                                                                              .
1099.27   .                                                                              .
1102.37   .                                                                              .
1105.47   .                               I          W        C    H                E     .   R
1108.57   .                                                                              .
1111.67   .                                                                              .
1114.78   .                                  I          W        C    H             E     .   R
1117.88   .                                                                              .
1120.98   .                                                                              .
1124.08   .                                     I          W        C    H          E     .   R
1127.18   .                                                                              .
1130.29   .                                        I          W       C    H         E     .   R
1133.39   .                                                                              .
1136.49   .                                           I          W      C    H       E     .   R
1139.59   .                                                                              .
1142.69   .                                              I          W    C    H      E     .   R
1145.80   .                                              I          W    C    H      E     .   R
1148.90   .                                                 I          W  C      H    E     .   R
```

U21

1152.00 . I W C H E . R

2831.680 2833.380 2835.081 2836.781 2838.482 2840.182 2841.883 2843.583 2845.283 2846.984 2848.683

N O T E S
1. GLOSSARY
   I = INVERT ELEVATION
   C = CRITICAL DEPTH
   W = WATER SURFACE ELEVATION
   S = SUPER-ELEVATION
   H = HEIGHT OF CHANNEL
   E = ENERGY GRADE LINE
   X = CURVES CROSSING OVER
   B = BRIDGE ENTRANCE OR EXIT
   Y = WALL ENTRANCE OR EXIT
2. STATIONS FOR POINTS AT A JUMP MAY NOT BE PLOTTED EXACTLY

Ultimate Condition WSPG Summary
Skye Village Road Lateral - U31 Model

WSPG Station	Plan Station	Storm Drain Dimension	Invert Elevation (ft)	Q_{100} (cfs)	WSE (ft)	Velocity (ft/s)	FG Elevation	HGL Check[1]
1000.00	63+35.32	6' x 6' RCB	2824.89	398	2835.80	11.06	2838.32	OK
1010.00	63+24.93	4' x 8' RCB	2825.60	398	2835.46	12.44	2837.13	OK
1078.00	62+76.06	4' x 8' RCB	2830.16	398	2836.46	12.44	2839.43	OK
1094.00	62+75.2	4' x 8' RCB	2830.24	398	2836.59	12.44	2839.52	OK
1189.00	62+69.97	4' x 8' RCB	2830.72	398	2837.07	12.44	2841.10	OK

1 - 'HGL Check' reflects the minimum 1-ft below finished grade.

```
T1 SKYE CANYON INFRASTRUCTURE - PHASE 3A
T2 BY OLYMPIA COMPANIES
T3 SKYE VILLAGE ROAD MAINLINE LATERAL (FACILITY U31)
SO   1000.0002824.890  6      .013                2835.800
TS   1010.0002825.600 10      .013
R    1078.0002830.160 10      .013                                 77.922    .000 0
R    1094.0002830.240 10      .013
SH   1189.0002830.720 10      .013
CD   5  3   0    .000   9.000   18.000  .000  .000   .00
CD   6  3   0    .000   6.000    6.000  .000  .000   .00
CD   7  3   0    .000   4.000    8.000  .000  .000   .00
CD   8  3   0    .000   7.000   15.000  .000  .000   .00
CD   9  3   0    .000   9.000   15.000  .000  .000   .00
CD  10  3   0    .000   4.000    8.000  .000  .000   .00
CD  18  4   1    .000   1.500     .000  .000  .000   .00
CD  24  4   1    .000   2.000     .000  .000  .000   .00
CD  30  4   1    .000   2.500     .000  .000  .000   .00
CD  36  4   1    .000   3.000     .000  .000  .000   .00
CD  42  4   1    .000   3.500     .000  .000  .000   .00
CD  48  4   1    .000   4.000     .000  .000  .000   .00
CD  54  4   1    .000   4.500     .000  .000  .000   .00
CD  60  4   1    .000   5.000     .000  .000  .000   .00
CD  72  4   1    .000   6.000     .000  .000  .000   .00
CD   1  6   0     0.0      0.0     0.0     0.0      0.0    0.0
CD   2  6   0     0.0      0.0     0.0     0.0      0.0    0.0
CD   3  6   0     0.0      0.0     0.0     0.0      0.0    0.0
CD   4  6   0     0.0      0.0     0.0     0.0      0.0    0.0
PTS  121   .000   .000 10.000   .000 10.000   .010 10.000  5.500  9.490  6.870
PTS       9.000  7.280  8.500  7.500  8.000  7.630  7.520  7.740  7.000  7.840
PTS       6.000  7.960  5.000  8.000  4.000  7.960  3.000  7.840  2.480  7.740
PTS       2.000  7.630  1.500  7.500  1.000  7.280   .510  6.870   .000  5.500
PTS        .000   .010
PTS  221   .000   .000  8.000   .000  8.000   .010  8.000  5.000  7.900  5.570
PTS       7.700  5.950  7.500  6.190  7.250  6.390  7.000  6.530  6.000  6.800
PTS       5.000  6.950  4.000  7.000  3.000  6.950  2.000  6.800  1.000  6.530
PTS        .750  6.390   .500  6.190   .300  5.950   .100  5.570   .000  5.000
PTS        .000   .010
PTS  321   .000   .000 10.000   .000 10.000   .010 10.000  6.500  9.490  7.870
PTS       9.000  8.280  8.500  8.500  8.000  8.630  7.520  8.740  7.000  8.840
PTS       6.000  8.960  5.000  9.000  4.000  8.960  3.000  8.840  2.480  8.740
PTS       2.000  8.630  1.500  8.500  1.000  8.280   .510  7.870   .000  6.500
PTS        .000   .010
PTS  421   .000   .000  8.000   .000  8.000   .010  8.000  6.000  7.900  6.570
PTS       7.700  6.950  7.500  7.190  7.250  7.390  7.000  7.530  6.000  7.800
PTS       5.000  7.950  4.000  8.000  3.000  7.950  2.000  7.800  1.000  7.530
PTS        .750  7.390   .500  7.190   .300  6.950   .100  6.570   .000  6.000
PTS        .000   .010
Q          398.000   .0
```

FILE: U31.WSW W S P G W - EDIT LISTING - Version 14.10 Date: 3-29-2018 Time: 1:26:19

WATER SURFACE PROFILE - CHANNEL DEFINITION LISTING

CARD CODE	SECT NO	CHN TYPE	NO OF PIER/PIP	AVE PIER WIDTH	HEIGHT 1 DIAMETER	BASE WIDTH	ZL	ZR	INV DROP	Y(1)	Y(2)	Y(3)	Y(4)	Y(5)	Y(6)	Y(7)	Y(8)	Y(9)	Y(10)
CD	5	3	0	.000	9.000	18.000	.000	.000	.00										
CD	6	3	0	.000	6.000	6.000	.000	.000	.00										
CD	7	3	0	.000	4.000	8.000	.000	.000	.00										
CD	8	3	0	.000	7.000	15.000	.000	.000	.00										
CD	9	3	0	.000	9.000	15.000	.000	.000	.00										
CD	10	3	0	.000	4.000	8.000	.000	.000	.00										
CD	18	4	1		1.500														
CD	24	4	1		2.000														
CD	30	4	1		2.500														
CD	36	4	1		3.000														
CD	42	4	1		3.500														
CD	48	4	1		4.000														
CD	54	4	1		4.500														
CD	60	4	1		5.000														
CD	72	4	1		6.000														
CD	1	6	0	.000															
CD	2	6	0	.000															
CD	3	6	0	.000															
CD	4	6	0	.000															

FILE: W S P G W - EDIT LISTING - Version 14.10 Date: 3-29-2018 Time: 1:26:19

WATER SURFACE PROFILE - CROSS SECTION POINT LISTING

CARD CODE	SECT NO	NO OF POINTS	X(1) , Y(1) X(8) , Y(8)	X(2) , Y(2) X(9) , Y(9)	X(3) , Y(3) X(10) ,Y(10)	X(4) , Y(4) X(11) ,Y(11)	X(5) , Y(5) X(N) , Y(N)	X(6) , Y(6) X(N+1),Y(N+1)	X(7) , Y(7) X(35) ,Y(35)					
PTS	1	21	.000	.000	10.000	.000	10.000	.010	10.000	5.500	9.490	6.870	9.000	7.280	8.500	7.500
PTS			8.000	7.630	7.520	7.740	7.000	7.840	6.000	7.960	5.000	8.000	4.000	7.960	3.000	7.840
PTS			2.480	7.740	2.000	7.630	1.500	7.500	1.000	7.280	.510	6.870	.000	5.500	.000	.010
PTS	2	21	.000	.000	8.000	.000	8.000	.010	8.000	5.000	7.900	5.570	7.700	5.950	7.500	6.190
PTS			7.250	6.390	7.000	6.530	6.000	6.800	5.000	6.950	4.000	7.000	3.000	6.950	2.000	6.800
PTS			1.000	6.530	.750	6.390	.500	6.190	.300	5.950	.100	5.570	.000	5.000	.000	.010
PTS	3	21	.000	.000	10.000	.000	10.000	.010	10.000	6.500	9.490	7.870	9.000	8.280	8.500	8.500
PTS			8.000	8.630	7.520	8.740	7.000	8.840	6.000	8.960	5.000	9.000	4.000	8.960	3.000	8.840
PTS			2.480	8.740	2.000	8.630	1.500	8.500	1.000	8.280	.510	7.870	.000	6.500	.000	.010
PTS	4	21	.000	.000	8.000	.000	8.000	.010	8.000	6.000	7.900	6.570	7.700	6.950	7.500	7.190
PTS			7.250	7.390	7.000	7.530	6.000	7.800	5.000	7.950	4.000	8.000	3.000	7.950	2.000	7.800
PTS			1.000	7.530	.750	7.390	.500	7.190	.300	6.950	.100	6.570	.000	6.000	.000	.010

W S P G W

WATER SURFACE PROFILE - TITLE CARD LISTING

HEADING LINE NO 1 IS -
SKYE CANYON INFRASTRUCTURE - PHASE 3A

HEADING LINE NO 2 IS -
BY OLYMPIA COMPANIES

HEADING LINE NO 3 IS -
SKYE VILLAGE ROAD MAINLINE LATERAL (FACILITY U31)

W S P G W

WATER SURFACE PROFILE - ELEMENT CARD LISTING

ELEMENT NO 1 IS A SYSTEM OUTLET * *

U/S DATA	STATION	INVERT	SECT	W S ELEV
	1000.000	2824.890	6	2835.800

ELEMENT NO 2 IS A TRANSITION * *

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE
	1010.000	2825.600	10	.013	.000	.000

ELEMENT NO 3 IS A REACH * *

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	1078.000	2830.160	10	.013	50.000	77.922	.000	0

ELEMENT NO 4 IS A REACH * *

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	1094.000	2830.240	10	.013	.000	.000	.000	0

ELEMENT NO 5 IS A SYSTEM HEADWORKS * *

U/S DATA	STATION	INVERT	SECT	W S ELEV
	1189.000	2830.720	10	.000

Program Package Serial Number: 7189

WATER SURFACE PROFILE LISTING Date: 3-29-2018 Time: 1:26:23

SKYE CANYON INFRASTRUCTURE - PHASE 3A

BY OLYMPIA COMPANIES

SKYE VILLAGE ROAD MAINLINE LATERAL (FACILITY U31)

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
1000.000	2824.890	10.910	2835.800	398.00	11.06	1.90	2837.70	.00	5.15	6.00	6.000	6.000	.00	0 .0
TRANS STR	.0710					.0054	.05	10.91	.80		.013	.00	.00	BOX
1010.000	2825.600	9.864	2835.464	398.00	12.44	2.40	2837.87	.00	4.00	8.00	4.000	8.000	.00	0 .0
68.000	.0671					.0081	.55	.00	1.10	1.56	.013	.00	.00	BOX
1078.000	2830.160	6.300	2836.460	398.00	12.44	2.40	2838.86	.00	4.00	8.00	4.000	8.000	.00	0 .0
16.000	.0050					.0081	.13	6.30	1.10	3.91	.013	.00	.00	BOX
1094.000	2830.240	6.349	2836.589	398.00	12.44	2.40	2838.99	.00	4.00	8.00	4.000	8.000	.00	0 .0
95.000	.0050					.0064	.10	6.35	1.10	3.91	.013	.00	.00	BOX
1189.000	2830.720	6.349	2837.069	398.00	12.44	2.40	2839.47	.00	4.00	8.00	4.000	8.000	.00	0 .0

SKYE CANYON INFRASTRUCTURE - PHASE 3A

BY OLYMPIA COMPANIES

SKYE VILLAGE ROAD MAINLINE LATERAL (FACILITY U31)

1000.00 .I C H W E . TX

1003.86 .

1007.71 .

1011.57 . I H W E . R

1015.43 .

1019.29 .

1023.14 .

1027.00 .

1030.86 .

1034.71 .

1038.57 .

1042.43 .

1046.29 .

1050.14 .

1054.00 .

1057.86 .

1061.71 .

1065.57 .

1069.43 .

1073.29 .

1077.14 .

1081.00 . I H W E . R

1084.86 .

1088.71 .

1092.57 .

1096.43 . I H W E . R

1100.29 .

1104.14 .

1108.00 . .

1111.86 . .

1115.71 . .

1119.57 . .

1123.43 . .

1127.29 . .

1131.14 . .

1135.00 . .

1138.86 . .

1142.71 . .

1146.57 . .

1150.43 . .

1154.29 . .

1158.14 . .

1162.00 . .

1165.86 . .

1169.71 . .

1173.57 . .

1177.43 . .

1181.29 . .

1185.14 . .

U31

1189.00 . I H W E. R

2824.890 2826.348 2827.806 2829.264 2830.722 2832.180 2833.638 2835.096 2836.554 2838.012 2839.471

N O T E S
1. GLOSSARY
   I = INVERT ELEVATION
   C = CRITICAL DEPTH
   W = WATER SURFACE ELEVATION
   S = SUPER-ELEVATION
   H = HEIGHT OF CHANNEL
   E = ENERGY GRADE LINE
   X = CURVES CROSSING OVER
   B = BRIDGE ENTRANCE OR EXIT
   Y = WALL ENTRANCE OR EXIT
2. STATIONS FOR POINTS AT A JUMP MAY NOT BE PLOTTED EXACTLY

```
T1 SKYE CANYON INFRASTRUCTURE - PHASE 3A
T2 BY OLYMPIA COMPANIES
T3 SKYE VILLAGE ROAD MAINLINE LATERAL (FACILITY P29)
SO   1000.0002826.440 18      .013               2836.910
R    1008.0002829.190 18      .013
SH   1008.0002829.190 18      .013
CD   6  3   0    .000   6.000    6.000  .000  .000   .00
CD   8  3   0    .000   5.000    8.000  .000  .000   .00
CD  18  4   1    .000   1.500     .000  .000  .000   .00
CD  24  4   1    .000   2.000     .000  .000  .000   .00
CD  30  4   1    .000   2.500     .000  .000  .000   .00
CD  36  4   1    .000   3.000     .000  .000  .000   .00
CD  42  4   1    .000   3.500     .000  .000  .000   .00
CD  48  4   1    .000   4.000     .000  .000  .000   .00
CD  54  4   1    .000   4.500     .000  .000  .000   .00
CD  60  4   1    .000   5.000     .000  .000  .000   .00
CD  72  4   1    .000   6.000     .000  .000  .000   .00
CD   1  6   0      0.0      0.0     0.0     0.0      0.0    0.0
CD   2  6   0      0.0      0.0     0.0     0.0      0.0    0.0
CD   3  6   0      0.0      0.0     0.0     0.0      0.0    0.0
PTS  121   .000   .000 10.000   .000 10.000   .010 10.000  5.500  9.490  6.870
PTS       9.000  7.280  8.500  7.500  8.000  7.630  7.520  7.740  7.000  7.840
PTS       6.000  7.960  5.000  8.000  4.000  7.960  3.000  7.840  2.480  7.740
PTS       2.000  7.630  1.500  7.500  1.000  7.280   .510  6.870   .000  5.500
PTS        .000   .010
PTS  221   .000   .000  8.000   .000  8.000   .010  8.000  5.000  7.900  5.570
PTS       7.700  5.950  7.500  6.190  7.250  6.390  7.000  6.530  6.000  6.800
PTS       5.000  6.950  4.000  7.000  3.000  6.950  2.000  6.800  1.000  6.530
PTS        .750  6.390   .500  6.190   .300  5.950   .100  5.570   .000  5.000
PTS        .000   .010
PTS  321   .000   .000  8.000   .000  8.000   .010  8.000  3.000  7.900  3.570
PTS       7.700  3.950  7.500  4.190  7.250  4.390  7.000  4.530  6.000  4.800
PTS       5.000  4.950  4.000  5.000  3.000  4.950  2.000  4.800  1.000  4.530
PTS        .750  4.390   .500  4.190   .300  3.950   .100  3.570   .000  3.000
PTS        .000   .010
Q            8.500   .0
```

FILE: U29E.WSW W S P G W - EDIT LISTING - Version 14.10 Date: 3-29-2018 Time: 2:35: 1

WATER SURFACE PROFILE - CHANNEL DEFINITION LISTING

CARD CODE	SECT NO	CHN TYPE	NO OF PIER/PIP	AVE PIER WIDTH	HEIGHT 1 DIAMETER	BASE WIDTH	ZL	ZR	INV DROP	Y(1)	Y(2)	Y(3)	Y(4)	Y(5)	Y(6)	Y(7)	Y(8)	Y(9)	Y(10)
CD	6	3	0	.000	6.000	6.000	.000	.000	.00										
CD	8	3	0	.000	5.000	8.000	.000	.000	.00										
CD	18	4	1		1.500														
CD	24	4	1		2.000														
CD	30	4	1		2.500														
CD	36	4	1		3.000														
CD	42	4	1		3.500														
CD	48	4	1		4.000														
CD	54	4	1		4.500														
CD	60	4	1		5.000														
CD	72	4	1		6.000														
CD	1	6	0	.000															
CD	2	6	0	.000															
CD	3	6	0	.000															

FILE: W S P G W - EDIT LISTING - Version 14.10 Date: 3-29-2018 Time: 2:35: 1

WATER SURFACE PROFILE - CROSS SECTION POINT LISTING

CARD CODE	SECT NO	NO OF POINTS	X(1) , Y(1) X(8) , Y(8)	X(2) , Y(2) X(9) , Y(9)	X(3) , Y(3) X(10) ,Y(10)	X(4) , Y(4) X(11) ,Y(11)	X(5) , Y(5) X(N) , Y(N)	X(6) , Y(6) X(N+1),Y(N+1)	X(7) , Y(7) X(35) ,Y(35)						
PTS	1	21	.000	.000	10.000	.000	10.000	.010	10.000	5.500	9.490	6.870	9.000	7.280	8.500	7.500
PTS			8.000	7.630	7.520	7.740	7.000	7.840	6.000	7.960	5.000	8.000	4.000	7.960	3.000	7.840
PTS			2.480	7.740	2.000	7.630	1.500	7.500	1.000	7.280	.510	6.870	.000	5.500	.000	.010
PTS	2	21	.000	.000	8.000	.000	8.000	.010	8.000	5.000	7.900	5.570	7.700	5.950	7.500	6.190
PTS			7.250	6.390	7.000	6.530	6.000	6.800	5.000	6.950	4.000	7.000	3.000	6.950	2.000	6.800
PTS			1.000	6.530	.750	6.390	.500	6.190	.300	5.950	.100	5.570	.000	5.000	.000	.010
PTS	3	21	.000	.000	8.000	.000	8.000	.010	8.000	3.000	7.900	3.570	7.700	3.950	7.500	4.190
PTS			7.250	4.390	7.000	4.530	6.000	4.800	5.000	4.950	4.000	5.000	3.000	4.950	2.000	4.800
PTS			1.000	4.530	.750	4.390	.500	4.190	.300	3.950	.100	3.570	.000	3.000	.000	.010

W S P G W

WATER SURFACE PROFILE - TITLE CARD LISTING

HEADING LINE NO 1 IS -

SKYE CANYON INFRASTRUCTURE - PHASE 3A

HEADING LINE NO 2 IS -

BY OLYMPIA COMPANIES

HEADING LINE NO 3 IS -

SKYE VILLAGE ROAD MAINLINE LATERAL (FACILITY P29)

W S P G W

WATER SURFACE PROFILE - ELEMENT CARD LISTING

ELEMENT NO 1 IS A SYSTEM OUTLET * *

U/S DATA	STATION	INVERT	SECT	W S ELEV
	1000.000	2826.440	18	2836.910

ELEMENT NO 2 IS A REACH * *

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	1008.000	2829.190	18	.013	.000	.000	.000	0

ELEMENT NO 3 IS A SYSTEM HEADWORKS * *

U/S DATA	STATION	INVERT	SECT	W S ELEV
	1008.000	2829.190	18	.000

FILE: U29E.WSW W S P G W - CIVILDESIGN Version 14.08 PAGE 1

Program Package Serial Number: 7189

WATER SURFACE PROFILE LISTING Date: 3-29-2018 Time: 2:35: 4

SKYE CANYON INFRASTRUCTURE - PHASE 3A

BY OLYMPIA COMPANIES

SKYE VILLAGE ROAD MAINLINE LATERAL (FACILITY P29)

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
1000.000	2826.440	10.470	2836.910	8.50	4.81	.36	2837.27	.00	1.13	.00	1.500	.000	.00	1 .0
8.000	.3438					.0065	.05	10.47	.00	.38	.013	.00	.00	PIPE
1008.000	2829.190	7.772	2836.962	8.50	4.81	.36	2837.32	.00	1.13	.00	1.500	.000	.00	1 .0

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

Grand Canyon Drive

Model "P203"

Ultimate Condition WSPG Summary
Grand Canyon Drive - P203 Model

WSPG Station	Plan Station	Storm Drain Dimension	Invert Elevation (ft)	Q_{100} (cfs)	WSE (ft)	Velocity (ft/s)	FG Elevation	HGL Check[1]
1000.00	52+97.92	42" RCP	2760.19	113	2763.69	11.74	N/A	N/A
1076.00	53+20.33	42" RCP	2760.57	113	2765.24	11.74	2768.41	OK
1076.00	53+20.33	36" RCP	2761.07	60	2766.81	8.49	2768.41	OK
1276.00	55+21.83	36" RCP	2764.07	60	2768.51	8.49	2771.39	OK
1276.00	55+21.83	30" RCP	2764.57	55	2767.90	11.20	2771.39	OK
1476.00	57+23.33	30" RCP	2767.58	55	2771.63	11.20	2774.60	OK
1676.00	59+24.82	30" RCP	2772.58	55	2774.35	14.84	2779.54	OK
1876.00	61+26.32	30" RCP	2777.59	55	2779.40	14.43	2785.04	OK
1946.00	61+96.73	30" RCP	2779.34	55	2781.23	13.84	2786.96	OK
2022.00	62+37.18	30" RCP	2781.24	55	2783.59	11.47	N/A	N/A
2022.00	62+37.18	30" RCP	2781.24	55	2783.59	11.47	N/A	N/A

1 - 'HGL Check' reflects the minimum 1-ft below finished grade.

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T1 SKYE CANYON INFRASTRUCTURE - PHASE 3A
T2 BY OLYMPIA COMPANIES
T3 PARCEL 2.03 TO BASIN OFF12 - STORM DRAIN
SO   1000.0002760.190 42      .013               2763.69
R    1076.0002760.570 42      .013                                    69.00 1
JX   1076.0002761.070 36 36   .013   53.0           2761.07
R    1276.0002764.070 36      .013                                     6.00 1
JX   1276.0002764.570 30 18   .013    5.0           2765.57         48.0
R    1476.0002767.580 30      .013                                     6.00 1
R    1676.0002772.580 30      .013                                     6.00 1
R    1876.0002777.590 30      .013                                     4.00 1
R    1946.0002779.340 30      .013                                    60.00 1
R    2022.0002781.240 30      .013                                         1
SH   2022.0002781.240 30      .013
CD   1  2   0    .000   4.000   10.000  .000  .000   .00
CD  18  4   1    .000   1.500     .000  .000  .000   .00
CD  24  4   1    .000   2.000     .000  .000  .000   .00
CD  30  4   1    .000   2.500     .000  .000  .000   .00
CD  36  4   1    .000   3.000     .000  .000  .000   .00
CD  42  4   1    .000   3.500     .000  .000  .000   .00
CD  48  4   1    .000   4.000     .000  .000  .000   .00
CD  54  4   1    .000   4.500     .000  .000  .000   .00
CD  60  4   1    .000   5.000     .000  .000  .000   .00
Q           55.000   .0
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FILE: P203.WSW W S P G W - EDIT LISTING - Version 14.07 Date:10- 8-2017 Time:10: 5:29

WATER SURFACE PROFILE - CHANNEL DEFINITION LISTING

CARD CODE	SECT NO	CHN TYPE	NO OF PIER/PIP	AVE PIER WIDTH	HEIGHT 1 DIAMETER	BASE WIDTH	ZL	ZR	INV DROP	Y(1)	Y(2)	Y(3)	Y(4)	Y(5)	Y(6)	Y(7)	Y(8)	Y(9)	Y(10)
CD	1	2	0	.000	4.000	10.000			.00										
CD	18	4	1		1.500														
CD	24	4	1		2.000														
CD	30	4	1		2.500														
CD	36	4	1		3.000														
CD	42	4	1		3.500														
CD	48	4	1		4.000														
CD	54	4	1		4.500														
CD	60	4	1		5.000														

W S P G W

WATER SURFACE PROFILE - TITLE CARD LISTING

HEADING LINE NO 1 IS -

SKYE CANYON INFRASTRUCTURE - PHASE 3A

HEADING LINE NO 2 IS -

BY OLYMPIA COMPANIES

HEADING LINE NO 3 IS -

PARCEL 2.03 TO BASIN OFF12 - STORM DRAIN

W S P G W

WATER SURFACE PROFILE - ELEMENT CARD LISTING

ELEMENT NO 1 IS A SYSTEM OUTLET * * *

U/S DATA	STATION	INVERT	SECT	W S ELEV
	1000.000	2760.190	42	2763.690

ELEMENT NO 2 IS A REACH * * *

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	1076.000	2760.570	42	.013	.000	.000	69.000	1

ELEMENT NO 3 IS A JUNCTION * * * * * *

U/S DATA	STATION	INVERT	SECT	LAT-1	LAT-2	N	Q3	Q4	INVERT-3	INVERT-4	PHI 3	PHI 4
	1076.000	2761.070	36	36	0	.013	53.000	.000	2761.070	.000	.000	.000

RADIUS	ANGLE
.000	.000

ELEMENT NO 4 IS A REACH * * *

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	1276.000	2764.070	36	.013	.000	.000	6.000	1

ELEMENT NO 5 IS A JUNCTION * * * * * *

U/S DATA	STATION	INVERT	SECT	LAT-1	LAT-2	N	Q3	Q4	INVERT-3	INVERT-4	PHI 3	PHI 4
	1276.000	2764.570	30	18	0	.013	5.000	.000	2765.570	.000	48.000	.000

RADIUS	ANGLE
.000	.000

ELEMENT NO 6 IS A REACH * * *

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	1476.000	2767.580	30	.013	.000	.000	6.000	1

ELEMENT NO 7 IS A REACH * * *

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	1676.000	2772.580	30	.013	.000	.000	6.000	1

ELEMENT NO 8 IS A REACH * * *

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	1876.000	2777.590	30	.013	.000	.000	4.000	1

ELEMENT NO 9 IS A REACH * * *

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	1946.000	2779.340	30	.013	.000	.000	60.000	1

ELEMENT NO 10 IS A REACH * * *

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	2022.000	2781.240	30	.013	.000	.000	.000	1

W S P G W

WATER SURFACE PROFILE - ELEMENT CARD LISTING

ELEMENT NO 11 IS A SYSTEM HEADWORKS * *

U/S DATA	STATION	INVERT	SECT	W S ELEV
	2022.000	2781.240	30	.000

Program Package Serial Number: 1704

WATER SURFACE PROFILE LISTING Date:10- 8-2017 Time:10: 5:35

SKYE CANYON INFRASTRUCTURE - PHASE 3A
BY OLYMPIA COMPANIES
PARCEL 2.03 TO BASIN OFF12 - STORM DRAIN

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head / SF Ave	Energy Grd.El. / HF	Super Elev / SE Dpth	Critical Depth / Froude N	Flow Top Width / Norm Dp	Height/Dia.-FT / "N"	Base Wt or I.D. / X-Fall	ZL / ZR	No Wth Prs/Pip / Type Ch
1000.000	2760.190	3.500	2763.690	113.00	11.74	2.14	2765.83	.00	3.20	.00	3.500	.000	.00	1 .0
76.000	.0050					.0126	.96	3.50	.00	3.50	.013	.00	.00	PIPE
1076.000	2760.570	4.673	2765.243	113.00	11.74	2.14	2767.39	.00	3.20	.00	3.500	.000	.00	1 .0
JUNCT STR	.0000					.0104	.00	4.67	.00		.013	.00	.00	PIPE
1076.000	2761.070	5.738	2766.808	60.00	8.49	1.12	2767.93	.00	2.50	.00	3.000	.000	.00	1 .0
200.000	.0150					.0081	1.62	5.74	.00	1.91	.013	.00	.00	PIPE
1276.000	2764.070	4.435	2768.505	60.00	8.49	1.12	2769.62	.00	2.50	.00	3.000	.000	.00	1 .0
JUNCT STR	.0000					.0130	.00	4.43	.00		.013	.00	.00	PIPE
1276.000	2764.570	3.331	2767.901	55.00	11.20	1.95	2769.85	.00	2.35	.00	2.500	.000	.00	1 .0
200.000	.0151					.0180	3.60	3.33	.00	2.50	.013	.00	.00	PIPE
1476.000	2767.580	4.053	2771.633	55.00	11.20	1.95	2773.58	.00	2.35	.00	2.500	.000	.00	1 .0
149.834	.0250					.0180	2.69	4.05	.00	1.77	.013	.00	.00	PIPE
1625.834	2771.326	3.102	2774.428	55.00	11.20	1.95	2776.38	.00	2.35	.00	2.500	.000	.00	1 .0
HYDRAULIC JUMP														
1625.834	2771.326	1.766	2773.092	55.00	14.84	3.42	2776.51	.00	2.35	2.28	2.500	.000	.00	1 .0
50.166	.0250					.0251	1.26	1.77	2.05	1.77	.013	.00	.00	PIPE
1676.000	2772.580	1.766	2774.346	55.00	14.84	3.42	2777.76	.00	2.35	2.28	2.500	.000	.00	1 .0
25.516	.0251					.0251	.64	1.77	2.05	1.77	.013	.00	.00	PIPE

Program Package Serial Number: 1704

WATER SURFACE PROFILE LISTING Date:10- 8-2017 Time:10: 5:35

SKYE CANYON INFRASTRUCTURE - PHASE 3A
BY OLYMPIA COMPANIES
PARCEL 2.03 TO BASIN OFF12 - STORM DRAIN

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head / SF Ave	Energy Grd.El. / HF	Super Elev / SE Dpth	Critical Depth / Froude N	Flow Top Width / Norm Dp	Height/Dia.-FT / "N"	Base Wt or I.D. / X-Fall	ZL / ZR	No Wth Prs/Pip / Type Ch
1701.516	2773.219	1.766	2774.985	55.00	14.84	3.42	2778.40	.00	2.35	2.28	2.500	.000	.00	1 .0
174.484	.0251					.0242	4.23	1.77	2.05	1.77	.013	.00	.00	PIPE
1876.000	2777.590	1.813	2779.403	55.00	14.43	3.23	2782.63	.00	2.35	2.23	2.500	.000	.00	1 .0
70.000	.0250					.0224	1.57	1.81	1.95	1.77	.013	.00	.00	PIPE

1946.000	2779.340	1.886	2781.227	55.00	13.84	2.97	2784.20	.00	2.35	2.15	2.500	.000	.00	1	.0				
35.813	.0250					.0203	.73	1.89	1.79	1.77	.013	.00	.00	PIPE					
1981.813	2780.235	1.972	2782.208	55.00	13.24	2.72	2784.93	.00	2.35	2.04	2.500	.000	.00	1	.0				
22.082	.0250					.0185	.41	1.97	1.64	1.77	.013	.00	.00	PIPE					
2003.895	2780.787	2.076	2782.863	55.00	12.63	2.48	2785.34	.00	2.35	1.88	2.500	.000	.00	1	.0				
12.872	.0250					.0169	.22	2.08	1.46	1.77	.013	.00	.00	PIPE					
2016.767	2781.109	2.196	2783.305	55.00	12.04	2.25	2785.56	.00	2.35	1.63	2.500	.000	.00	1	.0				
5.233	.0250					.0159	.08	2.20	1.27	1.77	.013	.00	.00	PIPE					
2022.000	2781.240	2.354	2783.594	55.00	11.47	2.04	2785.64	.00	2.35	1.17	2.500	.000	.00	1	.0				

SKYE CANYON INFRASTRUCTURE - PHASE 3A

BY OLYMPIA COMPANIES

PARCEL 2.03 TO BASIN OFF12 - STORM DRAIN

1000.00	.I	CH	E	.	R
1020.86	.			.	
1041.71	.			.	
1062.57	.			.	
1083.43	. I	CH	W E	.	JX
1104.29	. I	C H	W E	.	R
1125.14	.			.	
1146.00	.			.	
1166.86	.			.	
1187.71	.			.	
1208.57	.			.	
1229.43	.			.	

```
1250.29  .                                                                .
1271.14  .                                                                .
1292.00  .            I       C H   W   E                                 .  JX
1312.86  .              I       CH  W     E                               .  R
1333.71  .                                                                .
1354.57  .                                                                .
1375.43  .                                                                .
1396.29  .                                                                .
1417.14  .                                                                .
1438.00  .                                                                .
1458.86  .                                                                .
1479.71  .                        I       H    W      E                   .  R
1500.57  .                                                                .
1521.43  .                                                                .
1542.29  .                                                                .
1563.14  .                                                                .
1584.00  .                                                                .
1604.86  .                                                                .
1625.71  .                                                                .
1646.57  .                                 I       H W      E             .  R
1667.43  .                                 I     W  H        E             .  R
1688.29  .                                     I     W CH        E        .  R
1709.14  .                                       I     W CH       E       .  R
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1730.00    .                                                                                                                .

1750.86    .                                                                                                                .

1771.71    .                                                                                                                .

1792.57    .                                                                                                                .

1813.43    .                                                                                                                .

1834.29    .                                                                                                                .

1855.14    .                                                                                                                .

1876.00    .                                                    I      W CH          E                                    .    R

1896.86    .                                                                                                                .

1917.71    .                                                                                                                .

1938.57    .                                                                                                                .

1959.43    .                                                           I      W CH         E                               .    R

1980.29    .                                                                                                                .

2001.14    .                                                              I       W H         E                           .    R

2022.00    .                                                                 I         WH        E                         .    R

           2760.190  2762.735  2765.279  2767.824  2770.369  2772.913  2775.458  2778.003  2780.547  2783.092  2785.638
```

N O T E S
1. GLOSSARY
   I = INVERT ELEVATION
   C = CRITICAL DEPTH
   W = WATER SURFACE ELEVATION
   S = SUPER-ELEVATION
   H = HEIGHT OF CHANNEL
   E = ENERGY GRADE LINE
   X = CURVES CROSSING OVER
   B = BRIDGE ENTRANCE OR EXIT
   Y = WALL ENTRANCE OR EXIT
2. STATIONS FOR POINTS AT A JUMP MAY NOT BE PLOTTED EXACTLY

Model "U203"

Ultimate Condition WSPG Summary
Grand Canyon Drive - U203 Model

WSPG Station	Plan Station	Storm Drain Dimension	Invert Elevation (ft)	Q_{100} (cfs)	WSE (ft)	Velocity (ft/s)	FG Elevation	HGL Check[1]
1000.00	52+97.92	42" RCP	2760.19	118	2763.69	12.26	N/A	N/A
1076.00	53+20.33	42" RCP	2760.57	118	2765.38	12.26	2768.41	OK
1076.00	53+20.33	36" RCP	2761.07	65	2767.07	9.20	2768.41	OK
1276.00	55+21.83	36" RCP	2764.07	65	2769.06	9.20	2771.39	OK
1276.00	55+21.83	30" RCP	2764.57	55	2768.86	11.20	2771.39	OK
1476.00	57+23.33	30" RCP	2767.58	55	2772.60	11.20	2774.60	OK
1676.00	59+24.82	30" RCP	2772.58	55	2776.33	11.20	2779.54	OK
1876.00	61+26.32	30" RCP	2777.59	55	2779.48	13.78	2785.04	OK
1946.00	61+96.73	30" RCP	2779.34	55	2781.60	11.78	2786.96	OK
1946.00	61+96.73	30" RCP	2779.34	52	2781.15	13.63	2786.96	OK
2022.00	62+37.18	30" RCP	2781.24	52	2783.56	10.93	N/A	N/A
2022.00	62+37.18	30" RCP	2781.24	52	2783.56	10.93	N/A	N/A

1 - 'HGL Check' reflects the minimum 1-ft below finished grade.

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T1 SKYE CANYON INFRASTRUCTURE - PHASE 3A
T2 BY OLYMPIA COMPANIES
T3 PARCEL 2.03 TO BASIN OFF12 - STORM DRAIN
SO   1000.0002760.190 42      .013               2763.69
R    1076.0002760.570 42      .013                                      69.00 1
JX   1076.0002761.070 36 36   .013   53.0           2761.07
R    1276.0002764.070 36      .013                                       6.00 1
JX   1276.0002764.570 30 18 18.013    5.0      5.0  2765.57 2765.57  48.0 48.0
R    1476.0002767.580 30      .013                                       6.00 1
R    1676.0002772.580 30      .013                                       6.00 1
R    1876.0002777.590 30      .013                                       4.00 1
R    1946.0002779.340 30      .013                                      60.00 1
JX   1946.0002779.340 30 18   .013    3.0           2780.34          90.0
R    2022.0002781.240 30      .013                                            1
SH   2022.0002781.240 30      .013
CD   1  2   0    .000   4.000   10.000  .000  .000   .00
CD  18  4   1    .000   1.500     .000  .000  .000   .00
CD  24  4   1    .000   2.000     .000  .000  .000   .00
CD  30  4   1    .000   2.500     .000  .000  .000   .00
CD  36  4   1    .000   3.000     .000  .000  .000   .00
CD  42  4   1    .000   3.500     .000  .000  .000   .00
CD  48  4   1    .000   4.000     .000  .000  .000   .00
CD  54  4   1    .000   4.500     .000  .000  .000   .00
CD  60  4   1    .000   5.000     .000  .000  .000   .00
Q            52.000   .0
```

FILE: U203.WSW W S P G W - EDIT LISTING - Version 14.07 Date:10- 8-2017 Time:10:56: 7

WATER SURFACE PROFILE - CHANNEL DEFINITION LISTING

CARD CODE	SECT NO	CHN TYPE	NO OF PIER/PIP	AVE PIER WIDTH	HEIGHT 1 DIAMETER	BASE WIDTH	ZL	ZR	INV DROP	Y(1)	Y(2)	Y(3)	Y(4)	Y(5)	Y(6)	Y(7)	Y(8)	Y(9)	Y(10)
CD	1	2	0	.000	4.000	10.000			.00										
CD	18	4	1		1.500														
CD	24	4	1		2.000														
CD	30	4	1		2.500														
CD	36	4	1		3.000														
CD	42	4	1		3.500														
CD	48	4	1		4.000														
CD	54	4	1		4.500														
CD	60	4	1		5.000														

W S P G W

WATER SURFACE PROFILE - TITLE CARD LISTING

HEADING LINE NO 1 IS -

SKYE CANYON INFRASTRUCTURE - PHASE 3A

HEADING LINE NO 2 IS -

BY OLYMPIA COMPANIES

HEADING LINE NO 3 IS -

PARCEL 2.03 TO BASIN OFF12 - STORM DRAIN

W S P G W

WATER SURFACE PROFILE - ELEMENT CARD LISTING

ELEMENT NO 1 IS A SYSTEM OUTLET * *

U/S DATA	STATION	INVERT	SECT	W S ELEV
	1000.000	2760.190	42	2763.690

ELEMENT NO 2 IS A REACH * *

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	1076.000	2760.570	42	.013	.000	.000	69.000	1

ELEMENT NO 3 IS A JUNCTION * * * * * *

U/S DATA	STATION	INVERT	SECT	LAT-1	LAT-2	N	Q3	Q4	INVERT-3	INVERT-4	PHI 3	PHI 4
	1076.000	2761.070	36	36	0	.013	53.000	.000	2761.070	.000	.000	.000

RADIUS	ANGLE
.000	.000

ELEMENT NO 4 IS A REACH * *

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	1276.000	2764.070	36	.013	.000	.000	6.000	1

ELEMENT NO 5 IS A JUNCTION * * * * * *

U/S DATA	STATION	INVERT	SECT	LAT-1	LAT-2	N	Q3	Q4	INVERT-3	INVERT-4	PHI 3	PHI 4
	1276.000	2764.570	30	18	18	.013	5.000	5.000	2765.570	2765.570	48.000	48.000

RADIUS	ANGLE
.000	.000

ELEMENT NO 6 IS A REACH * *

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	1476.000	2767.580	30	.013	.000	.000	6.000	1

ELEMENT NO 7 IS A REACH * *

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	1676.000	2772.580	30	.013	.000	.000	6.000	1

ELEMENT NO 8 IS A REACH * *

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	1876.000	2777.590	30	.013	.000	.000	4.000	1

ELEMENT NO 9 IS A REACH * *

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	1946.000	2779.340	30	.013	.000	.000	60.000	1

ELEMENT NO 10 IS A JUNCTION * * * * * *

U/S DATA	STATION	INVERT	SECT	LAT-1	LAT-2	N	Q3	Q4	INVERT-3	INVERT-4	PHI 3	PHI 4
	1946.000	2779.340	30	18	0	.013	3.000	.000	2780.340	.000	90.000	.000

RADIUS	ANGLE
.000	.000

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

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

W S P G W

WATER SURFACE PROFILE - ELEMENT CARD LISTING

ELEMENT NO 11 IS A REACH * *

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	2022.000	2781.240	30	.013	.000	.000	.000	1

ELEMENT NO 12 IS A SYSTEM HEADWORKS * *

U/S DATA	STATION	INVERT	SECT	W S ELEV

U203

2022.000 2781.240 30 .000

Program Package Serial Number: 1704

WATER SURFACE PROFILE LISTING Date:10- 8-2017 Time:10:56:12

SKYE CANYON INFRASTRUCTURE - PHASE 3A

BY OLYMPIA COMPANIES

PARCEL 2.03 TO BASIN OFF12 - STORM DRAIN

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head / SF Ave	Energy Grd.El. / HF	Super Elev / SE Dpth	Critical Depth / Froude N	Flow Top Width / Norm Dp	Height/Dia.-FT / "N"	Base Wt or I.D. / X-Fall	ZL / ZR	No Wth Prs/Pip / Type Ch
1000.000	2760.190	3.500	2763.690	118.00	12.26	2.34	2766.03	.00	3.24	.00	3.500	.000	.00	1 .0
76.000	.0050					.0138	1.05	3.50	.00	3.50	.013	.00	.00	PIPE
1076.000	2760.570	4.814	2765.384	118.00	12.26	2.34	2767.72	.00	3.24	.00	3.500	.000	.00	1 .0
JUNCT STR	.0000					.0116	.00	4.81	.00		.013	.00	.00	PIPE
1076.000	2761.070	5.997	2767.067	65.00	9.20	1.31	2768.38	.00	2.59	.00	3.000	.000	.00	1 .0
200.000	.0150					.0095	1.90	6.00	.00	2.02	.013	.00	.00	PIPE
1276.000	2764.070	4.988	2769.058	65.00	9.20	1.31	2770.37	.00	2.59	.00	3.000	.000	.00	1 .0
JUNCT STR	.0000					.0137	.00	4.99	.00		.013	.00	.00	PIPE
1276.000	2764.570	4.293	2768.864	55.00	11.20	1.95	2770.81	.00	2.35	.00	2.500	.000	.00	1 .0
200.000	.0151					.0180	3.60	4.29	.00	2.50	.013	.00	.00	PIPE
1476.000	2767.580	5.016	2772.596	55.00	11.20	1.95	2774.54	.00	2.35	.00	2.500	.000	.00	1 .0
200.000	.0250					.0180	3.60	5.02	.00	1.77	.013	.00	.00	PIPE
1676.000	2772.580	3.748	2776.328	55.00	11.20	1.95	2778.28	.00	2.35	.00	2.500	.000	.00	1 .0
114.331	.0251					.0180	2.06	3.75	.00	1.77	.013	.00	.00	PIPE
1790.331	2775.444	3.010	2778.455	55.00	11.20	1.95	2780.40	.00	2.35	.00	2.500	.000	.00	1 .0
HYDRAULIC JUMP														
1790.331	2775.444	1.809	2777.253	55.00	14.46	3.25	2780.50	.00	2.35	2.24	2.500	.000	.00	1 .0
7.904	.0251					.0236	.19	1.81	1.95	1.77	.013	.00	.00	PIPE

Program Package Serial Number: 1704

WATER SURFACE PROFILE LISTING Date:10- 8-2017 Time:10:56:12

SKYE CANYON INFRASTRUCTURE - PHASE 3A

BY OLYMPIA COMPANIES

PARCEL 2.03 TO BASIN OFF12 - STORM DRAIN

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head / SF Ave	Energy Grd.El. / HF	Super Elev / SE Dpth	Critical Depth / Froude N	Flow Top Width / Norm Dp	Height/Dia.-FT / "N"	Base Wt or I.D. / X-Fall	ZL / ZR	No Wth Prs/Pip / Type Ch
1798.235	2775.642	1.809	2777.451	55.00	14.46	3.25	2780.70	.00	2.35	2.24	2.500	.000	.00	1 .0
77.765	.0251					.0223	1.74	1.81	1.95	1.77	.013	.00	.00	PIPE

1876.000	2777.590	1.894	2779.484	55.00	13.78	2.95	2782.43	.00	2.35	2.14	2.500	.000	.00	1 .0
13.434	.0250					.0208	.28	1.89	1.78	1.77	.013	.00	.00	PIPE
1889.434	2777.926	1.921	2779.847	55.00	13.59	2.87	2782.71	.00	2.35	2.11	2.500	.000	.00	1 .0
29.714	.0250					.0195	.58	1.92	1.73	1.77	.013	.00	.00	PIPE
1919.148	2778.669	2.018	2780.687	55.00	12.96	2.61	2783.29	.00	2.35	1.97	2.500	.000	.00	1 .0
17.359	.0250					.0177	.31	2.02	1.56	1.77	.013	.00	.00	PIPE
1936.507	2779.103	2.128	2781.231	55.00	12.35	2.37	2783.60	.00	2.35	1.78	2.500	.000	.00	1 .0
9.493	.0250					.0163	.16	2.13	1.38	1.77	.013	.00	.00	PIPE
1946.000	2779.340	2.261	2781.601	55.00	11.78	2.15	2783.76	.00	2.35	1.47	2.500	.000	.00	1 .0
JUNCT STR	.0000					.0184	.00	2.26	1.16		.013	.00	.00	PIPE
1946.000	2779.340	1.814	2781.154	52.00	13.63	2.89	2784.04	.00	2.32	2.23	2.500	.000	.00	1 .0
24.002	.0250					.0202	.49	1.81	1.84	1.69	.013	.00	.00	PIPE
1970.002	2779.940	1.866	2781.806	52.00	13.23	2.72	2784.53	.00	2.32	2.18	2.500	.000	.00	1 .0
24.417	.0250					.0186	.45	1.87	1.74	1.69	.013	.00	.00	PIPE
1994.418	2780.551	1.956	2782.507	52.00	12.62	2.47	2784.98	.00	2.32	2.06	2.500	.000	.00	1 .0
15.031	.0250					.0168	.25	1.96	1.57	1.69	.013	.00	.00	PIPE

Program Package Serial Number: 1704

WATER SURFACE PROFILE LISTING Date:10- 8-2017 Time:10:56:12

SKYE CANYON INFRASTRUCTURE - PHASE 3A
BY OLYMPIA COMPANIES
PARCEL 2.03 TO BASIN OFF12 - STORM DRAIN

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
2009.450	2780.926	2.057	2782.984	52.00	12.03	2.25	2785.23	.00	2.32	1.91	2.500	.000	.00	1 .0
9.006	.0250					.0153	.14	2.06	1.41	1.69	.013	.00	.00	PIPE
2018.456	2781.151	2.174	2783.326	52.00	11.47	2.04	2785.37	.00	2.32	1.68	2.500	.000	.00	1 .0
3.544	.0250					.0143	.05	2.17	1.23	1.69	.013	.00	.00	PIPE
2022.000	2781.240	2.323	2783.563	52.00	10.93	1.86	2785.42	.00	2.32	1.28	2.500	.000	.00	1 .0

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PARCEL 2.03 TO BASIN OFF12 - STORM DRAIN

```
1000.00  .I          CH        E                                    .   R
1020.86  .                                                          .
1041.71  .                                                          .
1062.57  .                                                          .
1083.43  . I           CH    W       E                              .   JX
1104.29  .   I       C H         W    E                             .   R
1125.14  .                                                          .
1146.00  .                                                          .
1166.86  .                                                          .
1187.71  .                                                          .
1208.57  .                                                          .
1229.43  .                                                          .
1250.29  .                                                          .
1271.14  .                                                          .
1292.00  .              I       C H      W    E                     .   JX
1312.86  .                I       CH     W      E                   .   R
1333.71  .                                                          .
1354.57  .                                                          .
1375.43  .                                                          .
1396.29  .                                                          .
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1417.14  .                                                                .
1438.00  .                                                                .
1458.86  .                                                                .
1479.71  .                    I       CH        W     E                   .   R
1500.57  .                                                                .
1521.43  .                                                                .
1542.29  .                                                                .
1563.14  .                                                                .
1584.00  .                                                                .
1604.86  .                                                                .
1625.71  .                                                                .
1646.57  .                                                                .
1667.43  .                                                                .
1688.29  .                          I       CH  W       E                 .   R
1709.14  .                                                                .
1730.00  .                                                                .
1750.86  .                                                                .
1771.71  .                                                                .
1792.57  .                              I       CH W      E               .   R
1813.43  .                              I     W CH        E               .   R
1834.29  .                               I     W CH        E              .   R
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1855.14    .                                                                                                  .
1876.00    .                                                        I       W H         E                     .    R
1896.86    .                                                          I      W CH        E                     .    R
1917.71    .                                                                                                  .
1938.57    .                                                             I       WCH       E                  .    R
1959.43    .                                                               I       WH       E                  .    R
1980.29    .                                                               I        WH       E                 .    JX
2001.14    .                                                               I       W H        E                .    R
2022.00    .                                                                  I      W CH       E             .    R

          2760.190  2762.713  2765.236  2767.759  2770.282  2772.805  2775.328  2777.851  2780.374  2782.896  2785.420
```

N O T E S
1. GLOSSARY
   I = INVERT ELEVATION
   C = CRITICAL DEPTH
   W = WATER SURFACE ELEVATION
   S = SUPER-ELEVATION
   H = HEIGHT OF CHANNEL
   E = ENERGY GRADE LINE
   X = CURVES CROSSING OVER
   B = BRIDGE ENTRANCE OR EXIT
   Y = WALL ENTRANCE OR EXIT
2. STATIONS FOR POINTS AT A JUMP MAY NOT BE PLOTTED EXACTLY

Street E

Ultimate Condition WSPG Summary
Street E - PRO Model

WSPG Station	Plan Station	Storm Drain Dimension	Invert Elevation (ft)	Q_{100} (cfs)	WSE (ft)	Velocity (ft/s)	FG Elevation	HGL Check[1]
1000.00	"SD" 11+59.20	54" RCP	2795.46	98	2797.33	15.65	2817.16	OK
1090.00	N/A	54" RCP	2797.27	98	2799.18	15.23	2811.00	OK
1090.00	N/A	Wall Exit	2797.27	98	2799.18	15.25	2811.00	OK
1105.00	88+40.47	54" RCP	2798.80	98	2801.71	9.02	2813.25	OK
1105.00	88+40.47	36" RCP	2798.80	95	2800.53	22.44	2813.25	OK
1226.00	89+25.68	36" RCP	2811.08	78	2813.38	13.40	2818.92	OK
1277.00	89+76.88	36" RCP	2812.20	70	2814.05	15.28	2820.09	OK
1379.00	90+79.27	36" RCP	2814.45	70	2816.29	15.45	2822.45	OK
1420.00	91+20.14	36" RCP	2815.35	70	2817.17	15.59	2823.39	OK
1435.00	91+30.47	36" RCP	2815.59	70	2817.38	15.91	2823.31	OK
1538.00	59+70.24	36" RCP	2817.86	70	2819.55	17.12	2825.90	OK
1619.00	58+89.26	36" RCP	2819.64	70	2821.18	19.20	2828.00	OK
1700.00	58+08.28	36" RCP	2822.94	70	2824.48	19.17	2830.83	OK
1781.00	57+27.3	36" RCP	2826.24	70	2827.78	19.11	2834.39	OK
1862.00	56+46.32	36" RCP	2829.54	70	2831.10	18.93	2838.39	OK
2135.00	53+73.61	36" RCP	2840.65	70	2843.31	8.93	2848.16	OK
2135.00	53+73.61	Wall Entrance	2840.65	70	2843.31	8.93	2848.16	OK
2298.00	45+76.49	42" RCP	2841.47	70	2844.28	8.46	N/A	N/A
2298.00	45+76.49	42" RCP	2841.47	70	2844.28	8.46	N/A	N/A

1 - 'HGL Check' reflects the minimum 1-ft below finished grade.

Skye Park Drive

Ultimate Condition WSPG Summary
Skye Park Drive - 205a Model

WSPG Station	Plan Station	Storm Drain Dimension	Invert Elevation (ft)	Q_{100} (cfs)	WSE (ft)	Velocity (ft/s)	FG Elevation	HGL Check[1]
1000.00	"GCD" 70+11.7	30" RCP	2806.44	40	2808.94	8.15	N/A	N/A
1056.00	105+56.	30" RCP	2806.78	40	2809.68	8.15	2813.53	OK
1206.00	104+05.6	30" RCP	2807.99	40	2811.36	8.15	2814.52	OK
1267.00	103+75.2	30" RCP	2808.29	40	2811.94	8.15	N/A	N/A
1267.00	103+75.2	30" RCP	2808.29	40	2811.94	8.15	N/A	N/A

1 - 'HGL Check' reflects the minimum 1-ft below finished grade.

```
T1 SKYE CANYON INFRASTRUCTURE - PHASE 3A
T2 BY OLYMPIA COMPANIES
T3 PARCEL 2.05a TO BASIN OFF11 - STORM DRAIN
SO   1000.0002806.440 30      .013               2808.94
R    1056.0002806.780 30      .013                                    45.00 1
R    1206.0002807.990 30      .013                                    60.00 1
R    1267.0002808.290 30      .013
SH   1267.0002808.290 30      .013
CD   1  2   0    .000   4.000   10.000  .000  .000   .00
CD  18  4   1    .000   1.500     .000  .000  .000   .00
CD  24  4   1    .000   2.000     .000  .000  .000   .00
CD  30  4   1    .000   2.500     .000  .000  .000   .00
CD  36  4   1    .000   3.000     .000  .000  .000   .00
CD  42  4   1    .000   3.500     .000  .000  .000   .00
CD  48  4   1    .000   4.000     .000  .000  .000   .00
CD  54  4   1    .000   4.500     .000  .000  .000   .00
CD  60  4   1    .000   5.000     .000  .000  .000   .00
Q           40.000   .0
```

FILE: 205a.WSW W S P G W - EDIT LISTING - Version 14.07 Date:10-19-2017 Time: 8:45: 6

WATER SURFACE PROFILE - CHANNEL DEFINITION LISTING PAGE 1

CARD CODE	SECT NO	CHN TYPE	NO OF PIER/PIP	AVE PIER WIDTH	HEIGHT 1 DIAMETER	BASE WIDTH	ZL	ZR	INV DROP	Y(1)	Y(2)	Y(3)	Y(4)	Y(5)	Y(6)	Y(7)	Y(8)	Y(9)	Y(10)
CD	1	2	0	.000	4.000	10.000			.00										
CD	18	4	1		1.500														
CD	24	4	1		2.000														
CD	30	4	1		2.500														
CD	36	4	1		3.000														
CD	42	4	1		3.500														
CD	48	4	1		4.000														
CD	54	4	1		4.500														
CD	60	4	1		5.000														

W S P G W PAGE NO 1

WATER SURFACE PROFILE - TITLE CARD LISTING

HEADING LINE NO 1 IS -

SKYE CANYON INFRASTRUCTURE - PHASE 3A

HEADING LINE NO 2 IS -

BY OLYMPIA COMPANIES

HEADING LINE NO 3 IS -

PARCEL 2.05a TO BASIN OFF11 - STORM DRAIN

W S P G W PAGE NO 2

WATER SURFACE PROFILE - ELEMENT CARD LISTING

ELEMENT NO 1 IS A SYSTEM OUTLET * * *

U/S DATA	STATION	INVERT	SECT	W S ELEV
	1000.000	2806.440	30	2808.940

ELEMENT NO 2 IS A REACH * * *

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	1056.000	2806.780	30	.013	.000	.000	45.000	1

ELEMENT NO 3 IS A REACH * * *

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	1206.000	2807.990	30	.013	.000	.000	60.000	1

ELEMENT NO 4 IS A REACH * * *

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	1267.000	2808.290	30	.013	.000	.000	.000	0

ELEMENT NO 5 IS A SYSTEM HEADWORKS * *

U/S DATA	STATION	INVERT	SECT	W S ELEV
	1267.000	2808.290	30	.000

♠ FILE: 205a.WSW W S P G W - CIVILDESIGN Version 14.07 PAGE 1

Program Package Serial Number: 1704

WATER SURFACE PROFILE LISTING Date:10-19-2017 Time: 8:45:12

SKYE CANYON INFRASTRUCTURE - PHASE 3A

BY OLYMPIA COMPANIES

PARCEL 2.05a TO BASIN OFF11 - STORM DRAIN

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head / SF Ave	Energy Grd.El. / HF	Super Elev / SE Dpth	Critical Depth / Froude N	Flow Top Width / Norm Dp	Height/Dia.-FT / "N"	Base Wt or I.D. / X-Fall	ZL / ZR	No Wth Prs/Pip / Type Ch
1000.000	2806.440	2.500	2808.940	40.00	8.15	1.03	2809.97	.00	2.13	.00	2.500	.000	.00	1 .0
56.000	.0061					.0095	.53	2.50	.00	2.50	.013	.00	.00	PIPE
1056.000	2806.780	2.897	2809.677	40.00	8.15	1.03	2810.71	.00	2.13	.00	2.500	.000	.00	1 .0
150.000	.0081					.0095	1.43	2.90	.00	2.50	.013	.00	.00	PIPE
1206.000	2807.990	3.369	2811.359	40.00	8.15	1.03	2812.39	.00	2.13	.00	2.500	.000	.00	1 .0
61.000	.0049					.0095	.58	3.37	.00	2.50	.013	.00	.00	PIPE
1267.000	2808.290	3.649	2811.939	40.00	8.15	1.03	2812.97	.00	2.13	.00	2.500	.000	.00	1 .0

♠

♠

SKYE CANYON INFRASTRUCTURE - PHASE 3A

BY OLYMPIA COMPANIES

PARCEL 2.05a TO BASIN OFF11 - STORM DRAIN

1000.00 .I C H E . R

1005.45 . .

1010.90 . .

1016.35 . .

1021.80 . .

1027.24 . .

1032.69 . .

1038.14 . .

1043.59 . .

1049.04 . .

1054.49 . .

1059.94 . I C H W E . R

1065.39 . .

1070.84 . .

1076.29 . .

1081.73 . .

1087.18 . .

1092.63 . .

1098.08 . .

1103.53 . .

1108.98 . .

1114.43 . .

1119.88 . .

1125.33 . .

1130.78 . .

1136.22 . .

1141.67 . .

1147.12 . .

1152.57 . .

1158.02 . .

1163.47 . .

1168.92 . .

```
1174.37   .                                                                .
1179.82   .                                                                .
1185.27   .                                                                .
1190.71   .                                                                .
1196.16   .                                                                .
1201.61   .                                                                .
1207.06   .                    I                       C    H         W          E        .   R
1212.51   .                                                                .
1217.96   .                                                                .
1223.41   .                                                                .
1228.86   .                                                                .
1234.31   .                                                                .
1239.76   .                                                                .
1245.20   .                                                                .
1250.65   .                                                                .
1256.10   .                                                                .
1261.55   .                                                                .
1267.00   .                        I                       C    H            W           E .   R
          2806.440  2807.093  2807.746  2808.399  2809.052  2809.705  2810.358  2811.011  2811.665  2812.318  2812.970
```

N O T E S
1. GLOSSARY
   I = INVERT ELEVATION
   C = CRITICAL DEPTH
   W = WATER SURFACE ELEVATION
   S = SUPER-ELEVATION
   H = HEIGHT OF CHANNEL
   E = ENERGY GRADE LINE
   X = CURVES CROSSING OVER
   B = BRIDGE ENTRANCE OR EXIT

Y = WALL ENTRANCE OR EXIT

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

APPENDIX E

Master Drainage Study Update #4; *Slater Hanifan Group*

Approval Letter

CITY OF LAS VEGAS
INTER-OFFICE MEMORANDUM

DATE: October 12, 2017

TO:
Land Development Services
Department of Public Works

FROM:
Oh Sang Kwon, P.E.
Flood Control Section
Department of Public Works

SUBJECT:	Drainage Study for:		**COPIES TO:**
Skye Canyon Master Drainage Study – Update #4			Slater Hanifan Group
Cross Streets:	Fort Apache Road & Moccasin Road		KAG Development South, LLC
File Number:	F:\Depot\DSMemos\DS4420O.doc		Bart Anderson, P.E., DevCo
Parcel Number:	125-06-001-001		CCRFCD
Zoning Action:			CCPW
FEMA Flood Zone	YES	NO X	NDOT; NV Energy
Proposed Storm Drain	YES X	NO	PB America, Inc.

HISTORY	DATE RECEIVED	DATE REVIEWED	COMMENTS	REVIEW FEES	FEES PAID Transaction #
1st Submittal	6/22/2010	7/13/2010	Not Approved	$1,000.00	147216: $1000
2nd Submittal	9/17/2010	10/4/2010	Not Approved	$400.00	153788: $400
3rd Submittal	10/15/2011	11/14/2011	Not Approved	$400.00	153788: $400
4th Submittal	2/13/2012	3/1/2012	Conditional Approval	$400.00	274196: $400
CCRFCD	5/23/2012	5/24/2012	Concurrence Recv'd	N/C	N/C
5th Submittal NDOT Comments	9/10/2012	9/19/2012	Conditional Approval	N/C	N/C
6th Submittal	12/4/2014	12/30/2014	Conditional Approval	$400.00	378889: $400
7th Submittal	2/17/2015	3/3/2015	Conditional Approval	$400.00	385987: $400
8th Submittal	3/16/2015	4/6/2015	See Comments Below	$400.00	388961: $400
CCRFCD	4/2/2015	4/6/2015	Concurrence Recv'd	N/C	N/C
9th Submittal	6/23/2015	7/21/2015	See Comments Below	$400.00	403025: $400
Revised Memo	8/12/2015	8/12/2015	See Comments Below	N/A	N/A
10th Submittal	10/19/2015	11/23/2015	Conditional Approval	$400.00	N/A
11th Submittal	4/19/2016	5/16/2016 & 8/15/2016	See Comments Below	$400.00	440941: $400
12th Submittal	7/25/2017	9/7/2017 & 10/11/2017	See Comments Below	$400.00	488746: $400
			TOTAL FEES (LDDRS):	**$4,600.00**	----

REMARKS: **12th Submittal: Update # 4 – Overall Master Plan Revision of Skye Canyon development. A new MPA must be submitted to *City of Las Vegas* and *CCRFCD* for approval and shall be adopted by the *City of Las Vegas City Council* prior to the final approval of the subject Overall Master Study.**

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

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

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

1. The overall concept presented in the Master Plan Update #4 for Skye Canyon appears to satisfy the intent of providing regional connectivity of proposed Master Planned facilities without impacting the National Monument. Specific Technical Drainage Studies shall be required to address the specific impacts of each proposed Master Planned facility and the interaction with proposed facilities needed for each phase of development.
2. The Master Plan Update #4 includes a revised Concept for the Regional Flood Control Master Plan Facilities that are identified to be constructed by the Master Developer. Generally these MPU Facilities are shown on Exhibit J, dated July 24, 2017 and include the following general alignments; Skye Village Road - from W. Skye Canyon Park Dr. to Oso Blanca Rd., Iron Mountain Rd. - from the DB #2 outfall to Skye Village Rd., Oso Blanco Rd. – from Skye Village Rd. through the Kyle Canyon/US-95 Interchange to Log Cabin Way., Log Cabin Way – from east of US-95 to N. Skye Canyon Park Dr., and N. Skye Canyon Park Dr. – from Log Cabin Way to Moccasin Rd. The proposed MPU Facility within the Moccasin Rd. alignment – from N. Skye Canyon Park Dr. to the existing Upper Las Vegas Wash MPU Facility is identified to be constructed by the City.
3. Update #4 discussed that *due to the updated plan of constructing the ultimate MPU facilities with the infrastructure improvements, there are no longer interim facilities proposed in place of ultimate facilities*. Based upon that premise, Flood Control requests that Exhibit J be revised to show that flows west of US-95 are routed south to connect into the existing MPU facility that was extended with the Horse Interchange project. This flow connection matches the CCRFCD Master Plan and basin routing. The facilities between CHD02B and CHD06B along the west side of US-95 are local facilities that shall be constructed by the Master Developer and identified as such on a Revised Exhibit J. The result will reduce the impacts to the east side of US-95. Review and revise the flows for facilities 26 thru 26-3 and 17 thru 17-2.
4. The provided Phasing Plan (Exhibit O) has identified the schematic facilities necessary within each Phase. Flood Control concurs that the construction of Phase 3 & 4 MPU infrastructure is critical to the success of the Phased developments. Changes and timing of the Phases and the corresponding infrastructure improvements shall require Updated Phasing Plans that are approved by the City of Las Vegas and Regional Flood Control prior to the approval of future Master Drainage Study updates.
5. The implementation of the CCRFCD Master Plan is being progressed with the recent bid opening of the NDOT US-95 facilities from the CC-215 interchange north to the Kyle Canyon interchange. Construction of the associated CCRFCD MPU facilities allows for the utilization of the existing MPU facilities constructed with the Horse Interchange. Phased development west of US-95 shall maximize the flow collection into this facility prior to allowing flows to cross US-95 using the existing culvert system. The Ultimate Condition will have the west side of these culvert systems removed, no longer having flows cross US-95 as per the CCRFCD Master Plan.
6. The premise of the Master Plan Update #4 for Skye Canyon is to continue to show a new CCRFCD Master Plan Detention Basin that is located outside of the Skye Canyon development. The City of Las Vegas is in the process of applying for BLM grants for this detention basin site located along Kyle

Canyon Road west of the Skye Canyon Development. This ultimate facility shall be included in the MPA as a CCRFCD facility. The intent of the Detention Basin (157DB) is to reduce developed flows to maintain the existing condition flow rate in the ultimate condition and reduce the size of the downstream regional facilities. The concept for the addition of this detention basin to the CCRFCD Master Plan is acceptable to the City and will require the submittal of technical studies to refine the facility parameters.

7. The ultimate condition Exhibit J shows that a portion of the developed flows will drain north of Moccasin into the BLM land and the National Monument to mimic existing drainage patterns. Concentrated flow discharges at EC19 and EC20 to the north shall still require BLM and National Park Service concurrence. Detailed drainage studies that specifically address the impacts of development and storm discharge along the Moccasin corridor west of Skye Canyon Park Dr. shall be provided prior to the City considering the removal of BLM and National Park Service concurrence.

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

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

10. Flood Control requires an interim condition drainage analysis in support of the Phasing Plan that clearly shows the impacts to each Phase, existing washes, upstream concentration points and the downstream concentration points. Flood Control needs to make sure that each Phase of Development is protected during the interim and full build-out of this overall project.

11. The interim conditions of the detention basin outfall impacts are being addressed with the technical drainage studies for each basin. This discharge impact must be accounted for in the interim condition without negatively impacting the existing downstream neighborhoods.

12. CCRFCD concurrence has previously been provided. A new concurrence for Update #4 shall be provided from CCRFCD after Conditional Approval by the City of Las Vegas.

13. CCPW concurrence has previously been provided. A new concurrence for Update #4 shall be provided from CCPW after Conditional Approval by the City of Las Vegas.

14. NDOT concurrence has previously been provided. A new concurrence for Update #4 shall be provided from NDOT after Conditional Approval by the City of Las Vegas.

<u>The following comments are repeated until they are complete:</u>

1. Please note that the Traffic Study must be approved prior to final approval of the Master Drainage Study. If the street layout does not match the Master Drainage Study, an update to the Master Drainage Study must be submitted to address the changes.

2. Per a meeting held in August 18, 2011 between the developer and the *City of Las Vegas*, it was agreed that NV Energy's approval of any proposed drainage facilities within their access easements (such as the proposed detention basins) must be obtained prior to the final approval of the Master Drainage Study. Please provide documentation for such approval or acknowledgment.

3. Please note that any future technical drainage study submittals that differ from the Master Drainage Study (ie. Changes in pods, infrastructure, flows etc.) will require an update to the Master Drainage Study and this update must be approved by the *City of Las Vegas Flood Control Section* prior to final approval of technical drainage study.

4. The proposed detention basins will require coordination with the State of Nevada, Division of Water Resources Dam Safety and will require the State's approval prior to permitting.

5. Please note that the proposed 100-year flood protection facilities identified on Exhibit J must be constructed by the Master Developer as a part of the master planned infrastructure. Technical drainage studies are required for each phase of the master planned infrastructure improvements. The technical drainage studies for the infrastructure improvements may be submitted with conditional approval of this Master Drainage Study. However, final approval for the Master Drainage Study must be obtained prior to conditional approval of the infrastructure drainage studies.
6. Technical drainage studies are required for each of the Pod's. The technical drainage studies for the Pod's may not be submitted until the conditional approval of the pertinent infrastructure drainage study is obtained. Final approval for the infrastructure drainage study must be obtained prior to conditional approval of the impacted Pod drainage studies.
7. Building permits for the homes within the individual Pod's will not be issued until construction of the street and flood control infrastructure around the Pod is substantially complete or interim protection is provided per the approved technical drainage study.
8. The design of debris basins at all major culvert entrances to limit the amount of sediment and debris entering the storm drain facilities will be required in a future infrastructure study.
9. Please note that all detention basins must be designed per CCRFCD criteria including a low flow facility around the detention basin.
10. Please note that all proposed interim facilities must be maintained by the master developer.
11. Provide a legal description of the proposed detention basins prior to recordation of the parent final map.
12. Continue to coordinate the proposed drainage facilities with *Sheep Mountain Parkway* project. Please contact Greg McDermott, P.E., at (702)-229-2143 to coordinate the proposed drainage facilities. The detention basin outfall facilities need to account for the future *Sheep Mountain Parkway* improvements.

NOTE: Any future changes to the proposed design (or design assumptions) as outlined in the approved master drainage study and attached preliminary grading plan which affect drainage must be addressed in a Drainage Study Amendment and accepted by the *City of Las Vegas Flood Control Section*. Additionally, conditional acceptance of a drainage study is valid for a period of one (1) year. If the proposed construction has not been completed in that time period, the *City of Las Vegas* reserves the right to require additional conditions and/or submission and acceptance of a complete drainage study update prior to further construction of a project.

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

END OF REMARKS
Osk/pbj

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

Drainage Exhibits

MASTER DRAINAGE STUDY
UPDATE #4
SUPPLEMENT – RESPONSE TO CLV CONDITIONS OF APPROVAL

Skye Canyon
City of Las Vegas, Nevada

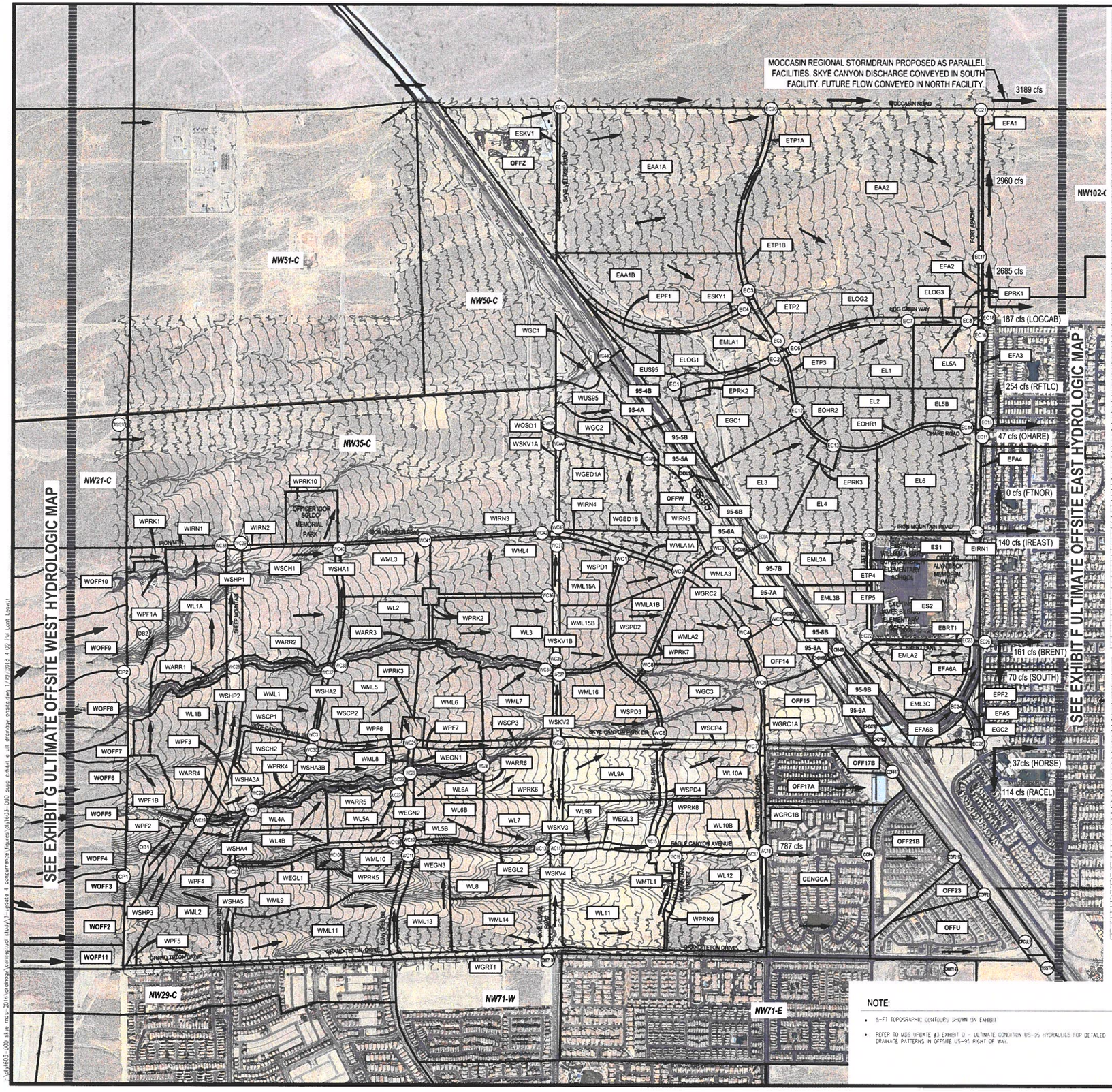
Job No.: OLY1603.000
Date: February 2018

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:
Olympia Companies
11411 Southern Highlands Parkway, Suite 300
Las Vegas, NV 89141
Phone: 702-220-6565 ▪ Fax: 702-220-6566



Lant Leavitt, P.E.
NV Professional Engineer No. 18287

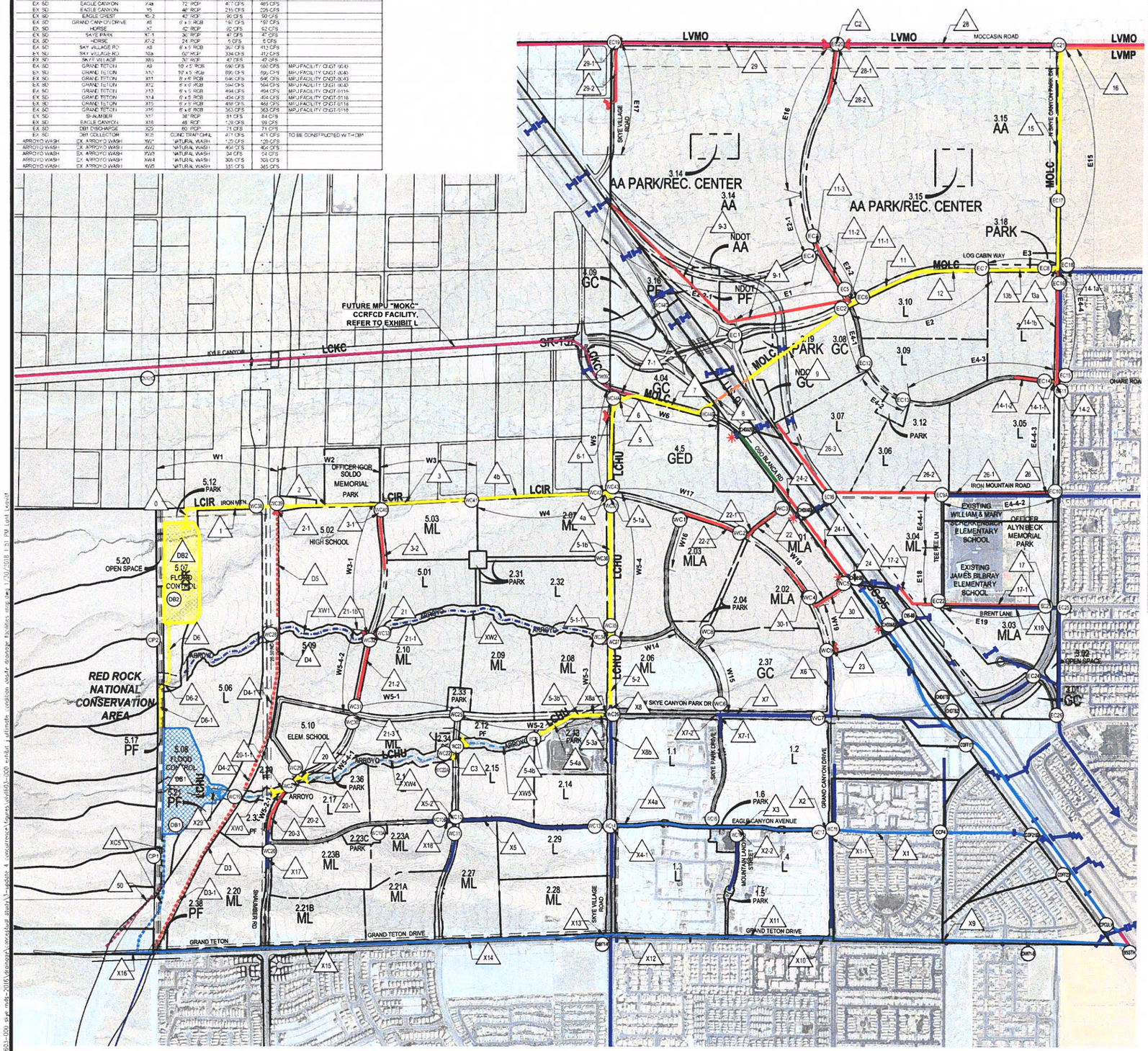

MOCCASIN REGIONAL STORMDRAIN PROPOSED AS PARALLEL FACILITIES. SKYE CANYON DISCHARGE CONVEYED IN SOUTH FACILITY. FUTURE FLOW CONVEYED IN NORTH FACILITY.
3189 cfs
2960 cfs
2685 cfs
187 cfs (LOGCAB)
254 cfs (RFTLC)
47 cfs (OHARE)
0 cfs (FTNOR)
140 cfs (IREAST)
161 cfs (BRENT)
70 cfs (SOUTH)
37cfs (HORSE)
114 cfs (RACEL)
787 cfs
MOCCASIN ROAD
SKYE CANYON PARK DR
SKYE CANYON WAY
FORT APACHE ROAD
OHARE ROAD
IRON MOUNTAIN ROAD
EAGLE CANYON AVENUE
GRAND TETON DRIVE
NW51-C
NW50-C
NW35-C
NW21-C
NW29-C
NW71-W
NW71-E
NW102-C
SEE EXHIBIT G ULTIMATE OFFSITE WEST HYDROLOGIC MAP
SEE EXHIBIT F ULTIMATE OFFSITE EAST HYDROLOGIC MAP
OFFICER IGOR SOLDO MEMORIAL PARK
ALYN BECK MEMORIAL PARK
EXISTING ES-35 ELEMENTARY SCHOOL
ESKV1
OFFZ
ETP1A
EAA1A
EAA2
ETP1B
EAA1B
EPF1
ESKY1
ETP2
ELOG2
ELOG3
EFA1
EFA2
EPRK1
EFA3
EFA4
EFA5
EFA6A
EFA6B
EPF2
EML3C
EMLA2
EML3A
EML3B
ETP4
ETP5
ES1
ES2
EIRN1
EBRT1
OFF14
OFF15
OFF17A
OFF17B
OFF21B
OFF23
OFFU
EMLA1
ELOG1
EUS95
95-4B
95-4A
95-5B
95-5A
95-6B
95-6A
95-7B
95-7A
95-8B
95-8A
95-9B
95-9A
EPRK2
EGC1
EOHR2
EOHR1
EL1
EL2
EL3
EL4
EL5A
EL5B
EL6
WUS95
WOS01
WSKV1A
WGC2
WGED1A
WGED1B
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WIRN5
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WL10A
WL10B
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WSKV3
WSKV4
WGC3
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WGRC2
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FACILITY HYDRAULICS SUMMARY TABLE

NETWORK	STREET ID	FACILITY ID	FACILITY TYPE	DESIGN FLOWRATE	PROPOSED FLOWRATE	COMMENTS
EX SD	EAGLE CANYON	X1	8' x 8' RCB	800 CFS	787 CFS	
EX SD	GRAND CANYON	X1-1	48" RCP	110 CFS	84 CFS	
EX SD	EAGLE CANYON	X2	8' x 8' RCB	720 CFS	605 CFS	
EX SD	MOUNTAIN LANDING	X2-2	48" RCP	110 CFS	106 CFS	
EX SD	EAGLE CANYON	X3	7'-9" RCP	776 CFS	635 CFS	
EX SD	SKYE VILLAGE	X4-1	42" RCP	117 CFS	140 CFS	
EX SD	EAGLE CANYON	X4a	72" RCP	477 CFS	485 CFS	
EX SD	EAGLE CANYON	X5	48" RCP	215 CFS	226 CFS	
EX SD	EAGLE CREST	X5-2	42" RCP	90 CFS	50 CFS	
EX SD	GRAND CANYON DRIVE	X6	8' x 5' RCB	787 CFS	787 CFS	
EX SD	HORSE	X7	42" RCP	62 CFS	62 CFS	
EX SD	SKYE PARK	X7-1	36" RCP	47 CFS	47 CFS	
EX SD	HORSE	X7-2	24 RCP	5 CFS	5 CFS	
EX SD	SKY VILLAGE RD	X8	8' x 5' RCB	367 CFS	413 CFS	
EX SD	SKY VILLAGE RD	X8a	60" HDP	334 CFS	413 CFS	
EX SD	SKYE VILLAGE	X8b	30" RCP	47 CFS	47 CFS	
EX SD	GRAND TETON	X9	10' x 5' RCB	680 CFS	680 CFS	MPU FACILITY OLQT 0043
EX SD	GRAND TETON	X10	10' x 5' RCB	890 CFS	890 CFS	MPU FACILITY OLQT 0043
EX SD	GRAND TETON	X11	8' x 6' RCB	646 CFS	646 CFS	MPU FACILITY OLQT 0043
EX SD	GRAND TETON	X12	6' x 6' RCB	764 CFS	764 CFS	MPU FACILITY OLQT 0043
EX SD	GRAND TETON	X13	6' x 5' RCB	494 CFS	494 CFS	MPU FACILITY OLQT 0116
EX SD	GRAND TETON	X14	6' x 5' RCB	494 CFS	494 CFS	MPU FACILITY OLQT 0116
EX SD	GRAND TETON	X15	6' x 5' RCB	459 CFS	459 CFS	MPU FACILITY OLQT 0116
EX SD	GRAND TETON	X16	6' x 6' RCB	363 CFS	363 CFS	MPU FACILITY OLQT 0116
EX SD	SHUMAKER	X17	36" RCP	81 CFS	84 CFS	
EX SD	EAGLE CANYON	X18	48" RCP	128 CFS	99 CFS	
EX SD	DB1 DISCHARGE	X29	60" RCP	73 CFS	71 CFS	
EX SD	241 COLLECTOR	XC5	CONC TRAP CHNL	471 CFS	471 CFS	TO BE CONSTRUCTED W T-H DB1
ARROYO WASH	EX ARROYO WASH	XW1	NATURAL WASH	120 CFS	120 CFS	
ARROYO WASH	EX ARROYO WASH	XW2	NATURAL WASH	404 CFS	404 CFS	
ARROYO WASH	EX ARROYO WASH	XW3	NATURAL WASH	84 CFS	84 CFS	
ARROYO WASH	EX ARROYO WASH	XW4	NATURAL WASH	309 CFS	309 CFS	
ARROYO WASH	EX ARROYO WASH	XW5	NATURAL WASH	335 CFS	365 CFS	

DETENTION BASIN HYDRAULIC SUMMARY TABLE

FACILITY ID	INFLOW	OUTFLOW	100-YR STORAGE	DEBRIS STORAGE	TOTAL STORAGE	PMF FLOW	COMMENTS
DB1	794 CFS	71 CFS	57 AC-FT	6 AC-FT	63 AC-FT	6744 CFS	EXISTING DETENTION BASIN 1
DB2	708 CFS	70 CFS	72 AC-FT	6 AC-FT	78 AC-FT	5899 CFS	PROPOSED DETENTION BASIN 2


LVMO
LVMP
MOCCASIN ROAD
SKYE CANYON PARK DR
E17
E16
E15
E18
E19
E1
E2
E2-1
E2-2
E3
E4-1
E4-2
E4-3
E4-4-1
E4-4-2
3.14 AA PARK/REC. CENTER
3.15 AA PARK/REC. CENTER
3.15 AA
3.14 AA
3.18 PARK
NDOT AA
NDOT PF
NDOT GC
3.16 PF
4.09 GC
3.10 L
3.08 GC
3.19 PARK
3.09 L
3.07 L
3.12 PARK
3.05 L
3.06 L
4.04 GC
4.5 GED
2.01 MLA
2.03 MLA
3.04 ML
2.02 MLA
3.03 MLA
2.04 PARK
2.07 ML
2.31 PARK
2.32 L
5.01 L
5.03 ML
5.12 PARK
5.02 HIGH SCHOOL
5.20 OPEN SPACE
5.00 FLOOD CONTROL
5.09
5.06 L
5.10 ELEM. SCHOOL
5.08 FLOOD CONTROL
5.17 PF
2.10 ML
2.09 ML
2.08 ML
2.06 ML
2.33 PARK
2.12 PF
2.34 ML
2.13 PARK
2.36 PARK
2.15 L
2.14 L
2.17 L
2.3 PF
2.23C PARK
2.23A ML
2.23B ML
2.21A ML
2.21B ML
2.27 ML
2.28 ML
2.29 L
2.37 GC
1.1 L
1.2 L
1.6 PARK
1.3 L
1.4 L
1.5 PARK
3.92 OPEN SPACE
4.10 GC
2.38 PF
2.20 ML
RED ROCK NATIONAL CONSERVATION AREA
FUTURE MPU "MOKC" CCRFCD FACILITY, REFER TO EXHIBIT L
OFFICER IGOR SOLDO MEMORIAL PARK
WILLIAM S. ENGELMANN ELEMENTARY SCHOOL
ALYN BECK MEMORIAL PARK
EXISTING JAMES PILBRAY ELEMENTARY SCHOOL
SR-159
KYLE CANYON
LCKE
LCIR
LCHU
LCMU
LCMC
LVMO
LOG CABIN WAY
IRON MOUNTAIN ROAD
TEE PEE LN
BRENT LANE
OHARE ROAD
EAGLE CANYON AVENUE
GRAND CANYON DRIVE
SKYE PARK DRIVE
SKYE VILLAGE ROAD
SHUMAKER RD
GRAND TETON DRIVE
OSO BLANCA RD
ARROYO
DB1
DB2
W1
W2
W3
W4
W5
W6
W16
W17
W18
W19
W14
W15
W5-1
W5-2
W5-3
W5-4
W5-4-1
W5-4-2
W2-1
W2-2
W2-3
W3-1
XW1
XW2
XW3
XW4
XW5
C1
C2
C3
C4
C5
C6
C7
C8
C9
C10
C11
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C39
C40

APPENDIX F

Cd of Electronic Files & Revised Improvement Plans