TECHNICAL DRAINAGE STUDY AMMENDMENT

VEGAS DRIVE IMPROVEMENTS
SHADOW MOUNTAIN PLACE
TO
RANCHO DRIVE

PDG PROJECT No. 05333-C

PREPARED FOR:

CITY OF LAS VEGAS
DEPARTMENT OF PUBLIC WORKS

November 23, 2011

PREPARED BY:

POGGEMEYER DESIGN GROUP, INC.
ENGINEERS – PLANNERS – SURVEYORS – LANDSCAPE ARCHITECTS
6960 SMOKE RANCH ROAD, SUITE 110
LAS VEGAS, NEVADA 89128
(702) 255-8100 (702) 255-8375 FAX
ContactUs@poggemeyer.com

HYDROLOGIC CRITERIA AND DRAINAGE MANUAL

DRAINAGE STUDY INFORMATION FORM

Name of Development: Vegas Drive Improvements - Shadow Mountain Place to Rancho Drive Date: November 22, 2011

Location of Development: a) Descriptive (Cross Streets) North/South: Shadow Mtn Plc / Rancho Dr.

East/West: Vegas Drive

b) Section: 24, 25, 19, 20, 29, 30 Township: 20 South Range: 60 & 61 East

c) APN : Portions of 139-301-01-001 & 002

Name of Owner: City of Las Vegas

Telephone No.: (702) 292-2143 Fax No.: E-Mail Address:

Address: 330 North Rancho, Las Vegas, Nevada 89106

Contact Person-Name: Jason M. Calhoun, P.E., CFM **Telephone No.:** (702) 255-8100

* **E-Mail Address:** jcalhoun@poggemeyer.com **Fax No.:** (702) 255-8375

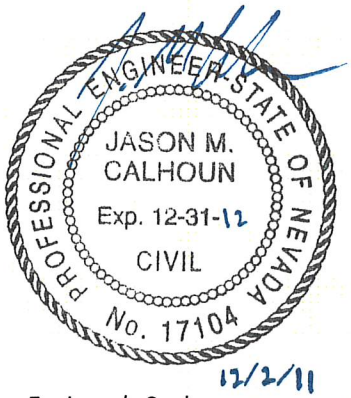
Firm: Poggemeyer Design Group, Inc.

Address: 6960 Smoke Ranch Road, Suite 110 - Las Vegas, NV 89128

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	Street Improvements	

1. Total Owned Land Area: At Site: 12.3 +/- Acres Being Developed/Disturbed: 12.3 +/- Acres
2. Is a portion or all of the subject property located in a designated 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.): Public Storm Drain Improvements
5. Approximate upstream land area which drains to the subject site: 1.6 +/- Sq-mi
6. Has the site drainage been evaluated in the past? ☒ **YES** ☐ **NO** If yes, please identify documentation: Regional Drainage Facility Alternatives Study - Vegas Drive by PDG, 5/07; 2002 & 2008 MPU by PBS&J;
7. If known, please briefly identify the proposed discharge point(s) of runoff from the site: Connecting to an existing 84" RCP just west of the Vegas and Rancho Intersection
8. Briefly describe your proposed schedule for the subject project: As soon as possible



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.

***New Required Field**

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

Local Entity File No.

Revision	Date

REFERENCE:

STANDARD FORM 1

Updated 05/01/2008

November 22, 2011

POGGEMEYER
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Mr. Todd Myers, P.E.
Engineering Project Manager
Clark County Regional Flood Control District
600 S. Grand Central Parkway, Suite 300
Las Vegas, NV 89106

RE: Amendment for the Vegas Drive Improvements
Shadow Mountain Place to Rancho Drive
PDG PROJECT # 05333-D

Dear Mr. Myers,

The purpose of this submittal is to provide an amendment to the Vegas Drive Technical Drainage Study. The upstream most portion of the storm drain system had to be redesigned per the City of Las Vegas Flood Control. The changes consist of approximately 500-ft of the storm drain (RCB) having its slope changed to 0.4% and being upsized from a 6-ft wide by 5-ft tall box to an 8-ft wide by 5-ft tall box. This change will ensure that the Hydraulic Grade Line for the storm drain will no longer be above the street surface as it was before. The change in slope will result in the RCB being deeper in the ground and will also require other facilities to be relocated. Another consequence of this revision is that the laterals for the drop inlets will connect with the main line at different locations as will the connection point for the SD3 storm drain system. That system now connects at stationing 17+74.77 instead of 20+91.85, therefore eliminating several hundred feet of storm drain. A transition structure will now be located at the old SD3 connection point to change from the new box to the 72-inch RCP storm drain. Please note that per Peter Jackson at the City of Las Vegas Flood Control a "Flapper Valve" will be installed at the upstream connection of the manhole at Station 13+00 of the SD-3 storm drain within Shadow Lane. This "Flapper Valve" will prevent water from the main line from backing up the SD-3 storm drain and out letting via the drop inlets in that system. This is an issue as the HGL in the Vegas system is higher than the grate elevations for the Shadow Mountain inlets.

We hope that all concerns have been addressed. If you have any questions, please contact me at (702) 255-8100.
Sincerely,

6960 Smoke Ranch Road, Suite 110 | Las Vegas, Nevada 89128-3204 | P 702-255-8100 F 702-255-8375 | www.poggemeyer.com

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POGGEMEYER DESIGN GROUP, INC.

Jason M. Calhoun, P.E., CFM, LEED® AP
Vice President
Flood Control Manager

City of Las Vegas
Flood Control Section

Review Comments/Responses

November 22, 2011

POGGEMEYER
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Mr. Peter Jackson, C.F.M.
Flood Control Section
City of Las Vegas
Department of Public Works
330 North Rancho Blvd.
Las Vegas, NV 89106

Re: Vegas Drive Improvements – Shadow Mountain Place to Rancho Drive – Pre-Final Submittal – (DS4211, Hansen #11554)
Response to Comments Dated September 23, 2009
PDG #05333-D

Dear Mr. Jackson:

Below are the comments submitted by you regarding the above mentioned Pre-Final Submittal and design plans. These are followed by our responses.

1) The pavement rehabilitation and SID improvements have been removed from the project. Revise the Roadway Profiles (Sheet C-1 through Sheet C-9) to reflect matching the existing pavement. The PGL design no longer applies as the street rehabilitation portion is no longer a part of this project.

Response #1: The pavement improvements have been revised as directed in the attached email from Lorrie Dunford.

2) Flood Control and Street Rehabilitation concur on the removal of the 1" UTACS from the Typical Paving Sections as the street rehabilitation portion is no longer a part of this project.

Response #2: UTACS has been removed as requested.

3) The plans need to be revised to reflect the removal and replacement of the curb & gutter and sidewalk along the south side of Vegas Drive between Shadow Mountain place and Michael Way. Revise Sheets C-1 & SD-1 accordingly.

Response #3: Sheet C-1 reflects R & R of sidewalk for drop inlet installation. The recent relocation of the 8'x5' main line north in Vegas Drive negates the need for complete R & R.

4) The inlet on the west side of Decatur Boulevard south of Vegas Drive is located within an existing driveway. This drive is proposed to be removed with a future development (the Decatur-Vegas project Hansen # 29988, currently under design). This project needs to show the existing driveway limits and replace the needed curb and gutter and sidewalk to the drive limits if they are not totally removed by the placement of the new inlet.

Response #4: Noted, plans revised.

5) Review the design considerations of the excessive ground water on the trench sections. This project should handle the ground water similar to how the Oakey, Birch to Cahlan project did.

Response #5: Covered under the Special Provisions.

6) Sheet C-3 & SD-3: Show the driveway limits near Drop Inlet #11, near Station VD 34+87.

Response #6: Noted, plans revised.

7) Sheet C-4 & SD-4: Show the driveway limits near the northwest corner of Vegas and Decatur.

Response #7: Noted, plans revised.

8) Coordinate the limits of the traffic markings shown on the TS Sheets with the Traffic Engineering Division to reflect the reduced paving. The traffic markings need to match the existing roadway

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conditions. The markings west of Decatur are painted, while the markings to the east use buttons.

Response #8: Traffic markings have been updated for the entire project to reflect the pavement improvements directed by Lorrie Dunford in the attached email.

9) The Detailed Intersection Grading Plans (Sheet C-12 & C-13) should have a tighter grid on paving elevations.

Response #9: Grading plans have been further detailed as requested.

10) Sheet SD-10: Relocate the Plug & Cap notes to the inlets.

Response #10: Noted, plans revised.

11) Coordinate the Foundation/Earthwork Notes to match the Type II requirements.

Response #11: Noted, plans revised.

12) Revise Sheet C-11 to include the "O" note.

Response #12: Noted, plans revised.

13) Portions of the proposed improvements are within Clark County jurisdiction. Continue to coordinate the necessary approvals and permits with the Clark County Department of Development Services. The necessary Permits' must be acquired prior to seeking construction funding from the CCRFCD.

Response #13: Coordination with Clark County is ongoing. The encroachment permit application was transmitted to the City for submittal.

14) The proposed improvement plans show drainage facilities of a size that must be reviewed for Maintenance and Access concerns. *Streets & Sanitation* review and approval must be secured prior to final approval.

Response #14: Street & Sanitation review to be coordinated through City.

15) Additional minor comments are shown on the attached storm drain plans.

Response #15: Noted, plans revised.

We hope that all of your comments and concerns have been adequately addressed. If you have any question, please do not hesitate to call me at 255-8100.

Very truly yours,

POGGEMEYER DESIGN GROUP, INC.

Jason M. Calhoun, P.E., CFM, LEED® AP BD+C
Vice President
Flood Control Manager

Jason Calhoun

From: Lorraine Dunford [ldunford@LasVegasNevada.GOV]
Sent: Tuesday, October 04, 2011 5:25 PM
To: Adam Pilarz
Cc: msorenson@lasvegasnevada.gov; Tim Parks; Peter Jackson; Felix Kwakwa; Sam Dunnam; David Bowers
Subject: RE: Vegas Drive Pavement Rehabilitation

The pavement rehab will be close to what you have assumed:
New pavement work

- *West of Shadow Mountain*: New sewer is contained to the south side of Vegas Drive but meanders to avoid existing water so patching may not be preferred, **Mill and overlay south half of Vegas Drive??** We need to follow RTC standards for permanent patching and mill to the lane lines. Quantity/cost assessed to Sanitation.
- *Shadow Mountain to Decatur*: New sewer is on north side of Vegas Drive, **Extend full-depth to centerline** Yes on the south side **~~(or maintain at 5' off??)~~, add mill and overlay for entire north half??** (except where full-depth already exists on north) You can decrease the width of the patches to the minimum and mill and overlay the north half. Quantity/cost assessed to Sanitation
- *Decatur to Parkchester*: new sewer is contained on south side with storm drain, **Maintain south half full-depth –** Yes **NO REHAB on north half??** No, it will be a mill/overlay but separate the quantity and costs. I am still trying to find a separate funding source.
- *Parkchester to Rancho*: **no change, NO REHAB on north half??** Still full depth on the south half to STA 88+00 where the storm drain crosses to the north side then full depth on the north side. Mill/Overlay sections on north/south not receiving full depth pavement. Track quantity and cost separately with those on the north half from Decatur to Parkchester.
- *Shadow Mountain alignment*: new sewer is on east half of street with storm drain, **Widen permanent patch to centerline to include new sewer??** With the new sewer and storm drain, I believe the County will require a mill/overlay on the entire east half of the street.

All the UTACS is removed from the plans and I have referenced centerline but in some cases where there is an offset crown with a median the full depth may be less than centerline. Centerline is actually a reference to the crown of the roadway because our street rehab folks previously commented that it is too difficult to mill/overlay over the crown and suggested full depth replacement to the crown.

From: Adam Pilarz [mailto:APilarz@poggemeyer.com]
Sent: Thursday, September 29, 2011 9:44 AM
To: Lorraine Dunford
Cc: msorenson@lasvegasnevada.gov; Tim Parks; Peter Jackson; Felix Kwakwa; Sam Dunnam
Subject: Vegas Drive Pavement Rehabilitation

Lorrie,

We've gone back and forth several times on the limits/manner of pavement rehab for Vegas Drive so I want to make sure we are all on the same page as we proceed with incorporating the relief sewer into the storm drain project. I've attached the roadway sheets that are impacted by the new sewer for your information…the pavement limits shown may differ from what you have based on the last round of comments several months ago. I've highlighted the existing rehab work and outlined the new sewer.

<u>Current state of pavement rehab:</u>

- All work is full-depth replacement, no mill and overlay
- *West of Shadow Mountain*: no work
- *Shadow Mountain to Decatur*: full-depth replacement 5' south of centerline with some partial and

full-width sections near Michael (see attached C01 & C02)

- *Decatur to Parkchester*: full-depth south half to centerline
- *Parkchester to Rancho*: full-depth south half to centerline with partial full-width near Rancho
- *Shadow Mountain alignment*: 12' +/- wide permanent patch for storm drain

New pavement work:

- *West of Shadow Mountain*: New sewer is contained to the south side of Vegas Drive but meanders to avoid existing water so patching may not be preferred, **Mill and overlay south half of Vegas Drive??**
- *Shadow Mountain to Decatur*: New sewer is on north side of Vegas Drive, **Extend full-depth to centerline (or maintain at 5' off??), add mill and overlay for entire north half??** (except where full-depth already exists on north)
- *Decatur to Parkchester*: new sewer is contained on south side with storm drain, **Maintain south half full-depth – NO REHAB on north half??**
- *Parkchester to Rancho*: **no change, NO REHAB on north half??**
- *Shadow Mountain alignment*: new sewer is on east half of street with storm drain, **Widen permanent patch to centerline to include new sewer??**

Please let us know as soon as you can if the above assumptions are correct or what modifications are required so we can proceed, we will address the payment sharing for this work once we nail down the limits. Feel free to give me a call if you have any questions.

Thanks,

ADAM PILARZ, PE
POGGEMEYER DESIGN GROUP, INC.
OFFICE: (702) 255-8100
MOBILE: (702) 592-4672

Memorandum

City of Las Vegas
Department of Public Works
Engineering Planning

To: Lorrie Dunford, P.E.
Engineering Design

From: Peter Jackson, CFM
Flood Control Section

Date: September 23, 2009

Re: Vegas Drive Improvements – Shadow Mountain Place to Rancho Drive : PRE-FINAL Submittal (DS4211, Hansen #11554)

Flood Control has reviewed the Pre-Final Design Submittal for the Vegas Drive Improvements (Shadow Mountain Place to Rancho Drive) and we offer the following comments:

1. The pavement rehabilitation and SID improvements have been removed from the project. Revise the Roadway Profiles (Sheet C-1 through C-9) to reflect matching the existing pavement. The PGL design no longer applies as the street rehabilitation portion is no longer a part of this project.
2. Flood Control and Street Rehabilitation concur on the removal of the 1" UTACS from the Typical Paving Sections as the street rehabilitation portion is no longer a part of this project.
3. The plans need to be revised to reflect the removal and replacement of the curb & gutter and sidewalk along the south side of Vegas Drive between Shadow Mountain place and Michael Way. Revise Sheets C-1 & SD-1 accordingly.
4. The inlet on the west side of Decatur Boulevard south of Vegas Drive is located within an existing driveway. This drive is proposed to be removed with a future development (the Decatur-Vegas project Hansen # 29988, currently under design). This project needs to show the existing driveway limits and replace the needed curb & gutter and sidewalk to the drive limits if they are not totally removed by the placement of the new inlet.
5. Review the design considerations of the excessive ground water on the trench sections. This project should handle the ground water similar to how the Oakey, Birch to Cahlan project did.
6. Sheet C-3 & SD-3: Show the driveway limits near Drop Inlet # 11, near Station VD 34+87.
7. Sheet C-4 & SD-4: Show the driveway limits near the northwest corner of Vegas and Decatur.
8. Coordinate the limits of the traffic markings shown on the TS Sheets with the Traffic Engineering Division to reflect the reduced paving. The traffic markings need to match the existing roadway conditions. The markings west of Decatur are painted, while the markings to the east use buttons.

9. The Detailed Intersection Grading Plans (Sheets C-12 & C-13) should have a tighter grid on paving elevations.
10. Sheet SD-10: Relocate the Plug & Cap notes to the inlets.
11. Coordinate the Foundation/Earthwork Notes to match the Type II requirements.
12. Revise Sheet C-11 to include the "O" note.
13. Portions of the proposed improvements are within Clark County jurisdiction. Continue to coordinate the necessary approvals and permits with the Clark County Department of Development Services. The necessary Permits' must be acquired prior to seeking construction funding from the CCRFCD.
14. The proposed improvement plans show drainage facilities of a size that must be reviewed for Maintenance and Access concerns. *Streets & Sanitation* review and approval must be secured prior to final approval.
15. Additional minor comments are shown on the attached storm drain plans.

CC: Robert Welch, P.E. – CLV
Mark Sorensen, P.E. – CLV
Todd Myers, P.E. – CCRFCD

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APPENDIX E

Hydraulics

E-3.1

Storm Drain Lateral HGL Calculations

VEGAS DRIVE IMPROVEMENTS - SHADOW MOUNTAIN PLACE TO RANCHO DRIVE

100-YR HGL CALCULATIONS FOR STORM DRAIN LATERALS (INTERIM CONDITION)

MODIFIED STANDARD FORM 6

EACH ROW REPRESENTS A SEGMENT OF PIPE AND AN UPSTREAM INLET																FLOW DATA								ENERGY LOSS DATA				ENERGY AND HYDRAULIC DATA			CHECK - CONSIDER LATERAL AS CULVERT		CONTROL U/S HGL	COMMENTS		
CALL OUT	LOCATION		EQUIV PIPE SIZE/ TYPE (IN)	INVERTS (English)				D/S HGL ELEVATION			CRITICAL DEPTH													PIPE	INLET			PIPE / TRANSITION			INLET CONTROL					
	FROM D/S STATION (OUTLET)	TO U/S STATION (INLET)		D/S ELEV (FT)	U/S ELEV (FT)	PIPE LENGTH (FT)	PIPE SLOPE (%)	CONTROL D/S HGL ELEV (FT)	CALC[1] D/S HGL ELEV (FT)	CRITICAL D/S HGL ELEV (FT)	D_c* (FT)	TOP WIDTH (FT)	FLOW AREA (FT^2)	Q_calc (CFS)	D (FT)	TOP WIDTH (FT)	A (FT^2)	Φ**	Q (CFS)	V (FPS)	$H_V=V^2/2g$ (FT)	S_f*** (FT/FT)	H_f (FT)	K_i	H_i (FT)	D/S EGL ELEV (FT)	U/S EGL ELEV (FT)	U/S HGL ELEV (FT)	H_w/D (HDS No. 5)	U/S HGL ELEV (FT)	U/S HGL ELEV (FT)	METHOD CONTROL U/S HGL	U/S ROADWAY SURFACE ELEV	DEPTH BELOW ROADWAY SURFACE
DI2	**"LVOW" 16+30.19, 3.00' RT**	**"VD" 6+13.83, 35.00' RT**	**36**	**2234.94**	**2237.76**	**12.73**	22.11	**2243.70**	**2243.70**	**2237.73**	**2.79**	1.5309	6.8511	82.19	3.00	0.00	7.07	0.0049	**82.0**	11.60	2.09	0.0151	0.19	**0.5**	1.05	2245.79	2247.03	2244.94	**2.00**	2243.76	2244.94	OUTLET	**2247.2** +/-	2.3
DI2A	**"LVOW" 17+61.57, 3.00' RT**	**"VD" 7+44.91, 35.00' RT**	**36**	**2234.42**	**2237.18**	**12.73**	21.64	**2241.58**	**2241.58**	**2237.09**	**2.67**	1.8773	6.6455	70.91	3.00	0.00	7.07	0.0049	**71.0**	10.04	1.57	0.0113	0.14	**0.5**	0.78	2243.15	2244.08	2242.51	**1.65**	2242.13	2242.51	OUTLET	**2245.1** +/-	2.6
DI3	**"LVOW" 19+40.72, 3.00' RT**	**"VD" 9+24.06, 35.00' RT**	**36**	**2233.70**	**2236.57**	**12.73**	22.55	**2239.15**	**2239.15**	**2236.24**	**2.54**	2.1619	6.3822	62.19	3.00	0.00	7.07	0.0049	**62.0**	8.77	1.20	0.0086	0.11	**0.5**	0.60	2240.35	2241.05	2239.86	**1.39**	2240.74	2240.74	INLET	**2242.6** +/-	1.8
DI3A	**"LVOW" 19+29.43, 3.00' LT**	**"VD" 9+24.06, 35.00' LT**	**18**	**2233.75**	**2236.57**	**60.00**	4.70	**2239.15**	**2239.15**	**2234.28**	**0.53**	1.4340	0.5584	1.88	1.50	0.00	1.77	0.0049	**2.0**	1.13	0.02	0.0004	0.02	**0.5**	0.01	2239.17	2239.20	2239.18	**0.48**	2237.29	2239.18	OUTLET	**2242.6** +/-	3.4
LAT1A	**"LVOW" 16+45.87, 3.00' LT**	**"VD" 5+94.16, 33.87' LT**	**4'x4' RCB**	**2234.87**	**2239.65**	**67.70**	7.06	**2242.97**	**2242.97**	**2238.45**	**3.58**	4.0000	14.3200	153.67	4.00	0.00	16.00	0.0049	**154.0**	9.63	1.44	0.0048	0.33	**0.5**	0.88	2244.41	2245.61	2244.17	**1.43**	2242.51	2244.17	OUTLET	**2247.0** +/-	2.8
LAT1A	**"VD" 5+94.16, 33.87' LT**	**"VD" 5+47.06, 33.83' LT**	**42**	**2241.75**	**2241.93**	**27.44**	0.66	**2244.58**	**2244.17**	**2244.58**	**2.83**	2.7596	8.3246	82.00	2.83	2.76	8.32	0.0049	**82.0**	9.85	1.51	0.0089	0.24	**0.4**	0.60	2246.08	2246.93	2245.42	**1.34**	2246.62	2246.62	INLET	**2248.2** +/-	1.5
LAT2A	**"LVOW" 26+26.00, 3.00' RT**	**"VD" 16+23.52, 32.38' RT**	**18**	**2225.77**	**2226.53**	**7.63**	9.96	**2229.30**	**2229.30**	**2227.15**	**1.38**	0.8041	1.7034	14.00	1.50	0.00	1.77	0.0049	**14.0**	7.92	0.98	0.0177	0.13	**0.4**	0.39	2230.28	2230.80	2229.83	**2.29**	2229.97	2229.97	INLET	**2234.3** +/-	4.3
LAT2	**"LVOW" 32+67.94, 3.00' LT**	**"VD" 22+66.51, 32.24' LT**	**18**	**2217.33**	**2220.70**	**47.41**	7.11	**2220.29**	**2220.29**	**2218.55**	**1.22**	1.1659	1.5414	10.00	1.50	0.00	1.77	0.0049	**10.0**	5.66	0.50	0.0090	0.43	**0.4**	0.20	2220.79	2221.41	2220.92	**1.48**	2222.92	2222.92	INLET	**2223.7** +/-	0.8
LAT3	**"LVOW" 37+12.41, 3.00' RT**	**"VD" 27+09.94, 32.33' RT**	**18**	**2211.27**	**2212.79**	**7.58**	20.05	**2214.05**	**2214.05**	**2212.62**	**1.35**	0.8913	1.6781	13.00	1.50	0.00	1.77	0.0049	**13.0**	7.36	0.84	0.0153	0.12	**0.4**	0.34	2214.89	2215.34	2214.50	**2.01**	2215.81	2215.81	INLET	**2218.9** +/-	3.1
LAT4	**"LVOW" 37+85.20' 3.00' LT**	**"VD" 27+79.59, 1.46' LT**	**18**	**2210.99**	**2214.30**	**18.68**	17.72	**NUISANCE FLOW ONLY**																									**2218.3** +/-	-
LAT4A & LAT4B	**"LVOW" 38+50.00, 3.00' RT**	**"VD" 28+24.09, 43.23' RT**	**42**	**2207.80**	**2208.08**	**28.14**	1.00	**2212.15**	**2212.15**	**2211.04**	**3.24**	1.8515	9.2889	118.00	3.50	0.00	9.62	0.0049	**118.0**	12.26	2.34	0.0138	0.39	**0.5**	1.78	2214.49	2216.65	2214.31	**1.99**	2215.05	2215.05	INLET	**2217.0** +/-	2.0
LAT4A	**"VD" 28+24.09, 43.23' RT**	**"VD" 27+82.58, 66.01' RT**	**30**	**2209.08**	**2209.29**	**42.30**	0.50	**2215.05**	**2215.05**	**2211.46**	**2.38**	1.0713	4.8217	58.00	2.50	0.00	4.91	0.0049	**58.0**	11.82	2.17	0.0200	0.84	**0.4**	0.87	2217.21	2218.93	2216.76	**0.00**	2209.29	2216.76	OUTLET	**2217.7** +/-	0.9
LAT4B	**"VD" 28+24.09, 43.23' RT**	**"VD" 28+24.80, 106.87' RT**	**36**	**2208.58**	**2211.76**	**63.65**	5.00	**2215.05**	**2215.05**	**2211.08**	**2.50**	2.2324	6.2988	60.00	3.00	0.00	7.07	0.0049	**60.0**	8.49	1.12	0.0081	0.51	**0.3**	0.29	2216.16	2216.97	2215.85	**1.60**	2216.56	2216.56	INLET	**2217.6** +/-	1.0
LAT4B	**"VD" 28+24.80, 106.87' RT**	**"VD" 28+32.92, 119.58' RT**	**36**	**2211.86**	**2212.28**	**8.37**	5.02	**2216.56**	**2216.56**	**2214.36**	**2.50**	2.2324	6.2988	60.00	3.00	0.00	7.07	0.0049	**60.0**	8.49	1.12	0.0081	0.07	**0.4**	0.45	2217.68	2218.20	2217.08	**1.60**	2217.08	2217.08	INLET	**2217.8** +/-	0.7
LAT5	**"LVOW" 39+28.58, 3.00'LT**	**"VD" 29+26.11, 33.63' LT**	**18**	**2208.92**	**2211.47**	**48.38**	5.27	**2210.53**	**2210.53**	**2210.30**	**1.38**	0.8041	1.7034	14.00	1.50	0.00	1.77	0.0049	**14.0**	7.92	0.98	0.0177	0.86	**0.4**	0.39	2211.51	2212.75	2211.78	**2.31**	2214.94	2214.94	INLET	**2215.9** +/-	1.0
LAT6	**"LVOW" 43+65.00, 3.50' RT**	**"VD" 33+49.34, 32.16' RT**	**30**	**2199.46**	**2201.99**	**9.78**	25.87	**2201.70**	**2201.41**	**2201.70**	**2.24**	1.5197	4.6420	46.00	2.24	1.52	4.64	0.0049	**46.0**	9.91	1.53	0.0140	0.14	**0.4**	0.61	2203.23	2203.98	2202.45	**1.94**	2206.84	2206.84	INLET	**2208.8** +/-	2.0
LAT7 LT of SD	**"LVOW" 45+44.58, 3.50' LT**	**"VD" 34+87.92, 33.71' LT**	**30**	**2197.15**	**2198.25**	**67.78**	1.62	**2199.80**	**2199.80**	**2199.42**	**2.27**	1.4367	4.6870	48.00	2.50	0.00	4.91	0.0049	**48.0**	9.78	1.49	0.0137	0.93	**0.4**	0.59	2201.29	2202.81	2201.32	**2.18**	2203.70	2203.70	INLET	**2205.4** +/-	1.7

VEGAS DRIVE IMPROVEMENTS - SHADOW MOUNTAIN PLACE TO RANCHO DRIVE

100-YR HGL CALCULATIONS FOR STORM DRAIN LATERALS (INTERIM CONDITION)

MODIFIED STANDARD FORM 6

EACH ROW REPRESENTS A SEGMENT OF PIPE AND AN UPSTREAM INLET																																				
CALL OUT	LOCATION		EQUIV PIPE SIZE/ TYPE (IN)	INVERTS (English)				D/S HGL ELEVATION			CRITICAL DEPTH				FLOW DATA								ENERGY LOSS DATA			ENERGY AND HYDRAULIC DATA			CHECK - CONSIDER LATERAL AS CULVERT		CONTROL U/S HGL	COMMENTS		
																							PIPE	INLET		PIPE / TRANSITION			INLET CONTROL					
	FROM D/S STATION (OUTLET)	TO U/S STATION (INLET)		D/S ELEV (FT)	U/S ELEV (FT)	PIPE LENGTH (FT)	PIPE SLOPE (%)	CONTROL D/S HGL ELEV (FT)	CALC[1] D/S HGL ELEV (FT)	CRITICAL D/S HGL ELEV (FT)	D_c* (FT)	TOP WIDTH (FT)	FLOW AREA (FT^2)	Q_calc (CFS)	D (FT)	TOP WIDTH (FT)	A (FT^2)	Φ**	Q (CFS)	V (FPS)	$H_V=V^2/2g$ (FT)	S_f*** (FT/FT)	H_f (FT)	K_i	H_i (FT)	D/S EGL ELEV (FT)	U/S EGL ELEV (FT)	U/S HGL ELEV (FT)	H_w/D (HDS No. 5)	U/S HGL ELEV (FT)	U/S HGL ELEV (FT)	METHOD CONTROL U/S HGL	U/S ROADWAY SURFACE ELEV	DEPTH BELOW ROADWAY SURFACE
LAT16 RT of SD	**"LVOW" 75+16.85, 3.00' RT**	**"VD" 64+97.89, 32.39' RT**	**18**	**2158.40**	**2160.86**	**13.80**	17.83	**2162.45**	**2162.45**	**2159.81**	**1.41**	0.7235	1.7217	15.00	1.50	0.00	1.77	0.0049	**15.0**	8.49	1.12	0.0203	0.28	**0.4**	0.45	2163.57	2164.30	2163.18	**2.49**	2164.60	2164.60	INLET	**2170.1** +/-	5.5
LAT17 LT of SD	**"LVOW" 82+52.06, 3.00' LT**	**"VD" 72+46.39, 32.37' LT**	**18**	**2146.37**	**2150.23**	**39.79**	9.70	**2150.85**	**2150.85**	**2147.81**	**1.44**	0.5852	1.7438	17.00	1.50	0.00	1.77	0.0049	**17.0**	9.62	1.44	0.0261	1.04	**0.4**	0.58	2152.29	2153.90	2152.46	**3.08**	2154.85	2154.85	INLET	**2160.0** +/-	5.2
LAT17 RT of SD	**"LVOW" 82+52.06, 3.00' RT**	**"VD" 72+46.70, 32.11' RT**	**18**	**2150.02**	**2151.37**	**13.52**	9.99	**2151.43**	**2150.85**	**2151.43**	**1.41**	0.7234	1.7217	15.00	1.41	0.72	1.72	0.0049	**15.0**	8.71	1.18	0.0214	0.29	**0.4**	0.47	2152.61	2153.37	2152.19	**2.53**	2155.17	2155.17	INLET	**2159.9** +/-	4.7
LAT18 LT of SD	**"LVOW" 88+37.96, 3.00' LT**	**"VD" 78+11.28, 32.10' LT**	**24**	**2134.25**	**2140.39**	**49.18**	12.48	**2138.46**	**2138.46**	**2136.15**	**1.90**	0.8650	3.0843	33.00	2.00	0.00	3.14	0.0049	**33.0**	10.50	1.71	0.0212	1.04	**0.4**	0.69	2140.17	2141.91	2140.19	**2.80**	2145.99	2145.99	INLET	**2149.1** +/-	3.1
LAT18 RT of SD	**"LVOW" 88+37.96, 3.00' RT**	**"VD" 78+22.76, 32.33' RT**	**24**	**2138.02**	**2140.52**	**11.06**	22.60	**2139.81**	**2138.46**	**2139.81**	**1.79**	1.2341	2.9622	26.00	1.79	1.23	2.96	0.0049	**26.0**	8.78	1.20	0.0148	0.16	**0.4**	0.48	2141.00	2141.65	2140.45	**1.92**	2144.36	2144.36	INLET	**2149.5** +/-	5.1
LAT19	**"LVOW" 94+72.58, 3.00' LT**	**"VD" 84+38.65, 32.12' LT**	**24**	**2122.50**	**2128.11**	**52.43**	10.70	**2124.24**	**2124.14**	**2124.24**	**1.74**	1.3539	2.8963	24.00	1.74	1.35	2.90	0.0049	**24.0**	8.29	1.07	0.0132	0.69	**0.4**	0.43	2125.30	2126.42	2125.36	**1.76**	2131.63	2131.63	INLET	**2138.9** +/-	7.3
LAT20	**"LVOW" 98+13.62, 3.00' RT**	**"VD" 88+07.74, 32.60' RT**	**18**	**2114.75**	**2117.18**	**7.70**	31.56	**2116.13**	**2113.71**	**2116.13**	**1.38**	0.8042	1.7034	14.00	1.38	0.80	1.70	0.0049	**14.0**	8.22	1.05	0.0191	0.15	**0.4**	0.42	2117.18	2117.75	2116.70	**2.18**	2120.45	2120.45	INLET	**2127.7** +/-	7.3
LAT21	**"LVOW" 100+62.63, 3.00' LT**	**"VD" 90+46.51, 84.08' LT**	**18**	**2109.78**	**2114.38**	**51.15**	8.99	**2111.05**	**2110.88**	**2111.05**	**1.27**	1.0755	1.5986	11.00	1.27	1.08	1.60	0.0049	**11.0**	6.88	0.74	0.0134	0.68	**0.4**	0.29	2111.79	2112.77	2112.03	**1.65**	2116.86	2116.86	INLET	**2120.6** +/-	3.7
LAT21	**"VD" 90+46.51, 84.08' LT**	**"VD" 90+54.19, 84.53' LT**	**18**	**2114.58**	**2114.64**	**5.70**	1.05	**2116.86**	**2116.86**	**2115.85**	**1.27**	1.0755	1.5986	11.00	1.50	0.00	1.77	0.0049	**11.0**	6.22	0.60	0.0109	0.06	**0.4**	0.24	2117.46	2117.76	2117.16	**1.69**	2117.18	2117.18	INLET	**2121.5** +/-	4.3

Manning's n = 0.013

g = 32.17 ft / s^2

[1] CALC D/S HGL ELEV determined from D/S connecting pipe U/S HGL, or interpolated HGL determined from *VD455.dat* WSPG

*$D_c = g*A^3 - T*Q^2$

**$\Phi = 2*g*n^2/2.21$

***$S_f = \Phi * H_v/R^{\wedge}1.33$

VEGAS DRIVE IMPROVEMENTS - SHADOW MOUNTAIN PLACE TO RANCHO DRIVE

100-YR HGL CALCULATIONS FOR STORM DRAIN LATERALS (ULTIMATE CONDITION)

MODIFIED STANDARD FORM 6

EACH ROW REPRESENTS A SEGMENT OF PIPE AND AN UPSTREAM INLET

CALL OUT	LOCATION: FROM D/S STATION (OUTLET)	LOCATION: TO U/S STATION (INLET)	EQUIV PIPE SIZE/ TYPE (IN)	INVERTS (English): D/S ELEV (FT)	INVERTS (English): U/S ELEV (FT)	INVERTS (English): PIPE LENGTH (FT)	INVERTS (English): PIPE SLOPE (%)	D/S HGL ELEVATION: CONTROL D/S HGL ELEV (FT)	D/S HGL ELEVATION: CALC[1] D/S HGL ELEV (FT)	D/S HGL ELEVATION: CRITICAL D/S HGL ELEV (FT)	CRITICAL DEPTH: D_c* (FT)	CRITICAL DEPTH: TOP WIDTH (FT)	CRITICAL DEPTH: FLOW AREA (FT^2)	CRITICAL DEPTH: Q_calc (CFS)	FLOW DATA: D (FT)	FLOW DATA: TOP WIDTH (FT)	FLOW DATA: A (FT^2)	FLOW DATA: Φ**	FLOW DATA: Q (CFS)	FLOW DATA: V (FPS)	FLOW DATA: H_V= $V^2/2g$ (FT)	FLOW DATA: S_f*** (FT/FT)	ENERGY LOSS DATA: PIPE H_f (FT)	ENERGY LOSS DATA: INLET K_i	ENERGY LOSS DATA: INLET H_i (FT)	ENERGY AND HYDRAULIC DATA: PIPE / TRANSITION: D/S EGL ELEV (FT)	ENERGY AND HYDRAULIC DATA: PIPE / TRANSITION: U/S EGL ELEV (FT)	ENERGY AND HYDRAULIC DATA: PIPE / TRANSITION: U/S HGL ELEV (FT)	CHECK - CONSIDER LATERAL AS CULVERT: INLET CONTROL: H_w/D (HDS No. 5)	CHECK - CONSIDER LATERAL AS CULVERT: INLET CONTROL: U/S HGL ELEV (FT)	CONTROL U/S HGL: U/S HGL ELEV (FT)	COMMENTS: METHOD CONTROL U/S HGL	COMMENTS: U/S ROADWAY SURFACE ELEV	COMMENTS: DEPTH BELOW ROADWAY SURFACE
DI2	"LVOW" 16+30.19, 3.00' RT	"VD" 6+13.83, 35.00' RT	36	2234.94	2237.76	12.73	22.11	2243.70	2243.70	2235.99	1.05	2.8618	2.2048	10.96	3.00	0.00	7.07	0.0049	11.0	1.56	0.04	0.0003	0.00	0.5	-0.53	2243.74	2243.21	2243.18	0.37	2238.87	2243.18	OUTLET	2247.4 +/-	4.2
DI2A	"LVOW" 17+61.57, 3.00' RT	"VD" 7+44.91, 35.00' RT	36	2234.42	2237.18	12.73	21.64	2241.58	2241.58	2234.73	0.31	1.8264	0.3860	0.92	3.00	0.00	7.07	0.0049	1.0	0.14	0.00	0.0000	0.00	0.5	-0.56	2241.58	2241.02	2241.02	0.03	2237.27	2241.02	OUTLET	2245.2 +/-	4.2
DI3	"LVOW" 19+40.72, 3.00' RT	"VD" 9+24.06, 35.00' RT	36	2233.70	2236.57	12.73	22.55	2239.15	2239.15	2234.01	0.31	1.8264	0.3860	0.92	3.00	0.00	7.07	0.0049	1.0	0.14	0.00	0.0000	0.00	0.5	-0.56	2239.15	2238.59	2238.59	0.03	2236.66	2238.59	OUTLET	2242.5 +/-	3.9
DI3A	"LVOW" 19+29.43, 3.00' LT	"VD" 9+24.06, 35.00' LT	18	2233.75	2236.57	60.00	4.70	2242.97	2242.97	2234.28	0.53	1.4340	0.5584	1.88	1.50	0.00	1.77	0.0049	2.0	1.13	0.02	0.0004	0.02	0.5	0.01	2242.99	2243.02	2243.00	1.43	2238.72	2243.00	OUTLET	2247.3 +/-	4.3
LAT1A	"LVOW" 16+45.87, 3.00' LT	"VD" 5+94.16, 33.87' LT	4'x4' RCB	2234.87	2239.65	67.70	7.06	2242.97	2242.97	2235.56	0.69	4.0000	2.7600	13.00	4.00	0.00	16.00	0.0000	13.0	0.81	0.01	0.0000	0.00	0.5	-0.55	2242.98	2242.43	2242.42	0.27	2240.19	2242.42	OUTLET	2247.0 +/-	4.6
LAT2A	"LVOW" 26+26.00, 3.00' RT	"VD" 16+23.52, 32.38' RT	18	2225.77	2226.53	7.63	9.96	2229.30	2229.30	2226.87	1.10	1.3272	1.3881	8.00	1.50	0.00	1.77	0.0049	8.0	4.53	0.32	0.0058	0.04	0.4	0.13	2229.62	2229.79	2229.47	1.16	2228.27	2229.47	OUTLET	2234.3 +/-	4.8
LAT2	"LVOW" 32+67.94, 3.00' LT	"VD" 22+66.51, 32.24' LT	18	2217.33	2220.70	47.41	7.11	2220.29	2220.29	2218.36	1.03	1.3928	1.2913	7.00	1.50	0.00	1.77	0.0049	7.0	3.96	0.24	0.0044	0.21	0.4	0.10	2220.53	2220.84	2220.60	1.06	2222.29	2222.29	INLET	2223.7 +/-	1.4
LAT3	"LVOW" 37+12.41, 3.00' RT	"VD" 27+09.94, 32.33' RT	18	2211.27	2212.79	7.58	20.05	2214.05	2214.05	2212.37	1.10	1.3272	1.3881	8.00	1.50	0.00	1.77	0.0049	8.0	4.53	0.32	0.0058	0.04	0.4	0.13	2214.37	2214.54	2214.22	1.11	2214.46	2214.46	INLET	2218.9 +/-	4.4
LAT4	"LVOW" 37+85.20' 3.00' LT	"VD" 27+79.59, 1.46' LT	18	2210.99	2214.30	18.68	17.72	NUISANCE FLOW ONLY																									2218.3 +/-	-
LAT4A & LAT4B	"LVOW" 38+50.00, 3.00' RT	"VD" 28+24.09, 43.23' RT	42	2207.80	2208.08	28.14	1.00	2212.15	2212.15	2210.82	3.02	2.4039	8.8312	96.00	3.50	0.00	9.62	0.0049	96.0	9.98	1.55	0.0091	0.26	0.5	1.42	2213.70	2215.37	2213.82	1.80	2214.38	2214.38	INLET	2217.0 +/-	2.6
LAT4A	"VD" 28+24.09, 43.23' RT	"VD" 27+82.58, 66.01' RT	30	2209.08	2209.29	42.30	0.50	2214.38	2214.38	2211.46	2.38	1.0713	4.8217	58.00	2.50	0.00	4.91	0.0049	58.0	11.82	2.17	0.0200	0.84	0.4	0.87	2216.55	2218.26	2216.09	2.89	2216.52	2216.52	INLET	2217.7 +/-	1.2
LAT4B	"VD" 28+24.09, 43.23' RT	"VD" 28+24.80, 106.87' RT	36	2208.58	2211.76	63.65	5.00	2214.38	2214.38	2210.59	2.01	2.8239	5.0241	38.00	3.00	0.00	7.07	0.0049	38.0	5.38	0.45	0.0032	0.21	0.3	0.12	2214.83	2215.15	2214.70	1.03	2214.85	2214.85	INLET	2217.6 +/-	2.7
LAT4B	"VD" 28+24.80, 106.87' RT	"VD" 28+32.92, 119.58' RT	36	2211.86	2212.28	8.37	5.02	2214.85	2214.85	2213.87	2.01	2.8239	5.0241	38.00	2.99	0.35	7.07	0.0049	38.0	5.38	0.45	0.0032	0.03	0.4	0.18	2215.30	2215.51	2215.06	1.03	2215.37	2215.37	INLET	2217.8 +/-	2.4
LAT5	"LVOW" 39+28.58, 3.00'LT	"VD" 29+26.11, 33.63' LT	18	2208.92	2211.47	48.38	5.27	2210.53	2210.53	2210.08	1.16	1.2508	1.4714	9.00	1.50	0.00	1.77	0.0049	9.0	5.09	0.40	0.0073	0.35	0.4	0.16	2210.93	2211.45	2211.05	1.33	2213.47	2213.47	INLET	2215.9 +/-	2.4
LAT6	"LVOW" 43+65.00, 3.50' RT	"VD" 33+49.34, 32.16' RT	30	2199.46	2201.99	9.78	25.87	2201.41	2201.41	2201.30	1.84	2.2074	3.8656	29.00	1.95	2.07	4.11	0.0049	29.0	7.06	0.77	0.0071	0.07	0.4	0.31	2202.18	2202.56	2201.79	1.09	2204.72	2204.72	INLET	2208.8 +/-	4.1
LAT7 LT of SD	"LVOW" 45+44.58, 3.50' LT	"VD" 34+87.92, 33.71' LT	30	2197.15	2198.25	67.78	1.62	2199.80	2199.80	2198.92	1.77	2.2713	3.7211	27.00	2.50	0.00	4.91	0.0049	27.0	5.50	0.47	0.0043	0.29	0.4	0.19	2200.27	2200.75	2200.28	1.15	2201.13	2201.13	INLET	2205.4 +/-	4.3
LAT7 RT of SD	"LVOW" 45+44.58, 3.50' RT	"VD" 35+28.94, 32.20' RT	30	2198.09	2198.19	9.78	1.02	2199.80	2199.80	2199.61	1.52	2.4415	3.1211	20.00	1.71	2.32	3.58	0.0049	20.0	5.59	0.49	0.0045	0.04	0.4	0.19	2200.29	2200.52	2200.04	0.92	2200.49	2200.49	INLET	2205.0 +/-	4.5

VEGAS DRIVE IMPROVEMENTS - SHADOW MOUNTAIN PLACE TO RANCHO DRIVE

100-YR HGL CALCULATIONS FOR STORM DRAIN LATERALS (ULTIMATE CONDITION)

MODIFIED STANDARD FORM 6

EACH ROW REPRESENTS A SEGMENT OF PIPE AND AN UPSTREAM INLET

CALL OUT	LOCATION		EQUIV PIPE SIZE/ TYPE (IN)	INVERTS (English)				D/S HGL ELEVATION			CRITICAL DEPTH				FLOW DATA								ENERGY LOSS DATA			ENERGY AND HYDRAULIC DATA			CHECK - CONSIDER LATERAL AS CULVERT		CONTROL U/S HGL	COMMENTS		
																							PIPE	INLET		PIPE / TRANSITION			INLET CONTROL					
	FROM D/S STATION (OUTLET)	TO U/S STATION (INLET)		D/S ELEV (FT)	U/S ELEV (FT)	PIPE LENGTH (FT)	PIPE SLOPE (%)	CONTROL D/S HGL ELEV (FT)	CALC[1] D/S HGL ELEV (FT)	CRITICAL D/S HGL ELEV (FT)	D_c* (FT)	TOP WIDTH (FT)	FLOW AREA (FT^2)	Q_calc (CFS)	D (FT)	TOP WIDTH (FT)	A (FT^2)	Φ**	Q (CFS)	V (FPS)	H_V= $V^2/2g$ (FT)	S_f*** (FT/FT)	H_f (FT)	K_i	H_i (FT)	D/S EGL ELEV (FT)	U/S EGL ELEV (FT)	U/S HGL ELEV (FT)	H_w/D (HDS No. 5)	U/S HGL ELEV (FT)	U/S HGL ELEV (FT)	METHOD CONTROL U/S HGL	U/S ROADWAY SURFACE ELEV	DEPTH BELOW ROADWAY SURFACE
LAT8 LT of SD	**"LVOW" 45+99.64, 3.50' LT**	**"DR" 10+42.24, 49.24' LT**	**30**	**2196.31**	**2196.48**	**58.40**	0.29	**2199.35**	**2199.35**	**2196.97**	**0.66**	2.2048	1.0377	4.00	2.50	0.00	4.91	0.0049	**4.0**	0.81	0.01	0.0001	0.01	**0.2**	0.00	2199.36	2199.37	2199.36	**0.36**	2197.38	2199.36	OUTLET	**2205.0** +/-	5.6
LAT8 LT of SD	**"DR" 10+42.24, 49.24' LT**	**"DR" 11+20.76, 49.40' LT**	**30**	**2196.68**	**2196.91**	**78.54**	0.29	**2199.36**	**2199.36**	**2197.34**	**0.66**	2.2048	1.0377	4.00	2.50	0.00	4.91	0.0049	**4.0**	0.81	0.01	0.0001	0.01	**0.3**	0.00	2199.37	2199.38	2199.37	**0.36**	2197.81	2199.37	OUTLET	**2204.0** +/-	4.6
LAT8 LT of SD	**"DR" 11+20.76, 49.40' LT**	**"DR" 11+35.31, 60.81' LT**	**30**	**2197.10**	**2197.19**	**13.56**	0.66	**2199.37**	**2199.37**	**2197.76**	**0.66**	2.2048	1.0377	4.00	2.27	1.45	4.68	0.0049	**4.0**	0.85	0.01	0.0001	0.00	**0.4**	0.00	2199.38	2199.39	2199.37	**0.36**	2198.09	2199.37	OUTLET	**2204.4** +/-	5.0
LAT8 RT of SD	**"LVOW" 45+99.64, 3.50' RT**	**"DR" 8+16.53, 46.28' LT**	**24**	**2197.29**	**2198.09**	**161.85**	0.49	**2199.35**	**2199.35**	**2198.64**	**1.35**	1.8741	2.2546	14.00	2.00	0.00	3.14	0.0049	**14.0**	4.46	0.31	0.0038	0.62	**0.2**	0.06	2199.66	2200.34	2200.03	**1.07**	2200.23	2200.23	INLET	**2205.0** +/-	4.8
LAT8 RT of SD	**"DR" 8+16.53, 46.28' LT**	**"DR" 7+95.28, 64.71' LT**	**24**	**2198.29**	**2198.39**	**22.93**	0.44	**2200.23**	**2200.23**	**2199.64**	**1.35**	1.8741	2.2546	14.00	1.94	0.68	3.11	0.0049	**14.0**	4.50	0.31	0.0039	0.09	**0.4**	0.13	2200.54	2200.76	2200.44	**1.07**	2200.53	2200.53	INLET	**2204.8** +/-	4.2
LAT9	**"LVOW" 46+94.88, 3.50' RT**	**"DR" 9+42.164, 42.29' RT**	**24**	**2195.87**	**2196.89**	**42.58**	2.40	**2198.87**	**2198.87**	**2196.74**	**0.87**	1.9828	1.3096	6.00	2.00	0.00	3.14	0.0049	**6.0**	1.91	0.06	0.0007	0.03	**0.4**	0.02	2198.93	2198.98	2198.92	**0.60**	2198.09	2198.92	OUTLET	**2202.7** +/-	3.8
LAT9	**"DR" 9+42.164, 42.29' RT**	**"VD" 36+94.77, 70.62' RT**	**24**	**2197.09**	**2197.35**	**13.01**	2.00	**2198.92**	**2198.92**	**2197.96**	**0.87**	1.9828	1.3096	6.00	1.83	1.11	3.02	0.0049	**6.0**	1.99	0.06	0.0008	0.01	**0.4**	0.02	2198.98	2199.02	2198.96	**0.61**	2198.57	2198.96	OUTLET	**2203.9** +/-	4.9
LAT 10	**"LVOW" 50+91.70, 3.50' LT**	**"VD" 40+88.56, 32.21' LT**	**18**	**2193.21**	**2194.09**	**35.21**	2.50	**2196.48**	**2196.48**	**2193.98**	**0.77**	1.4994	0.9165	4.00	1.50	0.00	1.77	0.0049	**4.0**	2.26	0.08	0.0014	0.05	**0.4**	0.03	2196.56	2196.64	2196.56	**0.73**	2195.19	2196.56	OUTLET	**2200.4** +/-	3.8
LAT11	**"LVOW" 51+17.64, 3.50' RT**	**"VD" 40+89.39, 32.41' RT**	**24**	**2192.77**	**2193.67**	**26.03**	3.46	**2196.31**	**2196.31**	**2194.30**	**1.53**	1.6966	2.5781	18.00	2.00	0.00	3.14	0.0049	**18.0**	5.73	0.51	0.0063	0.16	**0.4**	0.20	2196.82	2197.19	2196.68	**1.31**	2196.29	2196.68	OUTLET	**2200.3** +/-	3.6
LAT12 LT of SD	**"LVOW" 54+55.67, 3.50' LT**	**"VD" 44+52.53, 32.01' LT**	**18**	**2188.20**	**2190.41**	**35.00**	6.31	**2188.87**	**2187.99**	**2188.87**	**0.67**	1.4908	0.7593	3.00	0.67	1.49	0.76	0.0049	**3.0**	3.95	0.24	0.0044	0.15	**0.4**	0.10	2189.11	2189.36	2189.12	**0.59**	2191.30	2191.30	INLET	**2197.3** +/-	6.0
LAT12 RT of SD	**"LVOW" 54+55.67, 3.50' RT**	**"VD" 44+50.02, 32.30' RT**	**18**	**2187.15**	**2187.21**	**18.31**	0.33	**2188.02**	**2187.99**	**2188.02**	**0.87**	1.4821	1.0563	5.00	0.87	1.48	1.06	0.0049	**5.0**	4.73	0.35	0.0063	0.12	**0.4**	0.14	2188.36	2188.62	2188.27	**0.86**	2188.50	2188.50	INLET	**2197.4** +/-	8.9
LAT13 LT of SD	**"LVOW" 62+02.00, 3.00' LT**	**"VD" 51+96.36, 32.01' LT**	**18**	**2175.47**	**2177.84**	**34.92**	6.79	**2176.57**	**2175.38**	**2176.57**	**1.10**	1.3272	1.3881	8.00	1.10	1.33	1.39	0.0049	**8.0**	5.76	0.52	0.0094	0.33	**0.4**	0.21	2177.09	2177.62	2177.10	**1.18**	2179.61	2179.61	INLET	**2187.0** +/-	7.4
LAT13 RT of SD	**"LVOW" 62+02.00, 3.00' RT**	**"VD" 51+96.35, 32.30' RT**	**18**	**2175.47**	**2177.25**	**18.22**	9.77	**2176.63**	**2175.38**	**2176.63**	**1.16**	1.2508	1.4714	9.00	1.16	1.25	1.47	0.0049	**9.0**	6.12	0.58	0.0106	0.19	**0.4**	0.23	2177.22	2177.64	2177.06	**1.31**	2179.22	2179.22	INLET	**2187.0** +/-	7.8
LAT14	**"LVOW" 67+45.00, 3.00' RT**	**"VD" 57+19.74, 32.40' RT**	**24**	**2167.17**	**2171.06**	**25.91**	15.01	**2171.92**	**2171.92**	**2168.81**	**1.64**	1.5321	2.7613	21.00	2.00	0.00	3.14	0.0049	**21.0**	6.68	0.69	0.0086	0.22	**0.4**	0.28	2172.61	2173.12	2172.42	**1.48**	2174.02	2174.02	INLET	**2179.4** +/-	5.4
LAT15	**"LVOW" 71+19.68, 3.00' LT**	**"VD" 60+98.67, 32.21' LT**	**18**	**2161.70**	**2166.53**	**39.47**	12.24	**2167.39**	**2167.39**	**2162.47**	**0.77**	1.4994	0.9165	4.00	1.50	0.00	1.77	0.0049	**4.0**	2.26	0.08	0.0014	0.06	**0.4**	0.03	2167.47	2167.56	2167.48	**0.68**	2167.55	2167.55	INLET	**2175.7** +/-	8.1
LAT16 LT of SD	**"LVOW" 75+16.85, 3.00' LT**	**"VD" 65+13.67, 32.22' LT**	**18**	**2156.95**	**2161.37**	**41.16**	10.74	**2162.45**	**2162.45**	**2157.82**	**0.87**	1.4821	1.0563	5.00	1.50	0.00	1.77	0.0049	**5.0**	2.83	0.12	0.0023	0.09	**0.4**	0.05	2162.57	2162.72	2162.59	**0.81**	2162.59	2162.59	OUTLET	**2170.0** +/-	7.4
LAT16 RT of SD	**"LVOW" 75+16.85, 3.00' RT**	**"VD" 64+97.89, 32.39' RT**	**18**	**2158.40**	**2160.86**	**13.80**	17.83	**2162.45**	**2162.45**	**2159.78**	**1.38**	0.8042	1.7034	14.00	1.50	0.00	1.77	0.0049	**14.0**	7.92	0.98	0.0177	0.24	**0.4**	0.39	2163.43	2164.06	2163.08	**2.25**	2164.24	2164.24	INLET	**2170.1** +/-	5.9

VEGAS DRIVE IMPROVEMENTS - SHADOW MOUNTAIN PLACE TO RANCHO DRIVE

100-YR HGL CALCULATIONS FOR STORM DRAIN LATERALS (ULTIMATE CONDITION)

MODIFIED STANDARD FORM 6

EACH ROW REPRESENTS A SEGMENT OF PIPE AND AN UPSTREAM INLET																																		
	LOCATION		EQUIV PIPE SIZE/ TYPE (IN)	INVERTS (English)				D/S HGL ELEVATION			CRITICAL DEPTH				FLOW DATA									ENERGY LOSS DATA			ENERGY AND HYDRAULIC DATA			CHECK - CONSIDER LATERAL AS CULVERT		CONTROL U/S HGL	COMMENTS		
																							PIPE	INLET		PIPE / TRANSITION			INLET CONTROL					
CALL OUT	FROM D/S STATION (OUTLET)	TO U/S STATION (INLET)		D/S ELEV (FT)	U/S ELEV (FT)	PIPE LENGTH (FT)	PIPE SLOPE (%)	CONTROL D/S HGL ELEV (FT)	CALC[1] D/S HGL ELEV (FT)	CRITICAL D/S HGL ELEV (FT)	D_c* (FT)	TOP WIDTH (FT)	FLOW AREA (FT^2)	Q_calc (CFS)	D (FT)	TOP WIDTH (FT)	A (FT^2)	Φ**	Q (CFS)	V (FPS)	H_V= $V^2/2g$ (FT)	S_f*** (FT/FT)	H_f (FT)	K_i	H_i (FT)	D/S EGL ELEV (FT)	U/S EGL ELEV (FT)	U/S HGL ELEV (FT)	H_w/D (HDS No. 5)	U/S HGL ELEV (FT)	U/S HGL ELEV (FT)	METHOD CONTROL U/S HGL	U/S ROADWAY SURFACE ELEV	DEPTH BELOW ROADWAY SURFACE
LAT17 LT of SD	"LVOW" 82+52.06, 3.00' LT	"VD" 72+46.39, 32.37' LT	18	2146.37	2150.23	39.79	9.70	2150.85	2150.85	2147.53	1.16	1.2508	1.4714	9.00	1.50	0.00	1.77	0.0049	9.0	5.09	0.40	0.0073	0.29	0.4	0.16	2151.25	2151.71	2151.30	1.31	2152.20	2152.20	INLET	2160.0 +/-	7.8
LAT17 RT of SD	"LVOW" 82+52.06, 3.00' RT	"VD" 72+46.70, 32.11' RT	18	2150.02	2151.37	13.52	9.99	2151.40	2150.85	2151.40	1.38	0.8042	1.7034	14.00	1.38	0.80	1.70	0.0049	14.0	8.22	1.05	0.0191	0.26	0.4	0.42	2152.45	2153.13	2152.08	2.29	2154.81	2154.81	INLET	2159.9 +/-	5.1
LAT18 LT of SD	"LVOW" 88+37.96, 3.00' LT	"VD" 78+11.28, 32.10' LT	24	2134.25	2140.39	49.18	12.48	2138.46	2138.46	2135.93	1.68	1.4736	2.8114	22.00	2.00	0.00	3.14	0.0049	22.0	7.00	0.76	0.0094	0.46	0.4	0.30	2139.22	2139.99	2139.23	1.58	2143.55	2143.55	INLET	2149.1 +/-	5.6
LAT18 RT of SD	"LVOW" 88+37.96, 3.00' RT	"VD" 78+22.76, 32.33' RT	24	2138.02	2140.52	11.06	22.60	2139.76	2138.46	2139.76	1.74	1.3539	2.8963	24.00	1.74	1.35	2.90	0.0049	24.0	8.29	1.07	0.0132	0.15	0.4	0.43	2140.82	2141.40	2140.33	1.72	2143.96	2143.96	INLET	2149.5 +/-	5.5
LAT19	"LVOW" 94+72.58, 3.00' LT	"VD" 84+38.65, 32.12' LT	24	2122.50	2128.11	52.43	10.70	2124.14	2124.14	2123.94	1.44	1.7925	2.4278	16.00	1.64	1.54	2.76	0.0049	16.0	5.80	0.52	0.0065	0.34	0.4	0.21	2124.66	2125.21	2124.69	1.12	2130.35	2130.35	INLET	2138.9 +/-	8.6
LAT20	"LVOW" 98+13.62, 3.00' RT	"VD" 88+07.74, 32.60' RT	18	2114.75	2117.18	7.70	31.56	2116.10	2113.71	2116.10	1.35	0.8914	1.6780	13.00	1.35	0.89	1.68	0.0049	13.0	7.75	0.93	0.0169	0.13	0.4	0.37	2117.04	2117.54	2116.61	1.95	2120.11	2120.11	INLET	2127.7 +/-	7.6
LAT21	"LVOW" 100+62.63, 3.00' LT	"VD" 90+46.51, 84.08' LT	18	2109.78	2114.38	51.15	8.99	2111.05	2110.88	2111.05	1.27	1.0755	1.5986	11.00	1.27	1.08	1.60	0.0049	11.0	6.88	0.74	0.0134	0.68	0.4	0.29	2111.79	2112.77	2112.03	1.65	2116.86	2116.86	INLET	2120.6 +/-	3.7
LAT21	"VD" 90+46.51, 84.08' LT	"VD" 90+54.19, 84.53' LT	18	2114.58	2114.64	5.70	1.05	2116.86	2116.86	2115.85	1.27	1.0755	1.5986	11.00	1.50	0.00	1.77	0.0049	11.0	6.22	0.60	0.0109	0.06	0.4	0.24	2117.46	2117.76	2117.16	1.69	2117.18	2117.18	INLET	2121.5 +/-	4.3

Manning's n = 0.013

g = 32.17 ft / s^2

[1] CALC D/S HGL ELEV determined from D/S connecting pipe U/S HGL, or interpolated HGL determined from *VD455.dat* WSPG

*$D_c = g*A^3 - T*Q^2$ **$\Phi = 2*g*n^2/2.21$ ***$S_f = \Phi * H_v/R^{1.33}$

E-4.1

WSPGW Model

Update2.wsw

100-YR Flows

(Interim Condition)

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	4	1		6.000														
CD	2	4	1		5.000														
CD	3	4	1		2.000														
CD	4	4	1		2.500														
CD	5	3	0	.000	5.000	8.000	.000	.000	.00										
CD	6	3	0	.000	5.000	6.000	.000	.000	.00										
CD	7	4	1		7.000														
CD	8	3	0	.000	5.000	7.000	.000	.000	.00										
CD	9	4	1		3.500														
CD	10	4	1		1.500														
CD	11	4	1		3.000														
CD	12	4	2		1.500														
CD	13	3	0	.000	3.000	3.000	.000	.000	.00										
CD	14	3	0	.000	2.000	9.000	.000	.000	.00										
CD	15	4	2		1.500														
CD	16	4	2		2.500														
CD	17	3	0	.000	5.000	10.000	.000	.000	.00										
CD	19	3	0	.000	5.000	8.000	.000	.000	.00										
CD	21	3	0	.000	5.000	8.000	.000	.000	.00										
CD	23	3	0	.000	5.000	8.000	.000	.000	.00										
CD	25	3	0	.000	4.000	4.000	.000	.000	.00										

WATER SURFACE PROFILE - TITLE CARD LISTING

HEADING LINE NO 1 IS -
Vegas Drive, Shadow Mountain Place to Rancho Drive - 05333

HEADING LINE NO 2 IS -
SD System - Shadow Mtn to Rancho, Start @ Critical Depth Upstream (8'x

HEADING LINE NO 3 IS -
File: UPDATE2.wsw, (100YR INTERIM CONDITION) Q=390 CFS, n=0.013, by JM

WATER SURFACE PROFILE - ELEMENT CARD LISTING

ELEMENT NO 1 IS A SYSTEM OUTLET * * *

U/S DATA	STATION	INVERT	SECT	W S ELEV
	-13299.190	2076.340	7	.000

ELEMENT NO 2 IS A REACH * * *

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MANH
	-12928.740	2080.910	7	.013	.000	.000	.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
	-12928.740	2081.110	7	0	0	.013	.000	.000	.000	.000	.000	.000

RADIUS	ANGLE
.000	.000

ELEMENT NO 4 IS A REACH * * *

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MANH
	-12656.190	2082.450	7	.013	.000	.000	.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
	-12656.190	2082.650	7	0	0	.013	.000	.000	.000	.000	.000	.000

RADIUS	ANGLE
.000	.000

ELEMENT NO 6 IS A REACH * * *

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MANH
	-12287.560	2085.570	7	.013	.000	.000	.000	1

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
	-12287.560	2085.770	7	10	0	.013	4.000	.000	2089.130	.000	90.000	.000

RADIUS	ANGLE
.000	.000

ELEMENT NO 8 IS A REACH * * *

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MANH
	-11986.210	2088.440	7	.013	.000	.000	.000	1

WATER SURFACE PROFILE - ELEMENT CARD LISTING

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
	-11986.210	2088.640	7	10	0	.013	1.000	.000	2091.670	.000	90.000	.000

RADIUS	ANGLE
.000	.000

ELEMENT NO 10 IS A REACH * * *

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MANH
	-11671.190	2091.430	7	.013	.000	.000	.000	1

ELEMENT NO 11 IS A JUNCTION * * * * * *

U/S DATA	STATION	INVERT	SECT	LAT-1	LAT-2	N	Q3	Q4	INVERT-3	INVERT-4	PHI 3	PHI 4
	-11671.190	2091.630	7	0	0	.013	.000	.000	.000	.000	.000	.000

RADIUS	ANGLE
.000	.000

ELEMENT NO 12 IS A REACH * * *

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MANH

```
                              -11356.190 2094.420     7                .013                                 .000     .000     .000     1
  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
                              -11356.190 2094.620     7    10     0    .013    1.000      .000  2100.020     .000  90.000
.000
                                                                                                   RADIUS   ANGLE
                                                                                                    .000     .000

  ELEMENT NO  14 IS A REACH           *         *     *
                      U/S DATA   STATION    INVERT   SECT                   N                          RADIUS   ANGLE     ANG PT  MAN
H
                              -10976.190 2098.000     7                .013                                 .000     .000     .000     1
  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
                              -10976.190 2098.200     7     0     0    .013     .000      .000     .000     .000    .000
.000
                                                                                                   RADIUS   ANGLE
                                                                                                    .000     .000
                                                   W S P G W                                                            PAGE NO   4
                           WATER SURFACE PROFILE - ELEMENT CARD LISTING
  ELEMENT NO  16 IS A REACH           *         *     *
                      U/S DATA   STATION    INVERT   SECT                   N                          RADIUS   ANGLE     ANG PT  MAN
H
                              -10633.680 2101.090     7                .013                                 .000     .000     .000     0
  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
                              -10633.680 2101.190     7     3     0    .013    5.000      .000  2105.690     .000  45.000
.000
                                                                                                   RADIUS   ANGLE
                                                                                                    .000     .000

  ELEMENT NO  18 IS A REACH           *         *     *
                      U/S DATA   STATION    INVERT   SECT                   N                          RADIUS   ANGLE     ANG PT  MAN
H
                              -10537.850 2101.810     7                .013                                 .000     .000     .000     1
  ELEMENT NO  19 IS A JUNCTION        *         *     *      *                  *                          *               *
                      U/S DATA   STATION    INVERT   SECT LAT-1 LAT-2   N      Q3         Q4    INVERT-3 INVERT-4  PHI 3  PHI 4
                              -10537.850 2101.910     5     2     0    .013   66.000      .000  2103.310     .000  45.000
.000
                                                                                                   RADIUS   ANGLE
                                                                                                    .000     .000

  ELEMENT NO  20 IS A REACH           *         *     *
                      U/S DATA   STATION    INVERT   SECT                   N                          RADIUS   ANGLE     ANG PT  MAN
H
                              -10484.440 2102.200     5                .013                                 .000     .000     .000     1
  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
                              -10484.440 2102.300     7     9     0    .013  -38.000      .000  2102.730     .000  90.000
.000
                                                                                                   RADIUS   ANGLE
                                                                                                    .000     .000

  ELEMENT NO  22 IS A REACH           *         *     *
                      U/S DATA   STATION    INVERT   SECT                   N                          RADIUS   ANGLE     ANG PT  MAN
H
                              -10466.760 2102.450     7                .013                                 .000     .000     .000     0
  ELEMENT NO  23 IS A JUNCTION        *         *     *      *                  *                          *               *
                      U/S DATA   STATION    INVERT   SECT LAT-1 LAT-2   N      Q3         Q4    INVERT-3 INVERT-4  PHI 3  PHI 4
                              -10466.760 2102.460     7    10     0    .013   -1.000      .000  2106.010     .000  90.000
.000
                                                                                                   RADIUS   ANGLE
                                                                                                    .000     .000
                                                   W S P G W                                                            PAGE NO   5
                           WATER SURFACE PROFILE - ELEMENT CARD LISTING
  ELEMENT NO  24 IS A REACH           *         *     *
                      U/S DATA   STATION    INVERT   SECT                   N                          RADIUS   ANGLE     ANG PT  MAN
H
                              -10405.750 2102.990     7                .013                                 .000     .000     .000     0
  ELEMENT NO  25 IS A JUNCTION        *         *     *      *                  *                          *               *
                      U/S DATA   STATION    INVERT   SECT LAT-1 LAT-2   N      Q3         Q4    INVERT-3 INVERT-4  PHI 3  PHI 4
                              -10405.750 2103.000     7    10     0    .013   -1.000      .000  2106.940     .000  90.000
.000
                                                                                                   RADIUS   ANGLE
                                                                                                    .000     .000

  ELEMENT NO  26 IS A REACH           *         *     *
                      U/S DATA   STATION    INVERT   SECT                   N                          RADIUS   ANGLE     ANG PT  MAN
H
                              -10355.120 2103.450     7                .013                                 .000     .000     .000     0
  ELEMENT NO  27 IS A JUNCTION        *         *     *      *                  *                          *               *
                      U/S DATA   STATION    INVERT   SECT LAT-1 LAT-2   N      Q3         Q4    INVERT-3 INVERT-4  PHI 3  PHI 4
                              -10355.120 2103.460     7    10     0    .013   -1.000      .000  2107.420     .000  90.000
.000
                                                                                                   RADIUS   ANGLE
                                                                                                    .000     .000

  ELEMENT NO  28 IS A REACH           *         *     *
                      U/S DATA   STATION    INVERT   SECT                   N                          RADIUS   ANGLE     ANG PT  MAN
H
                              -10313.940 2103.810     7                .013                                 .000     .000     .000     0
  ELEMENT NO  29 IS A JUNCTION        *         *     *      *                  *                          *               *
                      U/S DATA   STATION    INVERT   SECT LAT-1 LAT-2   N      Q3         Q4    INVERT-3 INVERT-4  PHI 3  PHI 4
                              -10313.940 2103.820     7     3     0    .013   30.000      .000  2107.580     .000  90.000
.000
                                                                                                   RADIUS   ANGLE
                                                                                                    .000     .000

  ELEMENT NO  30 IS A REACH           *         *     *
                      U/S DATA   STATION    INVERT   SECT                   N                          RADIUS   ANGLE     ANG PT  MAN
H
                              -10307.620 2103.880     7                .013                                 .000     .000     .000     1
  ELEMENT NO  31 IS A JUNCTION        *         *     *      *                  *                          *               *
```

U/S DATA STATION INVERT SECT LAT-1 LAT-2 N Q3 Q4 INVERT-3 INVERT-4 PHI 3 PHI 4
-10307.620 2103.980 1 0 0 .013 .000 .000 .000 .000 .000
.000

RADIUS ANGLE
.000 .000

W S P G W
WATER SURFACE PROFILE - ELEMENT CARD LISTING

ELEMENT NO 32 IS A REACH * * *
U/S DATA STATION INVERT SECT N RADIUS ANGLE ANG PT MAN
H
-10069.630 2106.890 1 .013 .000 .000 .000 0

ELEMENT NO 33 IS A JUNCTION * * * * * *
U/S DATA STATION INVERT SECT LAT-1 LAT-2 N Q3 Q4 INVERT-3 INVERT-4 PHI 3 PHI 4
-10069.630 2106.900 1 10 0 .013 1.000 .000 2109.780 .000 87.200
.000

RADIUS ANGLE
.000 .000

ELEMENT NO 34 IS A REACH * * *
U/S DATA STATION INVERT SECT N RADIUS ANGLE ANG PT MAN
H
-9949.070 2108.390 1 .013 .000 .000 .000 1

ELEMENT NO 35 IS A JUNCTION * * * * * *
U/S DATA STATION INVERT SECT LAT-1 LAT-2 N Q3 Q4 INVERT-3 INVERT-4 PHI 3 PHI 4
-9949.070 2108.490 1 0 0 .013 .000 .000 .000 .000 .000
.000

RADIUS ANGLE
.000 .000

ELEMENT NO 36 IS A REACH * * *
U/S DATA STATION INVERT SECT N RADIUS ANGLE ANG PT MAN
H
-9813.670 2110.150 1 .013 .000 .000 -23.464 1

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
-9813.670 2110.250 1 0 0 .013 -1.000 .000 2114.580 .000 .000
.000

RADIUS ANGLE
.000 .000

ELEMENT NO 38 IS A REACH * * *
U/S DATA STATION INVERT SECT N RADIUS ANGLE ANG PT MAN
H
-9472.580 2120.430 1 .013 .000 .000 .000 1

ELEMENT NO 39 IS A JUNCTION * * * * * *
U/S DATA STATION INVERT SECT LAT-1 LAT-2 N Q3 Q4 INVERT-3 INVERT-4 PHI 3 PHI 4
-9472.580 2120.530 1 3 0 .013 22.000 .000 2122.500 .000 60.000
.000

RADIUS ANGLE
.000 .000

W S P G W
WATER SURFACE PROFILE - ELEMENT CARD LISTING

ELEMENT NO 40 IS A REACH * * *
U/S DATA STATION INVERT SECT N RADIUS ANGLE ANG PT MAN
H
-9125.000 2130.900 1 .013 .000 .000 .000 1

ELEMENT NO 41 IS A JUNCTION * * * * * *
U/S DATA STATION INVERT SECT LAT-1 LAT-2 N Q3 Q4 INVERT-3 INVERT-4 PHI 3 PHI 4
-9125.000 2131.000 1 0 0 .013 .000 .000 .000 .000 .000
.000

RADIUS ANGLE
.000 .000

ELEMENT NO 42 IS A REACH * * *
U/S DATA STATION INVERT SECT N RADIUS ANGLE ANG PT MAN
H
-8837.960 2134.150 1 .013 .000 .000 .000 1

ELEMENT NO 43 IS A JUNCTION * * * * * *
U/S DATA STATION INVERT SECT LAT-1 LAT-2 N Q3 Q4 INVERT-3 INVERT-4 PHI 3 PHI 4
-8837.960 2134.250 1 3 3 .013 21.000 19.000 2134.370 2138.020 67.500
45.200

RADIUS ANGLE
.000 .000

ELEMENT NO 44 IS A REACH * * *
U/S DATA STATION INVERT SECT N RADIUS ANGLE ANG PT MAN
H
-8609.610 2136.750 1 .013 .000 .000 -.963 1

ELEMENT NO 45 IS A JUNCTION * * * * * *
U/S DATA STATION INVERT SECT LAT-1 LAT-2 N Q3 Q4 INVERT-3 INVERT-4 PHI 3 PHI 4
-8609.610 2136.850 1 0 0 .013 .000 .000 .000 .000 .000
.000

RADIUS ANGLE
.000 .000

ELEMENT NO 46 IS A REACH * * *
U/S DATA STATION INVERT SECT N RADIUS ANGLE ANG PT MAN
H
-8252.060 2146.270 1 .013 .000 .000 .963 1

ELEMENT NO 47 IS A JUNCTION * * * * * *
U/S DATA STATION INVERT SECT LAT-1 LAT-2 N Q3 Q4 INVERT-3 INVERT-4 PHI 3 PHI 4
-8252.060 2146.370 1 10 10 .013 15.000 15.000 2146.370 2150.020 90.000
90.000

RADIUS ANGLE
.000 .000

W S P G W
WATER SURFACE PROFILE - ELEMENT CARD LISTING

ELEMENT NO 48 IS A REACH * * *
U/S DATA STATION INVERT SECT N RADIUS ANGLE ANG PT MAN
H
-7900.000 2151.360 1 .013 .000 .000 .000 1

ELEMENT NO 49 IS A REACH * * *

```
                    U/S DATA   STATION    INVERT  SECT              N                        RADIUS    ANGLE     ANG PT  MAN
H
                               -7516.850 2156.800    1              .013                         .000     .000     -.655     1
  ELEMENT NO  50 IS A JUNCTION         *         *     *     *                    *                *                *
                    U/S DATA   STATION    INVERT  SECT LAT-1 LAT-2   N      Q3        Q4      INVERT-3 INVERT-4  PHI 3  PHI 4
                               -7516.850 2156.900    1    10    10   .013   10.000    15.000  2156.950 2158.900  74.400
45.000

                                                                                       RADIUS    ANGLE
  ELEMENT NO  51 IS A REACH            *         *     *                                 .000     .000
                    U/S DATA   STATION    INVERT  SECT              N                        RADIUS    ANGLE     ANG PT  MAN
H
                               -7119.680 2160.390    1              .013                         .000     .000      .667     1
  ELEMENT NO  52 IS A JUNCTION         *         *     *     *                    *                *                *
                    U/S DATA   STATION    INVERT  SECT LAT-1 LAT-2   N      Q3        Q4      INVERT-3 INVERT-4  PHI 3  PHI 4
                               -7119.680 2160.490    1    10     0   .013   -9.000      .000  2161.700      .000  62.900
.000

                                                                                       RADIUS    ANGLE
  ELEMENT NO  53 IS A REACH            *         *     *                                 .000     .000
                    U/S DATA   STATION    INVERT  SECT              N                        RADIUS    ANGLE     ANG PT  MAN
H
                               -6745.000 2163.780    1              .013                         .000     .000      .000     1
  ELEMENT NO  54 IS A JUNCTION         *         *     *     *                    *                *                *
                    U/S DATA   STATION    INVERT  SECT LAT-1 LAT-2   N      Q3        Q4      INVERT-3 INVERT-4  PHI 3  PHI 4
                               -6745.000 2163.880    1     3     0   .013  -25.000      .000  2167.170      .000   .000
.000

                                                                                       RADIUS    ANGLE
  ELEMENT NO  55 IS A REACH            *         *     *                                 .000     .000
                    U/S DATA   STATION    INVERT  SECT              N                        RADIUS    ANGLE     ANG PT  MAN
H
                               -6460.000 2167.740    1              .013                         .000     .000      .000     1
                                                        W S P G W                                                    PAGE NO   9
                        WATER SURFACE PROFILE - ELEMENT CARD LISTING
  ELEMENT NO  56 IS A REACH            *         *     *
                    U/S DATA   STATION    INVERT  SECT              N                        RADIUS    ANGLE     ANG PT  MAN
H
                               -6202.000 2171.230    1              .013                         .000     .000      .000     1
  ELEMENT NO  57 IS A JUNCTION         *         *     *     *                    *                *                *
                    U/S DATA   STATION    INVERT  SECT LAT-1 LAT-2   N      Q3        Q4      INVERT-3 INVERT-4  PHI 3  PHI 4
                               -6202.000 2171.330    1    15     0   .013  -29.000      .000  2175.470      .000  90.000
.000

                                                                                       RADIUS    ANGLE
  ELEMENT NO  58 IS A REACH            *         *     *                                 .000     .000
                    U/S DATA   STATION    INVERT  SECT              N                        RADIUS    ANGLE     ANG PT  MAN
H
                               -5850.000 2177.760    1              .013                         .000     .000      .000     1
  ELEMENT NO  59 IS A REACH            *         *     *
                    U/S DATA   STATION    INVERT  SECT              N                        RADIUS    ANGLE     ANG PT  MAN
H
                               -5475.000 2184.620    1              .013                         .000     .000      .000     0
  ELEMENT NO  60 IS A TRANSITION       *         *     *
                    U/S DATA   STATION    INVERT  SECT              N                        RADIUS   ANGLE
                               -5465.000 2184.800    8              .013                         .000     .000
  ELEMENT NO  61 IS A REACH            *         *     *
                    U/S DATA   STATION    INVERT  SECT              N                        RADIUS    ANGLE     ANG PT  MAN
H
                               -5455.670 2185.190    8              .013                         .000     .000      .000     0
  ELEMENT NO  62 IS A JUNCTION         *         *     *     *                    *                *                *
                    U/S DATA   STATION    INVERT  SECT LAT-1 LAT-2   N      Q3        Q4      INVERT-3 INVERT-4  PHI 3  PHI 4
                               -5455.670 2185.200    8    10    10   .013   10.000    13.000  2188.200 2187.150  90.000
90.000

                                                                                       RADIUS    ANGLE
  ELEMENT NO  63 IS A REACH            *         *     *                                 .000     .000
                    U/S DATA   STATION    INVERT  SECT              N                        RADIUS    ANGLE     ANG PT  MAN
H
                               -5330.000 2190.560    8              .013                         .000     .000      .000     0
  ELEMENT NO  64 IS A REACH            *         *     *
                    U/S DATA   STATION    INVERT  SECT              N                        RADIUS    ANGLE     ANG PT  MAN
H
                               -5117.640 2192.160    8              .013                         .000     .000      .000     0
  ELEMENT NO  65 IS A JUNCTION         *         *     *     *                    *                *                *
                    U/S DATA   STATION    INVERT  SECT LAT-1 LAT-2   N      Q3        Q4      INVERT-3 INVERT-4  PHI 3  PHI 4
                               -5117.640 2192.170    8     3     0   .013  -10.000      .000  2192.770      .000   .000
.000

                                                                                       RADIUS    ANGLE
                                                                                         .000     .000
                                                        W S P G W                                                    PAGE NO  10
                        WATER SURFACE PROFILE - ELEMENT CARD LISTING
  ELEMENT NO  66 IS A REACH            *         *     *
                    U/S DATA   STATION    INVERT  SECT              N                        RADIUS    ANGLE     ANG PT  MAN
H
                               -5091.700 2192.350    8              .013                         .000     .000      .000     0
  ELEMENT NO  67 IS A JUNCTION         *         *     *     *                    *                *                *
                    U/S DATA   STATION    INVERT  SECT LAT-1 LAT-2   N      Q3        Q4      INVERT-3 INVERT-4  PHI 3  PHI 4
                               -5091.700 2192.360    8    10     0   .013   -1.000      .000  2193.210      .000  90.000
.000

                                                                                       RADIUS    ANGLE
  ELEMENT NO  68 IS A REACH            *         *     *                                 .000     .000
                    U/S DATA   STATION    INVERT  SECT              N                        RADIUS    ANGLE     ANG PT  MAN
H
                               -4793.000 2194.630    8              .013                         .000     .000     2.723     0
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  ELEMENT NO  69 IS A REACH            *         *     *
                    U/S DATA   STATION    INVERT  SECT                N                        RADIUS    ANGLE     ANG PT  MAN
H
                               -4694.880 2195.360    8                .013                       .000     .000       .000     1
  ELEMENT NO  70 IS A JUNCTION         *         *     *     *                *                    *                    *
                    U/S DATA   STATION    INVERT  SECT LAT-1 LAT-2   N      Q3        Q4      INVERT-3 INVERT-4  PHI 3  PHI 4
                               -4694.880 2195.370    8     3     0   .013   -1.000     .000  2195.870      .000  90.000
.000
                                                                                              RADIUS    ANGLE
                                                                                                .000     .000
  ELEMENT NO  71 IS A REACH            *         *     *
                    U/S DATA   STATION    INVERT  SECT                N                        RADIUS    ANGLE     ANG PT  MAN
H
                               -4599.640 2196.080    8                .013                       .000     .000       .000     0
  ELEMENT NO  72 IS A JUNCTION         *         *     *     *                *                    *                    *
                    U/S DATA   STATION    INVERT  SECT LAT-1 LAT-2   N      Q3        Q4      INVERT-3 INVERT-4  PHI 3  PHI 4
                               -4599.640 2196.090    8     4     0   .013   -1.000     .000  2196.310      .000  90.000
.000
                                                                                              RADIUS    ANGLE
                                                                                                .000     .000
  ELEMENT NO  73 IS A REACH            *         *     *
                    U/S DATA   STATION    INVERT  SECT                N                        RADIUS    ANGLE     ANG PT  MAN
H
                               -4585.000 2196.200    8                .013                       .000     .000     -4.052     0
                                                                    W S P G W                                              PAGE NO  11
                                WATER SURFACE PROFILE - ELEMENT CARD LISTING
  ELEMENT NO  74 IS A REACH            *         *     *
                    U/S DATA   STATION    INVERT  SECT                N                        RADIUS    ANGLE     ANG PT  MAN
H
                               -4565.000 2196.420    8                .013                       .000     .000       .000     0
  ELEMENT NO  75 IS A REACH            *         *     *
                    U/S DATA   STATION    INVERT  SECT                N                        RADIUS    ANGLE     ANG PT  MAN
H
                               -4544.580 2196.640    8                .013                       .000     .000       .000     1
  ELEMENT NO  76 IS A JUNCTION         *         *     *     *                *                    *                    *
                    U/S DATA   STATION    INVERT  SECT LAT-1 LAT-2   N      Q3        Q4      INVERT-3 INVERT-4  PHI 3  PHI 4
                               -4544.580 2196.650    8    16     0   .013   -2.000     .000  2197.150      .000  45.000
.000
                                                                                              RADIUS    ANGLE
                                                                                                .000     .000
  ELEMENT NO  77 IS A REACH            *         *     *
                    U/S DATA   STATION    INVERT  SECT                N                        RADIUS    ANGLE     ANG PT  MAN
H
                               -4365.000 2198.620    8                .013                       .000     .000       .000     1
  ELEMENT NO  78 IS A JUNCTION         *         *     *     *                *                    *                    *
                    U/S DATA   STATION    INVERT  SECT LAT-1 LAT-2   N      Q3        Q4      INVERT-3 INVERT-4  PHI 3  PHI 4
                               -4365.000 2198.630    8     4     0   .013   -1.000     .000  2201.010      .000     .000
.000
                                                                                              RADIUS    ANGLE
                                                                                                .000     .000
  ELEMENT NO  79 IS A REACH            *         *     *
                    U/S DATA   STATION    INVERT  SECT                N                        RADIUS    ANGLE     ANG PT  MAN
H
                               -4358.000 2198.710    8                .013                       .000     .000       .000     0
  ELEMENT NO  80 IS A TRANSITION       *         *     *
                    U/S DATA   STATION    INVERT  SECT                N                        RADIUS   ANGLE
                               -4353.000 2198.800    1                .013                       .000     .000
  ELEMENT NO  81 IS A REACH            *         *     *
                    U/S DATA   STATION    INVERT  SECT                N                        RADIUS    ANGLE     ANG PT  MAN
H
                               -4185.000 2201.720    1                .013                       .000     .000       .000     1
  ELEMENT NO  82 IS A REACH            *         *     *
                    U/S DATA   STATION    INVERT  SECT                N                        RADIUS    ANGLE     ANG PT  MAN
H
                               -3928.580 2206.170    1                .013                       .000     .000       .000     1
  ELEMENT NO  83 IS A JUNCTION         *         *     *     *                *                    *                    *
                    U/S DATA   STATION    INVERT  SECT LAT-1 LAT-2   N      Q3        Q4      INVERT-3 INVERT-4  PHI 3  PHI 4
                               -3928.580 2206.180    1    10     0   .013   13.000     .000  2208.920      .000  90.000
.000
                                                                                              RADIUS    ANGLE
                                                                                                .000     .000
                                                                    W S P G W                                              PAGE NO  12
                                WATER SURFACE PROFILE - ELEMENT CARD LISTING
  ELEMENT NO  84 IS A REACH            *         *     *
                    U/S DATA   STATION    INVERT  SECT                N                        RADIUS    ANGLE     ANG PT  MAN
H
                               -3850.000 2207.550    1                .013                       .000     .000       .000     1
  ELEMENT NO  85 IS A JUNCTION         *         *     *     *                *                    *                    *
                    U/S DATA   STATION    INVERT  SECT LAT-1 LAT-2   N      Q3        Q4      INVERT-3 INVERT-4  PHI 3  PHI 4
                               -3850.000 2207.650    1     9     0   .013   20.000     .000  2208.360      .000     .000
.000
                                                                                              RADIUS    ANGLE
                                                                                                .000     .000
  ELEMENT NO  86 IS A REACH            *         *     *
                    U/S DATA   STATION    INVERT  SECT                N                        RADIUS    ANGLE     ANG PT  MAN
H
                               -3712.410 2209.540    1                .013                       .000     .000       .000     1
  ELEMENT NO  87 IS A JUNCTION         *         *     *     *                *                    *                    *
                    U/S DATA   STATION    INVERT  SECT LAT-1 LAT-2   N      Q3        Q4      INVERT-3 INVERT-4  PHI 3  PHI 4
                               -3712.410 2209.550    1    10     0   .013   13.000     .000  2211.270      .000     .000
.000
                                                                                              RADIUS    ANGLE
                                                                                                .000     .000
  ELEMENT NO  88 IS A REACH            *         *     *
                    U/S DATA   STATION    INVERT  SECT                N                        RADIUS    ANGLE     ANG PT  MAN
H
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                          -3665.000 2210.210    1              .013                        .000     .000      .000     1
  ELEMENT NO  89 IS A REACH          *         *     *
                  U/S DATA   STATION     INVERT  SECT              N                      RADIUS    ANGLE     ANG PT  MAN
H
                          -3267.940 2215.700    1              .013                        .000     .000      .000     1
  ELEMENT NO  90 IS A JUNCTION       *         *     *     *                 *                *                *
                  U/S DATA   STATION     INVERT  SECT LAT-1 LAT-2   N      Q3        Q4      INVERT-3 INVERT-4  PHI 3  PHI 4
                          -3267.940 2215.800    1    10     0   .013   10.000      .000  2217.330      .000  90.000
.000
                                                                                        RADIUS    ANGLE
                                                                                          .000     .000
  ELEMENT NO  91 IS A REACH          *         *     *
                  U/S DATA   STATION     INVERT  SECT              N                      RADIUS    ANGLE     ANG PT  MAN
H
                          -2878.060 2221.250    1              .013                        .000     .000      .000     1
                                                    W S P G W                                                   PAGE NO  13
                        WATER SURFACE PROFILE - ELEMENT CARD LISTING
  ELEMENT NO  92 IS A REACH          *         *     *
                  U/S DATA   STATION     INVERT  SECT              N                      RADIUS    ANGLE     ANG PT  MAN
H
                          -2626.000 2224.760    1              .013                        .000     .000      .000     1
  ELEMENT NO  93 IS A JUNCTION       *         *     *     *                 *                *                *
                  U/S DATA   STATION     INVERT  SECT LAT-1 LAT-2   N      Q3        Q4      INVERT-3 INVERT-4  PHI 3  PHI 4
                          -2626.000 2224.770    1    10     0   .013   13.000      .000  2225.770      .000     .000
.000
                                                                                        RADIUS    ANGLE
                                                                                          .000     .000
  ELEMENT NO  94 IS A REACH          *         *     *
                  U/S DATA   STATION     INVERT  SECT              N                      RADIUS    ANGLE     ANG PT  MAN
H
                          -2478.820 2226.830    1              .013                        .000     .000      .000     1
  ELEMENT NO  95 IS A REACH          *         *     *
                  U/S DATA   STATION     INVERT  SECT              N                      RADIUS    ANGLE     ANG PT  MAN
H
                          -2096.140 2232.180    1              .013                        .000     .000      .000     1
  ELEMENT NO  96 IS A TRANSITION     *         *     *
                  U/S DATA   STATION     INVERT  SECT              N                      RADIUS   ANGLE
                          -2085.580 2232.360   19              .013                        .000     .000
  ELEMENT NO  97 IS A REACH          *         *     *
                  U/S DATA   STATION     INVERT  SECT              N                      RADIUS    ANGLE     ANG PT  MAN
H
                          -2020.580 2233.380   19              .013                        .000     .000      .000     0
  ELEMENT NO  98 IS A REACH          *         *     *
                  U/S DATA   STATION     INVERT  SECT              N                      RADIUS    ANGLE     ANG PT  MAN
H
                          -1993.730 2233.490   19              .013                        .000     .000    -1.945     0
  ELEMENT NO  99 IS A REACH          *         *     *
                  U/S DATA   STATION     INVERT  SECT              N                      RADIUS    ANGLE     ANG PT  MAN
H
                          -1940.720 2233.680   19              .013                        .000     .000      .000     0
  ELEMENT NO 100 IS A JUNCTION       *         *     *     *                 *                *                *
                  U/S DATA   STATION     INVERT  SECT LAT-1 LAT-2   N      Q3        Q4      INVERT-3 INVERT-4  PHI 3  PHI 4
                          -1940.720 2233.700   19     9     0   .013   74.000      .000  2233.700      .000     .000
.000
                                                                                        RADIUS    ANGLE
                                                                                          .000     .000
  ELEMENT NO 101 IS A REACH          *         *     *
                  U/S DATA   STATION     INVERT  SECT              N                      RADIUS    ANGLE     ANG PT  MAN
H
                          -1929.430 2233.740   19              .013                        .000     .000      .000     0
                                                    W S P G W                                                   PAGE NO  14
                        WATER SURFACE PROFILE - ELEMENT CARD LISTING
  ELEMENT NO 102 IS A JUNCTION       *         *     *     *                 *                *                *
                  U/S DATA   STATION     INVERT  SECT LAT-1 LAT-2   N      Q3        Q4      INVERT-3 INVERT-4  PHI 3  PHI 4
                          -1929.430 2233.750   19    10     0   .013    2.000      .000  2233.750      .000  90.000
.000
                                                                                        RADIUS    ANGLE
                                                                                          .000     .000
  ELEMENT NO 103 IS A REACH          *         *     *
                  U/S DATA   STATION     INVERT  SECT              N                      RADIUS    ANGLE     ANG PT  MAN
H
                          -1774.770 2234.340   19              .013                        .000     .000      .000     0
  ELEMENT NO 104 IS A JUNCTION       *         *     *     *                 *                *                *
                  U/S DATA   STATION     INVERT  SECT LAT-1 LAT-2   N      Q3        Q4      INVERT-3 INVERT-4  PHI 3  PHI 4
                          -1774.770 2234.360   19     9     0   .013   62.000      .000  2235.350      .000     .000
.000
                                                                                        RADIUS    ANGLE
                                                                                          .000     .000
  ELEMENT NO 105 IS A REACH          *         *     *
                  U/S DATA   STATION     INVERT  SECT              N                      RADIUS    ANGLE     ANG PT  MAN
H
                          -1761.570 2234.400   19              .013                        .000     .000      .000     0
  ELEMENT NO 106 IS A JUNCTION       *         *     *     *                 *                *                *
                  U/S DATA   STATION     INVERT  SECT LAT-1 LAT-2   N      Q3        Q4      INVERT-3 INVERT-4  PHI 3  PHI 4
                          -1761.570 2234.420   19     9     0   .013   71.000      .000  2235.410      .000     .000
.000
                                                                                        RADIUS    ANGLE
                                                                                          .000     .000
  ELEMENT NO 107 IS A REACH          *         *     *
                  U/S DATA   STATION     INVERT  SECT              N                      RADIUS    ANGLE     ANG PT  MAN
H
                          -1645.870 2234.860   19              .013                        .000     .000      .000     0
  ELEMENT NO 108 IS A JUNCTION       *         *     *     *                 *                *                *
                  U/S DATA   STATION     INVERT  SECT LAT-1 LAT-2   N      Q3        Q4      INVERT-3 INVERT-4  PHI 3  PHI 4
                          -1645.870 2234.870   19    25     0   .013  153.000      .000  2234.870      .000     .000
.000
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                                                                                                    RADIUS    ANGLE
                                                                                                      .000     .000
  ELEMENT NO 109 IS A REACH                *         *     *
                    U/S DATA   STATION     INVERT  SECT                N                            RADIUS    ANGLE     ANG PT  MAN
H
                               -1630.190 2234.920   19                .013                             .000     .000      .000     0
  ELEMENT NO 110 IS A JUNCTION             *         *     *     *           *                          *                 *
                    U/S DATA   STATION     INVERT  SECT LAT-1 LAT-2    N       Q3        Q4      INVERT-3 INVERT-4  PHI 3  PHI 4
                               -1630.190 2234.940   19     9     0    .013    82.000      .000  2235.930      .000  45.000
.000
                                                                                                    RADIUS    ANGLE
                                                                                                      .000     .000
  ELEMENT NO 111 IS A REACH                *         *     *
                    U/S DATA   STATION     INVERT  SECT                N                            RADIUS    ANGLE     ANG PT  MAN
H
                               -1600.000 2235.040   19                .013                             .000     .000      .000     0
  ELEMENT NO 112 IS A SYSTEM HEADWORKS                   *                    *
                    U/S DATA   STATION     INVERT  SECT                                        W S ELEV
                               -1600.000 2235.050   19                                          .000
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Program Package Serial Number: 1492

WATER SURFACE PROFILE LISTING Date:11-22-2011 Time:10:47:55

Vegas Drive, Shadow Mountain Place to Rancho Drive - 05333

SD System - Shadow Mtn to Rancho, Start @ Critical Depth Upstream (8

'x File: UPDATE2.wsw, (100YR INTERIM CONDITION) Q=390 CFS, n=0.013, b

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 or "N"	Base Wt or I.D. / X-Fall	ZL / ZR	No Wth Prs/Pip / Type Ch
-13299.190	2076.340	5.323	2081.663	641.00	20.42	6.47	2088.13	.00	6.40	5.98	7.000	.000	.00	1 .0
236.363	.0123					.0113	2.67	5.32	1.57	5.21	.013	.00	.00	PIPE
-13062.830	2079.256	5.510	2084.766	641.00	19.73	6.04	2090.81	.00	6.40	5.73	7.000	.000	.00	1 .0
134.087	.0123					.0104	1.39	5.51	1.46	5.21	.013	.00	.00	PIPE
-12928.740	2080.910	5.798	2086.708	641.00	18.81	5.49	2092.20	.00	6.40	5.28	7.000	.000	.00	1 .0
JUNCT STR	.0000					.0093	.00	5.80	1.30		.013	.00	.00	PIPE
-12928.740	2081.110	6.396	2087.506	641.00	17.38	4.69	2092.20	.00	6.40	3.93	7.000	.000	.00	1 .0
50.436	.0049					.0093	.47	6.40	1.00	7.00	.013	.00	.00	PIPE
-12878.300	2081.358	7.000	2088.358	641.00	16.66	4.31	2092.67	.00	6.40	.00	7.000	.000	.00	1 .0
222.114	.0049					.0099	2.20	7.00	.00	7.00	.013	.00	.00	PIPE
-12656.190	2082.450	8.320	2090.770	641.00	16.66	4.31	2095.08	.00	6.40	.00	7.000	.000	.00	1 .0
JUNCT STR	.0000					.0101	.00	8.32	.00		.013	.00	.00	PIPE
-12656.190	2082.650	8.120	2090.770	641.00	16.66	4.31	2095.08	.00	6.40	.00	7.000	.000	.00	1 .0
368.631	.0079					.0101	3.71	8.12	.00	7.00	.013	.00	.00	PIPE
-12287.560	2085.570	9.127	2094.697	641.00	16.66	4.31	2099.00	.00	6.40	.00	7.000	.000	.00	1 .0
JUNCT STR	.0000					.0100	.00	9.13	.00		.013	.00	.00	PIPE
-12287.560	2085.770	9.034	2094.804	637.00	16.55	4.25	2099.06	.00	6.38	.00	7.000	.000	.00	1 .0
301.350	.0089					.0099	3.00	9.03	.00	6.22	.013	.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
-11986.210	2088.440	9.573	2098.013	637.00	16.55	4.25	2102.27	.00	6.38	.00	7.000	.000	.00	1 .0
JUNCT STR	.0000					.0099	.00	9.57	.00		.013	.00	.00	PIPE
-11986.210	2088.640	9.400	2098.040	636.00	16.53	4.24	2102.28	.00	6.38	.00	7.000	.000	.00	1 .0
315.020	.0089					.0099	3.12	9.40	.00	6.20	.013	.00	.00	PIPE
-11671.190	2091.430	9.944	2101.374	636.00	16.53	4.24	2105.61	.00	6.38	.00	7.000	.000	.00	1 .0
JUNCT STR	.0000					.0099	.00	9.94	.00		.013	.00	.00	PIPE
-11671.190	2091.630	9.744	2101.374	636.00	16.53	4.24	2105.61	.00	6.38	.00	7.000	.000	.00	1 .0
315.000	.0089					.0099	3.12	9.74	.00	6.20	.013	.00	.00	PIPE
-11356.190	2094.420	10.288	2104.708	636.00	16.53	4.24	2108.95	.00	6.38	.00	7.000	.000	.00	1 .0
JUNCT STR	.0000					.0099	.00	10.29	.00		.013	.00	.00	PIPE
-11356.190	2094.620	10.115	2104.735	635.00	16.50	4.23	2108.96	.00	6.38	.00	7.000	.000	.00	1 .0
380.000	.0089					.0099	3.75	10.11	.00	6.16	.013	.00	.00	PIPE
-10976.190	2098.000	10.701	2108.701	635.00	16.50	4.23	2112.93	.00	6.38	.00	7.000	.000	.00	1 .0
JUNCT STR	.0000					.0099	.00	10.70	.00		.013	.00	.00	PIPE
-10976.190	2098.200	10.501	2108.701	635.00	16.50	4.23	2112.93	.00	6.38	.00	7.000	.000	.00	1 .0
342.511	.0084					.0099	3.38	10.50	.00	7.00	.013	.00	.00	PIPE
-10633.680	2101.090	10.995	2112.085	635.00	16.50	4.23	2116.31	.00	6.38	.00	7.000	.000	.00	1 .0
JUNCT STR	.0000					.0098	.00	10.99	.00		.013	.00	.00	PIPE

Vegas Drive, Shadow Mountain Place to Rancho Drive - 05333
SD System - Shadow Mtn to Rancho, Start @ Critical Depth Upstream (8
'x File: UPDATE2.wsw, (100YR INTERIM CONDITION) Q=390 CFS, n=0.013, b

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS) / SF Ave	Vel Head / HF	Energy Grd.El. / SE Dpth	Super Elev / Froude N	Critical Depth / Norm Dp	Flow Top Width / "N"	Height/Dia.-FT / X-Fall	Base Wt or I.D. / ZR	ZL	No Wth Prs/Pip / Type Ch
-10633.680	2101.190	11.023	2112.213	630.00	16.37	4.16	2116.37	.00	6.36	.00	7.000	.000	.00	1 .0
95.830	.0065				.0097	.93	11.02	.00	7.00	.013	.00	.00		PIPE
-10537.850	2101.810	11.543	2113.353	630.00	16.37	4.16	2117.51	.00	6.36	.00	7.000	.000	.00	1 .0
JUNCT STR	.0000				.0086	.00	11.54	.00		.013	.00	.00		PIPE
---------- WARNING - Junction Analysis - Change in Channel Type ----------														
-10537.850	2101.910	13.187	2115.097	564.00	14.10	3.09	2118.18	.00	5.00	8.00	5.000	8.000	.00	0 .0
53.409	.0054				.0086	.46	13.19	1.11	4.93	.013	.00	.00		BOX
-10484.440	2102.200	13.509	2115.709	564.00	14.10	3.09	2118.80	.00	5.00	8.00	5.000	8.000	.00	0 .0
JUNCT STR	.0000				.0087	.00	13.51	1.11		.013	.00	.00		BOX
---------- WARNING - Junction Analysis - Change in Channel Type ----------														
-10484.440	2102.300	12.697	2114.997	602.00	15.64	3.80	2118.80	.00	6.27	.00	7.000	.000	.00	1 .0
17.681	.0085				.0089	.16	12.70	.00	5.90	.013	.00	.00		PIPE
-10466.760	2102.450	12.704	2115.154	602.00	15.64	3.80	2118.95	.00	6.27	.00	7.000	.000	.00	1 .0
JUNCT STR	.0000				.0089	.00	12.70	.00		.013	.00	.00		PIPE
-10466.760	2102.460	12.668	2115.128	603.00	15.67	3.81	2118.94	.00	6.28	.00	7.000	.000	.00	1 .0
61.010	.0087				.0089	.54	12.67	.00	5.82	.013	.00	.00		PIPE

Program Package Serial Number: 1492

WATER SURFACE PROFILE LISTING Date:11-22-2011 Time:10:47:55

Vegas Drive, Shadow Mountain Place to Rancho Drive - 05333

SD System - Shadow Mtn to Rancho, Start @ Critical Depth Upstream (8

'x File: UPDATE2.wsw, (100YR INTERIM CONDITION) Q=390 CFS, n=0.013, b

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
-10405.750	2102.990	12.682	2115.672	603.00	15.67	3.81	2119.48	.00	6.28	.00	7.000	.000	.00	1 .0
JUNCT STR	.0000					.0089	.00	12.68	.00		.013	.00	.00	PIPE
-10405.750	2103.000	12.647	2115.647	604.00	15.69	3.82	2119.47	.00	6.28	.00	7.000	.000	.00	1 .0
50.630	.0089					.0089	.45	12.65	.00	5.76	.013	.00	.00	PIPE
-10355.120	2103.450	12.649	2116.099	604.00	15.69	3.82	2119.92	.00	6.28	.00	7.000	.000	.00	1 .0
JUNCT STR	.0000					.0090	.00	12.65	.00		.013	.00	.00	PIPE
-10355.120	2103.460	12.614	2116.074	605.00	15.72	3.84	2119.91	.00	6.28	.00	7.000	.000	.00	1 .0
41.180	.0085					.0090	.37	12.61	.00	5.92	.013	.00	.00	PIPE
-10313.940	2103.810	12.633	2116.443	605.00	15.72	3.84	2120.28	.00	6.28	.00	7.000	.000	.00	1 .0
JUNCT STR	.0000					.0085	.00	12.63	.00		.013	.00	.00	PIPE
-10313.940	2103.820	13.366	2117.186	575.00	14.94	3.47	2120.65	.00	6.17	.00	7.000	.000	.00	1 .0
6.320	.0095					.0081	.05	13.37	.00	5.32	.013	.00	.00	PIPE
-10307.620	2103.880	13.530	2117.410	575.00	14.94	3.47	2120.88	.00	6.17	.00	7.000	.000	.00	1 .0
JUNCT STR	.0000					.0133	.00	13.53	.00		.013	.00	.00	PIPE
-10307.620	2103.980	10.544	2114.524	575.00	20.34	6.42	2120.95	.00	5.80	.00	6.000	.000	.00	1 .0
237.990	.0122					.0184	4.39	10.54	.00	6.00	.013	.00	.00	PIPE
-10069.630	2106.890	12.021	2118.911	575.00	20.34	6.42	2125.33	.00	5.80	.00	6.000	.000	.00	1 .0
JUNCT STR	.0000					.0184	.00	12.02	.00		.013	.00	.00	PIPE

Vegas Drive, Shadow Mountain Place to Rancho Drive - 05333
SD System - Shadow Mtn to Rancho, Start @ Critical Depth Upstream (8
'x File: UPDATE2.wsw, (100YR INTERIM CONDITION) Q=390 CFS, n=0.013, b

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
-10069.630	2106.900	12.055	2118.955	574.00	20.30	6.40	2125.35	.00	5.80	.00	6.000	.000	.00	1 .0
120.560	.0124					.0184	2.21	12.06	.00	6.00	.013	.00	.00	PIPE
-9949.070	2108.390	13.100	2121.490	574.00	20.30	6.40	2127.89	.00	5.80	.00	6.000	.000	.00	1 .0
JUNCT STR	.0000					.0184	.00	13.10	.00		.013	.00	.00	PIPE
-9949.070	2108.490	13.000	2121.490	574.00	20.30	6.40	2127.89	.00	5.80	.00	6.000	.000	.00	1 .0
135.400	.0123					.0184	2.49	13.00	.00	6.00	.013	.00	.00	PIPE
-9813.670	2110.150	14.643	2124.793	574.00	20.30	6.40	2131.19	.00	5.80	.00	6.000	.000	.00	1 .0
JUNCT STR	.0000					.0184	.00	14.64	.00		.013	.00	.00	PIPE
-9813.670	2110.250	14.498	2124.748	575.00	20.34	6.42	2131.17	.00	5.80	.00	6.000	.000	.00	1 .0
341.090	.0298					.0184	6.29	14.50	.00	4.01	.013	.00	.00	PIPE
-9472.580	2120.430	10.927	2131.357	575.00	20.34	6.42	2137.78	.00	5.80	.00	6.000	.000	.00	1 .0
JUNCT STR	.0000					.0177	.00	10.93	.00		.013	.00	.00	PIPE
-9472.580	2120.530	11.706	2132.236	553.00	19.56	5.94	2138.18	.00	5.77	.00	6.000	.000	.00	1 .0
347.580	.0298					.0171	5.93	11.71	.00	3.90	.013	.00	.00	PIPE
-9125.000	2130.900	7.559	2138.459	553.00	19.56	5.94	2144.40	.00	5.77	.00	6.000	.000	.00	1 .0
JUNCT STR	.0000					.0171	.00	7.56	.00		.013	.00	.00	PIPE
-9125.000	2131.000	7.459	2138.459	553.00	19.56	5.94	2144.40	.00	5.77	.00	6.000	.000	.00	1 .0
287.040	.0110					.0171	4.89	7.46	.00	6.00	.013	.00	.00	PIPE

Vegas Drive, Shadow Mountain Place to Rancho Drive - 05333
SD System - Shadow Mtn to Rancho, Start @ Critical Depth Upstream (8
'x File: UPDATE2.wsw, (100YR INTERIM CONDITION) Q=390 CFS, n=0.013, b

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
-8837.960	2134.150	9.500	2143.650	553.00	19.56	5.94	2149.59	.00	5.77	.00	6.000	.000	.00	1 .0
JUNCT STR	.0000					.0159	.00	9.50	.00		.013	.00	.00	PIPE
-8837.960	2134.250	10.909	2145.159	513.00	18.14	5.11	2150.27	.00	5.70	.00	6.000	.000	.00	1 .0
228.350	.0109					.0147	3.35	10.91	.00	6.00	.013	.00	.00	PIPE
-8609.610	2136.750	12.031	2148.781	513.00	18.14	5.11	2153.89	.00	5.70	.00	6.000	.000	.00	1 .0
JUNCT STR	.0000					.0147	.00	12.03	.00		.013	.00	.00	PIPE
-8609.610	2136.850	11.931	2148.781	513.00	18.14	5.11	2153.89	.00	5.70	.00	6.000	.000	.00	1 .0
357.551	.0263					.0147	5.25	11.93	.00	3.86	.013	.00	.00	PIPE
-8252.060	2146.270	8.029	2154.299	513.00	18.14	5.11	2159.41	.00	5.70	.00	6.000	.000	.00	1 .0
JUNCT STR	.0000					.0138	.00	8.03	.00		.013	.00	.00	PIPE
-8252.060	2146.370	9.090	2155.460	483.00	17.08	4.53	2159.99	.00	5.63	.00	6.000	.000	.00	1 .0
352.060	.0142					.0130	4.58	9.09	.00	4.71	.013	.00	.00	PIPE
-7900.000	2151.360	8.905	2160.265	483.00	17.08	4.53	2164.80	.00	5.63	.00	6.000	.000	.00	1 .0
383.150	.0142					.0130	4.98	8.91	.00	4.70	.013	.00	.00	PIPE
-7516.850	2156.800	8.685	2165.485	483.00	17.08	4.53	2170.02	.00	5.63	.00	6.000	.000	.00	1 .0
JUNCT STR	.0000					.0124	.00	8.69	.00		.013	.00	.00	PIPE
-7516.850	2156.900	9.384	2166.283	458.00	16.20	4.07	2170.36	.00	5.56	.00	6.000	.000	.00	1 .0
397.170	.0088					.0117	4.64	9.38	.00	6.00	.013	.00	.00	PIPE

Vegas Drive, Shadow Mountain Place to Rancho Drive - 05333
SD System - Shadow Mtn to Rancho, Start @ Critical Depth Upstream (8
'x File: UPDATE2.wsw, (100YR INTERIM CONDITION) Q=390 CFS, n=0.013, b

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
-7119.680	2160.390	10.751	2171.141	458.00	16.20	4.07	2175.22	.00	5.56	.00	6.000	.000	.00	1 .0
JUNCT STR	.0000					.0119	.00	10.75	.00		.013	.00	.00	PIPE
-7119.680	2160.490	10.489	2170.979	467.00	16.52	4.24	2175.22	.00	5.59	.00	6.000	.000	.00	1 .0
374.680	.0088					.0122	4.56	10.49	.00	6.00	.013	.00	.00	PIPE
-6745.000	2163.780	11.967	2175.747	467.00	16.52	4.24	2179.98	.00	5.59	.00	6.000	.000	.00	1 .0
JUNCT STR	.0000					.0128	.00	11.97	.00		.013	.00	.00	PIPE
-6745.000	2163.880	11.402	2175.281	492.00	17.40	4.70	2179.98	.00	5.65	.00	6.000	.000	.00	1 .0
285.000	.0135					.0135	3.85	11.40	.00	4.91	.013	.00	.00	PIPE
-6460.000	2167.740	11.623	2179.363	492.00	17.40	4.70	2184.06	.00	5.65	.00	6.000	.000	.00	1 .0
258.000	.0135					.0135	3.48	11.62	.00	4.91	.013	.00	.00	PIPE
-6202.000	2171.230	11.850	2183.080	492.00	17.40	4.70	2187.78	.00	5.65	.00	6.000	.000	.00	1 .0
JUNCT STR	.0000					.0143	.00	11.85	.00		.013	.00	.00	PIPE
-6202.000	2171.330	11.179	2182.510	521.00	18.43	5.27	2187.78	.00	5.72	.00	6.000	.000	.00	1 .0
352.000	.0183					.0151	5.33	11.18	.00	4.49	.013	.00	.00	PIPE
-5850.000	2177.760	10.340	2188.100	521.00	18.43	5.27	2193.37	.00	5.72	.00	6.000	.000	.00	1 .0
375.000	.0183					.0151	5.68	10.34	.00	4.49	.013	.00	.00	PIPE
-5475.000	2184.620	9.155	2193.776	521.00	18.43	5.27	2199.05	.00	5.72	.00	6.000	.000	.00	1 .0
TRANS STR	.0180					.0103	.10	9.16	.00		.013	.00	.00	PIPE

Vegas Drive, Shadow Mountain Place to Rancho Drive - 05333
SD System - Shadow Mtn to Rancho, Start @ Critical Depth Upstream (8
'x File: UPDATE2.wsw, (100YR INTERIM CONDITION) Q=390 CFS, n=0.013, b

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT) /	Water Elev /	Q (CFS) /	Vel (FPS) / SF Ave	Vel Head / HF	Energy Grd.El. / SE Dpth	Super Elev / Froude N	Critical Depth / Norm Dp	Flow Top Width / "N"	Height/Dia.-FT / X-Fall	Base Wt or I.D. / ZR	ZL	No Wth Prs/Pip / Type Ch
-5465.000	2184.800	11.117	2195.917	521.00	14.89	3.44	2199.36	.00	5.00	7.00	5.000	7.000	.00	0 .0
9.330	.0418					.0103	.10	11.12	1.17	2.48	.013	.00	.00	BOX
-5455.670	2185.190	10.823	2196.013	521.00	14.89	3.44	2199.45	.00	5.00	7.00	5.000	7.000	.00	0 .0
JUNCT STR	.0000					.0094	.00	10.82	1.17		.013	.00	.00	BOX
-5455.670	2185.200	11.407	2196.607	498.00	14.23	3.14	2199.75	.00	5.00	7.00	5.000	7.000	.00	0 .0
125.670	.0427					.0094	1.18	11.41	1.12	2.39	.013	.00	.00	BOX
-5330.000	2190.560	7.225	2197.785	498.00	14.23	3.14	2200.93	.00	5.00	7.00	5.000	7.000	.00	0 .0
212.360	.0075					.0094	1.99	7.22	1.12	4.55	.013	.00	.00	BOX
-5117.640	2192.160	7.614	2199.774	498.00	14.23	3.14	2202.92	.00	5.00	7.00	5.000	7.000	.00	0 .0
JUNCT STR	.0000					.0094	.00	7.61	1.12		.013	.00	.00	BOX
-5117.640	2192.170	7.477	2199.647	508.00	14.51	3.27	2202.92	.00	5.00	7.00	5.000	7.000	.00	0 .0
25.940	.0069					.0097	.25	7.48	1.14	4.77	.013	.00	.00	BOX
-5091.700	2192.350	7.550	2199.900	508.00	14.51	3.27	2203.17	.00	5.00	7.00	5.000	7.000	.00	0 .0
JUNCT STR	.0000					.0097	.00	7.55	1.14		.013	.00	.00	BOX
-5091.700	2192.360	7.514	2199.874	509.00	14.54	3.28	2203.16	.00	5.00	7.00	5.000	7.000	.00	0 .0
298.700	.0076					.0098	2.92	7.51	1.15	4.61	.013	.00	.00	BOX
-4793.000	2194.630	8.197	2202.827	509.00	14.54	3.28	2206.11	.00	5.00	7.00	5.000	7.000	.00	0 .0
98.120	.0074					.0098	.96	8.20	1.15	4.65	.013	.00	.00	BOX

Vegas Drive, Shadow Mountain Place to Rancho Drive - 05333
SD System - Shadow Mtn to Rancho, Start @ Critical Depth Upstream (8
'x File: UPDATE2.wsw, (100YR INTERIM CONDITION) Q=390 CFS, n=0.013, b

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
-4694.880	2195.360	8.591	2203.951	509.00	14.54	3.28	2207.24	.00	5.00	7.00	5.000	7.000	.00	0 .0
JUNCT STR	.0000					.0098	.00	8.59	1.15		.013	.00	.00	BOX
-4694.880	2195.370	8.556	2203.926	510.00	14.57	3.30	2207.22	.00	5.00	7.00	5.000	7.000	.00	0 .0
95.240	.0075					.0098	.94	8.56	1.15	4.65	.013	.00	.00	BOX
-4599.640	2196.080	8.781	2204.861	510.00	14.57	3.30	2208.16	.00	5.00	7.00	5.000	7.000	.00	0 .0
JUNCT STR	.0000					.0098	.00	8.78	1.15		.013	.00	.00	BOX
-4599.640	2196.090	8.745	2204.835	511.00	14.60	3.31	2208.15	.00	5.00	7.00	5.000	7.000	.00	0 .0
14.640	.0075					.0099	.14	8.75	1.15	4.65	.013	.00	.00	BOX
-4585.000	2196.200	8.824	2205.024	511.00	14.60	3.31	2208.33	.00	5.00	7.00	5.000	7.000	.00	0 .0
20.000	.0110					.0099	.20	8.82	1.15	4.01	.013	.00	.00	BOX
-4565.000	2196.420	8.802	2205.221	511.00	14.60	3.31	2208.53	.00	5.00	7.00	5.000	7.000	.00	0 .0
20.420	.0108					.0099	.20	8.80	1.15	4.04	.013	.00	.00	BOX
-4544.580	2196.640	8.948	2205.588	511.00	14.60	3.31	2208.90	.00	5.00	7.00	5.000	7.000	.00	0 .0
JUNCT STR	.0000					.0099	.00	8.95	1.15		.013	.00	.00	BOX
-4544.580	2196.650	8.887	2205.536	513.00	14.66	3.34	2208.87	.00	5.00	7.00	5.000	7.000	.00	0 .0
179.580	.0110					.0099	1.79	8.89	1.16	4.03	.013	.00	.00	BOX
-4365.000	2198.620	8.868	2207.489	513.00	14.66	3.34	2210.82	.00	5.00	7.00	5.000	7.000	.00	0 .0
JUNCT STR	.0000					.0099	.00	8.87	1.16		.013	.00	.00	BOX

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
-4365.000	2198.630	8.833	2207.462	514.00	14.69	3.35	2210.81	.00	5.00	7.00	5.000	7.000	.00	0 .0
7.000	.0114					.0100	.07	8.83	1.16	3.97	.013	.00	.00	BOX
-4358.000	2198.710	8.822	2207.532	514.00	14.69	3.35	2210.88	.00	5.00	7.00	5.000	7.000	.00	0 .0
TRANS STR	.0180					.0124	.06	8.82	1.16		.013	.00	.00	BOX
-4353.000	2198.800	7.368	2206.168	514.00	18.18	5.13	2211.30	.00	5.70	.00	6.000	.000	.00	1 .0
168.000	.0174					.0147	2.47	7.37	.00	4.54	.013	.00	.00	PIPE
-4185.000	2201.720	7.179	2208.899	514.00	18.18	5.13	2214.03	.00	5.70	.00	6.000	.000	.00	1 .0
256.420	.0174					.0147	3.78	7.18	.00	4.54	.013	.00	.00	PIPE
-3928.580	2206.170	6.763	2212.933	514.00	18.18	5.13	2218.06	.00	5.70	.00	6.000	.000	.00	1 .0
JUNCT STR	.0000					.0144	.00	6.76	.00		.013	.00	.00	PIPE
-3928.580	2206.180	7.265	2213.445	501.00	17.72	4.88	2218.32	.00	5.67	.00	6.000	.000	.00	1 .0
78.580	.0174					.0140	1.10	7.27	.00	4.43	.013	.00	.00	PIPE
-3850.000	2207.550	7.239	2214.789	501.00	17.72	4.88	2219.66	.00	5.67	.00	6.000	.000	.00	1 .0
JUNCT STR	.0000					.0134	.00	7.24	.00		.013	.00	.00	PIPE
-3850.000	2207.650	7.856	2215.506	481.00	17.01	4.49	2220.00	.00	5.63	.00	6.000	.000	.00	1 .0
137.590	.0137					.0129	1.77	7.86	.00	4.76	.013	.00	.00	PIPE
-3712.410	2209.540	7.966	2217.506	481.00	17.01	4.49	2222.00	.00	5.63	.00	6.000	.000	.00	1 .0
JUNCT STR	.0000					.0126	.00	7.97	.00		.013	.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
-3712.410	2209.550	8.330	2217.880	468.00	16.55	4.25	2222.13	.00	5.59	.00	6.000	.000	.00	1 .0
47.410	.0139					.0122	.58	8.33	.00	4.61	.013	.00	.00	PIPE
-3665.000	2210.210	8.462	2218.672	468.00	16.55	4.25	2222.93	.00	5.59	.00	6.000	.000	.00	1 .0
397.060	.0138					.0122	4.85	8.46	.00	4.62	.013	.00	.00	PIPE
-3267.940	2215.700	8.033	2223.733	468.00	16.55	4.25	2227.99	.00	5.59	.00	6.000	.000	.00	1 .0
JUNCT STR	.0000					.0120	.00	8.03	.00		.013	.00	.00	PIPE
-3267.940	2215.800	8.293	2224.093	458.00	16.20	4.07	2228.17	.00	5.56	.00	6.000	.000	.00	1 .0
389.880	.0140					.0117	4.56	8.29	.00	4.51	.013	.00	.00	PIPE
-2878.060	2221.250	7.606	2228.856	458.00	16.20	4.07	2232.93	.00	5.56	.00	6.000	.000	.00	1 .0
252.060	.0139					.0117	2.95	7.61	.00	4.52	.013	.00	.00	PIPE
-2626.000	2224.760	7.248	2232.008	458.00	16.20	4.07	2236.08	.00	5.56	.00	6.000	.000	.00	1 .0
JUNCT STR	.0000					.0114	.00	7.25	.00		.013	.00	.00	PIPE
-2626.000	2224.770	7.589	2232.359	445.00	15.74	3.85	2236.21	.00	5.51	.00	6.000	.000	.00	1 .0
147.180	.0140					.0110	1.62	7.59	.00	4.40	.013	.00	.00	PIPE
-2478.820	2226.830	7.346	2234.176	445.00	15.74	3.85	2238.02	.00	5.51	.00	6.000	.000	.00	1 .0
382.680	.0140					.0110	4.23	7.35	.00	4.40	.013	.00	.00	PIPE
-2096.140	2232.180	6.414	2238.594	445.00	15.74	3.85	2242.44	.00	5.51	.00	6.000	.000	.00	1 .0
TRANS STR	.0171					.0053	.06	6.41	.00		.013	.00	.00	PIPE

Vegas Drive, Shadow Mountain Place to Rancho Drive - 05333
SD System - Shadow Mtn to Rancho, Start @ Critical Depth Upstream (8
'x File: UPDATE2.wsw, (100YR INTERIM CONDITION) Q=390 CFS, n=0.013, b

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 "N"	Base Wt or I.D. X-Fall	ZL ZR	No Wth Prs/Pip Type Ch
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp				
-2085.580	2232.360	8.437	2240.797	445.00	11.13	1.92	2242.72	.00	4.58	8.00	5.000	8.000	.00	0 .0
65.000	.0157					.0053	.35	8.44	.88	2.79	.013	.00	.00	BOX
-2020.580	2233.380	7.764	2241.144	445.00	11.13	1.92	2243.07	.00	4.58	8.00	5.000	8.000	.00	0 .0
26.850	.0041					.0053	.14	7.76	.88	4.58	.013	.00	.00	BOX
-1993.730	2233.490	7.809	2241.299	445.00	11.13	1.92	2243.22	.00	4.58	8.00	5.000	8.000	.00	0 .0
53.010	.0036					.0053	.28	7.81	.88	4.83	.013	.00	.00	BOX
-1940.720	2233.680	7.902	2241.582	445.00	11.13	1.92	2243.50	.00	4.58	8.00	5.000	8.000	.00	0 .0
JUNCT STR	.0000					.0037	.00	7.90	.88		.013	.00	.00	BOX
-1940.720	2233.700	8.612	2242.312	371.00	9.27	1.34	2243.65	.00	4.06	8.00	5.000	8.000	.00	0 .0
11.290	.0035					.0037	.04	8.61	.73	4.22	.013	.00	.00	BOX
-1929.430	2233.740	8.614	2242.354	371.00	9.27	1.34	2243.69	.00	4.06	8.00	5.000	8.000	.00	0 .0
JUNCT STR	.0000					.0037	.00	8.61	.73		.013	.00	.00	BOX
-1929.430	2233.750	8.633	2242.383	369.00	9.23	1.32	2243.70	.00	4.04	8.00	5.000	8.000	.00	0 .0
154.660	.0038					.0037	.57	8.63	.73	4.09	.013	.00	.00	BOX
-1774.770	2234.340	8.610	2242.950	369.00	9.23	1.32	2244.27	.00	4.04	8.00	5.000	8.000	.00	0 .0
JUNCT STR	.0000					.0025	.00	8.61	.73		.013	.00	.00	BOX
-1774.770	2234.360	9.093	2243.453	307.00	7.68	.91	2244.37	.00	3.58	8.00	5.000	8.000	.00	0 .0
13.200	.0030					.0025	.03	9.09	.60	3.89	.013	.00	.00	BOX

W S P G W - CIVILDESIGN Version 14.05

Program Package Serial Number: 1492

WATER SURFACE PROFILE LISTING

Date:11-22-2011 Time:10:47:55

Vegas Drive, Shadow Mountain Place to Rancho Drive - 05333

SD System - Shadow Mtn to Rancho, Start @ Critical Depth Upstream (8

'x File: UPDATE2.wsw, (100YR INTERIM CONDITION) Q=390 CFS, n=0.013, b

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	ZR	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall			Type Ch
-1761.570	2234.400	9.087	2243.487	307.00	7.68	.91	2244.40	.00	3.58	8.00	5.000	8.000	.00	0	.0
JUNCT STR	.0000					.0015	.00	9.09	.60		.013	.00	.00	BOX	
-1761.570	2234.420	9.408	2243.828	236.00	5.90	.54	2244.37	.00	3.00	8.00	5.000	8.000	.00	0	.0
115.700	.0038					.0015	.17	9.41	.46	2.94	.013	.00	.00	BOX	
-1645.870	2234.860	9.142	2244.002	236.00	5.90	.54	2244.54	.00	3.00	8.00	5.000	8.000	.00	0	.0
JUNCT STR	.0000					.0002	.00	9.14	.46		.013	.00	.00	BOX	
-1645.870	2234.870	9.605	2244.476	83.00	2.08	.07	2244.54	.00	1.50	8.00	5.000	8.000	.00	0	.0
15.680	.0032					.0002	.00	9.61	.16	1.51	.013	.00	.00	BOX	
-1630.190	2234.920	9.559	2244.479	83.00	2.08	.07	2244.55	.00	1.50	8.00	5.000	8.000	.00	0	.0
JUNCT STR	.0000					.0000	.00	9.56	.16		.013	.00	.00	BOX	
-1630.190	2234.940	9.605	2244.545	1.00	.03	.00	2244.55	.00	.08	8.00	5.000	8.000	.00	0	.0
30.190	.0033					.0000	.00	9.61	.00	.09	.013	.00	.00	BOX	
-1600.000	2235.040	9.505	2244.545	1.00	.03	.00	2244.55	.00	.08	8.00	5.000	8.000	.00	0	.0

Vegas Drive, Shadow Mountain Place to Rancho Drive - 05333

SD System - Shadow Mtn to Rancho, Start @ Critical Depth Upstream (8

'x File: UPDATE2.wsw, (100YR INTERIM CONDITION) Q=390 CFS, n=0.013, b

-13299.19	.I WH E	. R
-13247.19	.	.
-13195.20	.	.
-13143.20	.	.
-13091.21	.	.
-13039.21	. I H E	. R
-12987.21	.	.
-12935.22	.	.
-12883.22	. I H E	. JX
-12831.22	. I H E	. R
-12779.23	. I CH E	. R
-12727.23	.	.
-12675.23	.	.
-12623.24	. I HW E	. JX
-12571.24	. I HW E	. R
-12519.24	.	.
-12467.25	.	.
-12415.25	.	.
-12363.25	.	.
-12311.26	.	.

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-12259.26    .     I   HW  E                                                .    JX
-12207.27    .     I   HW  E                                                .    R
-12155.27    .                                                              .
-12103.27    .                                                              .
-12051.28    .                                                              .
-11999.28    .                                                              .
-11947.28    .       I  CHW  E                                              .    JX
-11895.29    .       I   HW  E                                              .    R
-11843.29    .                                                              .
-11791.29    .                                                              .
-11739.30    .                                                              .
-11687.30    .                                                              .
-11635.31    .        I   CHW  E                                            .    JX
-11583.31    .         I  CHW  E                                            .    R
-11531.31    .                                                              .
-11479.32    .                                                              .
-11427.32    .                                                              .
-11375.32    .                                                              .
-11323.33    .          I   H W  E                                          .    JX
-11271.33    .          I   CHW  E                                          .    R
-11219.33    .                                                              .
-11167.34    .                                                              .
-11115.34    .                                                              .
-11063.34    .                                                              .
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-11011.35   .                                                    .
-10959.35   .          I   CH W E                                .   JX
-10907.36   .          I   CH W E                                .   R
-10855.36   .                                                    .
-10803.36   .                                                    .
-10751.37   .                                                    .
-10699.37   .                                                    .
-10647.37   .                                                    .
-10595.38   .            I   H  W E                              .   JX
-10543.38   .            I   H  W E                              .   R
-10491.38   .             I  CH  W E                             .   JX
-10439.39   .             I  H    WE                             .   R
-10387.39   .             I  H    W E                            .   JX
-10335.40   .             I   H  W  E                            .   R
-10283.40   .             I   H   W E                            .   JX
-10231.40   .             I   H   W E                            .   R
-10179.41   .             I   CH  W E                            .   JX
-10127.41   .             I   CH  W E                            .   R
-10075.41   .              I  CH  W E                            .   JX
-10023.42   .              I  CH  W E                            .   R
 -9971.42   .              I   H  W  E                           .   JX
 -9919.42   .              I   H   W E                           .   R
 -9867.43   .              I   H   W E                           .   JX
 -9815.43   .              I  H  W   E                           .   R
 -9763.43   .                I  H   W   E                        .   JX
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-9711.44   .              I  H   W   E                          .   R
-9659.44   .               I  H   W   E                         .   JX
-9607.45   .               I  H   W   E                         .   R
-9555.45   .                I  H    W   E                       .   JX
-9503.45   .                I  H    W   E                       .   R
-9451.46   .                     I  H  W   E                    .   JX
-9399.46   .                     I  H   W  E                    .   R
-9347.46   .                                                    .
-9295.47   .                                                    .
-9243.47   .                                                    .
-9191.47   .                                                    .
-9139.48   .                                                    .
-9087.48   .                        I  CH   E                   .   JX
-9035.49   .                        I  CH   E                   .   R
-8983.49   .                                                    .
-8931.49   .                                                    .
-8879.50   .                                                    .
-8827.50   .                          I  H  W  E                .   JX
-8775.50   .                          I  H  W  E                .   R
-8723.51   .                                                    .
-8671.51   .                                                    .
-8619.51   .                                                    .
-8567.52   .                           I   H   W  E             .   JX
-8515.52   .                           I   H   W  E             .   R
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-8463.53    .                                                    .
-8411.53    .                                                    .
-8359.53    .                                                    .
-8307.54    .                                                    .
-8255.54    .                                                    .
-8203.54    .                  I  CHW  E                         .    JX
-8151.55    .                  I  CH W E                         .    R
-8099.55    .                                                    .
-8047.55    .                                                    .
-7995.56    .                                                    .
-7943.56    .                                                    .
-7891.56    .                     I  CHW  E                      .    R
-7839.57    .                                                    .
-7787.57    .                                                    .
-7735.58    .                                                    .
-7683.58    .                                                    .
-7631.58    .                                                    .
-7579.59    .                                                    .
-7527.59    .                                                    .
-7475.59    .                        I   HW  E                   .    JX
-7423.60    .                        I   H W E                   .    R
-7371.60    .                                                    .
-7319.60    .                                                    .
-7267.61    .                                                    .
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-7215.61   .                                                    .
-7163.61   .                                                    .
-7111.62   .                    I   H  W E                      .   JX
-7059.62   .                     I  H  W E                      .   R
-7007.63   .                                                    .
-6955.63   .                                                    .
-6903.63   .                                                    .
-6851.64   .                                                    .
-6799.64   .                                                    .
-6747.64   .                                                    .
-6695.65   .                      I   H   W E                   .   JX
-6643.65   .                       I  H  W  E                   .   R
-6591.65   .                                                    .
-6539.66   .                                                    .
-6487.66   .                                                    .
-6435.67   .                         I  H   W  E                .   R
-6383.67   .                                                    .
-6331.67   .                                                    .
-6279.68   .                                                    .
-6227.68   .                                                    .
-6175.68   .                           I  H   W  E              .   JX
-6123.69   .                           I  CH  W  E              .   R
-6071.69   .                                                    .
-6019.69   .                                                    .
-5967.70   .                                                    .
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-5915.70	.		.	
-5863.71	.		.	
-5811.71	.	I H W E	.	R
-5759.71	.		.	
-5707.72	.		.	
-5655.72	.		.	
-5603.72	.		.	
-5551.73	.		.	
-5499.73	.		.	
-5447.73	.	I H W E	.	TX
-5395.74	.	I H WE	.	R
-5343.74	.	I H WE	.	JX
-5291.74	.	I H WE	.	R
-5239.75	.	I HWE	.	R
-5187.75	.		.	
-5135.76	.		.	
-5083.76	.	I HWE	.	JX
-5031.76	.	I HWE	.	R
-4979.77	.	I HWE	.	JX
-4927.77	.	I HWE	.	R
-4875.77	.		.	
-4823.78	.		.	
-4771.78	.	I HWE	.	R
-4719.78	.		.	

-4667.79	.	I H W E	.	JX
-4615.79	.	I H W E	.	R
-4563.79	.	I H W E	.	JX
-4511.80	.	I H W E	.	R
-4459.80	.	I H W E	.	R
-4407.81	.	I H W E	.	R
-4355.81	.	I H W E	.	JX
-4303.81	.	I H W E	.	R
-4251.82	.	I H W E	.	JX
-4199.82	.	I H W E	.	R
-4147.82	.	I H W E	.	TX
-4095.83	.	I HW E	.	R
-4043.83	.	I CH E	.	R
-3991.83	.		.	
-3939.84	.		.	
-3887.84	.	I HW E	.	JX
-3835.85	.	I HW E	.	R
-3783.85	.	I HW E	.	JX
-3731.85	.	I HW E	.	R
-3679.86	.	I HW E	.	JX
-3627.86	.	I H W E	.	R
-3575.86	.	I CHW E	.	R
-3523.87	.		.	
-3471.87	.		.	

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-3419.87    .                                                    .
-3367.88    .                                                    .
-3315.88    .                                                    .
-3263.88    .                                  I   HW  E         .   JX
-3211.89    .                                  I   HW  E         .   R
-3159.89    .                                                    .
-3107.90    .                                                    .
-3055.90    .                                                    .
-3003.90    .                                                    .
-2951.91    .                                                    .
-2899.91    .                                                    .
-2847.91    .                                      I  HW  E      .   R
-2795.92    .                                                    .
-2743.92    .                                                    .
-2691.92    .                                                    .
-2639.93    .                                                    .
-2587.93    .                                       I  HW E      .   JX
-2535.94    .                                       I  HW  E     .   R
-2483.94    .                                                    .
-2431.94    .                                        I  CH  E    .   R
-2379.95    .                                                    .
-2327.95    .                                                    .
-2275.95    .                                                    .
-2223.96    .                                                    .
-2171.96    .                                                    .
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-2119.96   .                                                                          .

-2067.97   .                                                                       I  CH E  .   TX

-2015.97   .                                                                       I  H WE  .   R

-1963.97   .                                                                        I  HW E .   R

-1911.98   .                                                                        I  H WE .   R

-1859.98   .                                                                        I  H WE .   JX

-1807.99   .                                                                        I CH WE .   R

-1755.99   .                                                                        I CH WE .   JX

-1703.99   .                                                                        I CH WE .   R

-1652.00   .                                                                        I  H  W .   JX

-1600.00   .                                                                        I  H  W .   R

        2076.340  2093.161  2109.981  2126.802  2143.622  2160.443  2177.263  2194.084  2210.905  2227.725  2244.545
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N O T E S
1. GLOSSARY
   I = INVERT ELEVATION
   C = CRITICAL DEPTH
   W = WATER SURFACE ELEVATION
   S = SUPER-ELEVATION
   H = HEIGHT OF CHANNEL
   E = ENERGY GRADE LINE
   X = CURVES CROSSING OVER
   B = BRIDGE ENTRANCE OR EXIT
   Y = WALL ENTRANCE OR EXIT
2. STATIONS FOR POINTS AT A JUMP MAY NOT BE PLOTTED EXACTLY

E-4.2

WSPGW Model

UpdateUlt2.wsw

100-YR Flows

(Ultimate Condition)

Program Package Serial Number: 1492

WATER SURFACE PROFILE LISTING Date:11-22-2011 Time:11: 6:38

Vegas Drive, Shadow Mountain Place to Rancho Drive - 05333

SD System - Shadow Mtn to Rancho, Start @ Critical Depth Upstream (8'

x5 File: UPDATEULT2.wsw, (100YR ULTIMATE CONDITION) Q=390 CFS, n=0.013

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
-13299.190	2076.340	4.800	2081.140	556.00	19.77	6.07	2087.21	.00	6.10	6.50	7.000	.000	.00	1 .0
196.712	.0123					.0109	2.15	4.80	1.67	4.67	.013	.00	.00	PIPE
-13102.480	2078.767	4.973	2083.740	556.00	19.01	5.61	2089.35	.00	6.10	6.35	7.000	.000	.00	1 .0
113.083	.0123					.0098	1.11	4.97	1.56	4.67	.013	.00	.00	PIPE
-12989.400	2080.162	5.202	2085.364	556.00	18.13	5.10	2090.47	.00	6.10	6.12	7.000	.000	.00	1 .0
60.655	.0123					.0088	.54	5.20	1.43	4.67	.013	.00	.00	PIPE
-12928.740	2080.910	5.454	2086.364	556.00	17.28	4.64	2091.00	.00	6.10	5.81	7.000	.000	.00	1 .0
JUNCT STR	.0000					.0076	.00	5.45	1.29		.013	.00	.00	PIPE
-12928.740	2081.110	6.098	2087.208	556.00	15.63	3.79	2091.00	.00	6.10	4.69	7.000	.000	.00	1 .0
40.041	.0049					.0067	.27	6.10	1.00	7.00	.013	.00	.00	PIPE
-12888.700	2081.307	6.515	2087.822	556.00	14.90	3.45	2091.27	.00	6.10	3.55	7.000	.000	.00	1 .0
137.848	.0049					.0069	.96	6.52	.81	7.00	.013	.00	.00	PIPE
-12750.850	2081.985	7.000	2088.985	556.00	14.45	3.24	2092.23	.00	6.10	.00	7.000	.000	.00	1 .0
94.661	.0049					.0075	.71	7.00	.00	7.00	.013	.00	.00	PIPE
-12656.190	2082.450	7.308	2089.758	556.00	14.45	3.24	2093.00	.00	6.10	.00	7.000	.000	.00	1 .0
JUNCT STR	.0000					.0076	.00	7.31	.00		.013	.00	.00	PIPE
-12656.190	2082.650	7.108	2089.758	556.00	14.45	3.24	2093.00	.00	6.10	.00	7.000	.000	.00	1 .0
368.631	.0079					.0076	2.79	7.11	.00	5.60	.013	.00	.00	PIPE

WATER SURFACE PROFILE LISTING Date:11-22-2011 Time:11: 6:38

Vegas Drive, Shadow Mountain Place to Rancho Drive - 05333
SD System - Shadow Mtn to Rancho, Start @ Critical Depth Upstream (8'
x5 File: UPDATEULT2.wsw, (100YR ULTIMATE CONDITION) Q=390 CFS, n=0.013

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
-12287.560	2085.570	7.142	2092.712	556.00	14.45	3.24	2095.95	.00	6.10	.00	7.000	.000	.00	1 .0
JUNCT STR	.0000					.0075	.00	7.14	.00		.013	.00	.00	PIPE
-12287.560	2085.770	7.035	2092.805	552.00	14.34	3.19	2096.00	.00	6.08	.00	7.000	.000	.00	1 .0
40.944	.0089					.0074	.30	7.04	.00	5.28	.013	.00	.00	PIPE
-12246.620	2086.133	7.000	2093.133	552.00	14.34	3.19	2096.33	.00	6.08	.00	7.000	.000	.00	1 .0
8.407	.0089					.0073	.06	7.00	.00	5.28	.013	.00	.00	PIPE
-12238.210	2086.207	6.981	2093.188	552.00	14.35	3.20	2096.38	.00	6.08	.72	7.000	.000	.00	1 .0
HYDRAULIC JUMP														
-12238.210	2086.207	5.197	2091.404	552.00	18.02	5.04	2096.44	.00	6.08	6.12	7.000	.000	.00	1 .0
251.998	.0089					.0095	2.39	5.20	1.42	5.28	.013	.00	.00	PIPE
-11986.210	2088.440	5.069	2093.509	552.00	18.49	5.31	2098.82	.00	6.08	6.26	7.000	.000	.00	1 .0
JUNCT STR	.0000					.0094	.00	5.07	1.49		.013	.00	.00	PIPE
-11986.210	2088.640	5.218	2093.858	551.00	17.91	4.98	2098.84	.00	6.08	6.10	7.000	.000	.00	1 .0
315.020	.0089					.0095	2.98	5.22	1.41	5.27	.013	.00	.00	PIPE
-11671.190	2091.430	5.048	2096.478	551.00	18.54	5.34	2101.82	.00	6.08	6.28	7.000	.000	.00	1 .0
JUNCT STR	.0000					.0094	.00	5.05	1.50		.013	.00	.00	PIPE
-11671.190	2091.630	5.230	2096.860	551.00	17.87	4.96	2101.82	.00	6.08	6.08	7.000	.000	.00	1 .0
315.000	.0089					.0093	2.94	5.23	1.40	5.27	.013	.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
-11356.190	2094.420	5.092	2099.511	551.00	18.37	5.24	2104.75	.00	6.08	6.23	7.000	.000	.00	1 .0
JUNCT STR	.0000					.0093	.00	5.09	1.48		.013	.00	.00	PIPE
-11356.190	2094.620	5.248	2099.868	550.00	17.77	4.90	2104.77	.00	6.07	6.07	7.000	.000	.00	1 .0
380.000	.0089					.0090	3.44	5.25	1.39	5.25	.013	.00	.00	PIPE
-10976.190	2098.000	5.188	2103.188	550.00	17.99	5.02	2108.21	.00	6.07	6.13	7.000	.000	.00	1 .0
JUNCT STR	.0000					.0087	.00	5.19	1.42		.013	.00	.00	PIPE
-10976.190	2098.200	5.427	2103.626	550.00	17.18	4.58	2108.21	.00	6.07	5.84	7.000	.000	.00	1 .0
111.281	.0084					.0082	.91	5.43	1.29	5.38	.013	.00	.00	PIPE
-10864.910	2099.139	5.464	2104.603	550.00	17.06	4.52	2109.12	.00	6.07	5.79	7.000	.000	.00	1 .0
195.801	.0084					.0078	1.52	5.46	1.27	5.38	.013	.00	.00	PIPE
-10669.110	2100.791	5.745	2106.536	550.00	16.27	4.11	2110.65	.00	6.07	5.37	7.000	.000	.00	1 .0
35.430	.0084					.0071	.25	5.75	1.14	5.38	.013	.00	.00	PIPE
-10633.680	2101.090	6.072	2107.162	550.00	15.51	3.74	2110.90	.00	6.07	4.75	7.000	.000	.00	1 .0
JUNCT STR	.0000					.0066	.00	6.07	1.00		.013	.00	.00	PIPE
-10633.680	2101.190	6.312	2107.502	545.00	14.92	3.46	2110.96	.00	6.05	4.17	7.000	.000	.00	1 .0
95.830	.0065					.0064	.61	6.31	.89	6.23	.013	.00	.00	PIPE
-10537.850	2101.810	6.283	2108.093	545.00	14.97	3.48	2111.57	.00	6.05	4.25	7.000	.000	.00	1 .0
JUNCT STR	.0000					.0050	.00	6.28	.90		.013	.00	.00	PIPE

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

Program Package Serial Number: 1492

WATER SURFACE PROFILE LISTING Date:11-22-2011 Time:11: 6:38

Vegas Drive, Shadow Mountain Place to Rancho Drive - 05333

SD System - Shadow Mtn to Rancho, Start @ Critical Depth Upstream (8'

x5 File: UPDATEULT2.wsw, (100YR ULTIMATE CONDITION) Q=390 CFS, n=0.013

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
-10537.850	2101.910	8.670	2110.580	430.00	10.75	1.79	2112.37	.00	4.48	8.00	5.000	8.000	.00	0 .0
53.409	.0054					.0050	.27	8.67	.85	4.01	.013	.00	.00	BOX
-10484.440	2102.200	8.735	2110.935	430.00	10.75	1.79	2112.73	.00	4.48	8.00	5.000	8.000	.00	0 .0
JUNCT STR	.0000					.0044	.00	8.74	.85		.013	.00	.00	BOX

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

-10484.440	2102.300	9.036	2111.336	398.00	10.34	1.66	2113.00	.00	5.26	.00	7.000	.000	.00	1 .0
17.681	.0085					.0039	.07	9.04	.00	4.22	.013	.00	.00	PIPE
JUNCT STR	.0000					.0039	.00	8.95	.00		.013	.00	.00	PIPE
-10466.760	2102.460	8.962	2111.421	397.00	10.32	1.65	2113.07	.00	5.25	.00	7.000	.000	.00	1 .0
61.010	.0087					.0039	.24	8.96	.00	4.18	.013	.00	.00	PIPE
-10405.750	2102.990	8.667	2111.657	397.00	10.32	1.65	2113.31	.00	5.25	.00	7.000	.000	.00	1 .0
JUNCT STR	.0000					.0038	.00	8.67	.00		.013	.00	.00	PIPE
-10405.750	2103.000	8.690	2111.690	395.00	10.26	1.64	2113.33	.00	5.24	.00	7.000	.000	.00	1 .0
50.630	.0089					.0038	.19	8.69	.00	4.13	.013	.00	.00	PIPE

Vegas Drive, Shadow Mountain Place to Rancho Drive - 05333
SD System - Shadow Mtn to Rancho, Start @ Critical Depth Upstream (8'
x5 File: UPDATEULT2.wsw, (100YR ULTIMATE CONDITION) Q=390 CFS, n=0.013

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
-10355.120	2103.450	8.434	2111.884	395.00	10.26	1.64	2113.52	.00	5.24	.00	7.000	.000	.00	1 .0
JUNCT STR	.0000					.0037	.00	8.43	.00		.013	.00	.00	PIPE
-10355.120	2103.460	8.603	2112.063	384.00	9.98	1.55	2113.61	.00	5.16	.00	7.000	.000	.00	1 .0
41.180	.0085					.0036	.15	8.60	.00	4.12	.013	.00	.00	PIPE
-10313.940	2103.810	8.402	2112.212	384.00	9.98	1.55	2113.76	.00	5.16	.00	7.000	.000	.00	1 .0
JUNCT STR	.0000					.0034	.00	8.40	.00		.013	.00	.00	PIPE
-10313.940	2103.820	8.736	2112.556	362.00	9.41	1.37	2113.93	.00	5.01	.00	7.000	.000	.00	1 .0
6.320	.0095					.0032	.02	8.74	.00	3.84	.013	.00	.00	PIPE
-10307.620	2103.880	8.766	2112.646	362.00	9.41	1.37	2114.02	.00	5.01	.00	7.000	.000	.00	1 .0
JUNCT STR	.0000					.0053	.00	8.77	.00		.013	.00	.00	PIPE
-10307.620	2103.980	7.521	2111.501	362.00	12.80	2.55	2114.05	.00	5.14	.00	6.000	.000	.00	1 .0
167.608	.0122					.0073	1.22	7.52	.00	3.96	.013	.00	.00	PIPE
-10140.010	2106.029	6.696	2112.725	362.00	12.80	2.55	2115.27	.00	5.14	.00	6.000	.000	.00	1 .0
HYDRAULIC JUMP														
-10140.010	2106.029	3.764	2109.793	362.00	19.39	5.84	2115.63	.00	5.14	5.80	6.000	.000	.00	1 .0
70.382	.0122					.0144	1.01	3.76	1.90	3.96	.013	.00	.00	PIPE
-10069.630	2106.890	3.723	2110.613	362.00	19.64	5.99	2116.60	.00	5.14	5.82	6.000	.000	.00	1 .0
JUNCT STR	.0000					.0157	.00	3.72	1.95		.013	.00	.00	PIPE

Vegas Drive, Shadow Mountain Place to Rancho Drive - 05333
SD System - Shadow Mtn to Rancho, Start @ Critical Depth Upstream (8'
x5 File: UPDATEULT2.wsw, (100YR ULTIMATE CONDITION) Q=390 CFS, n=0.013

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
-10069.630	2106.900	3.485	2110.385	351.00	20.60	6.59	2116.98	.00	5.07	5.92	6.000	.000	.00	1 .0
33.157	.0124					.0172	.57	3.49	2.14	3.86	.013	.00	.00	PIPE
-10036.470	2107.310	3.442	2110.752	351.00	20.91	6.79	2117.54	.00	5.07	5.93	6.000	.000	.00	1 .0
87.402	.0124					.0186	1.63	3.44	2.19	3.86	.013	.00	.00	PIPE
-9949.070	2108.390	3.312	2111.702	351.00	21.93	7.47	2119.17	.00	5.07	5.97	6.000	.000	.00	1 .0
JUNCT STR	.0000					.0196	.00	3.31	2.36		.013	.00	.00	PIPE
-9949.070	2108.490	3.334	2111.824	351.00	21.75	7.34	2119.17	.00	5.07	5.96	6.000	.000	.00	1 .0
1.754	.0123					.0194	.03	3.33	2.33	3.87	.013	.00	.00	PIPE
-9947.316	2108.511	3.331	2111.843	351.00	21.77	7.36	2119.21	.00	5.07	5.96	6.000	.000	.00	1 .0
72.136	.0123					.0207	1.49	3.33	2.33	3.87	.013	.00	.00	PIPE
-9875.181	2109.396	3.205	2112.601	351.00	22.84	8.10	2120.70	.00	5.07	5.99	6.000	.000	.00	1 .0
61.511	.0123					.0235	1.45	3.21	2.51	3.87	.013	.00	.00	PIPE
-9813.670	2110.150	3.086	2113.236	351.00	23.95	8.91	2122.14	.00	5.07	6.00	6.000	.000	.00	1 .0
JUNCT STR	.0000					.0267	.00	3.09	2.70		.013	.00	.00	PIPE
-9813.670	2110.250	2.913	2113.163	339.00	24.90	9.63	2122.79	.00	5.00	6.00	6.000	.000	.00	1 .0
229.612	.0298					.0268	6.15	2.91	2.91	2.87	.013	.00	.00	PIPE
-9584.058	2117.103	3.014	2120.117	339.00	23.83	8.82	2128.93	.00	5.00	6.00	6.000	.000	.00	1 .0
111.478	.0298					.0237	2.64	3.01	2.73	2.87	.013	.00	.00	PIPE

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
-9472.580	2120.430	3.131	2123.561	339.00	22.72	8.02	2131.58	.00	5.00	5.99	6.000	.000	.00	1 .0
JUNCT STR	.0000					.0240	.00	3.13	2.54		.013	.00	.00	PIPE
-9472.581	2120.530	2.909	2123.439	323.00	23.77	8.77	2132.21	.00	4.90	6.00	6.000	.000	.00	1 .0
22.458	.0298					.0256	.58	2.91	2.78	2.79	.013	.00	.00	PIPE
-9450.123	2121.200	2.923	2124.123	323.00	23.61	8.66	2132.78	.00	4.90	6.00	6.000	.000	.00	1 .0
113.809	.0298					.0239	2.72	2.92	2.76	2.79	.013	.00	.00	PIPE
-9336.314	2124.595	3.034	2127.630	323.00	22.52	7.87	2135.50	.00	4.90	6.00	6.000	.000	.00	1 .0
68.118	.0298					.0210	1.43	3.03	2.57	2.79	.013	.00	.00	PIPE
-9268.196	2126.628	3.151	2129.779	323.00	21.47	7.16	2136.94	.00	4.90	5.99	6.000	.000	.00	1 .0
46.777	.0298					.0186	.87	3.15	2.39	2.79	.013	.00	.00	PIPE
-9221.419	2128.023	3.274	2131.297	323.00	20.47	6.51	2137.80	.00	4.90	5.97	6.000	.000	.00	1 .0
34.357	.0298					.0164	.56	3.27	2.22	2.79	.013	.00	.00	PIPE
-9187.062	2129.048	3.403	2132.451	323.00	19.52	5.91	2138.37	.00	4.90	5.95	6.000	.000	.00	1 .0
26.134	.0298					.0145	.38	3.40	2.06	2.79	.013	.00	.00	PIPE
-9160.928	2129.828	3.539	2133.367	323.00	18.61	5.38	2138.74	.00	4.90	5.90	6.000	.000	.00	1 .0
20.232	.0298					.0128	.26	3.54	1.91	2.79	.013	.00	.00	PIPE
-9140.695	2130.432	3.683	2134.115	323.00	17.74	4.89	2139.00	.00	4.90	5.84	6.000	.000	.00	1 .0
15.695	.0298					.0113	.18	3.68	1.77	2.79	.013	.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
-9125.000	2130.900	3.837	2134.737	323.00	16.92	4.44	2139.18	.00	4.90	5.76	6.000	.000	.00	1 .0
JUNCT STR	.0000					.0104	.00	3.84	1.64		.013	.00	.00	PIPE
-9125.000	2131.000	3.900	2134.900	323.00	16.60	4.28	2139.18	.00	4.90	5.72	6.000	.000	.00	1 .0
97.428	.0110					.0099	.97	3.90	1.59	3.80	.013	.00	.00	PIPE
-9027.572	2132.069	3.972	2136.041	323.00	16.25	4.10	2140.14	.00	4.90	5.68	6.000	.000	.00	1 .0
107.608	.0110					.0091	.98	3.97	1.53	3.80	.013	.00	.00	PIPE
-8919.964	2133.250	4.145	2137.395	323.00	15.50	3.73	2141.12	.00	4.90	5.55	6.000	.000	.00	1 .0
53.414	.0110					.0081	.43	4.15	1.41	3.80	.013	.00	.00	PIPE
-8866.550	2133.836	4.332	2138.168	323.00	14.78	3.39	2141.56	.00	4.90	5.38	6.000	.000	.00	1 .0
28.590	.0110					.0073	.21	4.33	1.29	3.80	.013	.00	.00	PIPE
-8837.960	2134.150	4.534	2138.684	323.00	14.09	3.08	2141.77	.00	4.90	5.16	6.000	.000	.00	1 .0
JUNCT STR	.0000					.0111	.00	4.53	1.18		.013	.00	.00	PIPE
-8837.960	2134.250	3.105	2137.355	277.00	18.75	5.46	2142.82	.00	4.56	6.00	6.000	.000	.00	1 .0
45.005	.0109					.0157	.71	3.11	2.11	3.44	.013	.00	.00	PIPE
-8792.955	2134.742	3.045	2137.788	277.00	19.22	5.74	2143.53	.00	4.56	6.00	6.000	.000	.00	1 .0
71.952	.0109					.0174	1.25	3.05	2.19	3.44	.013	.00	.00	PIPE
-8721.003	2135.530	2.933	2138.463	277.00	20.16	6.31	2144.78	.00	4.56	6.00	6.000	.000	.00	1 .0
59.713	.0109					.0197	1.18	2.93	2.35	3.44	.013	.00	.00	PIPE

Vegas Drive, Shadow Mountain Place to Rancho Drive - 05333
SD System - Shadow Mtn to Rancho, Start @ Critical Depth Upstream (8'
x5 File: UPDATEULT2.wsw, (100YR ULTIMATE CONDITION) Q=390 CFS, n=0.013

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
-8661.290	2136.184	2.826	2139.010	277.00	21.15	6.94	2145.95	.00	4.56	5.99	6.000	.000	.00	1 .0
51.680	.0109					.0224	1.16	2.83	2.52	3.44	.013	.00	.00	PIPE
-8609.610	2136.750	2.725	2139.475	277.00	22.18	7.64	2147.11	.00	4.56	5.97	6.000	.000	.00	1 .0
JUNCT STR	.0000					.0236	.00	2.72	2.70		.013	.00	.00	PIPE
-8609.610	2136.850	2.741	2139.591	277.00	22.01	7.52	2147.11	.00	4.56	5.98	6.000	.000	.00	1 .0
63.226	.0263					.0228	1.44	2.74	2.67	2.65	.013	.00	.00	PIPE
-8546.385	2138.516	2.778	2141.294	277.00	21.62	7.26	2148.55	.00	4.56	5.98	6.000	.000	.00	1 .0
102.745	.0263					.0209	2.15	2.78	2.60	2.65	.013	.00	.00	PIPE
-8443.640	2141.223	2.883	2144.106	277.00	20.62	6.60	2150.71	.00	4.56	6.00	6.000	.000	.00	1 .0
62.039	.0263					.0184	1.14	2.88	2.43	2.65	.013	.00	.00	PIPE
-8381.601	2142.857	2.992	2145.849	277.00	19.66	6.00	2151.85	.00	4.56	6.00	6.000	.000	.00	1 .0
42.556	.0263					.0162	.69	2.99	2.26	2.65	.013	.00	.00	PIPE
-8339.045	2143.978	3.107	2147.085	277.00	18.74	5.45	2152.54	.00	4.56	6.00	6.000	.000	.00	1 .0
31.214	.0263					.0143	.45	3.11	2.10	2.65	.013	.00	.00	PIPE
-8307.831	2144.801	3.227	2148.028	277.00	17.87	4.96	2152.99	.00	4.56	5.98	6.000	.000	.00	1 .0
23.585	.0263					.0126	.30	3.23	1.96	2.65	.013	.00	.00	PIPE
-8284.246	2145.422	3.354	2148.776	277.00	17.04	4.51	2153.28	.00	4.56	5.96	6.000	.000	.00	1 .0
18.205	.0263					.0111	.20	3.35	1.82	2.65	.013	.00	.00	PIPE

Vegas Drive, Shadow Mountain Place to Rancho Drive - 05333
SD System - Shadow Mtn to Rancho, Start @ Critical Depth Upstream (8'
x5 File: UPDATEULT2.wsw, (100YR ULTIMATE CONDITION) Q=390 CFS, n=0.013

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
-8266.041	2145.902	3.487	2149.389	277.00	16.25	4.10	2153.49	.00	4.56	5.92	6.000	.000	.00	1 .0
13.981	.0263					.0099	.14	3.49	1.69	2.65	.013	.00	.00	PIPE
-8252.060	2146.270	3.629	2149.899	277.00	15.49	3.73	2153.62	.00	4.56	5.87	6.000	.000	.00	1 .0
JUNCT STR	.0000					.0117	.00	3.63	1.56		.013	.00	.00	PIPE
-8252.060	2146.370	3.025	2149.395	255.00	17.85	4.95	2154.34	.00	4.37	6.00	6.000	.000	.00	1 .0
352.060	.0142					.0136	4.80	3.02	2.04	3.02	.013	.00	.00	PIPE
-7900.000	2151.360	3.087	2154.447	255.00	17.39	4.70	2159.15	.00	4.37	6.00	6.000	.000	.00	1 .0
65.306	.0142					.0130	.85	3.09	1.96	3.02	.013	.00	.00	PIPE
-7834.694	2152.287	3.115	2155.402	255.00	17.19	4.59	2159.99	.00	4.37	6.00	6.000	.000	.00	1 .0
135.343	.0142					.0120	1.63	3.12	1.93	3.02	.013	.00	.00	PIPE
-7699.351	2154.209	3.236	2157.445	255.00	16.39	4.17	2161.62	.00	4.37	5.98	6.000	.000	.00	1 .0
70.016	.0142					.0106	.74	3.24	1.79	3.02	.013	.00	.00	PIPE
-7629.335	2155.203	3.363	2158.566	255.00	15.63	3.79	2162.36	.00	4.37	5.96	6.000	.000	.00	1 .0
43.539	.0142					.0094	.41	3.36	1.66	3.02	.013	.00	.00	PIPE
-7585.796	2155.821	3.497	2159.318	255.00	14.90	3.45	2162.77	.00	4.37	5.92	6.000	.000	.00	1 .0
28.939	.0142					.0083	.24	3.50	1.54	3.02	.013	.00	.00	PIPE
-7556.857	2156.232	3.639	2159.871	255.00	14.21	3.14	2163.01	.00	4.37	5.86	6.000	.000	.00	1 .0
19.496	.0142					.0073	.14	3.64	1.43	3.02	.013	.00	.00	PIPE

Vegas Drive, Shadow Mountain Place to Rancho Drive - 05333
SD System - Shadow Mtn to Rancho, Start @ Critical Depth Upstream (8'
x5 File: UPDATEULT2.wsw, (100YR ULTIMATE CONDITION) Q=390 CFS, n=0.013

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
-7537.361	2156.509	3.790	2160.299	255.00	13.55	2.85	2163.15	.00	4.37	5.79	6.000	.000	.00	1 .0
12.868	.0142					.0065	.08	3.79	1.32	3.02	.013	.00	.00	PIPE
-7524.493	2156.692	3.950	2160.642	255.00	12.92	2.59	2163.23	.00	4.37	5.69	6.000	.000	.00	1 .0
7.643	.0142					.0058	.04	3.95	1.22	3.02	.013	.00	.00	PIPE
-7516.850	2156.800	4.121	2160.921	255.00	12.32	2.36	2163.28	.00	4.37	5.57	6.000	.000	.00	1 .0
JUNCT STR	.0000					.0071	.00	4.12	1.13		.013	.00	.00	PIPE
-7516.850	2156.900	3.339	2160.239	237.00	14.66	3.34	2163.58	.00	4.22	5.96	6.000	.000	.00	1 .0
50.830	.0088					.0088	.45	3.34	1.57	3.34	.013	.00	.00	PIPE
-7466.020	2157.346	3.339	2160.686	237.00	14.66	3.34	2164.02	.00	4.22	5.96	6.000	.000	.00	1 .0
346.340	.0088					.0087	3.02	3.34	1.57	3.34	.013	.00	.00	PIPE
-7119.680	2160.390	3.358	2163.748	237.00	14.56	3.29	2167.04	.00	4.22	5.96	6.000	.000	.00	1 .0
JUNCT STR	.0000					.0087	.00	3.36	1.55		.013	.00	.00	PIPE
-7119.680	2160.490	3.314	2163.804	234.00	14.61	3.31	2167.12	.00	4.19	5.97	6.000	.000	.00	1 .0
37.598	.0088					.0088	.33	3.31	1.57	3.31	.013	.00	.00	PIPE
-7082.082	2160.820	3.314	2164.134	234.00	14.61	3.31	2167.45	.00	4.19	5.97	6.000	.000	.00	1 .0
337.082	.0088					.0085	2.86	3.31	1.57	3.31	.013	.00	.00	PIPE
-6745.000	2163.780	3.388	2167.168	234.00	14.22	3.14	2170.31	.00	4.19	5.95	6.000	.000	.00	1 .0
JUNCT STR	.0000					.0108	.00	3.39	1.51		.013	.00	.00	PIPE

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
-6745.000	2163.880	2.758	2166.638	213.00	16.79	4.38	2171.01	.00	3.99	5.98	6.000	.000	.00	1 .0
285.000	.0135					.0135	3.84	2.76	2.03	2.76	.013	.00	.00	PIPE
-6460.000	2167.740	2.764	2170.504	213.00	16.74	4.35	2174.86	.00	3.99	5.98	6.000	.000	.00	1 .0
258.000	.0135					.0132	3.40	2.76	2.02	2.76	.013	.00	.00	PIPE
-6202.000	2171.230	2.793	2174.023	213.00	16.52	4.24	2178.26	.00	3.99	5.99	6.000	.000	.00	1 .0
JUNCT STR	.0000					.0156	.00	2.79	1.98		.013	.00	.00	PIPE
-6202.000	2171.330	2.428	2173.758	197.00	18.37	5.24	2179.00	.00	3.83	5.89	6.000	.000	.00	1 .0
3.608	.0183					.0183	.07	2.43	2.40	2.43	.013	.00	.00	PIPE
-6198.392	2171.396	2.428	2173.824	197.00	18.37	5.24	2179.06	.00	3.83	5.89	6.000	.000	.00	1 .0
348.392	.0183					.0180	6.27	2.43	2.40	2.43	.013	.00	.00	PIPE
-5850.000	2177.760	2.448	2180.208	197.00	18.17	5.12	2185.33	.00	3.83	5.90	6.000	.000	.00	1 .0
214.817	.0183					.0168	3.62	2.45	2.36	2.43	.013	.00	.00	PIPE
-5635.183	2181.690	2.519	2184.209	197.00	17.48	4.75	2188.96	.00	3.83	5.92	6.000	.000	.00	1 .0
102.519	.0183					.0150	1.54	2.52	2.23	2.43	.013	.00	.00	PIPE
-5532.665	2183.565	2.612	2186.177	197.00	16.67	4.32	2190.49	.00	3.83	5.95	6.000	.000	.00	1 .0
57.665	.0183					.0132	.76	2.61	2.08	2.43	.013	.00	.00	PIPE
-5475.000	2184.620	2.709	2187.329	197.00	15.89	3.92	2191.25	.00	3.83	5.97	6.000	.000	.00	1 .0
TRANS STR	.0180					.0187	.19	2.71	1.94		.013	.00	.00	PIPE

Vegas Drive, Shadow Mountain Place to Rancho Drive - 05333
SD System - Shadow Mtn to Rancho, Start @ Critical Depth Upstream {8'
x5 File: UPDATEULT2.wsw, (100YR ULTIMATE CONDITION) Q=390 CFS, n=0.013

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
-5465.000	2184.800	1.503	2186.303	197.00	18.72	5.44	2191.74	.00	2.91	7.00	5.000	7.000	.00	0 .0
9.330	.0418					.0244	.23	1.50	2.69	1.26	.013	.00	.00	BOX
-5455.670	2185.190	1.530	2186.720	197.00	18.39	5.25	2191.97	.00	2.91	7.00	5.000	7.000	.00	0 .0
JUNCT STR	.0000					.0268	.00	1.53	2.62		.013	.00	.00	BOX
-5455.670	2185.200	1.375	2186.575	188.00	19.53	5.92	2192.50	.00	2.82	7.00	5.000	7.000	.00	0 .0
8.233	.0427					.0292	.24	1.38	2.93	1.22	.013	.00	.00	BOX
-5447.437	2185.551	1.390	2186.941	188.00	19.32	5.80	2192.74	.00	2.82	7.00	5.000	7.000	.00	0 .0
29.102	.0427					.0269	.78	1.39	2.89	1.22	.013	.00	.00	BOX
-5418.335	2186.792	1.458	2188.250	188.00	18.42	5.27	2193.52	.00	2.82	7.00	5.000	7.000	.00	0 .0
21.143	.0427					.0234	.49	1.46	2.69	1.22	.013	.00	.00	BOX
-5397.192	2187.694	1.529	2189.223	188.00	17.56	4.79	2194.01	.00	2.82	7.00	5.000	7.000	.00	0 .0
16.157	.0427					.0203	.33	1.53	2.50	1.22	.013	.00	.00	BOX
-5381.035	2188.383	1.604	2189.987	188.00	16.75	4.35	2194.34	.00	2.82	7.00	5.000	7.000	.00	0 .0
12.721	.0427					.0177	.22	1.60	2.33	1.22	.013	.00	.00	BOX
-5368.314	2188.926	1.682	2190.608	188.00	15.97	3.96	2194.57	.00	2.82	7.00	5.000	7.000	.00	0 .0
10.194	.0427					.0154	.16	1.68	2.17	1.22	.013	.00	.00	BOX
-5358.120	2189.361	1.764	2191.125	188.00	15.22	3.60	2194.72	.00	2.82	7.00	5.000	7.000	.00	0 .0
8.247	.0427					.0134	.11	1.76	2.02	1.22	.013	.00	.00	BOX

Program Package Serial Number: 1492

WATER SURFACE PROFILE LISTING Date:11-22-2011 Time:11: 6:38

Vegas Drive, Shadow Mountain Place to Rancho Drive - 05333

SD System - Shadow Mtn to Rancho, Start @ Critical Depth Upstream (8'

x5 File: UPDATEULT2.wsw, (100YR ULTIMATE CONDITION) Q=390 CFS, n=0.013

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
-5349.873	2189.712	1.850	2191.563	188.00	14.52	3.27	2194.83	.00	2.82	7.00	5.000	7.000	.00	0 .0
6.693	.0427					.0117	.08	1.85	1.88	1.22	.013	.00	.00	BOX
-5343.180	2189.998	1.941	2191.938	188.00	13.84	2.97	2194.91	.00	2.82	7.00	5.000	7.000	.00	0 .0
5.416	.0427					.0102	.06	1.94	1.75	1.22	.013	.00	.00	BOX
-5337.764	2190.229	2.035	2192.264	188.00	13.20	2.70	2194.97	.00	2.82	7.00	5.000	7.000	.00	0 .0
4.342	.0427					.0089	.04	2.04	1.63	1.22	.013	.00	.00	BOX
-5333.422	2190.414	2.135	2192.549	188.00	12.58	2.46	2195.01	.00	2.82	7.00	5.000	7.000	.00	0 .0
3.422	.0427					.0078	.03	2.13	1.52	1.22	.013	.00	.00	BOX
-5330.000	2190.560	2.239	2192.799	188.00	12.00	2.23	2195.03	.00	2.82	7.00	5.000	7.000	.00	0 .0
123.718	.0075					.0069	.85	2.24	1.41	2.21	.013	.00	.00	BOX
-5206.282	2191.492	2.329	2193.821	188.00	11.53	2.06	2195.89	.00	2.82	7.00	5.000	7.000	.00	0 .0
51.722	.0075					.0061	.32	2.33	1.33	2.21	.013	.00	.00	BOX
-5154.560	2191.882	2.443	2194.324	188.00	10.99	1.88	2196.20	.00	2.82	7.00	5.000	7.000	.00	0 .0
23.480	.0075					.0053	.13	2.44	1.24	2.21	.013	.00	.00	BOX
-5131.079	2192.059	2.562	2194.621	188.00	10.48	1.71	2196.33	.00	2.82	7.00	5.000	7.000	.00	0 .0
10.555	.0075					.0047	.05	2.56	1.15	2.21	.013	.00	.00	BOX
-5120.524	2192.138	2.687	2194.825	188.00	10.00	1.55	2196.38	.00	2.82	7.00	5.000	7.000	.00	0 .0
2.884	.0075					.0041	.01	2.69	1.07	2.21	.013	.00	.00	BOX

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 or "N"	Base Wt or I.D. / X-Fall	ZL / ZR	No Wth Prs/Pip / Type Ch
-5117.640	2192.160	2.819	2194.979	188.00	9.53	1.41	2196.39	.00	2.82	7.00	5.000	7.000	.00	0 .0
JUNCT STR	.0000					.0016	.00	2.82	1.00		.013	.00	.00	BOX
-5117.640	2192.170	3.598	2195.768	170.00	6.75	.71	2196.48	.00	2.64	7.00	5.000	7.000	.00	0 .0
18.552	.0069					.0016	.03	3.60	.63	2.12	.013	.00	.00	BOX
-5099.088	2192.299	3.431	2195.729	170.00	7.08	.78	2196.51	.00	2.64	7.00	5.000	7.000	.00	0 .0
7.388	.0069					.0018	.01	3.43	.67	2.12	.013	.00	.00	BOX
-5091.700	2192.350	3.361	2195.711	170.00	7.23	.81	2196.52	.00	2.64	7.00	5.000	7.000	.00	0 .0
JUNCT STR	.0000					.0017	.00	3.36	.69		.013	.00	.00	BOX
-5091.700	2192.360	3.475	2195.835	166.00	6.82	.72	2196.56	.00	2.59	7.00	5.000	7.000	.00	0 .0
1.789	.0076					.0017	.00	3.47	.65	2.02	.013	.00	.00	BOX
-5089.911	2192.374	3.457	2195.831	166.00	6.86	.73	2196.56	.00	2.59	7.00	5.000	7.000	.00	0 .0
HYDRAULIC JUMP														
-5089.911	2192.374	1.884	2194.258	166.00	12.59	2.46	2196.72	.00	2.59	7.00	5.000	7.000	.00	0 .0
66.869	.0076					.0098	.66	1.88	1.62	2.02	.013	.00	.00	BOX
-5023.042	2192.882	1.807	2194.689	166.00	13.13	2.68	2197.36	.00	2.59	7.00	5.000	7.000	.00	0 .0
50.824	.0076					.0112	.57	1.81	1.72	2.02	.013	.00	.00	BOX
-4972.218	2193.268	1.723	2194.991	166.00	13.77	2.94	2197.93	.00	2.59	7.00	5.000	7.000	.00	0 .0
40.654	.0076					.0129	.52	1.72	1.85	2.02	.013	.00	.00	BOX

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
-4931.564	2193.577	1.642	2195.219	166.00	14.44	3.24	2198.46	.00	2.59	7.00	5.000	7.000	.00	0 .0
34.444	.0076					.0148	.51	1.64	1.99	2.02	.013	.00	.00	BOX
-4897.120	2193.839	1.566	2195.405	166.00	15.14	3.56	2198.97	.00	2.59	7.00	5.000	7.000	.00	0 .0
30.171	.0076					.0170	.51	1.57	2.13	2.02	.013	.00	.00	BOX
-4866.949	2194.068	1.493	2195.561	166.00	15.88	3.92	2199.48	.00	2.59	7.00	5.000	7.000	.00	0 .0
26.993	.0076					.0195	.53	1.49	2.29	2.02	.013	.00	.00	BOX
-4839.956	2194.273	1.424	2195.697	166.00	16.66	4.31	2200.01	.00	2.59	7.00	5.000	7.000	.00	0 .0
24.498	.0076					.0225	.55	1.42	2.46	2.02	.013	.00	.00	BOX
-4815.458	2194.459	1.357	2195.817	166.00	17.47	4.74	2200.56	.00	2.59	7.00	5.000	7.000	.00	0 .0
22.458	.0076					.0259	.58	1.36	2.64	2.02	.013	.00	.00	BOX
-4793.000	2194.630	1.294	2195.924	166.00	18.32	5.21	2201.14	.00	2.59	7.00	5.000	7.000	.00	0 .0
11.337	.0074					.0288	.33	1.29	2.84	2.03	.013	.00	.00	BOX
-4781.664	2194.714	1.261	2195.975	166.00	18.81	5.49	2201.47	.00	2.59	7.00	5.000	7.000	.00	0 .0
19.782	.0074					.0322	.64	1.26	2.95	2.03	.013	.00	.00	BOX
-4761.882	2194.861	1.202	2196.063	166.00	19.72	6.04	2202.10	.00	2.59	7.00	5.000	7.000	.00	0 .0
18.433	.0074					.0372	.69	1.20	3.17	2.03	.013	.00	.00	BOX
-4743.449	2194.999	1.146	2196.145	166.00	20.69	6.65	2202.79	.00	2.59	7.00	5.000	7.000	.00	0 .0
17.235	.0074					.0429	.74	1.15	3.41	2.03	.013	.00	.00	BOX

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
-4726.214	2195.127	1.093	2196.220	166.00	21.70	7.31	2203.53	.00	2.59	7.00	5.000	7.000	.00	0 .0
16.157	.0074					.0495	.80	1.09	3.66	2.03	.013	.00	.00	BOX
-4710.057	2195.247	1.042	2196.289	166.00	22.76	8.04	2204.33	.00	2.59	7.00	5.000	7.000	.00	0 .0
15.177	.0074					.0572	.87	1.04	3.93	2.03	.013	.00	.00	BOX
-4694.880	2195.360	.994	2196.354	166.00	23.87	8.85	2205.20	.00	2.59	7.00	5.000	7.000	.00	0 .0
JUNCT STR	.0000					.0379	.00	.99	4.22		.013	.00	.00	BOX
-4694.880	2195.370	5.000	2200.370	618.00	17.66	4.84	2205.21	.00	5.00	7.00	5.000	7.000	.00	0 .0
95.240	.0075					.0144	1.37	5.00	1.39	5.00	.013	.00	.00	BOX
-4599.640	2196.080	5.664	2201.744	618.00	17.66	4.84	2206.59	.00	5.00	7.00	5.000	7.000	.00	0 .0
JUNCT STR	.0000					.0133	.00	5.66	1.39		.013	.00	.00	BOX
-4599.640	2196.090	6.418	2202.509	593.00	16.94	4.46	2206.97	.00	5.00	7.00	5.000	7.000	.00	0 .0
14.640	.0075					.0133	.19	6.42	1.34	5.00	.013	.00	.00	BOX
-4585.000	2196.200	6.563	2202.763	593.00	16.94	4.46	2207.22	.00	5.00	7.00	5.000	7.000	.00	0 .0
20.000	.0110					.0133	.27	6.56	1.34	4.50	.013	.00	.00	BOX
-4565.000	2196.420	6.608	2203.028	593.00	16.94	4.46	2207.49	.00	5.00	7.00	5.000	7.000	.00	0 .0
20.420	.0108					.0133	.27	6.61	1.34	4.54	.013	.00	.00	BOX
-4544.580	2196.640	6.883	2203.522	593.00	16.94	4.46	2207.98	.00	5.00	7.00	5.000	7.000	.00	0 .0
JUNCT STR	.0000					.0113	.00	6.88	1.34		.013	.00	.00	BOX

Vegas Drive, Shadow Mountain Place to Rancho Drive - 05333
SD System - Shadow Mtn to Rancho, Start @ Critical Depth Upstream (8'
x5 File: UPDATEULT2.wsw, (100YR ULTIMATE CONDITION) Q=390 CFS, n=0.013

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
-4544.580	2196.650	8.085	2204.735	548.00	15.66	3.81	2208.54	.00	5.00	7.00	5.000	7.000	.00	0 .0
179.580	.0110					.0113	2.04	8.08	1.23	4.24	.013	.00	.00	BOX
-4365.000	2198.620	8.342	2206.962	548.00	15.66	3.81	2210.77	.00	5.00	7.00	5.000	7.000	.00	0 .0
JUNCT STR	.0000					.0102	.00	8.34	1.23		.013	.00	.00	BOX
-4365.000	2198.630	8.965	2207.595	519.00	14.83	3.41	2211.01	.00	5.00	7.00	5.000	7.000	.00	0 .0
7.000	.0114					.0102	.07	8.97	1.17	4.00	.013	.00	.00	BOX
-4358.000	2198.710	8.956	2207.666	519.00	14.83	3.41	2211.08	.00	5.00	7.00	5.000	7.000	.00	0 .0
TRANS STR	.0180					.0126	.06	8.96	1.17		.013	.00	.00	BOX
-4353.000	2198.800	7.475	2206.275	519.00	18.36	5.23	2211.51	.00	5.71	.00	6.000	.000	.00	1 .0
168.000	.0174					.0150	2.52	7.48	.00	4.58	.013	.00	.00	PIPE
-4185.000	2201.720	7.340	2209.060	519.00	18.36	5.23	2214.29	.00	5.71	.00	6.000	.000	.00	1 .0
256.420	.0174					.0150	3.85	7.34	.00	4.58	.013	.00	.00	PIPE
-3928.580	2206.170	7.002	2213.172	519.00	18.36	5.23	2218.40	.00	5.71	.00	6.000	.000	.00	1 .0
JUNCT STR	.0000					.0148	.00	7.00	.00		.013	.00	.00	PIPE
-3928.580	2206.180	7.312	2213.492	511.00	18.07	5.07	2218.56	.00	5.70	.00	6.000	.000	.00	1 .0
78.580	.0174					.0146	1.14	7.31	.00	4.51	.013	.00	.00	PIPE
-3850.000	2207.550	7.340	2214.890	511.00	18.07	5.07	2219.96	.00	5.70	.00	6.000	.000	.00	1 .0
JUNCT STR	.0000					.0136	.00	7.34	.00		.013	.00	.00	PIPE

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
-3850.000	2207.650	8.483	2216.133	476.00	16.84	4.40	2220.53	.00	5.61	.00	6.000	.000	.00	1 .0
137.590	.0137					.0126	1.74	8.48	.00	4.71	.013	.00	.00	PIPE
-3712.410	2209.540	8.551	2218.091	476.00	16.84	4.40	2222.49	.00	5.61	.00	6.000	.000	.00	1 .0
JUNCT STR	.0000					.0124	.00	8.55	.00		.013	.00	.00	PIPE
-3712.410	2209.550	8.835	2218.385	468.00	16.55	4.25	2222.64	.00	5.59	.00	6.000	.000	.00	1 .0
47.410	.0139					.0122	.58	8.83	.00	4.61	.013	.00	.00	PIPE
-3665.000	2210.210	8.966	2219.176	468.00	16.55	4.25	2223.43	.00	5.59	.00	6.000	.000	.00	1 .0
397.060	.0138					.0122	4.85	8.97	.00	4.62	.013	.00	.00	PIPE
-3267.940	2215.700	8.538	2224.238	468.00	16.55	4.25	2228.49	.00	5.59	.00	6.000	.000	.00	1 .0
JUNCT STR	.0000					.0120	.00	8.54	.00		.013	.00	.00	PIPE
-3267.940	2215.800	8.690	2224.490	461.00	16.30	4.13	2228.62	.00	5.57	.00	6.000	.000	.00	1 .0
389.880	.0140					.0118	4.62	8.69	.00	4.54	.013	.00	.00	PIPE
-2878.060	2221.250	8.066	2229.316	461.00	16.30	4.13	2233.44	.00	5.57	.00	6.000	.000	.00	1 .0
252.060	.0139					.0118	2.99	8.07	.00	4.55	.013	.00	.00	PIPE
-2626.000	2224.760	7.749	2232.509	461.00	16.30	4.13	2236.64	.00	5.57	.00	6.000	.000	.00	1 .0
JUNCT STR	.0000					.0116	.00	7.75	.00		.013	.00	.00	PIPE
-2626.000	2224.770	8.023	2232.793	453.00	16.02	3.99	2236.78	.00	5.54	.00	6.000	.000	.00	1 .0
147.180	.0140					.0114	1.68	8.02	.00	4.47	.013	.00	.00	PIPE

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT) /	Water Elev /	Q (CFS) /	Vel (FPS) / SF Ave	Vel Head / HF	Energy Grd.El. / SE Dpth	Super Elev / Froude N	Critical Depth / Norm Dp	Flow Top Width / "N"	Height/Dia.-FT / X-Fall	Base Wt or I.D. / ZR	ZL /	No Wth Prs/Pip / Type Ch
-2478.820	2226.830	7.846	2234.677	453.00	16.02	3.99	2238.66	.00	5.54	.00	6.000	.000	.00	1 .0
382.680	.0140					.0114	4.38	7.85	.00	4.47	.013	.00	.00	PIPE
-2096.140	2232.180	7.074	2239.254	453.00	16.02	3.99	2243.24	.00	5.54	.00	6.000	.000	.00	1 .0
TRANS STR	.0171					.0055	.06	7.07	.00		.013	.00	.00	PIPE
-2085.580	2232.360	9.177	2241.538	453.00	11.32	1.99	2243.53	.00	4.64	8.00	5.000	8.000	.00	0 .0
65.000	.0157					.0055	.36	9.18	.89	2.83	.013	.00	.00	BOX
-2020.580	2233.380	8.530	2241.910	453.00	11.32	1.99	2243.90	.00	4.64	8.00	5.000	8.000	.00	0 .0
26.850	.0041					.0055	.15	8.53	.89	4.64	.013	.00	.00	BOX
-1993.730	2233.490	8.581	2242.071	453.00	11.32	1.99	2244.06	.00	4.64	8.00	5.000	8.000	.00	0 .0
53.010	.0036					.0055	.29	8.58	.89	4.89	.013	.00	.00	BOX
JUNCT STR	.0000					.0055	.00	8.68	.89		.013	.00	.00	BOX
-1940.720	2233.700	8.681	2242.381	452.00	11.30	1.98	2244.36	.00	4.63	8.00	5.000	8.000	.00	0 .0
11.290	.0035					.0055	.06	8.68	.89	4.90	.013	.00	.00	BOX
-1929.430	2233.740	8.703	2242.443	452.00	11.30	1.98	2244.43	.00	4.63	8.00	5.000	8.000	.00	0 .0
JUNCT STR	.0000					.0055	.00	8.70	.89		.013	.00	.00	BOX
-1929.430	2233.750	8.728	2242.479	450.00	11.25	1.97	2244.44	.00	4.62	8.00	5.000	8.000	.00	0 .0
154.660	.0038					.0055	.84	8.73	.89	4.75	.013	.00	.00	BOX

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
-1774.770	2234.340	8.982	2243.322	450.00	11.25	1.97	2245.29	.00	4.62	8.00	5.000	8.000	.00	0 .0
JUNCT STR	.0000					.0046	.00	8.98	.89		.013	.00	.00	BOX
-1774.770	2234.360	9.451	2243.811	415.00	10.38	1.67	2245.48	.00	4.37	8.00	5.000	8.000	.00	0 .0
13.200	.0030					.0046	.06	9.45	.82	4.89	.013	.00	.00	BOX
JUNCT STR	.0000					.0046	.00	9.47	.82		.013	.00	.00	BOX
-1761.570	2234.420	9.468	2243.888	414.00	10.35	1.66	2245.55	.00	4.37	8.00	5.000	8.000	.00	0 .0
115.700	.0038					.0046	.53	9.47	.82	4.46	.013	.00	.00	BOX
-1645.870	2234.860	9.562	2244.422	414.00	10.35	1.66	2246.09	.00	4.37	8.00	5.000	8.000	.00	0 .0
JUNCT STR	.0000					.0043	.00	9.56	.82		.013	.00	.00	BOX
-1645.870	2234.870	9.752	2244.622	401.00	10.02	1.56	2246.18	.00	4.27	8.00	5.000	8.000	.00	0 .0
15.680	.0032					.0043	.07	9.75	.79	4.67	.013	.00	.00	BOX
-1630.190	2234.920	9.770	2244.690	401.00	10.02	1.56	2246.25	.00	4.27	8.00	5.000	8.000	.00	0 .0
JUNCT STR	.0000					.0041	.00	9.77	.79		.013	.00	.00	BOX
-1630.190	2234.940	9.912	2244.852	390.00	9.75	1.48	2246.33	.00	4.19	8.00	5.000	8.000	.00	0 .0
30.190	.0036					.0041	.12	9.91	.77	4.33	.013	.00	.00	BOX
-1600.000	2235.050	9.925	2244.976	390.00	9.75	1.48	2246.45	.00	4.19	8.00	5.000	8.000	.00	0 .0

Vegas Drive, Shadow Mountain Place to Rancho Drive - 05333

SD System - Shadow Mtn to Rancho, Start @ Critical Depth Upstream (8'

x5 File: UPDATEULT2.wsw, (100YR ULTIMATE CONDITION) Q=390 CFS, n=0.013

-13299.19	.I WCH E	. R
-13267.31	.	.
-13235.43	.	.
-13203.56	.	.
-13171.68	.	.
-13139.80	.	.
-13107.92	.	.
-13076.04	. I WH E	. R
-13044.17	.	.
-13012.29	.	.
-12980.41	. I WH E	. R
-12948.53	.	.
-12916.66	. I WH E	. JX
-12884.78	. I H E	. R
-12852.90	. I WHE	. R
-12821.02	.	.
-12789.14	.	.
-12757.27	.	.

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-12725.39    .   I  CH E                                    .    R
-12693.51    .                                              .
-12661.63    .                                              .
-12629.75    .   I   H E                                    .    JX
-12597.88    .   I   H E                                    .    R
-12566.00    .                                              .
-12534.12    .                                              .
-12502.24    .                                              .
-12470.37    .                                              .
-12438.49    .                                              .
-12406.61    .                                              .
-12374.73    .                                              .
-12342.85    .                                              .
-12310.98    .                                              .
-12279.10    .     I   H E                                  .    JX
-12247.22    .     I   H E                                  .    R
-12215.34    .     I   H E                                  .    R
-12183.46    .     I   H E                                  .    R
-12151.59    .     I  WH E                                  .    R
-12119.71    .                                              .
-12087.83    .                                              .
-12055.95    .                                              .
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-12024.07   .                                                .
-11992.20   .                                                .
-11960.32   .       I  WH E                                  .    JX
-11928.44   .       I  WH E                                  .    R
-11896.56   .                                                .
-11864.68   .                                                .
-11832.81   .                                                .
-11800.93   .                                                .
-11769.05   .                                                .
-11737.17   .                                                .
-11705.29   .                                                .
-11673.42   .                                                .
-11641.54   .        I  WH E                                 .    JX
-11609.66   .        I   WHE                                 .    R
-11577.78   .                                                .
-11545.91   .                                                .
-11514.03   .                                                .
-11482.15   .                                                .
-11450.27   .                                                .
-11418.39   .                                                .
-11386.52   .                                                .
-11354.64   .          I  WH E                               .    JX
-11322.76   .          I  WH E                               .    R
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-10589.57   .          I   H E                                .   R
-10557.69   .                                                 .
-10525.81   .          I   WHE                                .   JX
-10493.93   .           I H  WE                               .   R
-10462.06   .           I CH WE                               .   JX
-10430.18   .           I  CHWE                               .   R
-10398.30   .           I  CHWE                               .   R
-10366.42   .           I  CHWE                               .   JX
-10334.55   .           I  CHWE                               .   R
-10302.67   .           I   CHE                               .   JX
-10270.79   .           I  C HE                               .   R
-10238.91   .            I  CHW                               .   JX
-10207.03   .            I  CHWE                              .   R
-10175.16   .            I  CHWE                              .   JX
-10143.28   .            I  HW E                              .   R
-10111.40   .             I  HWE                              .   R
-10079.52   .             I WH  E                             .   R
-10047.64   .             I  WH E                             .   JX
-10015.77   .             I  WH E                             .   R
 -9983.89   .              I WH  E                            .   R
 -9952.01   .                                                 .
 -9920.13   .              I WCH  E                           .   JX
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-9888.25	.	I WCH E	.	R
-9856.38	.	I WCH E	.	R
-9824.50	.	I WH E	.	R
-9792.62	.	I WCH E	.	JX
-9760.74	.	I WCH E	.	R
-9728.87	.		.	
-9696.99	.		.	
-9665.11	.		.	
-9633.23	.		.	
-9601.35	.		.	
-9569.48	.	I WCH E	.	R
-9537.60	.		.	
-9505.72	.		.	
-9473.84	.		.	
-9441.96	.	I WCH E	.	JX
-9410.09	.	I WCH E	.	R
-9378.21	.	I WH E	.	R
-9346.33	.		.	
-9314.45	.	I WH E	.	R
-9282.57	.		.	
-9250.70	.	I WCH E	.	R
-9218.82	.	I WH E	.	R
-9186.94	.	I WCH E	.	R

-9155.06	.	I WH E	.	R
-9123.19	.	I WCHE	.	R
-9091.31	.	I WHE	.	JX
-9059.43	.	I WHE	.	R
-9027.55	.	I WHE	.	R
-8995.67	.		.	
-8963.80	.		.	
-8931.92	.		.	
-8900.04	.	I WH E	.	R
-8868.16	.		.	
-8836.28	.	I WHE	.	R
-8804.41	.	I WHE	.	JX
-8772.53	.	IWCH E	.	R
-8740.65	.	I WH E	.	R
-8708.77	.	I WCH E	.	R
-8676.89	.		.	
-8645.02	.	IWCH E	.	R
-8613.14	.		.	
-8581.26	.	I WCH E	.	JX
-8549.38	.	I WCH E	.	R
-8517.50	.	I WCH E	.	R
-8485.63	.		.	

-8453.75	.	.	.
-8421.87	.	IWCH E	. R
-8389.99	.	.	.
-8358.12	.	IWCH E	. R
-8326.24	.	I WCHE	. R
-8294.36	.	I WH E	. R
-8262.48	.	I WCHE	. R
-8230.60	.	I WCHE	. R
-8198.73	.	I WHE	. JX
-8166.85	.	IWCHE	. R
-8134.97	.	.	.
-8103.09	.	.	.
-8071.21	.	.	.
-8039.34	.	.	.
-8007.46	.	.	.
-7975.58	.	.	.
-7943.70	.	.	.
-7911.82	.	.	.
-7879.95	.	IWCHE	. R
-7848.07	.	.	.
-7816.19	.	I WCHE	. R
-7784.31	.	.	.

-7752.44	.		.	
-7720.56	.		.	
-7688.68	.	I WCHE	.	R
-7656.80	.		.	
-7624.92	.	I WHE	.	R
-7593.05	.		.	
-7561.17	.	I WCH	.	R
-7529.29	.	I WH	.	R
-7497.41	.	I WHE	.	R
-7465.53	.	I WHE	.	R
-7433.66	.	I WHE	.	JX
-7401.78	.	I WHE	.	R
-7369.90	.	I WCH	.	R
-7338.02	.		.	
-7306.14	.		.	
-7274.27	.		.	
-7242.39	.		.	
-7210.51	.		.	
-7178.63	.		.	
-7146.76	.		.	
-7114.88	.	I WHE	.	JX
-7083.00	.	I WHE	.	R
-7051.12	.	I WCH	.	R

-7019.24	.			.	
-6987.37	.			.	
-6955.49	.			.	
-6923.61	.			.	
-6891.73	.			.	
-6859.85	.			.	
-6827.98	.			.	
-6796.10	.			.	
-6764.22	.			.	
-6732.34	.	I	WHE	.	JX
-6700.46	.	I	WHE	.	R
-6668.59	.			.	
-6636.71	.			.	
-6604.83	.			.	
-6572.95	.			.	
-6541.08	.			.	
-6509.20	.			.	
-6477.32	.			.	
-6445.44	.	I	WCH	.	R
-6413.56	.			.	
-6381.69	.			.	
-6349.81	.			.	

-6317.93	.			.	
-6286.05	.			.	
-6254.17	.			.	
-6222.30	.			.	
-6190.42	.	I WCH		.	JX
-6158.54	.	I WCHE		.	R
-6126.66	.	I WCHE		.	R
-6094.78	.			.	
-6062.91	.			.	
-6031.03	.			.	
-5999.15	.			.	
-5967.27	.			.	
-5935.40	.			.	
-5903.52	.			.	
-5871.64	.			.	
-5839.76	.	I W HE		.	R
-5807.88	.			.	
-5776.01	.			.	
-5744.13	.			.	
-5712.25	.			.	
-5680.37	.			.	
-5648.49	.			.	

-5616.62	.	I WCHE	.	R
-5584.74	.		.	
-5552.86	.		.	
-5520.98	.	IWCHE	.	R
-5489.10	.		.	
-5457.23	.	I W H	.	TX
-5425.35	.	IWCHE	.	R
-5393.47	.	IWCHE	.	JX
-5361.59	.	IWCH E	.	R
-5329.71	.	IW HE	.	R
-5297.84	.	IWCHE	.	R
-5265.96	.	IWCHE	.	R
-5234.08	.	IWCHE	.	R
-5202.20	.	IW H	.	R
-5170.33	.	IWCH	.	R
-5138.45	.	IWCH	.	R
-5106.57	.	IWCH	.	R
-5074.69	.	I WH	.	R
-5042.81	.	IWH	.	R
-5010.94	.	IWEH	.	R
-4979.06	.	I WH	.	R
-4947.18	.	I WH	.	R
-4915.30	.	IWH	.	R

-4883.42	.	IWEH	.	R
-4851.55	.	IWEH	.	JX
-4819.67	.	ICWH	.	R
-4787.79	.	ICWH	.	R
-4755.91	.	ICWH	.	JX
-4724.03	.	ICWH	.	R
-4692.16	.	ICWH	.	R
-4660.28	.	IWEH	.	R
-4628.40	.	IWCH	.	R
-4596.52	.	IWCH	.	R
-4564.65	.	IWCH	.	R
-4532.77	.	WC H	.	R
-4500.89	.	IW H	.	R
-4469.01	.	IW H	.	R
-4437.13	.	IW HE	.	R
-4405.26	.	IWCHE	.	R
-4373.38	.	IWCHE	.	R
-4341.50	.	IWCHE	.	R
-4309.62	.	IWCH E	.	R
-4277.74	.	IWCH E	.	R
-4245.87	.	IWCH E	.	R
-4213.99	.	IWCH E	.	JX

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-4182.11   .                I  H  E                    .   R
-4150.23   .                 I  H  E                   .   JX
-4118.35   .                 I  HW E                   .   R
-4086.48   .                 I  HW E                   .   R
-4054.60   .                 I  HW  E                  .   R
-4022.72   .                 I  HW  E                  .   JX
-3990.84   .                 I  H W E                  .   R
-3958.96   .                  I  H W  E                .   JX
-3927.09   .                  I  H  W E                .   R
-3895.21   .                  I  H  W E                .   TX
-3863.33   .                  I   HW  E                .   R
-3831.45   .                    I   HW  E              .   R
-3799.58   .                       I  HW  E            .   JX
-3767.70   .                       I  HW  E            .   R
-3735.82   .                        I  HW  E           .   JX
-3703.94   .                        I  H W E           .   R
-3672.06   .                         I  H W E          .   JX
-3640.19   .                         I  H W  E         .   R
-3608.31   .                         I  CHW  E         .   R
-3576.43   .                                           .
-3544.55   .                                           .
-3512.67   .                                           .
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-3480.80	.		.	
-3448.92	.		.	
-3417.04	.		.	
-3385.16	.		.	
-3353.28	.		.	
-3321.41	.		.	
-3289.53	.		.	
-3257.65	.	I HW E	.	JX
-3225.77	.	I H W E	.	R
-3193.90	.		.	
-3162.02	.		.	
-3130.14	.		.	
-3098.26	.		.	
-3066.38	.		.	
-3034.51	.		.	
-3002.63	.		.	
-2970.75	.		.	
-2938.87	.		.	
-2906.99	.		.	
-2875.12	.	I HW E	.	R
-2843.24	.		.	
-2811.36	.		.	
-2779.48	.		.	

-2747.60	.		.
-2715.73	.		.
-2683.85	.		.
-2651.97	.		.
-2620.09	.	I HW E	. JX
-2588.22	.	I HW E	. R
-2556.34	.		.
-2524.46	.		.
-2492.58	.		.
-2460.70	.	I H W E	. R
-2428.83	.		.
-2396.95	.		.
-2365.07	.		.
-2333.19	.		.
-2301.31	.		.
-2269.44	.		.
-2237.56	.		.
-2205.68	.		.
-2173.80	.		.
-2141.92	.		.
-2110.05	.		.
-2078.17	.	I CH E	. TX

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  -2046.29    .                                                                I  H  WE  .    R
  -2014.41    .                                                                I  H WE  .    R
  -1982.53    .                                                                I  H WE  .    R
  -1950.66    .                                                                         .
  -1918.78    .                                                                I  H WE  .    R
  -1886.90    .                                                                I  H WE  .    JX
  -1855.02    .                                                                I  H WE  .    R
  -1823.15    .                                                                         .
  -1791.27    .                                                                         .
  -1759.39    .                                                                I  H  WE  .    JX
  -1727.51    .                                                                I  H  WE  .    R
  -1695.63    .                                                                I  H  WE  .    R
  -1663.76    .                                                                         .
  -1631.88    .                                                                I CH WE  .    JX
  -1600.00    .                                                                I CH WE  .    R

           2076.340  2093.351  2110.363  2127.374  2144.385  2161.396  2178.407  2195.419  2212.430  2229.441  2246.452
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N O T E S
1. GLOSSARY
   I = INVERT ELEVATION
   C = CRITICAL DEPTH
   W = WATER SURFACE ELEVATION
   S = SUPER-ELEVATION
   H = HEIGHT OF CHANNEL
   E = ENERGY GRADE LINE
   X = CURVES CROSSING OVER
   B = BRIDGE ENTRANCE OR EXIT
   Y = WALL ENTRANCE OR EXIT
2. STATIONS FOR POINTS AT A JUMP MAY NOT BE PLOTTED EXACTLY

E-4.3

WSPGW Model

SD3-100U.wsw

100-YR Flows

(Ultimate Condition)

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	4	1		1.500														
CD	2	4	1		2.000														
CD	3	4	1		2.500														
CD	4	4	1		3.000														
CD	5	4	1		3.500														

W S P G W

WATER SURFACE PROFILE - TITLE CARD LISTING

HEADING LINE NO 1 IS -

Vegas Drive, Shadow Mountain Place to Rancho Drive - 05333

HEADING LINE NO 2 IS -

SD3 System - Shadow Mtn Plc LATERAL, Start @ Known Downstream HGL Elev.

HEADING LINE NO 3 IS -

File: SD3-100U.wsw, (100YR ULTIMATE CONDITION)Q=9CFS, n=0.013, by JLW

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
	-1714.770	2234.360	5	2237.360

WARNING - ADJACENT SECTIONS ARE NOT IDENTICAL - SEE SECTION NUMBERS AND CHANNEL DEFINITIONS

ELEMENT NO 2 IS A REACH * * *

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	-1670.210	2234.580	4	.013	.000	.000	-89.435	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
	-1670.210	2234.680	4	1	0	.013	5.000	.000	2236.200	.000	90.000	.000

RADIUS	ANGLE
.000	.000

ELEMENT NO 4 IS A REACH * * *

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	-1300.000	2235.640	4	.013	.000	.000	-.766	1

ELEMENT NO 5 IS A REACH * * *

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	-962.800	2236.520	4	.013	.000	.000	.766	1

ELEMENT NO 6 IS A JUNCTION * * * * * * *

U/S DATA	STATION	INVERT	SECT	LAT-1	LAT-2	N	Q3	Q4	INVERT-3	INVERT-4	PHI 3	PHI 4
	-962.800	2236.620	3	0	0	.013	11.000	.000	2236.620	.000	90.000	.000

RADIUS	ANGLE
.000	.000

ELEMENT NO 7 IS A REACH * * *

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	-942.800	2236.880	3	.013	.000	.000	.000	1

ELEMENT NO 8 IS A JUNCTION * * * * * * *

U/S DATA	STATION	INVERT	SECT	LAT-1	LAT-2	N	Q3	Q4	INVERT-3	INVERT-4	PHI 3	PHI 4
	-942.800	2236.980	2	0	0	.013	10.000	.000	2236.980	.000	90.000	.000

RADIUS	ANGLE
.000	.000

W S P G W

WATER SURFACE PROFILE - ELEMENT CARD LISTING

ELEMENT NO 9 IS A REACH * * *

U/S DATA	STATION	INVERT	SECT	N	RADIUS	ANGLE	ANG PT	MAN H
	-922.800	2237.240	2	.013	.000	.000	.000	1

ELEMENT NO 10 IS A SYSTEM HEADWORKS * *

U/S DATA	STATION	INVERT	SECT	W S ELEV
	-922.800	2237.240	2	.000

W S P G W - CIVILDESIGN Version 14.05

Program Package Serial Number: 1492

WATER SURFACE PROFILE LISTING

Date:11-22-2011 Time:11: 2:24

Vegas Drive, Shadow Mountain Place to Rancho Drive - 05333

SD3 System - Shadow Mtn Plc LATERAL, Start @ Known Downstream HGL Elev

File: SD3-100U.wsw, (100YR ULTIMATE CONDITION)Q=9CFS, n=0.013, by JL

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
-1714.770	2234.360	3.000	2237.360	35.00	4.95	.38	2237.74	.00	1.92	.00	3.000	.000	.00	1 .0
44.560	.0049					.0028	.12	3.00	.00	1.93	.013	.00	.00	PIPE
-1670.210	2234.580	3.034	2237.614	35.00	4.95	.38	2237.99	.00	1.92	.00	3.000	.000	.00	1 .0
JUNCT STR	.0000					.0024	.00	3.03	.00		.013	.00	.00	PIPE
-1670.210	2234.680	3.136	2237.816	30.00	4.24	.28	2238.10	.00	1.77	.00	3.000	.000	.00	1 .0
257.406	.0026					.0020	.52	3.14	.00	2.19	.013	.00	.00	PIPE
-1412.804	2235.347	3.000	2238.347	30.00	4.24	.28	2238.63	.00	1.77	.00	3.000	.000	.00	1 .0
112.804	.0026					.0019	.21	3.00	.00	2.19	.013	.00	.00	PIPE
-1300.000	2235.640	2.916	2238.556	30.00	4.28	.28	2238.84	.00	1.77	.99	3.000	.000	.00	1 .0
236.824	.0026					.0018	.42	2.92	.28	2.18	.013	.00	.00	PIPE
-1063.176	2236.258	2.692	2238.950	30.00	4.49	.31	2239.26	.00	1.77	1.82	3.000	.000	.00	1 .0
100.376	.0026					.0018	.18	2.69	.41	2.18	.013	.00	.00	PIPE
-962.800	2236.520	2.595	2239.115	30.00	4.62	.33	2239.45	.00	1.77	2.05	3.000	.000	.00	1 .0
JUNCT STR	.0000					.0020	.00	2.59	.46		.013	.00	.00	PIPE
-962.800	2236.620	2.848	2239.469	19.00	3.87	.23	2239.70	.00	1.48	.00	2.500	.000	.00	1 .0
20.000	.0130					.0021	.04	2.85	.00	1.11	.013	.00	.00	PIPE
-942.800	2236.880	2.643	2239.523	19.00	3.87	.23	2239.76	.00	1.48	.00	2.500	.000	.00	1 .0
JUNCT STR	.0000					.0019	.00	2.64	.00		.013	.00	.00	PIPE

Program Package Serial Number: 1492

WATER SURFACE PROFILE LISTING Date:11-22-2011 Time:11: 2:24

Vegas Drive, Shadow Mountain Place to Rancho Drive - 05333

SD3 System - Shadow Mtn Plc LATERAL, Start @ Known Downstream HGL Elev

File: SD3-100U.wsw, (100YR ULTIMATE CONDITION)Q=9CFS, n=0.013, by JL

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
-942.800	2236.980	2.912	2239.892	9.00	2.86	.13	2240.02	.00	1.07	.00	2.000	.000	.00	1 .0
20.000	.0130					.0016	.03	2.91	.00	.82	.013	.00	.00	PIPE
-922.800	2237.240	2.690	2239.930	9.00	2.86	.13	2240.06	.00	1.07	.00	2.000	.000	.00	1 .0

Vegas Drive, Shadow Mountain Place to Rancho Drive - 05333

SD3 System - Shadow Mtn Plc LATERAL, Start @ Known Downstream HGL Elev

File: SD3-100U.wsw, (100YR ULTIMATE CONDITION)Q=9CFS, n=0.013, by JL

```
-1714.77  .I                          C              H     E                    .  R
-1698.61  .                                                                     .
-1682.44  .                                                                     .
-1666.28  .  I                         C              HW    E                    .  JX
-1650.12  .    I                       C                H W   E               .  R
-1633.96  .                                                                     .
-1617.79  .                                                                     .
-1601.63  .                                                                     .
-1585.47  .                                                                     .
-1569.31  .                                                                     .
-1553.14  .                                                                     .
-1536.98  .                                                                     .
-1520.82  .                                                                     .
-1504.66  .                                                                     .
-1488.49  .                                                                     .
-1472.33  .                                                                     .
-1456.17  .                                                                     .
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-1423.84  .                                                                     .
-1407.68  .              I                 C              H   E                 .  R
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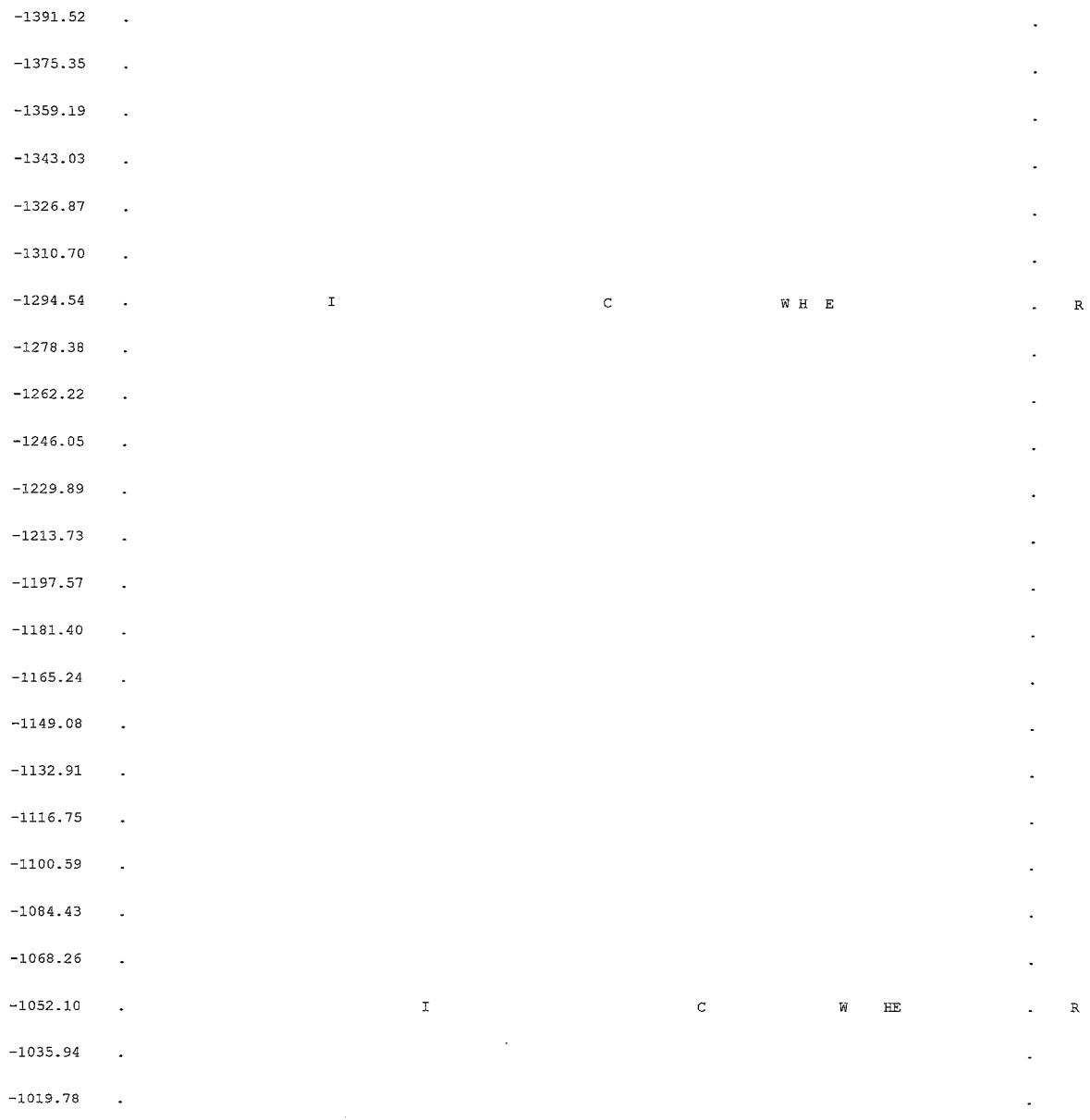
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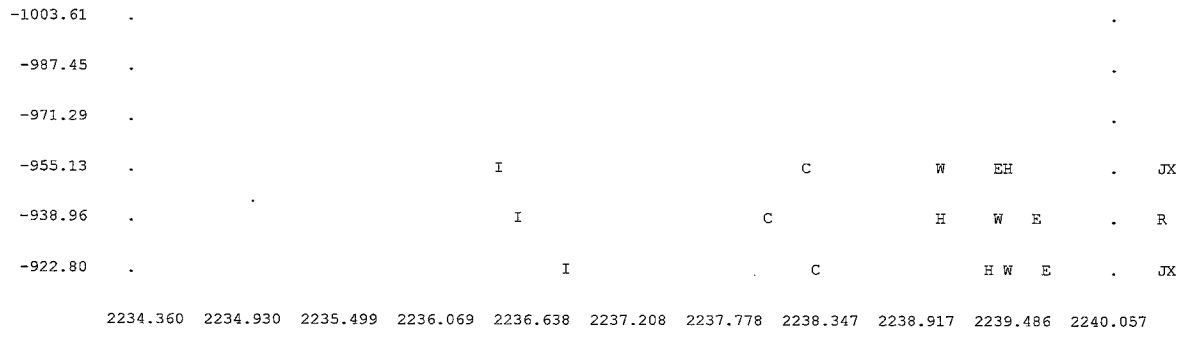

N O T E S
1. GLOSSARY
   I = INVERT ELEVATION
   C = CRITICAL DEPTH
   W = WATER SURFACE ELEVATION
   S = SUPER-ELEVATION
   H = HEIGHT OF CHANNEL
   E = ENERGY GRADE LINE
   X = CURVES CROSSING OVER
   B = BRIDGE ENTRANCE OR EXIT
   Y = WALL ENTRANCE OR EXIT
2. STATIONS FOR POINTS AT A JUMP MAY NOT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