



ADDENDUM TO THE TECHNICAL DRAINAGE STUDY

Skye Canyon North Arroyo Storm Drain

SEPTEMBER 2022

PREPARED FOR:
Century Communities of Nevada, LLC.
Las Vegas, NV

PREPARED BY:

Westwood

Skye Canyon North Arroyo Storm Drain

Addendum to the Technical Drainage Study

City of Las Vegas, NV

Prepared For:

Century Communities of Nevada, LLC
6345 South Jones Boulevard
Las Vegas, NV 89118
Phone: 702-873-5338

Prepared By:

Westwood Professional Services
5725 W. Badura Avenue, Suite 100
Las Vegas, NV 89118
Phone: (702) 284-5300
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Project Number: CEN2018.000
Date: September 2022

Lant Leavitt, P.E.
NV Professional Engineer No. 18287
Assisted by: Phil Koerschner

HYDROLOGIC CRITERIA AND DRAINAGE DESIGN MANUAL
DRAINAGE STUDY INFORMATION FORM

Name of Development: Skye Canyon North Arroyo Storm Drain Addendum Date: September 2022
 Location of Development: a) Descriptive (Cross Streets): North/South: Shaumber Road
East/West: Skye Canyon Park Drive
 b) Section: 12 Township: 19 South Range: 59 East
 c) APN: 126-12-515-101, 516-117, 610-009, 611-010, 613-014, 614-120, 616-082, 617-114

Name of Owner: Century Communities Nevada, LLC
 Telephone No.: 702-220-6565 Fax No.: 702-220-6566 E-mail Address: Paulo.Chavez@centurycommur
 Address: 6345 South Jones Boulevard Las Vegas NV 89118

Contact Person – Name: Lant Leavitt, P.E. Telephone No.: (702) 284-5300
 *E-mail Address: Lant.Leavitt@westwoodps.com Fax No.: (702) 284-5399
 Firm: Westwood Professional Services
 Address: 5725 W. Badura Av Las Vegas NV 89118

Type of Land Development/Land Disturbance Process:

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

- Total Owned Land Area: At Site: 4 AC Being Developed/Disturbed: 4 AC
- Is a portion or all of the subject property located in a FEMA Flood Hazard Area? ☐ Yes** ☒ No
- Is the property bordered or crossed by an existing or proposed Clark County Regional Flood Control District Master Planned Facility? ☐ Yes** ☒ No
- Proposed type of development (Residential, Commercial, Etc.): Storm Drain Infrastructure to support future/existing Residential Development
- Approximate upstream land area which drains to the subject site: Approx 0.14 sqmi
- Has the site drainage been evaluated in the past? ☒ Yes** ☐ No If yes, please identify documentation: Master Drainage Study Update #7 for Skye Canyon (DS 4420) & Technical Drainage Study for Skye Canyon Infrastructure Phase 3B/3C (DS 4953)
- If known, please briefly identify the proposed discharge point(s) of runoff from the site: Existing storm drain in Skye Canyon 2.31 Park
- Briefly describe your proposed schedule for the subject project: ASAP



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

***Newly Required Field**

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

Local Entity File No.	Revision	Date

REFERENCE:

STANDARD FORM 1

Updated 05/01/2008

CEN2018.000

September 15, 2022

Albert Sung, P.E.
City of Las Vegas
495 S. Main Street, 5th Floor
Las Vegas, NV 89101

**Subject: Technical Drainage Study Addendum for
Skye Canyon North Arroyo Storm Drain**

Mr. Sung:

This letter certifies that all items provided on electronic submittal CD matches 100% of the *Technical Drainage Study Addendum for Skye Canyon North Arroyo Storm Drain* bound paper version.

Respectfully Submitted,
WESTWOOD PROFESSIONAL SERVICES



Lant Leavitt, P.E.
Project Manager – Water Resources Department

CEN2018.000

September 15, 2022

City of Las Vegas
Department of Public Works – Flood Control
495 S. Main Street
Las Vegas, Nevada 89101

**Subject: Skye Canyon North Arroyo Storm Drain
Addendum to the Technical Drainage Study
(CLV# DS5598)**

This letter is submitted in response to the comments contained in the August 1, 2022 review memorandum, regarding the above referenced project. A copy of the City of Las Vegas comment letter is provided in Appendix A. The comments in the review memorandum are individually addressed as follows:

- 1. Comment:** *The proposed construction of the 54" RCP storm drain mainline, east of Shaumber that is an extension of CLV#107V7512, shall be constructed in one phase with the North Arroyo Project. The construction of headwalls, access roads, and outlet structures shown as part of the Park Drainage Study (DS5595) is unnecessary and creates connection complications with construction for the North Arroyo. Construction of the park may occur concurrently the North Arroyo drainage improvements.*

Response: 54-inch storm drain mainline through Parcel 2.36 Park is now shown to be constructed on North Arroyo Storm Drain plans.

- 2. Comment:** *Revise Exhibit E to reflect that the entire North Arroyo storm drain being constructed with this project.*

Response: Exhibit E, provided in Appendix B, revised to reflect extents of North Arroyo storm drain through Parcel 2.36 Park.

- 3. Comment:** *Revise PP-1 and PP-2 to reflect storm drain collection.*

Response: Sheets PP-1 and PP-2 revised on included plans to show storm drain mainline and laterals constructed with North Arroyo Storm Drain plans.

- 4. Comment:** *No Building Permit will be issued for lots adjacent to the North Arroyo. The permits will be released upon substantial completion of the North Arroyo drainage facilities. Provide a drainage study update to incorporate the connection of the parcel improvements with the proposed North Arroyo drainage improvements.*

Response: Noted.

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

Response: Since this is not a residential or commercial parcel proposed for development, no applications (SDRs, TMS, etc.) have been submitted to planning, and there are no zoning/planning conditions available. However, there is discussion of the North Arroyo in the Skye Canyon Development Agreement, excerpts provided in Appendix F.

6. **Comment:** *Coordinate with the Planning Department (Fred Solis) to determine the Common Element/Landscape/Trail improvements required with the project. These necessary plans need Planning Department approval prior to the Final Approval of the North Arroyo Storm Drain Improvement Plans.*

Response: Coordination with the Planning Department is on-going and will be completed prior to final approval of the improvement plans. Currently a meeting has been held with Fred and a concept landscape design provided.

7. **Comment:** *Sites with a grade difference of 2 feet above or below existing grades are required to have approval from the City of Las Vegas Planning and Development Department. The engineer must submit copies of the grading plans and detail sheet with a letter justifying the grade difference to the City Planning Department (229-6301). The engineer must provide City Planning approval with the next submittal.*

Response: City Planning approval letter for grade difference provided in Appendix E.

8. **Comment:** *Provide a 12-foot maintenance access road for access to each of the existing/proposed storm drain manholes.*

Response: A 12-ft maintenance access road is provided along the storm drain mainline alignment to provide access to storm drain manholes. The upstream connection point to the existing storm drain in the Parcel 2.36 Park is revised so that the proposed storm drain maintains the same slope and can be connected with a concrete collar to avoid having to provide access to a manhole at this location. Manholes within existing residential parcel drainage easements outside of the arroyo corridor are proposed to be privately maintained via the parcel drainage easement.

9. **Comment:** *Exhibit E: Provide the subbasin boundary lines for WARR3(a), WARR(b), WARR(c), and WARR(d).*

Response: Boundary lines are shown on Exhibit E provided in Appendix B. In addition, subbasins have been shaded to help clarify the extents.

10. **Comment:** *Provide the referenced drainage easement computations and specific energy computations for Skye Canyon 2.08 & 2.09 Phase 2 to ensure containment of the flow.*

Response: Referenced drainage easement computations have been provided in Appendix G.

11. **Comment:** *Provide the referenced drainage easement computations and specific energy computations for Skye Canyon 5.01 & 5.03 to ensure containment of the flow.*

Response: Referenced drainage easement computations have been provided in Appendix H.

12. **Comment:** *Provide an extended lateral (SDDI#1, Facility 5.01L) that extends to the existing drainage easement and a specifically designed, modified CM2 drainage inlet or extend the concrete apron to the drainage easement and provide sufficient design information to confine the flow within the concrete section to collect the 100-year flow into the proposed inlet.*

Response: Proposed field inlet location and concrete apron extents revised to collect flow directly adjacent to the existing drainage easement.

13. **Comment:** *Provide an extended lateral (SDDI#2, Facility 2.08-LI) that extends to the existing drainage easement and a specifically designed, modified CM2 drainage inlet or extend the concrete apron to the drainage easement and provide sufficient design to confine the flow into the inlet.*

Response: The existing residential development (Parcel 2.08/2.09 Phase 2) discharges storm water at this location via a depressed curb. An additional field inlet is proposed directly adjacent to this discharge point to collect the flow. The additional field inlet is proposed to discharge in an 18-inch RCP to the original field inlet, which is being kept to intercept arroyo onsite flows.

14. **Comment:** *SDDI 3 and SDDI 4 are 2.5' X 3.0' NDOT Type 2A's and the computations and exhibit say they are 2.5' X 2.0'. Review and revise accordingly.*

Response: Plan callouts revised to match computations and exhibit (2.5-ft x 2.0-ft).

15. **Comment:** *Provide D-Load computations and justification for the class of the pipe proposed.*

Response: D-Load calculations are provided in Appendix D in justification proposed pipe classes.

16. **Comment:** *Revise WSPG table summaries to include a column showing the storm drain stationing following the improvement plans.*

Response: WSPG summary table revised to include a column showing storm drain stationing, refer to Appendix C.

17. **Comment:** *Provide a WSPG model for the lateral connecting Skye Canyon 2.10 and the mainline North Arroyo storm drain.*

Response: WSPG models are provided for both Parcel 2.10 laterals, the west lateral near the 2.36 Park, and the east lateral near the boundary with Parcel 2.08/2.09, refer to Appendix C.

18. **Comment:** *The Landscape Plan needs to show no trees within the 22' Maintenance Access (12-foot plus 5foot shoulders on each side) cross-sections. Clearly show the 40-foot Public Drainage Easement on the Landscape Plans.*

Response: Proposed tree and existing easement locations are being coordinated with the landscape designer.

19. **Comment:** *Sheet PP-6: Provide a transition structure between the proposed 66" RCP and the existing RCB structure.*

Response: This transition will be structurally designed by a structural engineer following TDS approval. However, a non-structural detail is provided on Detail 12, Sheet DT-2 to show the general design of the structure.

20. **Comment:** *Sheet D-2: Limit the use of NDOT Type 2A grates in areas with frequent walking. Instead use NDOT Type 2 grates to avoid potential impacts to development.*

Response: NDOT Type 2A grates have been replaced with Type 2 grates. Grate interception and inlet sizing calculations are revised in Appendix C.

21. **Comment:** *The existing 40-foot Public Drainage Easement to be Privately Maintained is shown per Recorded Final Map (File 160/Pg.72 of Plats). The mainline North Arroyo storm drain is in a Public Drainage Easement with the storm drain system to be publicly maintained. The surface Improvements within the North Arroyo are to be Privately Maintained and noted as such on the plans. Structures associated with the mainline, built in this study, and accepting offsite flow are also publicly maintained. However, laterals not*

collecting offsite flow (SDDI 3 & SDDI 4) are to be privately maintained and should be label as such on the improvement plans.

Response: The improvement plans have been revised to include easement and maintenance responsibility labels.

22. Comment: *Indicate what is being removed and replaced within the improvements and provide structural details to indicate how it should be done. Structural plans for the storm drain improvements must be submitted for review. Provide a soils report, structural calculations and specifications, two wet stamped structural sets, and a grading plan to the Building Department for processing. The engineer must provide a copy of Building Department approval of the structures to Flood Control prior to final acceptance of the drainage study.*

Response: A removal sheet is included to call out what is proposed to be removed. Structural drawings will be prepared upon TDS approval to address any required structural details for removal of existing improvements.

We believe the above responses and revisions provided on the amended improvement plans have adequately satisfied the concerns in the subject review memorandum. The revised improvement plan sheets adopting the revisions addressed in this letter have been included in the last appendix of this addendum. If you have any questions or require additional information, please do not hesitate to contact our office at (702) 284-5300.

Respectfully Submitted,
WESTWOOD PROFESSIONAL SERVICES



Lant Leavitt, P.E.
Project Manager – Water Resources Services

CC: Todd Steadham, PE, LEED AP
Mark Failla, PE, CFM

List of Appendices

Appendix A	City of Las Vegas Comment Letter
Appendix B	Drainage Exhibits • Exhibit E – Proposed Condition Drainage Map
Appendix C	Hydraulic Analyses • Mainline WSPG Model – NOAR • West Parcel 2.10 WSPG Model – SDW • East Parcel 2.10 WSPG Model – SDE • Drop Inlet #2 and #5 System WSPG Model – DI52 • Inlet Sizing Computations • Lateral Loss Computations
Appendix D	D-Load Calculations
Appendix E	City Planning Approval Letter
Appendix F	Skye Canyon Development Agreement Excerpts
Appendix G	Reference Material Skye Canyon Parcels 2.08 & 2.09 (DS05242) • Approval Letter • Referenced Hydraulics
Appendix H	Reference Material Skye Canyon 5.01 & 5.03 (DS5411) • Approval Letter • Referenced Hydraulics
Appendix I	Improvement Plans

APPENDIX A

City of Las Vegas Comment Letter

CITY OF LAS VEGAS		DATE:
INTER-OFFICE MEMORANDUM		August 23, 2022
TO: Land Development Services Department of Building & Safety		FROM: Peter Jackson, CFM Senior Engineering Associate Department of Public Works
SUBJECT:	Drainage Study for:	COPIES TO:
Skye Canyon North Arroyo Storm Drain		Westwood Professional Services
Cross Streets:	Shaumber Rd & Skye Canyon Park Dr	Century Communities
File Number:	F:\Depot\DSMemos\DS05598A.doc	Bart Anderson, P.E., DevCo
Parcel Number:	126-12-515-101	
Zoning Action:		
FEMA Flood Zone	YES NO X	
Proposed Storm Drain	YES X NO	

HISTORY	DATE RECEIVED	DATE REVIEWED	COMMENTS	REVIEW FEES	FEES PAID Payment Trn #
1 st Submittal	7/27/2022	8/23/2022	See Comments Below	\$400.00	4882548: \$400
			TOTAL FEES (LDDRS):	\$400.00	----

REMARKS:

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

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

1. The proposed construction of the 54" RCP storm drain mainline, east of Shaumber that is an extension of CLV#107V7512, shall be constructed in one phase with the North Arroyo Project. The construction of headwalls, access roads, and outlet structures shown as part of the Park Drainage Study (DS5595) is unnecessary and creates connection complications with construction for the North Arroyo. Construction of the park may occur concurrently the North Arroyo drainage improvements.
2. Revise Exhibit E to reflect that the entire North Arroyo storm drain being constructed with this project.
3. Revise PP-1 and PP-2 to reflect storm drain collection.
4. No Building Permit will be issued for lots adjacent to the North Arroyo. The permits will be released upon substantial completion of the North Arroyo drainage facilities. Provide a drainage study update to incorporate the connection of the parcel improvements with the proposed North Arroyo drainage improvements.
5. Provide a copy of the zoning/planning conditions associated with this site with the next submittal to verify compliance with conditions. *Flood Control* will not issue conditional approval of the drainage study without the associated zoning/planning conditions (issued by the *City Council*). Any associated conditions of approval that revise the site drainage parameters will require that the drainage study be revised and resubmitted.

6. Coordinate with the Planning Department (Fred Solis) to determine the Common Element/Landscape/Trail improvements required with the project. These necessary plans need Planning Department approval prior to the Final Approval of the North Arroyo Storm Drain Improvement Plans.
7. Sites with a grade difference of 2 feet above or below existing grades are required to have approval from the City of Las Vegas Planning and Development Department. The engineer must submit copies of the grading plans and detail sheet with a letter justifying the grade difference to the City Planning Department (229-6301). The engineer must provide City Planning approval with the next submittal.
8. Provide a 12-foot maintenance access road for access to each of the existing/proposed storm drain manholes.
9. **Exhibit E:** Provide the subbasin boundary lines for WARR3(a), WARR(b), WARR(c), and WARR(d).
10. Provide the referenced drainage easement computations and specific energy computations for Skye Canyon 2.08 & 2.09 Phase 2 to ensure containment of the flow.
11. Provide the referenced drainage easement computations and specific energy computations for Skye Canyon 5.01 & 5.03 to ensure containment of the flow.
12. Provide an extended lateral (SDDI#1, Facility 5.01L) that extends to the existing drainage easement and a specifically designed, modified CM2 drainage inlet or extend the concrete apron to the drainage easement and provide sufficient design information to confine the flow within the concrete section to collect the 100-year flow into the proposed inlet.
13. Provide an extended lateral (SDDI#2, Facility 2.08-L1) that extends to the existing drainage easement and a specifically designed, modified CM2 drainage inlet or extend the concrete apron to the drainage easement and provide sufficient design to confine the flow into the inlet.
14. SDDI 3 and SDDI 4 are 2.5' X 3.0' NDOT Type 2A's and the computations and exhibit say they are 2.5' X 2.0'. Review and revise accordingly.
15. Provide D-Load computations and justification for the class of the pipe proposed.
16. Revise WSPG table summaries to include a column showing the storm drain stationing following the improvement plans.
17. Provide a WSPG model for the lateral connecting Skye Canyon 2.10 and the mainline North Arroyo storm drain.
18. The Landscape Plan needs to show no trees within the 22' Maintenance Access (12-foot plus 5-foot shoulders on each side) cross-sections. Clearly show the 40-foot Public Drainage Easement on the Landscape Plans.
19. **Sheet PP-6:** Provide a transition structure between the proposed 66" RCP and the existing RCB structure.
20. **Sheet D-2:** Limit the use of NDOT Type 2A grates in areas with frequent walking. Instead use NDOT Type 2 grates to avoid potential impacts to development.
21. The existing 40-foot Public Drainage Easement to be Privately Maintained is shown per Recorded Final Map (File 160/Pg.72 of Plats). The mainline North Arroyo storm drain is in a Public Drainage Easement with the storm drain system to be publicly maintained. The surface Improvements within the North Arroyo are to be Privately Maintained and noted as such on the plans. Structures associated with the mainline, built in this study, and accepting offsite flow are also publicly maintained. However, laterals not collecting offsite flow (SDDI 3 & SDDI 4) are to be privately maintained and should be label as such on the improvement plans.

22. Indicate what is being removed and replaced within the improvements and provide structural details to indicate how it should be done. Structural plans for the storm drain improvements must be submitted for review. Provide a soils report, structural calculations and specifications, two wet stamped structural sets, and a grading plan to the Building Department for processing. The engineer must provide a copy of Building Department approval of the structures to Flood Control prior to final acceptance of the drainage study.

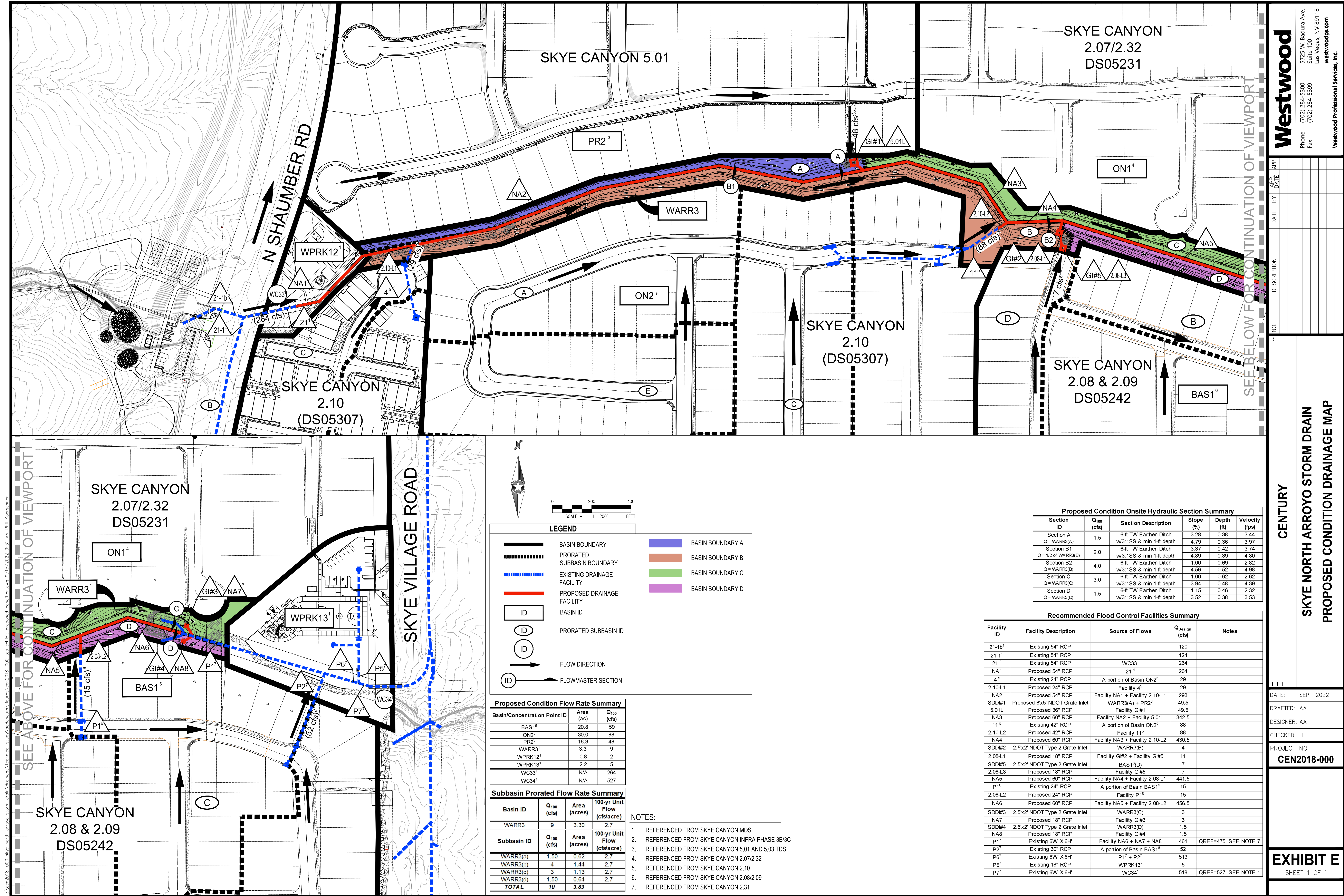
NOTE: Please be advised that all land surface area disturbances over 1 acre or any area adjacent to a water way must submit to the *Nevada Division of Environmental Protection* a "Notice of Intent" to discharge that certifies a stormwater pollution prevention plan has been developed and is maintained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

END OF REMARKS
PBJ/CAA

T/R/S: T19S/R59E/S12
AREA F-12

APPENDIX B

Drainage Exhibits



LEGEND

BASIN BOUNDARY

PRORATED SUBBASIN BOUNDARY

EXISTING DRAINAGE FACILITY

PROPOSED DRAINAGE FACILITY

ID BASIN ID

PRORATED SUBBASIN ID

FLOW DIRECTION

FLOWMASTER SECTION

BASIN BOUNDARY A

BASIN BOUNDARY B

BASIN BOUNDARY C

BASIN BOUNDARY D

Proposed Condition Flow Rate Summary		
Basin/Concentration Point ID	Area (ac)	Q ₁₀₀ (cfs)
BAS1 ⁶	20.8	59
ON2 ⁵	30.0	88
PR2 ³	16.3	48
WARR3 ¹	3.3	9
WPRK12 ¹	0.8	2
WPRK13 ¹	2.2	5
WC33 ¹	N/A	264
WC34 ¹	N/A	527

Subbasin Prorated Flow Rate Summary			
Basin ID	Q ₁₀₀ (cfs)	Area (acres)	100-yr Unit Flow (cfs/acre)
WARR3	9	3.30	2.7
Subbasin ID	Q ₁₀₀ (cfs)	Area (acres)	100-yr Unit Flow (cfs/acre)
WARR3(a)	1.50	0.62	2.7
WARR3(b)	4	1.44	2.7
WARR3(c)	3	1.13	2.7
WARR3(d)	1.50	0.64	2.7
TOTAL	10	3.83	

- NOTES:
1. REFERENCED FROM SKYE CANYON MDS
 2. REFERENCED FROM SKYE CANYON INFRA PHASE 3B/3C
 3. REFERENCED FROM SKYE CANYON 5.01 AND 5.03 TDS
 4. REFERENCED FROM SKYE CANYON 2.07/2.32
 5. REFERENCED FROM SKYE CANYON 2.10
 6. REFERENCED FROM SKYE CANYON 2.08/2.09
 7. REFERENCED FROM SKYE CANYON 2.31

Proposed Condition Onsite Hydraulic Section Summary					
Section ID	Q ₁₀₀ (cfs)	Section Description	Slope (%)	Depth (ft)	Velocity (fps)
Section A Q = WARR3(A)	1.5	6-ft TW Earthen Ditch w/3.1SS & min 1-ft depth	3.28	0.38	3.44
Section B1 Q = 1/2 of WARR3(B)	2.0	6-ft TW Earthen Ditch w/3.1SS & min 1-ft depth	4.79	0.36	3.97
Section B2 Q = WARR3(B)	4.0	6-ft TW Earthen Ditch w/3.1SS & min 1-ft depth	3.37	0.42	3.74
Section C Q = WARR3(C)	3.0	6-ft TW Earthen Ditch w/3.1SS & min 1-ft depth	4.89	0.39	4.30
Section D Q = WARR3(D)	1.5	6-ft TW Earthen Ditch w/3.1SS & min 1-ft depth	1.00	0.69	2.82
			4.56	0.52	4.98
			1.00	0.62	2.62
			3.94	0.48	4.39
			1.15	0.46	2.32
			3.52	0.38	3.53

Recommended Flood Control Facilities Summary				
Facility ID	Facility Description	Source of Flows	Q _{Design} (cfs)	Notes
21-1b ¹	Existing 54" RCP		120	
21-1 ¹	Existing 54" RCP		124	
21 ¹	Existing 54" RCP	WC33 ¹	264	
NA1	Proposed 54" RCP	21 ¹	264	
4 ⁵	Existing 24" RCP	A portion of Basin ON2 ⁵	29	
2.10-L1	Proposed 24" RCP	Facility 4 ⁵	29	
NA2	Proposed 54" RCP	Facility NA1 + Facility 2.10-L1	293	
SDD#1	Proposed 6x5' NDOT Grate Inlet	WARR3(A) + PR2 ³	49.5	
5.01L	Proposed 36" RCP	Facility GI#1	49.5	
NA3	Proposed 60" RCP	Facility NA2 + Facility 5.01L	342.5	
11 ⁵	Existing 42" RCP	A portion of Basin ON2 ⁵	88	
2.10-L2	Proposed 42" RCP	Facility 11 ⁵	88	
NA4	Proposed 60" RCP	Facility NA3 + Facility 2.10-L2	430.5	
SDD#2	2.5x2' NDOT Type 2 Grate Inlet	WARR3(B)	4	
2.08-L1	Proposed 18" RCP	Facility GI#2 + Facility GI#5	11	
SDD#5	2.5x2' NDOT Type 2 Grate Inlet	BAS1 ⁶ (D)	7	
2.08-L3	Proposed 18" RCP	Facility GI#5	7	
NA5	Proposed 60" RCP	Facility NA4 + Facility 2.08-L1	441.5	
P1 ⁶	Existing 24" RCP	A portion of Basin BAS1 ⁶	15	
2.08-L2	Proposed 24" RCP	Facility P1 ⁶	15	
NA6	Proposed 60" RCP	Facility NA5 + Facility 2.08-L2	456.5	
SDD#3	2.5x2' NDOT Type 2 Grate Inlet	WARR3(C)	3	
NA7	Proposed 18" RCP	Facility GI#3	3	
SDD#4	2.5x2' NDOT Type 2 Grate Inlet	WARR3(D)	1.5	
NA8	Proposed 18" RCP	Facility GI#4	1.5	
P1 ⁷	Existing 6W X 6H ⁷	Facility NA6 + NA7 + NA8	461	QREF=475, SEE NOTE 7
P2 ⁷	Existing 30" RCP	A portion of Basin BAS1 ⁶	52	
P6 ⁷	Existing 6W X 6H ⁷	P1 ⁷ + P2 ⁷	513	
P5 ⁷	Existing 18" RCP	WPRK13 ¹	5	
P7 ⁷	Existing 6W X 6H ⁷	WC34 ¹	518	QREF=527, SEE NOTE 1

Westwood

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westwoodps.com
Westwood Professional Services, Inc.

CENTURY

SKYE NORTH ARROYO STORM DRAIN

PROPOSED CONDITION DRAINAGE MAP

DATE: SEPT 2022

DRAFTER: AA

DESIGNER: AA

CHECKED: LL

PROJECT NO.

CEN2018-000

EXHIBIT E

SHEET 1 OF 1

APPENDIX C

Hydraulic Analyses

Mainline WSPG Model - NOAR

Ultimate Condition WSPG Summary									
CONNECTION TO EX SD: PH3B/3C INFRA US/P2.31 PARK DS									
NORTH ARROYO STORM DRAIN (NOAR.WSW)									
WSPG Station	Storm Drain Dimension	Improvement Plan Stationing	Invert Elevation (ft)	Q ₁₀₀ (cfs)	WSE (ft)	Velocity (ft/s)	FG Elevation	Facility Description	HGL Check ¹
1 - 'HGL Check' reflects the minimum 1-ft below finished grade.									
1000.00	6' x 6' RCB	32+01.25	2843.32	463.00	2846.75	22.48	2865.54	EX P2.31 SD	OK
1254.12	6' x 6' RCB	34+55.37	2848.15	463.00	2850.74	29.79	2864.17		OK
1278.32	6' x 6' RCB	34+79.57	2851.25	463.00	2854.05	27.50	2863.73		OK
1280.82	6' x 6' RCB	34+79.57	2851.57	458.50	2854.34	27.56	2863.73	Junction with Facilities GI#3 & GI#4	OK
1288.80	6' x 6' RCB	34+71.61	2852.59	458.50	2855.46	26.67	2863.00		OK
1298.80	9' x 7' RCB	34+61.57	2854.00	458.50	2857.03	25.22	2863.00		OK
1298.81	9' x 7' RCB	34+61.57	2854.00	458.50	2856.46	26.64	2863.00	Connection to EX P2.31 SD	OK
1298.81	9' x 7' RCB	34+61.57	2854.00	458.50	2857.85	25.79	2863.00		OK
1298.81	Transition	34+61.57	2854.00	458.50	2856.46	26.64	2863.00		OK
1412.60	66" RCP	33+45.30	2856.35	458.50	2860.04	27.03	2865.92	SDMH #16	OK
1413.85	66" RCP	33+45.30	2856.37	458.50	2860.06	27.05	2865.92		OK
1415.10	66" RCP	33+45.30	2856.40	458.50	2860.09	27.07	2865.92		OK
1518.69	66" RCP	32+41.71	2858.54	458.50	2862.05	28.64	2868.52	SDMH #15	OK
1521.19	66" RCP	32+41.71	2858.63	443.50	2862.03	28.81	2868.52		OK
1578.65	66" RCP	31+79.26	2860.79	443.50	2864.20	28.65	2870.86		OK
1579.90	66" RCP	31+79.26	2860.83	443.50	2864.24	28.65	2870.86	SDMH #14	OK
1581.15	66" RCP	31+79.26	2860.88	443.50	2864.29	28.65	2870.86		OK
1807.17	66" RCP	29+53.24	2869.34	443.50	2872.89	27.34	2879.32		SDMH #13
2067.04	66" RCP	26+90.87	2879.07	443.50	2883.25	22.89	2889.14	SDMH #12	OK
2068.29	66" RCP	26+90.87	2879.11	443.50	2883.30	22.85	2889.14		OK
2069.54	66" RCP	26+90.87	2879.16	432.50	2883.10	23.75	2889.14		OK
2180.02	66" RCP	25+77.89	2883.30	432.50	2888.33	18.97	2893.37	SDMH #11	OK
2180.85	66" RCP	25+77.89	2883.33	432.50	2888.41	18.86	2893.37		OK
2181.69	66" RCP	25+77.89	2883.36	432.50	2888.50	18.73	2893.37		OK
2182.52	66" RCP	25+77.89	2883.39	432.50	2888.66	18.47	2893.37		OK
2185.02	60" RCP	25+77.89	2883.93	344.50	2890.50	17.55	2893.37		OK
2274.63	60" RCP	24+83.27	2885.35	344.50	2892.30	17.55	2894.99		OK
2275.88	60" RCP	24+83.27	2885.37	344.50	2892.56	17.55	2894.99	SDMH #10	OK
2277.13	60" RCP	24+83.27	2885.39	344.50	2892.98	17.55	2894.99		OK
2433.54	60" RCP	23+24.36	2888.70	344.50	2895.94	17.55	2897.73		OK
2436.04	60" RCP	23+24.36	2888.75	344.50	2896.44	17.55	2897.73	SDMH #9	OK

Ultimate Condition WSPG Summary
CONNECTION TO EX SD: PH3B/3C INFRA US/P2.31 PARK DS
NORTH ARROYO STORM DRAIN (NOAR.WSW)

WSPG Station	Storm Drain Dimension	Improvement Plan Stationing	Invert Elevation (ft)	Q ₁₀₀ (cfs)	WSE (ft)	Velocity (ft/s)	FG Elevation	Facility Description	HGL Check ¹
1 - 'HGL Check' reflects the minimum 1-ft below finished grade.									
2534.14	60" RCP	22+23.72	2891.48	344.50	2898.16	17.55	2901.13	SDMH #8	OK
2536.64	54" RCP	22+23.72	2891.55	295.00	2894.57	26.01	2901.13		OK
2648.54	54" RCP	21+09.31	2895.92	295.00	2899.01	25.34	2905.00	SDMH #7	OK
2651.04	54" RCP	21+09.31	2896.02	295.00	2899.11	25.32	2905.00		OK
2823.60	54" RCP	19+34.25	2901.86	295.00	2904.95	25.29	2910.91	SDMH #6	OK
2826.10	54" RCP	19+34.25	2901.94	295.00	2905.04	25.29	2910.91		OK
3069.13	54" RCP	16+86.22	2910.15	295.00	2913.26	25.16	2919.30	SDMH #5	OK
3071.63	54" RCP	16+86.22	2910.32	295.00	2913.44	25.03	2919.30		OK
3074.13	54" RCP	16+86.22	2910.40	295.00	2913.53	25.03	2919.30	SDMH #4	OK
3297.52	54" RCP	14+57.83	2917.74	295.00	2920.87	25.00	2927.02		OK
3300.02	54" RCP	14+57.83	2917.91	295.00	2921.05	24.87	2927.02	SDMH #3	OK
3302.52	54" RCP	14+57.83	2918.00	295.00	2921.14	24.86	2927.02		OK
3466.75	54" RCP	12+88.61	2923.66	295.00	2926.92	23.93	2934.76	SDMH #2	OK
3469.25	54" RCP	12+88.61	2923.75	266.00	2926.67	24.37	2934.76		OK
3471.75	54" RCP	12+88.61	2923.88	266.00	2926.81	24.29	2934.76	SDMH #1	OK
3573.70	54" RCP	11+81.66	2928.78	266.00	2932.20	20.51	2944.81		OK
3576.20	54" RCP	11+81.66	2928.79	264.00	2932.13	20.86	2944.81	Concrete Collar	OK
3577.45	54" RCP	11+81.66	2928.80	264.00	2932.13	20.90	2944.81		OK
3578.70	54" RCP	11+81.66	2928.81	264.00	2932.14	20.94	2944.81	Concrete Collar	OK
3701.82	54" RCP	10+53.53	2931.35	264.00	2934.59	21.55	2946.72		OK
3704.32	54" RCP	10+53.53	2931.36	264.00	2934.59	21.65	2946.72	Concrete Collar	OK
3705.57	54" RCP	10+53.53	2931.37	264.00	2934.59	21.68	2946.72		OK
3706.82	54" RCP	10+53.53	2931.38	264.00	2934.59	21.72	2946.72	Concrete Collar	OK
3753.12	54" RCP	10+04.74	2932.41	264.00	2935.60	21.93	N/A		N/A
3755.62	54" RCP	10+04.74	2932.47	264.00	2935.65	21.95	N/A	Ex SDMH #26 (CLV #107V7512)	N/A
3864.01	54" RCP	8+96.35	2936.65	264.00	2940.97	16.83	2952.60		OK

NOAR

T1	CEN2018:	SKYE CANYON	NORTH ARROYO
T2	NORTH ARROYO	(NOAR.WSW)	
T3	CONNECTION TO EX SD:	PH3B/3C INFR	
S0	1000.0002843.320	1	
R	1254.1202848.150	1	.015
R	1278.3202851.248	1	.015
JX	1280.8202851.568	1	18 18.015
R	1288.8002852.590	1	.015
R	1298.8002854.000	1	.015
TS	1298.8102854.000	2	
R	1298.8102854.000	2	.013
WX	1298.8102854.000	66	
R	1412.6002856.348	66	.013
R	1413.8502856.374	66	.013
R	1415.1002856.400	66	.013
R	1518.6902858.540	66	.013
JX	1521.1902858.634	66 24	.013
R	1578.6502860.786	66	.013
R	1579.9002860.833	66	.013
R	1581.1502860.880	66	.013
R	1807.1702869.340	66	.013
R	2067.0402879.066	66	.013
R	2068.2902879.113	66	.013
JX	2069.5402879.160	66 18	.013
R	2180.0202883.296	66	.013
R	2180.8532883.328	66	.013
R	2181.6872883.359	66	.013
R	2182.5202883.390	66	.013
JX	2185.0202883.930	60 42	.013
R	2274.6302885.350	60	.013
R	2275.8802885.370	60	.013
R	2277.1302885.390	60	.013
R	2433.5402888.697	60	.013
R	2436.0402888.750	60	.013
R	2534.1402891.480	60	.013
JX	2536.6402891.550	54 36	.013
R	2648.5402895.922	54	.013
R	2651.0402896.020	54	.013
R	2823.6002901.855	54	.013
R	2826.1002901.940	54	.013
R	3069.1302910.151	54	.013
JX	3071.6302910.320	54	.013
R	3074.1302910.403	54	.013
R	3297.5202917.744	54	.013
JX	3300.0202917.910	54	.013
R	3302.5202917.996	54	.013
R	3466.7502923.664	54	.013
JX	3469.2502923.750	54 24	.013
R	3471.7502923.883	54	.013
R	3573.7002928.780	54	.013
JX	3576.2002928.790	54 18	.013
R	3577.4502928.800	54	.013
R	3578.7002928.810	54	.013
R	3701.8202931.350	54	.013

NOAR

U/S DATA	STATION	INVERT	SECT	NOAR
ELEMENT NO 10 IS A REACH	1298.810	2854.000	66	
U/S DATA	STATION	INVERT	SECT	
	1412.600	2856.348	66	N .013
ELEMENT NO 11 IS A REACH	STATION	INVERT	SECT	
U/S DATA	1413.850	2856.374	66	N .013

W S P G W

WATER SURFACE PROFILE - ELEMENT CARD LISTING

U/S DATA	STATION	INVERT	SECT	W S P G W
ELEMENT NO 12 IS A REACH	1415.100	2856.400	66	
U/S DATA	STATION	INVERT	SECT	
	1518.690	2858.540	66	N .013
ELEMENT NO 13 IS A REACH	STATION	INVERT	SECT	
U/S DATA	1521.190	2858.634	66	N .013

U/S DATA	STATION	INVERT	SECT	W S P G W
ELEMENT NO 14 IS A JUNCTION	1521.190	2858.634	66	
U/S DATA	STATION	INVERT	SECT	
	1521.190	2858.634	66	N .013

U/S DATA	STATION	INVERT	SECT	W S P G W
ELEMENT NO 15 IS A REACH	1578.650	2860.786	66	
U/S DATA	STATION	INVERT	SECT	
	1579.900	2860.833	66	N .013
ELEMENT NO 16 IS A REACH	STATION	INVERT	SECT	
U/S DATA	1581.150	2860.880	66	N .013
ELEMENT NO 17 IS A REACH	STATION	INVERT	SECT	
U/S DATA	1807.170	2869.340	66	N .013
ELEMENT NO 18 IS A REACH	STATION	INVERT	SECT	
U/S DATA	2067.040	2879.066	66	N .013
ELEMENT NO 19 IS A REACH	STATION	INVERT	SECT	
U/S DATA	2068.290	2879.113	66	N .013
ELEMENT NO 20 IS A REACH	STATION	INVERT	SECT	
U/S DATA	2069.540	2879.160	66	N .013

W S P G W

WATER SURFACE PROFILE - ELEMENT CARD LISTING

U/S DATA	STATION	INVERT	SECT	W S P G W
ELEMENT NO 21 IS A JUNCTION	2069.540	2879.160	66	
U/S DATA	STATION	INVERT	SECT	
	2180.020	2883.296	66	N .013
ELEMENT NO 22 IS A REACH	STATION	INVERT	SECT	
U/S DATA	2180.853	2883.328	66	N .013
ELEMENT NO 23 IS A REACH	STATION	INVERT	SECT	
U/S DATA	2180.853	2883.328	66	N .013
ELEMENT NO 24 IS A REACH	STATION	INVERT	SECT	
U/S DATA	2180.853	2883.328	66	N .013

ELEMENT NO	25 IS A REACH U/S DATA	2181.687	2883.359	66	*	NOAR .013	2185.020	2883.930	60	42	0	Q4	Q3	Q4	INVERT-3	INVERT-4	PHI 3	PHI 4	ANGLE	RADIUS	ANG PT	MAN H
ELEMENT NO 25	IS A REACH	2181.687	2883.359	66	*	NOAR .013	2185.020	2883.930	60	42	0	Q4	Q3	Q4	INVERT-3	INVERT-4	PHI 3	PHI 4	ANGLE	RADIUS	ANG PT	MAN H
ELEMENT NO 26	IS A JUNCTION U/S DATA	2182.520	2883.390	66	*	NOAR .013	2185.020	2883.930	60	42	0	Q4	Q3	Q4	INVERT-3	INVERT-4	PHI 3	PHI 4	ANGLE	RADIUS	ANG PT	MAN H
ELEMENT NO 27	IS A REACH U/S DATA	2274.630	2885.350	60	*	NOAR .013	2275.880	2885.370	60													
ELEMENT NO 28	IS A REACH U/S DATA	2277.130	2885.390	60	*	NOAR .013	2277.130	2885.390	60													
ELEMENT NO 29	IS A REACH U/S DATA	2433.540	2888.697	60	*	NOAR .013	2436.040	2888.750	60													
ELEMENT NO 30	IS A REACH U/S DATA	2534.140	2891.480	60	*	NOAR .013	2536.640	2891.550	54	36	0	Q3	Q4	Q3	INVERT-3	INVERT-4	PHI 3	PHI 4	ANGLE	RADIUS	ANG PT	MAN H
ELEMENT NO 31	IS A REACH U/S DATA	2648.540	2895.922	54	*	NOAR .013	2651.040	2896.020	54													
ELEMENT NO 32	IS A REACH U/S DATA	2823.600	2901.855	54	*	NOAR .013	2826.100	2901.940	54													
ELEMENT NO 33	IS A JUNCTION U/S DATA	3069.130	2910.151	54	*	NOAR .013	3071.630	2910.320	54	0	0	Q3	Q4	Q3	INVERT-3	INVERT-4	PHI 3	PHI 4	ANGLE	RADIUS	ANG PT	MAN H

W S P G W

WATER SURFACE PROFILE - ELEMENT CARD LISTING

ELEMENT NO	34 IS A REACH U/S DATA	2648.540	2895.922	54 <th>* <th>NOAR .013</th> <th>2651.040</th> <th>2896.020</th> <th>54 <th>* <th>NOAR .013</th> <th>2823.600</th> <th>2901.855</th> <th>54 <th>* <th>NOAR .013</th> <th>2826.100</th> <th>2901.940</th> <th>54 <th>* <th>NOAR .013</th> <th>3069.130</th> <th>2910.151</th> <th>54 <th>* <th>NOAR .013</th> <th>3071.630</th> <th>2910.320</th> <th>54 <th>0 <th>0 <th>Q3 <th>Q4 <th>INVERT-3 <th>INVERT-4 <th>PHI 3 <th>PHI 4 <th>ANGLE <th>RADIUS <th>ANG PT <th>MAN H </th></th></th></th></th></th></th></th></th></th></th></th></th></th></th></th></th></th></th></th></th></th>	* <th>NOAR .013</th> <th>2651.040</th> <th>2896.020</th> <th>54 <th>* <th>NOAR .013</th> <th>2823.600</th> <th>2901.855</th> <th>54 <th>* <th>NOAR .013</th> <th>2826.100</th> <th>2901.940</th> <th>54 <th>* <th>NOAR .013</th> <th>3069.130</th> <th>2910.151</th> <th>54 <th>* <th>NOAR .013</th> <th>3071.630</th> <th>2910.320</th> <th>54 <th>0 <th>0 <th>Q3 <th>Q4 <th>INVERT-3 <th>INVERT-4 <th>PHI 3 <th>PHI 4 <th>ANGLE <th>RADIUS <th>ANG PT <th>MAN H </th></th></th></th></th></th></th></th></th></th></th></th></th></th></th></th></th></th></th></th></th>	NOAR .013	2651.040	2896.020	54 <th>* <th>NOAR .013</th> <th>2823.600</th> <th>2901.855</th> <th>54 <th>* <th>NOAR .013</th> <th>2826.100</th> <th>2901.940</th> <th>54 <th>* <th>NOAR .013</th> <th>3069.130</th> <th>2910.151</th> <th>54 <th>* <th>NOAR .013</th> <th>3071.630</th> <th>2910.320</th> <th>54 <th>0 <th>0 <th>Q3 <th>Q4 <th>INVERT-3 <th>INVERT-4 <th>PHI 3 <th>PHI 4 <th>ANGLE <th>RADIUS <th>ANG PT <th>MAN H </th></th></th></th></th></th></th></th></th></th></th></th></th></th></th></th></th></th></th></th>	* <th>NOAR .013</th> <th>2823.600</th> <th>2901.855</th> <th>54 <th>* <th>NOAR .013</th> <th>2826.100</th> <th>2901.940</th> <th>54 <th>* <th>NOAR .013</th> <th>3069.130</th> <th>2910.151</th> <th>54 <th>* <th>NOAR .013</th> <th>3071.630</th> <th>2910.320</th> <th>54 <th>0 <th>0 <th>Q3 <th>Q4 <th>INVERT-3 <th>INVERT-4 <th>PHI 3 <th>PHI 4 <th>ANGLE <th>RADIUS <th>ANG PT <th>MAN H </th></th></th></th></th></th></th></th></th></th></th></th></th></th></th></th></th></th></th>	NOAR .013	2823.600	2901.855	54 <th>* <th>NOAR .013</th> <th>2826.100</th> <th>2901.940</th> <th>54 <th>* <th>NOAR .013</th> <th>3069.130</th> <th>2910.151</th> <th>54 <th>* <th>NOAR .013</th> <th>3071.630</th> <th>2910.320</th> <th>54 <th>0 <th>0 <th>Q3 <th>Q4 <th>INVERT-3 <th>INVERT-4 <th>PHI 3 <th>PHI 4 <th>ANGLE <th>RADIUS <th>ANG PT <th>MAN H </th></th></th></th></th></th></th></th></th></th></th></th></th></th></th></th></th></th>	* <th>NOAR .013</th> <th>2826.100</th> <th>2901.940</th> <th>54 <th>* <th>NOAR .013</th> <th>3069.130</th> <th>2910.151</th> <th>54 <th>* <th>NOAR .013</th> <th>3071.630</th> <th>2910.320</th> <th>54 <th>0 <th>0 <th>Q3 <th>Q4 <th>INVERT-3 <th>INVERT-4 <th>PHI 3 <th>PHI 4 <th>ANGLE <th>RADIUS <th>ANG PT <th>MAN H </th></th></th></th></th></th></th></th></th></th></th></th></th></th></th></th></th>	NOAR .013	2826.100	2901.940	54 <th>* <th>NOAR .013</th> <th>3069.130</th> <th>2910.151</th> <th>54 <th>* <th>NOAR .013</th> <th>3071.630</th> <th>2910.320</th> <th>54 <th>0 <th>0 <th>Q3 <th>Q4 <th>INVERT-3 <th>INVERT-4 <th>PHI 3 <th>PHI 4 <th>ANGLE <th>RADIUS <th>ANG PT <th>MAN H </th></th></th></th></th></th></th></th></th></th></th></th></th></th></th></th>	* <th>NOAR .013</th> <th>3069.130</th> <th>2910.151</th> <th>54 <th>* <th>NOAR .013</th> <th>3071.630</th> <th>2910.320</th> <th>54 <th>0 <th>0 <th>Q3 <th>Q4 <th>INVERT-3 <th>INVERT-4 <th>PHI 3 <th>PHI 4 <th>ANGLE <th>RADIUS <th>ANG PT <th>MAN H </th></th></th></th></th></th></th></th></th></th></th></th></th></th></th>	NOAR .013	3069.130	2910.151	54 <th>* <th>NOAR .013</th> <th>3071.630</th> <th>2910.320</th> <th>54 <th>0 <th>0 <th>Q3 <th>Q4 <th>INVERT-3 <th>INVERT-4 <th>PHI 3 <th>PHI 4 <th>ANGLE <th>RADIUS <th>ANG PT <th>MAN H </th></th></th></th></th></th></th></th></th></th></th></th></th></th>	* <th>NOAR .013</th> <th>3071.630</th> <th>2910.320</th> <th>54 <th>0 <th>0 <th>Q3 <th>Q4 <th>INVERT-3 <th>INVERT-4 <th>PHI 3 <th>PHI 4 <th>ANGLE <th>RADIUS <th>ANG PT <th>MAN H </th></th></th></th></th></th></th></th></th></th></th></th></th>	NOAR .013	3071.630	2910.320	54 <th>0 <th>0 <th>Q3 <th>Q4 <th>INVERT-3 <th>INVERT-4 <th>PHI 3 <th>PHI 4 <th>ANGLE <th>RADIUS <th>ANG PT <th>MAN H </th></th></th></th></th></th></th></th></th></th></th></th>	0 <th>0 <th>Q3 <th>Q4 <th>INVERT-3 <th>INVERT-4 <th>PHI 3 <th>PHI 4 <th>ANGLE <th>RADIUS <th>ANG PT <th>MAN H </th></th></th></th></th></th></th></th></th></th></th>	0 <th>Q3 <th>Q4 <th>INVERT-3 <th>INVERT-4 <th>PHI 3 <th>PHI 4 <th>ANGLE <th>RADIUS <th>ANG PT <th>MAN H </th></th></th></th></th></th></th></th></th></th>	Q3 <th>Q4 <th>INVERT-3 <th>INVERT-4 <th>PHI 3 <th>PHI 4 <th>ANGLE <th>RADIUS <th>ANG PT <th>MAN H </th></th></th></th></th></th></th></th></th>	Q4 <th>INVERT-3 <th>INVERT-4 <th>PHI 3 <th>PHI 4 <th>ANGLE <th>RADIUS <th>ANG PT <th>MAN H </th></th></th></th></th></th></th></th>	INVERT-3 <th>INVERT-4 <th>PHI 3 <th>PHI 4 <th>ANGLE <th>RADIUS <th>ANG PT <th>MAN H </th></th></th></th></th></th></th>	INVERT-4 <th>PHI 3 <th>PHI 4 <th>ANGLE <th>RADIUS <th>ANG PT <th>MAN H </th></th></th></th></th></th>	PHI 3 <th>PHI 4 <th>ANGLE <th>RADIUS <th>ANG PT <th>MAN H </th></th></th></th></th>	PHI 4 <th>ANGLE <th>RADIUS <th>ANG PT <th>MAN H </th></th></th></th>	ANGLE <th>RADIUS <th>ANG PT <th>MAN H </th></th></th>	RADIUS <th>ANG PT <th>MAN H </th></th>	ANG PT <th>MAN H </th>	MAN H
ELEMENT NO 34	IS A REACH	2648.540	2895.922	54	*	NOAR .013	2651.040	2896.020	54	*	NOAR .013	2823.600	2901.855	54	*	NOAR .013	2826.100	2901.940	54	*	NOAR .013	3069.130	2910.151	54	*	NOAR .013	3071.630	2910.320	54	0	0	Q3	Q4	INVERT-3	INVERT-4	PHI 3	PHI 4	ANGLE	RADIUS	ANG PT	MAN H
ELEMENT NO 35	IS A REACH	2651.040	2896.020	54	*	NOAR .013	2823.600	2901.855	54	*	NOAR .013	2826.100	2901.940	54	*	NOAR .013	3069.130	2910.151	54	*	NOAR .013	3071.630	2910.320	54	*	NOAR .013	3071.630	2910.320	54	0	0	Q3	Q4	INVERT-3	INVERT-4	PHI 3	PHI 4	ANGLE	RADIUS	ANG PT	MAN H
ELEMENT NO 36	IS A REACH	2823.600	2901.855	54	*	NOAR .013	2826.100	2901.940	54	*	NOAR .013	3069.130	2910.151	54	*	NOAR .013	3071.630	2910.320	54	*	NOAR .013	3071.630	2910.320	54	*	NOAR .013	3071.630	2910.320	54	0	0	Q3	Q4	INVERT-3	INVERT-4	PHI 3	PHI 4	ANGLE	RADIUS	ANG PT	MAN H
ELEMENT NO 37	IS A REACH	2826.100	2901.940	54	*	NOAR .013	3069.130	2910.151	54	*	NOAR .013	3071.630	2910.320	54	*	NOAR .013	3071.630	2910.320	54	*	NOAR .013	3071.630	2910.320	54	*	NOAR .013	3071.630	2910.320	54	0	0	Q3	Q4	INVERT-3	INVERT-4	PHI 3	PHI 4	ANGLE	RADIUS	ANG PT	MAN H
ELEMENT NO 38	IS A REACH	3069.130	2910.151	54	*	NOAR .013	3071.630	2910.320	54	*	NOAR .013	3071.630	2910.320	54	*	NOAR .013	3071.630	2910.320	54	*	NOAR .013	3071.630	2910.320	54	*	NOAR .013	3071.630	2910.320	54	0	0	Q3	Q4	INVERT-3	INVERT-4	PHI 3	PHI 4	ANGLE	RADIUS	ANG PT	MAN H
ELEMENT NO 39	IS A JUNCTION	3071.630	2910.320	54	*	NOAR .013	3071.630	2910.320	54	*	NOAR .013	3071.630	2910.320	54	*	NOAR .013	3071.630	2910.320	54	*	NOAR .013	3071.630	2910.320	54	*	NOAR .013	3071.630	2910.320	54	0	0	Q3	Q4	INVERT-3	INVERT-4	PHI 3	PHI 4	ANGLE	RADIUS	ANG PT	MAN H

*

Date: 9-14-2022 Time:10:19:12

CEN2018: SKYE CANYON NORTH ARROYO

NORTH ARROYO (NOAR.WSW)

CONNECTION TO EX SD: PH3B/3C INFRA US/P2.31 PARK DS

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Width	Top Dia.	Height/ I.D.	Base Wt	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch	
1000.000	2843.320	3.433	2846.753	463.00	22.48	7.85	2854.60	.00	5.70	6.00	6.000	6.000	.00	0	.0
55.545	.0190					.0291	1.62	3.43	2.14	3.96	.015	.00	.00	BOX	
1055.545	2844.376	3.288	2847.663	463.00	23.47	8.55	2856.22	.00	5.70	6.00	6.000	6.000	.00	0	.0
50.677	.0190					.0329	1.67	3.29	2.28	3.96	.015	.00	.00	BOX	
1106.222	2845.339	3.135	2848.473	463.00	24.62	9.41	2857.88	.00	5.70	6.00	6.000	6.000	.00	0	.0
43.473	.0190					.0373	1.62	3.13	2.45	3.96	.015	.00	.00	BOX	
1149.695	2846.165	2.989	2849.154	463.00	25.82	10.35	2859.51	.00	5.70	6.00	6.000	6.000	.00	0	.0
38.377	.0190					.0424	1.63	2.99	2.63	3.96	.015	.00	.00	BOX	
1188.073	2846.895	2.850	2849.744	463.00	27.08	11.39	2861.13	.00	5.70	6.00	6.000	6.000	.00	0	.0
34.538	.0190					.0481	1.66	2.85	2.83	3.96	.015	.00	.00	BOX	
1222.611	2847.551	2.717	2850.268	463.00	28.40	12.53	2862.79	.00	5.70	6.00	6.000	6.000	.00	0	.0
31.509	.0190					.0547	1.72	2.72	3.04	3.96	.015	.00	.00	BOX	
1254.120	2848.150	2.591	2850.740	463.00	29.79	13.78	2864.52	.00	5.70	6.00	6.000	6.000	.00	0	.0
10.798	.1280					.0558	.60	2.59	3.26	1.95	.015	.00	.00	BOX	
1264.918	2849.532	2.676	2852.208	463.00	28.84	12.91	2865.12	.00	5.70	6.00	6.000	6.000	.00	0	.0
13.402	.1280					.0502	.67	2.68	3.11	1.95	.015	.00	.00	BOX	
1278.320	2851.248	2.806	2854.054	463.00	27.50	11.74	2865.80	.00	5.70	6.00	6.000	6.000	.00	0	.0
JUNCT STR	.1280					.0472	.12	2.81	2.89		.015	.00	.00	BOX	

W S P G W - CIVILDESIGN Version 14.08
Program Package Serial Number: 7189

Date: 9-14-2022 Time:10:19:12

CEN2018: SKYE CANYON NORTH ARROYO

NORTH ARROYO (NOAR.WSW)

CONNECTION TO EX SD: PH3B/3C INFRA US/P2.31 PARK DS

NOAR

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Width	Height/ Dia.-FT or I.D.	Base Wt	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****
1280.820	2851.568	2.773	2854.341	458.50	27.56	11.79	2866.13	.00	5.66	6.00	6.000	6.000	.00	0 .0
7.980	.1281					.0455	.36	2.77	2.92	1.93	.015	.00	.00	BOX
1288.800	2852.590	2.865	2855.455	458.50	26.67	11.05	2866.50	.00	5.66	6.00	6.000	6.000	.00	0 .0
1.614	.1410					.0431	.07	2.87	2.78	1.87	.015	.00	.00	BOX
1290.414	2852.818	2.889	2855.707	458.50	26.45	10.86	2866.57	.00	5.66	6.00	6.000	6.000	.00	0 .0
8.386	.1410					.0400	.34	2.89	2.74	1.87	.015	.00	.00	BOX
1298.800	2854.000	3.030	2857.030	458.50	25.22	9.88	2866.91	.00	5.66	6.00	6.000	6.000	.00	0 .0
TRANS STR	.0000					.0356	.00	3.03	2.55		.014	.00	.00	BOX
1298.810	2854.000	2.458	2856.458	458.50	26.64	11.02	2867.48	.00	5.11	7.00	9.000	7.000	.00	0 .0
WALL EXIT														
1298.810	2854.000	3.852	2857.852	458.50	25.79	10.33	2868.18	.00	5.31	5.04	5.500	.000	.00	1 .0
113.790	.0206					.0282	3.20	3.85	2.42	4.28	.013	.00	.00	PIPE
1412.600	2856.348	3.693	2860.041	458.50	27.03	11.35	2871.39	.00	5.31	5.17	5.500	.000	.00	1 .0
1.250	.0209					.0298	.04	3.69	2.63	4.26	.013	.00	.00	PIPE
1413.850	2856.374	3.690	2860.064	458.50	27.05	11.36	2871.43	.00	5.31	5.17	5.500	.000	.00	1 .0
1.250	.0207					.0298	.04	3.69	2.63	4.27	.013	.00	.00	PIPE
1415.100	2856.400	3.688	2860.088	458.50	27.07	11.38	2871.47	.00	5.31	5.17	5.500	.000	.00	1 .0
17.784	.0207					.0302	.54	3.69	2.64	4.28	.013	.00	.00	PIPE

▲ FILE: NOAR.WSW

W S P G W - CIVILDESIGN Version 14.08

Program Package Serial Number: 7189

WATER SURFACE PROFILE LISTING

Date: 9-14-2022 Time:10:19:12

CEN2018: SKYE CANYON NORTH ARROYO

NORTH ARROYO (NOAR.WSW)

CONNECTION TO EX SD: PH3B/3C INFRA US/P2.31 PARK DS

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

NOAR													
1432.884	2856.767	3.660	2860.427	458.50	27.31	11.58	2872.01	.00	5.31	5.19	5.500	.000	.00 1 .0
85.806	.0207	-	-	-	-	.0324	2.78	3.66	2.68	4.28	.013	.00	PIPE
1518.690	2858.540	3.511	2862.051	458.50	28.64	12.74	2874.79	.00	5.31	5.29	5.500	.000	.00 1 .0
JUNCT STR	.0376	-	-	-	-	.0349	.09	3.51	2.90	-	.013	.00	PIPE
1521.190	2858.634	3.395	2862.029	443.50	28.81	12.89	2874.92	.00	5.29	5.35	5.500	.000	.00 1 .0
57.460	.0374	-	-	-	-	.0352	2.02	3.40	2.99	3.33	.013	.00	PIPE
1578.650	2860.786	3.411	2864.197	443.50	28.65	12.74	2876.94	.00	5.29	5.34	5.500	.000	.00 1 .0
1.250	.0377	-	-	-	-	.0350	.04	3.41	2.96	3.33	.013	.00	PIPE
1579.900	2860.833	3.411	2864.244	443.50	28.65	12.74	2876.99	.00	5.29	5.34	5.500	.000	.00 1 .0
1.250	.0375	-	-	-	-	.0350	.04	3.41	2.96	3.33	.013	.00	PIPE
1581.150	2860.880	3.411	2864.291	443.50	28.65	12.74	2877.03	.00	5.29	5.34	5.500	.000	.00 1 .0
226.020	.0374	-	-	-	-	.0330	7.46	3.41	2.96	3.33	.013	.00	PIPE
1807.170	2869.340	3.551	2872.891	443.50	27.34	11.61	2884.50	.00	5.29	5.26	5.500	.000	.00 1 .0
87.682	.0374	-	-	-	-	.0298	2.61	3.55	2.74	3.33	.013	.00	PIPE
1894.852	2872.622	3.660	2876.282	443.50	26.41	10.83	2887.11	.00	5.29	5.19	5.500	.000	.00 1 .0
78.820	.0374	-	-	-	-	.0270	2.13	3.66	2.59	3.33	.013	.00	PIPE
1973.672	2875.572	3.820	2879.392	443.50	25.18	9.85	2889.24	.00	5.29	5.07	5.500	.000	.00 1 .0
54.011	.0374	-	-	-	-	.0240	1.30	3.82	2.38	3.33	.013	.00	PIPE
FILE: NOAR.WSW													

W S P G W - CIVILDESIGN Version 14.08
 Program Package Serial Number: 7189
 WATER SURFACE PROFILE LISTING
 Date: 9-14-2022 Time:10:19:12
 CEN2018: SKYE CANYON NORTH ARROYO
 NORTH ARROYO (NOAR.WSW)
 CONNECTION TO EX SD: PH38/3C INFRA US/P2.31 PARK DS

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

2027.682	2877.593	3.992	2881.585	443.50	24.01	8.95	2890.54	.00	5.29	4.91	5.500	.000	.00 1 .0
39.358	.0374	-	-	-	-	.0215	.85	3.99	2.18	3.33	.013	.00	PIPE
2067.040	2879.066	4.180	2883.246	443.50	22.89	8.14	2891.38	.00	5.29	4.70	5.500	.000	.00 1 .0

NOAR														
1.250	.0377	-	-	-	-	-	-	-	-	-	-	-	-	-
2068.290	2879.113	4.187	2883.300	443.50	22.85	8.11	2891.41	.00	5.29	4.69	5.500	.000	.00	1 .0
JUNCT STR	.0375	-	-	-	-	-	-	-	-	-	-	-	-	-
2069.540	2879.160	3.939	2883.099	432.50	23.75	8.76	2891.86	.00	5.27	4.96	5.500	.000	.00	1 .0
28.427	.0374	-	-	-	-	-	-	-	-	-	-	-	-	-
2097.967	2880.224	4.069	2884.293	432.50	22.95	8.18	2892.47	.00	5.27	4.83	5.500	.000	.00	1 .0
30.671	.0374	-	-	-	-	-	-	-	-	-	-	-	-	-
2128.638	2881.372	4.264	2885.636	432.50	21.88	7.44	2893.07	.00	5.27	4.59	5.500	.000	.00	1 .0
23.163	.0374	-	-	-	-	-	-	-	-	-	-	-	-	-
2151.801	2882.240	4.482	2886.721	432.50	20.86	6.76	2893.48	.00	5.27	4.27	5.500	.000	.00	1 .0
17.064	.0374	-	-	-	-	-	-	-	-	-	-	-	-	-
2168.865	2882.878	4.731	2887.610	432.50	19.89	6.14	2893.75	.00	5.27	3.81	5.500	.000	.00	1 .0
11.155	.0374	-	-	-	-	-	-	-	-	-	-	-	-	-
2180.020	2883.296	5.038	2888.334	432.50	18.97	5.59	2893.92	.00	5.27	3.05	5.500	.000	.00	1 .0
.833	.0384	-	-	-	-	-	-	-	-	-	-	-	-	-
FILE: NOAR.WSW														

W S P G W - CIVILDESIGN Version 14.08
Program Package Serial Number: 7189

Date: 9-14-2022 Time:10:19:12

WATER SURFACE PROFILE LISTING

CEN2018: SKYE CANYON NORTH ARROYO

NORTH ARROYO (NOAR.WSW)

CONNECTION TO EX SD: PH3B/3C INFRA US/P2.31 PARK DS

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	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****
2180.853	2883.328	5.083	2888.411	432.50	18.86	5.52	2893.93	.00	5.27	2.91	5.500	.000	.00	1 .0
.834	.0372	-	-	-	-	-	-	-	-	-	-	-	-	-
2181.687	2883.359	5.138	2888.497	432.50	18.73	5.45	2893.94	.00	5.27	2.73	5.500	.000	.00	1 .0
.833	.0372	-	-	-	-	-	-	-	-	-	-	-	-	-
2182.520	2883.390	5.268	2888.658	432.50	18.47	5.30	2893.96	.00	5.27	2.21	5.500	.000	.00	1 .0
JUNCT STR	.2160	-	-	-	-	-	-	-	-	-	-	-	-	-

NOAR															
2185.020	2883.930	6.568	2890.498	344.50	17.55	4.78	2895.28	.00	4.80	.00	5.000	.000	.00	1	.0
89.610	.0158	-	-	-	-	.0175	1.57	6.57	.00	4.37	.013	.00	.00	PIPE	
2274.630	2885.350	6.953	2892.303	344.50	17.55	4.78	2897.08	.00	4.80	.00	5.000	.000	.00	1	.0
1.250	.0160	-	-	-	-	.0175	.02	6.95	.00	4.34	.013	.00	.00	PIPE	
2275.880	2885.370	7.191	2892.561	344.50	17.55	4.78	2897.34	.00	4.80	.00	5.000	.000	.00	1	.0
1.250	.0158	-	-	-	-	.0175	.02	7.19	.00	4.38	.013	.00	.00	PIPE	
2277.130	2885.390	7.590	2892.980	344.50	17.55	4.78	2897.76	.00	4.80	.00	5.000	.000	.00	1	.0
156.410	.0211	-	-	-	-	.0175	2.74	7.59	.00	3.74	.013	.00	.00	PIPE	
2433.540	2888.697	7.240	2895.938	344.50	17.55	4.78	2900.72	.00	4.80	.00	5.000	.000	.00	1	.0
2.500	.0212	-	-	-	-	.0175	.04	7.24	.00	3.74	.013	.00	.00	PIPE	
2436.040	2888.750	7.691	2896.441	344.50	17.55	4.78	2901.22	.00	4.80	.00	5.000	.000	.00	1	.0
98.100	.0278	-	-	-	-	.0175	1.72	7.69	.00	3.36	.013	.00	.00	PIPE	
FILE: NOAR.MSW															
W S P G W - CIVILDESIGN Version 14.08															

FILE: NOAR.WSW

W S P G W - CIVILDESIGN Version 14.08
Program Package Serial Number: 7189

Date: 9-14-2022 Time:10:19:12

WATER SURFACE PROFILE LISTING

CEN2018: SKYE CANYON NORTH ARROYO

NORTH ARROYO (NOAR.WSW)

CONNECTION TO EX SD: PH3B/3C INFRA US/P2.31 PARK DS

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Width	Top Height/ Dia.-FT or I.D.	Base Wt	No Wth Prs/Pip		
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch	
*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	
2534.140	2891.480	6.678	2898.157	344.50	17.55	4.78	2902.94	.00	4.80	.00	5.000	.000	.00	1	.0
JUNCT STR	.0280	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2536.640	2891.550	3.018	2894.568	295.00	26.01	10.51	2905.08	.00	4.38	4.23	4.500	.000	.00	1	.0
111.900	.0391	-	-	-	-	.0349	3.91	3.02	2.80	2.93	.013	.00	.00	PIPE	
2648.540	2895.922	3.090	2899.012	295.00	25.34	9.97	2908.98	.00	4.38	4.17	4.500	.000	.00	1	.0
2.500	.0392	-	-	-	-	.0338	.08	3.09	2.67	2.93	.013	.00	.00	PIPE	
2651.040	2896.020	3.092	2899.112	295.00	25.32	9.96	2909.07	.00	4.38	4.17	4.500	.000	.00	1	.0
172.560	.0338	-	-	-	-	.0337	5.81	3.09	2.67	3.09	.013	.00	.00	PIPE	
2823.600	2901.855	3.095	2904.950	295.00	25.29	9.93	2914.88	.00	4.38	4.17	4.500	.000	.00	1	.0
Page 5															

NOAR													
	-	-	-	-	-	-	-	-	-	-	-	-	-
2.500	.0340												PIPE
2826.100	2901.940												PIPE
243.030	.0338												PIPE
3069.130	2910.151												PIPE
JUNCT STR	.0677												PIPE
3071.630	2910.320												PIPE
2.500	.0332												PIPE
3074.130	2910.403												PIPE
223.390	.0329												PIPE

W S P G W - CIVILDESIGN Version 14.08

FILE: NOAR.WSW

PAGE

Date: 9-14-2022 Time: 10:19:12

WSPGW - CIVILDESIGN Version 14.08

Program Package Serial Number: 7189

WATER SURFACE PROFILE LISTING

CEN2018: SKYE CANYON NORTH ARROYO

NORTH ARROYO (NOAR.WSW)

CONNECTION TO EX SD: PH3B/3C INFRA US/P2.31 PARK DS

NOTES ON THE SUBMISSION OF MANUSCRIPTS

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Width	Top Dia.	Height/FT or I.D.	No With Prs/PIp
L/Elem	Ch Slope												
*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****
3297.520	2917.744	3.128	2920.872	295.00	25.00	9.71	2930.58	.00	4.38	4.14	4.500	.000	1 .0
- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	-
JUNCT STR	.0664					.0325	.08	3.13	2.61		.013	.00	PIPE
3300.020	2917.910	3.143	2921.053	295.00	24.87	9.60	2930.66	.00	4.38	4.13	4.500	.000	1 .0
- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	-
2.500	.0345					.0323	.08	3.14	2.59	3.07	.013	.00	PIPE
3302.520	2917.996	3.143	2921.140	295.00	24.86	9.60	2930.74	.00	4.38	4.13	4.500	.000	1 .0
- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	-
164.230	.0345					.0309	5.07	3.14	2.59	3.07	.013	.00	PIPE
3466.750	2923.664	3.257	2926.922	295.00	23.93	8.89	2935.81	.00	4.38	4.02	4.500	.000	1 .0
- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	-
JUNCT STR	.0344					.0308	.08	3.26	2.41		.013	.00	PIPE
3469.250	2923.750	2.918	2926.668	266.00	24.37	9.22	2935.89	.00	4.32	4.30	4.500	.000	1 .0
- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	-
2.500	.0532					.0321	.08	2.92	2.69	2.48	.013	.00	PIPE
3471.750	2923.883	2.926	2926.809	266.00	24.29	9.17	2935.97	.00	4.32	4.29	4.500	.000	1 .0
- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	-
23.574	.0480					.0309	.73	2.93	2.68	2.56	.013	.00	PIPE

NOAR													
3495.324	2925.015	2.995	2928.010	266.00	23.66	8.70	2936.71	.00	4.32	4.25	4.500	.000	.00 1 .0
33.415	.0480	- -	- -	- -	- -	.0283	.95	2.99	2.56	2.56	.013	.00	.00 PIPE
3528.739	2926.620	3.125	2929.746	266.00	22.56	7.91	2937.65	.00	4.32	4.15	4.500	.000	.00 1 .0
25.327	.0480	- -	- -	- -	- -	.0252	.64	3.13	2.36	2.56	.013	.00	.00 PIPE
3554.066	2927.837	3.266	2931.103	266.00	21.51	7.19	2938.29	.00	4.32	4.01	4.500	.000	.00 1 .0
19.634	.0480	- -	- -	- -	- -	.0226	.44	3.27	2.16	2.56	.013	.00	.00 PIPE

W S P G W - CIVILDESIGN Version 14.08

Program Package Serial Number: 7189

WATER SURFACE PROFILE LISTING

CEN2018: SKYE CANYON NORTH ARROYO

NORTH ARROYO (NOAR.WSW)

CONNECTION TO EX SD: PH3B/3C INFRA US/P2.31 PARK DS

Date: 9-14-2022 Time:10:19:12

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Width	Height/Dia.-FT	Base Wt I.D.	No Wth Prs/Pip ZL
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall ZR	Type Ch *****
3573.700	2928.780	3.420	2932.200	266.00	20.51	6.53	2938.73	.00	4.32	3.84	4.500	.000	.00 1 .0
JUNCT STR	.0040	- -	- -	- -	- -	.0218	.05	3.42	1.97		.013	.00	.00 PIPE
3576.200	2928.790	3.339	2932.129	264.00	20.86	6.76	2938.89	.00	4.32	3.94	4.500	.000	.00 1 .0
1.250	.0080	- -	- -	- -	- -	.0223	.03	3.34	2.05	4.50	.013	.00	.00 PIPE
3577.450	2928.800	3.333	2932.134	264.00	20.90	6.78	2938.92	.00	4.32	3.94	4.500	.000	.00 1 .0
1.250	.0080	- -	- -	- -	- -	.0224	.03	3.33	2.06	4.50	.013	.00	.00 PIPE
3578.700	2928.810	3.327	2932.137	264.00	20.94	6.81	2938.95	.00	4.32	3.95	4.500	.000	.00 1 .0
123.120	.0206	- -	- -	- -	- -	.0232	2.86	3.33	2.07	3.45	.013	.00	.00 PIPE
3701.820	2931.350	3.237	2934.588	264.00	21.55	7.21	2941.80	.00	4.32	4.04	4.500	.000	.00 1 .0
JUNCT STR	.0040	- -	- -	- -	- -	.0241	.06	3.24	2.18		.013	.00	.00 PIPE
3704.320	2931.360	3.225	2934.585	264.00	21.65	7.28	2941.86	.00	4.32	4.06	4.500	.000	.00 1 .0
1.250	.0080	- -	- -	- -	- -	.0243	.03	3.22	2.20	4.50	.013	.00	.00 PIPE
3705.570	2931.370	3.219	2934.589	264.00	21.68	7.30	2941.89	.00	4.32	4.06	4.500	.000	.00 1 .0
1.250	.0078	- -	- -	- -	- -	.0244	.03	3.22	2.21	4.50	.013	.00	.00 PIPE
3706.820	2931.380	3.214	2934.594	264.00	21.72	7.33	2941.92	.00	4.32	4.07	4.500	.000	.00 1 .0

46.300 .0222 NOAR
 3753.120 2932.410 3.185 2935.595 264.00 21.93 7.47 2943.07 .00 4.32 4.09 4.500 .000 .00 1 .0
 2.500 .0225
 FILE: NOAR.WSW

W S P G W - CIVILDESIGN Version 14.08
 Program Package Serial Number: 7189

WATER SURFACE PROFILE LISTING
 NORTH ARROYO (NOAR.WSW)
 CONNECTION TO EX SD: PH3B/3C INFRA US/P2.31 PARK DS

Date: 9-14-2022 Time: 10:19:12

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Width	Top Width	Height/Dia. -FT or I.D.	Base Wt	No With Prs/pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
3755.620	2932.466	3.184	2935.650	264.00	21.95	7.48	2943.13	.00	4.32	4.09	4.500	.000	.00	1 .0
21.744	.0386					.0242	.53	3.18	2.26	2.73	.013	.00	.00	PIPE
3777.364	2933.305	3.264	2936.570	264.00	21.36	7.09	2943.66	.00	4.32	4.02	4.500	.000	.00	1 .0
30.077	.0386					.0223	.67	3.26	2.15	2.73	.013	.00	.00	PIPE
3807.441	2934.466	3.418	2937.884	264.00	20.37	6.44	2944.33	.00	4.32	3.85	4.500	.000	.00	1 .0
22.426	.0386					.0200	.45	3.42	1.96	2.73	.013	.00	.00	PIPE
3829.867	2935.332	3.587	2938.919	264.00	19.42	5.86	2944.78	.00	4.32	3.62	4.500	.000	.00	1 .0
16.680	.0386					.0181	.30	3.59	1.77	2.73	.013	.00	.00	PIPE
3846.547	2935.976	3.778	2939.754	264.00	18.52	5.33	2945.08	.00	4.32	3.30	4.500	.000	.00	1 .0
11.743	.0386					.0167	.20	3.78	1.57	2.73	.013	.00	.00	PIPE
3858.290	2936.429	4.005	2940.434	264.00	17.66	4.84	2945.27	.00	4.32	2.82	4.500	.000	.00	1 .0
5.720	.0386					.0159	.09	4.00	1.35	2.73	.013	.00	.00	PIPE
3864.010	2936.650	4.316	2940.966	264.00	16.83	4.40	2945.37	.00	4.32	1.78	4.500	.000	.00	1 .0

West Parcel 2.10 WSPG Model - SDW

Ultimate Condition WSPG Summary West Parcel 2.10 System (SDW.WSW)										
year	Storm Drain Station	Improvement Plan Sheet	Storm Drain Dimension	Invert Elevation (ft)	Q ₁₀₀ (cfs)	WSE (ft)	Velocity (ft/s)	FG Elevation	Facility Description	HGL Check ¹
1 - 'HGL Check' reflects the minimum 1-ft below finished grade.										
979.57	19+00.70 R 0.03	SD-04	24" RCP	2926.25	29.0	2927.18	20.18	2932.70	SDMH #3	OK
995.00	10+51.77	SD-04	24" RCP	2930.65	29.0	2932.09	12.01	2935.97	SDMH #17	OK
997.50		SD-04	24" RCP	2930.90	29.0	2932.44	11.16	2935.97		OK
1000.00		SD-04	24" RCP	2931.15	29.0	2933.00	9.57	2935.97		OK
1030.11	N/A	N/A	24" RCP	2931.48	29.0	2933.60	9.23	2942.90	EX SDDI #2 (107Y5207)	OK
1030.11		N/A	24" RCP	2931.48	29.0	2934.94	0.68	2942.90		OK
1032.61		N/A	24" RCP	2931.48	29.0	2934.94	0.68	2942.90		OK
1032.61		N/A	24" RCP	2931.48	14.0	2934.95	7.92	2942.90		OK
1035.11		N/A	18" RCP	2931.98	14.0	2934.99	7.92	2942.90		OK
1035.11	N/A	N/A	18" RCP	2931.98	14.0	2934.99	7.92	2942.90	NDOT Type 2A	OK
1143.85		N/A	18" RCP	2933.07	14.0	2936.92	7.92	2941.97		OK

[illegible]

WATER SURFACE PROFILE LISTING

Date: 8-30-2022 Time: 5:47:38

SKYE CANYON NORTH ARROYO - TDS

REFERENCED FROM SKYE CANYON PARCEL 2.10 - TDS ADD

ONSITE STORM DRAIN - WEST MAINLINE

***** W E S T P A I N L I N E *****														*****	
Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Width	Height/Dia.-FT or I.D.	ZL	No Wth Prs/Pip		
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	Type Ch		
*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****		
979.570	2926.250	.933	2927.183	29.00	20.18	6.32	2933.50	.00	1.85	2.00	2.000	.000	0 .0		
2.352	.2852					.0789	.19	.93	4.19	.67	.013	.00	PIPE		
981.922	2926.921	.964	2927.885	29.00	19.34	5.81	2933.69	.00	1.85	2.00	2.000	.000	0 .0		
2.282	.2852					.0699	.16	.96	3.93	.67	.013	.00	PIPE		
984.204	2927.572	1.001	2928.573	29.00	18.44	5.28	2933.85	.00	1.85	2.00	2.000	.000	0 .0		
1.974	.2852					.0616	.12	1.00	3.66	.67	.013	.00	PIPE		
986.179	2928.135	1.039	2929.174	29.00	17.58	4.80	2933.97	.00	1.85	2.00	2.000	.000	0 .0		
1.714	.2852					.0543	.09	1.04	3.41	.67	.013	.00	PIPE		
987.893	2928.623	1.080	2929.703	29.00	16.76	4.36	2934.06	.00	1.85	1.99	2.000	.000	0 .0		
1.493	.2852					.0479	.07	1.08	3.17	.67	.013	.00	PIPE		
989.386	2929.049	1.122	2930.171	29.00	15.98	3.97	2934.14	.00	1.85	1.99	2.000	.000	0 .0		
1.300	.2852					.0423	.05	1.12	2.95	.67	.013	.00	PIPE		
990.686	2929.419	1.167	2930.586	29.00	15.24	3.60	2934.19	.00	1.85	1.97	2.000	.000	0 .0		
1.132	.2852					.0374	.04	1.17	2.73	.67	.013	.00	PIPE		
991.818	2929.742	1.214	2930.957	29.00	14.53	3.28	2934.23	.00	1.85	1.95	2.000	.000	0 .0		
.983	.2852					.0331	.03	1.21	2.53	.67	.013	.00	PIPE		
992.800	2930.022	1.265	2931.287	29.00	13.85	2.98	2934.27	.00	1.85	1.93	2.000	.000	0 .0		
.850	.2852					.0294	.02	1.26	2.34	.67	.013	.00	PIPE		

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

SKYE CANYON NORTH ARROYO - TDS

REFERENCED FROM SKYE CANYON PARCEL 2.10 - TDS ADD

ONSITE STORM DRAIN - WEST MAINLINE

Date: 8-30-2022 Time: 5:47:38

SDW

*****															No Wth
Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Width	Top Dia.-FT or I.D.	Base Wt	ZL	Prs/Pip	
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch	
*****															*****
993.650	2930.265	1.318	2931.583	29.00	13.21	2.71	2934.29	.00	1.85	1.90	2.000	.000	.00	0 .0	
.730	.2852	-	-	-	-	.0261	.02	1.32	2.16	.67	.013	.00	.00	PIPE	
994.380	2930.473	1.375	2931.848	29.00	12.59	2.46	2934.31	.00	1.85	1.85	2.000	.000	.00	0 .0	
.620	.2852	-	-	-	-	.0233	.01	1.38	1.99	.67	.013	.00	.00	PIPE	
995.000	2930.650	1.437	2932.086	29.00	12.01	2.24	2934.32	.00	1.85	1.80	2.000	.000	.00	0 .0	
.964	.1000	-	-	-	-	.0213	.02	1.44	1.83	.89	.013	.00	.00	PIPE	
995.964	2930.746	1.471	2932.218	29.00	11.71	2.13	2934.35	.00	1.85	1.76	2.000	.000	.00	0 .0	
1.536	.1000	-	-	-	-	.0196	.03	1.47	1.74	.89	.013	.00	.00	PIPE	
997.500	2930.900	1.541	2932.441	29.00	11.16	1.94	2934.38	.00	1.85	1.68	2.000	.000	.00	0 .0	
.303	.1000	-	-	-	-	.0184	.01	1.54	1.58	.89	.013	.00	.00	PIPE	
997.803	2930.930	1.558	2932.489	29.00	11.04	1.89	2934.38	.00	1.85	1.66	2.000	.000	.00	0 .0	
1.113	.1000	-	-	-	-	.0173	.02	1.56	1.55	.89	.013	.00	.00	PIPE	
998.917	2931.042	1.638	2932.680	29.00	10.53	1.72	2934.40	.00	1.85	1.54	2.000	.000	.00	0 .0	
.762	.1000	-	-	-	-	.0158	.01	1.64	1.39	.89	.013	.00	.00	PIPE	
999.679	2931.118	1.730	2932.848	29.00	10.04	1.57	2934.41	.00	1.85	1.37	2.000	.000	.00	0 .0	
.321	.1000	-	-	-	-	.0147	.00	1.73	1.22	.89	.013	.00	.00	PIPE	
1000.000	2931.150	1.846	2932.996	29.00	9.57	1.42	2934.42	.00	1.85	1.07	2.000	.000	.00	0 .0	
14.040	.0109	-	-	-	-	.0148	.21	1.85	1.00	2.00	.013	.00	.00	PIPE	
*****															PAGE

▲ FILE: SDW.MSW

W S P G W - CIVILDESIGN Version 14.08

Program Package Serial Number: 7189

WATER SURFACE PROFILE LISTING

SKYE CANYON NORTH ARROYO - TDS

REFERENCED FROM SKYE CANYON PARCEL 2.10 - TDS ADD

ONSITE STORM DRAIN - WEST MAINLINE

Date: 8-30-2022 Time: 5:47:38

1014.040	2931.303	2.000	2933.303	29.00	9.23	1.32	2934.63	.00	1.85	.00	2.000	.000	.00	.0
- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
16.070	.0109					.0159	.26	2.00	.00	2.00	.013	.00	.00	PIPE
1030.110	2931.479	2.124	2933.603	29.00	9.23	1.32	2934.93	.00	1.85	.00	2.000	.000	.00	.0
- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
WALL ENTRANCE														
1030.110	2931.479	3.457	2934.936	29.00	.68	.01	2934.94	.00	.56	12.29	10.000	12.290	.00	.0
- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
2.500	.0004					.0000	.00	3.46	.06	1.10	.013	.00	.00	RECTANG
1032.610	2931.480	3.456	2934.936	29.00	.68	.01	2934.94	.00	.56	12.29	10.000	12.290	.00	.0
- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
JUNCT STR	.0000					.0000	.00	3.46	.06		.013	.00	.00	RECTANG
1032.610	2931.480	3.467	2934.947	14.00	7.92	.97	2935.92	.00	1.38	.00	1.500	.000	.00	.0
- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
2.500	.2000					.0178	.04	3.47	.00	.56	.013	.00	.00	PIPE
1035.110	2931.980	3.011	2934.991	14.00	7.92	.97	2935.97	.00	1.38	.00	1.500	.000	.00	.0
- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
WALL EXIT														
1035.110	2931.980	3.012	2934.992	14.00	7.92	.97	2935.97	.00	1.38	.00	1.500	.000	.00	.0
- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
108.740	.0100					.0178	1.93	3.01	.00	1.50	.013	.00	.00	PIPE
1143.850	2933.070	3.854	2936.924	14.00	7.92	.97	2937.90	.00	1.38	.00	1.500	.000	.00	.0
- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -

East Parcel 2.10 WSPG Model - SDE

Ultimate Condition WSPG Summary East Parcel 2.10 System (SDE.WSW)										
WSPG Station	Equivalent Roadway Station	Improvement Plan Sheet	Storm Drain Dimension	Invert Elevation (ft)	Q ₁₀₀ (cfs)	WSE (ft)	Velocity (ft/s)	FG Elevation	Facility Description	HGL Check ¹
1 - 'HGL Check' reflects the minimum 1-ft below finished grade.										
977.84	25+77.89	PP-8	42" RCP	2885.39	88.0	2886.70	26.77	2893.37	SDMH #11	OK
1000.00	12+83.06	PP-8	42" RCP	2894.25	88.0	2896.85	11.49	2899.25	SDMH #18	OK
1074.56	N/A	N/A	42" RCP	2895.00	88.0	2897.92	10.28	2903.25	SDMH #3	OK
1074.56			36" RCP	2890.99	64.0	2894.14	9.05	2903.25		OK
1137.43			36" RCP	2896.13	64.0	2899.25	9.05	2902.04		OK
1137.43			36" RCP	2896.13	64.0	2899.37	9.05	2902.04	SDMH #2	OK
1137.43			30" RCP	2891.99	40.0	2898.92	9.09	2902.04		OK
1328.81			30" RCP	2901.45	40.0	2903.55	9.09	2907.25		OK
1328.81			30" RCP	2901.45	40.0	2903.58	8.98	2907.25	SDMH #1	OK
1328.81			24" RCP	2901.95	20.0	2904.57	6.37	2907.25		OK
1357.62			24" RCP	2902.24	20.0	2904.80	6.37	2907.95	SDDI #3	OK

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

SDE

T1 SKYE CANYON NORTH ARROYO - TDS									
T2 REFERENCED FROM SKYE CANYON PARCEL 2.10 - TDS ADD									
T3 ONSITE STORM DRAIN - EAST MAINLINE									
S0	977.840	2885.390	42	.013					2890.498
R	1000.000	2894.250	42	.013					
R	1074.560	2895.000	42	.013					
JX	1074.560	2895.500	36	24	.013	24.000			2896.500
R	1137.429	2896.129	36		.013				
R	1137.430	2896.130	36		.013				
JX	1137.430	2896.630	30	24	.013	24.000			2897.130
R	1328.809	2901.449	30		.013				
R	1328.810	2901.450	30		.013				
JX	1328.810	2901.950	24	24	.013	20.000			2901.950
R	1357.620	2902.240	24		.013				
SH	1357.620	2902.240	24		.013				
CD	18	4	0	0.000	1.500	0.000	0.000	0.000	0.0000.00
CD	24	4	0	0.000	2.000	0.000	0.000	0.000	0.0000.00
CD	30	4	0	0.000	2.500	0.000	0.000	0.000	0.0000.00
CD	36	4	0	0.000	3.000	0.000	0.000	0.000	0.0000.00
CD	42	4	0	0.000	3.500	0.000	0.000	0.000	0.0000.00
Q			20.000	0					

W S P G W - EDIT LISTING - Version 14.10
 WATER SURFACE PROFILE - CHANNEL DEFINITION LISTING

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

CD 18 4 0 1.500
 CD 24 4 0 2.000
 CD 30 4 0 2.500
 CD 36 4 0 3.000
 CD 42 4 0 3.500

W S P G W

PAGE NO 1

WATER SURFACE PROFILE - TITLE CARD LISTING

HEADING LINE NO 1 IS -

SKYE CANYON NORTH ARROYO - TDS

HEADING LINE NO 2 IS -

REFERENCED FROM SKYE CANYON PARCEL 2.10 - TDS ADD

HEADING LINE NO 3 IS -

ONSITE STORM DRAIN - EAST MAINLINE

W S P G W

PAGE NO 2

WATER SURFACE PROFILE - ELEMENT CARD LISTING

ELEMENT NO 1 IS A SYSTEM OUTLET *
 U/S DATA STATION INVERT SECT
 977.840 2885.390 42
 W S ELEV
 2890.498

ELEMENT NO 2 IS A REACH
 U/S DATA STATION INVERT SECT
 1000.000 2894.250 42

ELEMENT NO 3 IS A REACH
 U/S DATA STATION INVERT SECT
 1074.560 2895.000 42

ELEMENT NO 4 IS A JUNCTION
 U/S DATA STATION INVERT SECT LAT-1 LAT-2 N Q3 Q4 INVERT-3 INVERT-4 PHI 3 PHI 4
 1074.560 2895.500 36 24 0 .013 24.000 .000 2896.500 .000 35.000 .000
 RADIUS .000 .000 .000 .000 .000
 ANG PT MAN H .000 0

ELEMENT NO 5 IS A REACH
 U/S DATA STATION INVERT SECT
 1137.429 2896.129 36

ELEMENT NO 6 IS A REACH
 U/S DATA STATION INVERT SECT
 1137.430 2896.130 36

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
 1137.430 2896.630 30 24 0 .013 24.000 .000 2897.130 .000 63.000 .000
 RADIUS .000 .000 .000 .000 .000
 ANG PT MAN H 12.000 1

ELEMENT NO 8 IS A REACH
 U/S DATA STATION INVERT SECT
 1328.809 2901.449 30

ELEMENT NO 9 IS A REACH
 U/S DATA STATION INVERT SECT
 1328.810 2901.450 30

ELEMENT NO 10 IS A JUNCTION
 U/S DATA STATION INVERT SECT LAT-1 LAT-2 N Q3 Q4 INVERT-3 INVERT-4 PHI 3 PHI 4
 1328.810 2901.950 24 24 0 .013 20.000 .000 2901.950 .000 30.000 .000
 RADIUS .000 .000 .000 .000 .000
 ANG PT MAN H 15.000 0

SDE

W S P G W
WATER SURFACE PROFILE - ELEMENT CARD LISTING
ELEMENT NO 11 IS A REACH
U/S DATA STATION INVERT SECT
1357.620 2902.240 24
ELEMENT NO 12 IS A SYSTEM HEADWORKS
U/S DATA STATION INVERT SECT
1357.620 2902.240 24

RADIUS .000
ANGLE .000
PAGE NO 3
RADIUS .000
ANGLE .000
ANG PT MAN H
.000 0
W S ELEV
.000

Date: 7-26-2022 Time: 9:23:50

SKYE CANYON NORTH ARROYO - TDS
REFERENCED FROM SKYE CANYON PARCEL 2.10 - TDS ADD
ONSITE STORM DRAIN - EAST MAINLINE

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Width	Top Dia.	Height/ I.D.	Base Wt	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
977.840	2885.390	1.310	2886.700	88.00	26.77	11.13	2897.83	.00	2.92	3.39	3.500	.000	.00	0 .0
2.316	.3998					.0821	.19	1.31	4.79	.88	.013	.00	.00	PIPE
980.156	2886.316	1.345	2887.661	88.00	25.84	10.37	2898.03	.00	2.92	3.40	3.500	.000	.00	0 .0
2.737	.3998					.0733	.20	1.34	4.55	.88	.013	.00	.00	PIPE
982.893	2887.410	1.394	2888.804	88.00	24.64	9.43	2898.23	.00	2.92	3.43	3.500	.000	.00	0 .0
2.403	.3998					.0643	.15	1.39	4.25	.88	.013	.00	.00	PIPE
985.296	2888.371	1.444	2889.815	88.00	23.49	8.57	2898.38	.00	2.92	3.45	3.500	.000	.00	0 .0
2.115	.3998					.0565	.12	1.44	3.97	.88	.013	.00	.00	PIPE
987.411	2889.216	1.497	2890.714	88.00	22.40	7.79	2898.50	.00	2.92	3.46	3.500	.000	.00	0 .0
1.864	.3998					.0496	.09	1.50	3.71	.88	.013	.00	.00	PIPE
989.275	2889.962	1.553	2891.514	88.00	21.35	7.08	2898.60	.00	2.92	3.48	3.500	.000	.00	0 .0
1.645	.3998					.0436	.07	1.55	3.46	.88	.013	.00	.00	PIPE
990.920	2890.619	1.610	2892.229	88.00	20.36	6.44	2898.67	.00	2.92	3.49	3.500	.000	.00	0 .0
1.452	.3998					.0383	.06	1.61	3.22	.88	.013	.00	.00	PIPE
992.372	2891.200	1.671	2892.871	88.00	19.41	5.85	2898.72	.00	2.92	3.50	3.500	.000	.00	0 .0
1.281	.3998					.0337	.04	1.67	3.00	.88	.013	.00	.00	PIPE
993.652	2891.712	1.734	2893.446	88.00	18.51	5.32	2898.77	.00	2.92	3.50	3.500	.000	.00	0 .0
1.128	.3998					.0297	.03	1.73	2.80	.88	.013	.00	.00	PIPE

Date: 7-26-2022 Time: 9:23:50

SKYE CANYON NORTH ARROYO - TDS
REFERENCED FROM SKYE CANYON PARCEL 2.10 - TDS ADD
ONSITE STORM DRAIN - EAST MAINLINE

SDE

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 or I.D.	Base Wt	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
994.780	2892.163	1.800	2893.963	88.00	17.65	4.84	2898.80	.00	2.92	3.50	3.500	.000	.00	0 .0
.990	.3998					.0262	.03	1.80	2.61	.88	.013	.00	.00	PIPE
995.770	2892.559	1.870	2894.429	88.00	16.83	4.40	2898.83	.00	2.92	3.49	3.500	.000	.00	0 .0
.867	.3998					.0231	.02	1.87	2.42	.88	.013	.00	.00	PIPE
996.637	2892.905	1.943	2894.848	88.00	16.04	4.00	2898.85	.00	2.92	3.48	3.500	.000	.00	0 .0
.754	.3998					.0204	.02	1.94	2.25	.88	.013	.00	.00	PIPE
997.391	2893.207	2.020	2895.227	88.00	15.30	3.63	2898.86	.00	2.92	3.46	3.500	.000	.00	0 .0
.652	.3998					.0180	.01	2.02	2.09	.88	.013	.00	.00	PIPE
998.043	2893.467	2.102	2895.569	88.00	14.59	3.30	2898.87	.00	2.92	3.43	3.500	.000	.00	0 .0
.557	.3998					.0159	.01	2.10	1.94	.88	.013	.00	.00	PIPE
998.600	2893.690	2.188	2895.878	88.00	13.91	3.00	2898.88	.00	2.92	3.39	3.500	.000	.00	0 .0
.470	.3998					.0141	.01	2.19	1.79	.88	.013	.00	.00	PIPE
999.070	2893.878	2.280	2896.158	88.00	13.26	2.73	2898.89	.00	2.92	3.34	3.500	.000	.00	0 .0
.388	.3998					.0126	.00	2.28	1.66	.88	.013	.00	.00	PIPE
999.457	2894.033	2.378	2896.411	88.00	12.64	2.48	2898.89	.00	2.92	3.27	3.500	.000	.00	0 .0
.309	.3998					.0112	.00	2.38	1.53	.88	.013	.00	.00	PIPE
999.767	2894.157	2.483	2896.640	88.00	12.05	2.26	2898.90	.00	2.92	3.18	3.500	.000	.00	0 .0
.233	.3998					.0100	.00	2.48	1.40	.88	.013	.00	.00	PIPE

FILE: SDE.WSW

W S P G W - CIVILDESIGN Version 14.08

Program Package Serial Number: 7189

WATER SURFACE PROFILE LISTING

SKYE CANYON NORTH ARROYO - TDS

REFERENCED FROM SKYE CANYON PARCEL 2.10 - TDS ADD

ONSITE STORM DRAIN - EAST MAINLINE

Date: 7-26-2022 Time: 9:23:50

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 or I.D.	Base Wt	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
994.780	2892.163	1.800	2893.963	88.00	17.65	4.84	2898.80	.00	2.92	3.50	3.500	.000	.00	0 .0
.990	.3998					.0262	.03	1.80	2.61	.88	.013	.00	.00	PIPE
995.770	2892.559	1.870	2894.429	88.00	16.83	4.40	2898.83	.00	2.92	3.49	3.500	.000	.00	0 .0
.867	.3998					.0231	.02	1.87	2.42	.88	.013	.00	.00	PIPE
996.637	2892.905	1.943	2894.848	88.00	16.04	4.00	2898.85	.00	2.92	3.48	3.500	.000	.00	0 .0
.754	.3998					.0204	.02	1.94	2.25	.88	.013	.00	.00	PIPE
997.391	2893.207	2.020	2895.227	88.00	15.30	3.63	2898.86	.00	2.92	3.46	3.500	.000	.00	0 .0
.652	.3998					.0180	.01	2.02	2.09	.88	.013	.00	.00	PIPE
998.043	2893.467	2.102	2895.569	88.00	14.59	3.30	2898.87	.00	2.92	3.43	3.500	.000	.00	0 .0
.557	.3998					.0159	.01	2.10	1.94	.88	.013	.00	.00	PIPE
998.600	2893.690	2.188	2895.878	88.00	13.91	3.00	2898.88	.00	2.92	3.39	3.500	.000	.00	0 .0
.470	.3998					.0141	.01	2.19	1.79	.88	.013	.00	.00	PIPE
999.070	2893.878	2.280	2896.158	88.00	13.26	2.73	2898.89	.00	2.92	3.34	3.500	.000	.00	0 .0
.388	.3998					.0126	.00	2.28	1.66	.88	.013	.00	.00	PIPE
999.457	2894.033	2.378	2896.411	88.00	12.64	2.48	2898.89	.00	2.92	3.27	3.500	.000	.00	0 .0
.309	.3998					.0112	.00	2.38	1.53	.88	.013	.00	.00	PIPE
999.767	2894.157	2.483	2896.640	88.00	12.05	2.26	2898.90	.00	2.92	3.18	3.500	.000	.00	0 .0
.233	.3998					.0100	.00	2.48	1.40	.88	.013	.00	.00	PIPE

SDE

1000.000	2894.250	2.598	2896.847	88.00	11.49	2.05	2898.90	.00	2.92	3.06	3.500	.000	.00	.0
- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
30.548	.0101					.0093	.28	2.60	1.28	2.53	.013	.00	.00	PIPE
1030.548	2894.557	2.639	2897.196	88.00	11.31	1.99	2899.18	.00	2.92	3.01	3.500	.000	.00	.0
- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
35.869	.0101					.0086	.31	2.64	1.24	2.53	.013	.00	.00	PIPE
1066.417	2894.918	2.769	2897.687	88.00	10.78	1.80	2899.49	.00	2.92	2.85	3.500	.000	.00	.0
- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
8.143	.0101					.0078	.06	2.77	1.12	2.53	.013	.00	.00	PIPE
1074.560	2895.000	2.915	2897.916	88.00	10.28	1.64	2899.55	.00	2.92	2.61	3.500	.000	.00	.0
- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
JUNCT STR	.0000					.0083	.00	2.92	1.00			.00	.00	PIPE
1074.560	2895.500	3.109	2898.609	64.00	9.05	1.27	2899.88	.00	2.57	.00	3.000	.000	.00	.0
- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
62.869	.0100					.0092	.58	3.11	.00	2.36	.013	.00	.00	PIPE
1137.429	2896.129	3.122	2899.251	64.00	9.05	1.27	2900.52	.00	2.57	.00	3.000	.000	.00	.0
- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
1137.430	2896.130	3.235	2899.365	64.00	9.05	1.27	2900.64	.00	2.57	.00	3.000	.000	.00	.0
- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
JUNCT STR	.0000					.0094	.00	3.24	.00			.00	.00	PIPE
1137.430	2896.630	3.618	2900.248	40.00	8.15	1.03	2901.28	.00	2.13	.00	2.500	.000	.00	.0
- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
42.494	.0252					.0095	.40	3.62	.00	1.42	.013	.00	.00	PIPE
1179.924	2897.700	2.981	2900.681	40.00	8.15	1.03	2901.71	.00	2.13	.00	2.500	.000	.00	.0
- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
HYDRAULIC JUMP														
1179.924	2897.700	1.453	2899.153	40.00	13.51	2.83	2901.99	.00	2.13	2.47	2.500	.000	.00	.0
- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
33.482	.0252					.0228	.76	1.45	2.17	1.42	.013	.00	.00	PIPE
FILE: SDE.MSW														PAGE 4

Date: 7-26-2022 Time: 9:23:50

Program Package Serial Number: 7189
W S P G W - CIVILDESIGN Version 14.08

SKYE CANYON NORTH ARROYO - TDS
REFERENCED FROM SKYE CANYON PARCEL 2.10 - TDS ADD
ONSITE STORM DRAIN - EAST MAINLINE

*****														*****	
Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Width	Top Height/ Dia.-FT	Base Wt I.D.	No Wth Prs/Pip ZL		
L/Elem	Ch Slope	*****	*****	*****	*****	SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall ZR	Type Ch	*****	
1213.406	2898.543	1.472	2900.015	40.00	13.30	2.75	2902.76	.00	2.13	2.46	2.500	.000	.00	.0	-
- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	-

SDE														PIPE	
45.889	.0252					.0210	.97	1.47	2.12	1.42	.013	.00	.00	PIPE	
1259.295	2899.698	1.532	2901.230	40.00	12.68	2.50	2903.73	.00	2.13	2.44	2.500	.000	.00	0	.0
25.004	.0252	- -	- -	- -	- -	.0186	.47	1.53	1.96	1.42	.013	.00	.00	PIPE	
1284.300	2900.328	1.596	2901.924	40.00	12.09	2.27	2904.19	.00	2.13	2.40	2.500	.000	.00	0	.0
16.063	.0252	- -	- -	- -	- -	.0165	.27	1.60	1.82	1.42	.013	.00	.00	PIPE	
1300.363	2900.732	1.663	2902.396	40.00	11.53	2.06	2904.46	.00	2.13	2.36	2.500	.000	.00	0	.0
10.993	.0252	- -	- -	- -	- -	.0147	.16	1.66	1.68	1.42	.013	.00	.00	PIPE	
1311.356	2901.009	1.736	2902.745	40.00	11.00	1.88	2904.62	.00	2.13	2.30	2.500	.000	.00	0	.0
7.655	.0252	- -	- -	- -	- -	.0131	.10	1.74	1.54	1.42	.013	.00	.00	PIPE	
1319.011	2901.202	1.814	2903.016	40.00	10.48	1.71	2904.72	.00	2.13	2.23	2.500	.000	.00	0	.0
5.196	.0252	- -	- -	- -	- -	.0117	.06	1.81	1.41	1.42	.013	.00	.00	PIPE	
1324.207	2901.333	1.900	2903.232	40.00	10.00	1.55	2904.78	.00	2.13	2.14	2.500	.000	.00	0	.0
3.210	.0252	- -	- -	- -	- -	.0106	.03	1.90	1.29	1.42	.013	.00	.00	PIPE	
1327.417	2901.414	1.994	2903.407	40.00	9.53	1.41	2904.82	.00	2.13	2.01	2.500	.000	.00	0	.0
1.392	.0252	- -	- -	- -	- -	.0096	.01	1.99	1.16	1.42	.013	.00	.00	PIPE	
1328.809	2901.449	2.100	2903.549	40.00	9.09	1.28	2904.83	.00	2.13	1.83	2.500	.000	.00	0	.0
.001	.8889	- -	- -	- -	- -	.0090	.00	2.10	1.03	.54	.013	.00	.00	PIPE	5
FILE: SDE.WSW W S P G W - CIVILDDESIGN Version 14.08															

Date: 7-26-2022 Time: 9:23:50

WATER SURFACE PROFILE LISTING

SKYE CANYON NORTH ARROYO - TDS

REFERENCED FROM SKYE CANYON PARCEL 2.10 - TDS ADD

ONSITE STORM DRAIN - EAST MAINLINE

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Width	Top Dia.	Height/ 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
1328.810	2901.450	2.129	2903.578	40.00	8.98	1.25	2904.83	.00	2.13	1.78	2.500	.000	.00	0 .0
JUNCT STR	.0000					.0084	.00	2.13	1.00		.013	.00	.00	PIPE
1328.810	2901.950	2.624	2904.574	20.00	6.37	.63	2905.20	.00	1.61	.00	2.000	.000	.00	0 .0
28.810	.0101					.0078	.23	2.62	.00	1.46	.013	.00	.00	PIPE

1357.620	2902.240	2.559	2904.799	20.00	6.37	.63	2905.43	SDE	.00	1.61	.00	2.000	.000	.00	0	.0
-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	

Drop Inlet #2 and #5 System WSPG Model – DI52

Ultimate Condition WSPG Summary										
NDOT DROP INLETS #2 AND #5 SYSTEM System (DI52.WSW)										
year	Storm Drain Station	Improvement Plan Sheet	Storm Drain Dimension	Invert Elevation (ft)	Q ₁₀₀ (cfs)	WSE (ft)	Velocity (ft/s)	FG Elevation	Facility Description	HGL Check ¹
1 - 'HGL Check' reflects the minimum 1-ft below finished grade.										
1000.00	26+90.87	PP-8	24" RCP	2882.66	11.0	2883.50	10.82	2889.14	SDMH #2	OK
1022.07	0+88.28	PP-8	24" RCP	2882.79	11.0	2883.51	13.14	2887.30	SDDI #2	OK
1024.57		PP-8	24" RCP	2882.81	11.0	2883.51	13.45	2887.30		OK
1024.67		PP-8	18" RCP	2882.81	7.0	2883.21	18.16	2887.30		OK
1025.92		PP-8	24" RCP	2882.81	7.0	2883.21	18.56	2887.30		OK
1027.17	0+50.00	PP-8	24" RCP	2882.82	7.0	2883.21	18.98	2887.30	SDDI #5	OK
1065.45		PP-8	24" RCP	2891.98	7.0	2893.00	5.45	2895.00		OK

DI52

T1 CEN2018: SKYE CANYON NORTH ARROYO
T2 Drop Inlet #5 and #2 (DI52.WSW)
T3 NDOT field inlets #2 and #5

SO	1000.0002882.660	18				2883.300			
R	1022.0702882.790	18	.013					0.0	
R	1024.5702882.805	18	.013					0.0	
JX	1024.6702882.805	18	.013	4.0		2882.805		90.0	
R	1025.9202882.813	18	.013					15.0	
R	1027.1702882.820	18	.013					8.0	
R	1065.4502891.980	18	.013						
SH	1065.4502891.980	18							
CD	1	3	0	0.000	6.000	0.000	0.000	0.000	0.00
CD	18	4	1	0.000	1.500	0.000	0.000	0.000	0.00
CD	24	4	1	0.000	2.000	0.000	0.000	0.000	0.00
CD	30	4	1	0.000	2.500	0.000	0.000	0.000	0.00
CD	36	4	1	0.000	3.000	0.000	0.000	0.000	0.00
CD	42	4	1	0.000	3.500	0.000	0.000	0.000	0.00
CD	48	4	1	0.000	4.000	0.000	0.000	0.000	0.00
CD	54	4	1	0.000	4.500	0.000	0.000	0.000	0.00
CD	60	4	1	0.000	5.000	0.000	0.000	0.000	0.00
CD	66	4	1	0.000	5.500	0.000	0.000	0.000	0.00
CD	2	3	0	0.000	9.000	7.000	0.000	0.000	0.00
Q					7.000				

FILE: DI52.WSW

W S P G W - EDIT LISTING - Version 14.10

Date: 9-14-2022 Time: 3:13:28

WATER SURFACE PROFILE - CHANNEL DEFINITION LISTING

CARD

SECT

CHN

NO

OF

AVE

PIER

HEIGHT

1

BASE

ZL

ZR

INV

Y(1)

Y(2)

Y(3)

Y(4)

Y(5)

Y(6)

Y(7)

Y(8)

Y(9)

Y(10)

CODE

NO

TYPE

PIER/PIP

WIDTH

DIAMETER

WIDTH

DROP

CD	1	3	0	.000	6.000	6.000	.000	.00
CD	18	4	1	1.500				
CD	24	4	1	2.000				
CD	30	4	1	2.500				
CD	36	4	1	3.000				
CD	42	4	1	3.500				
CD	48	4	1	4.000				
CD	54	4	1	4.500				
CD	60	4	1	5.000				
CD	66	4	1	5.500				
CD	2	3	0	.000	7.000	.000	.000	.00

PAGE NO 1

WATER SURFACE PROFILE - TITLE CARD LISTING

HEADING LINE NO 1 IS -

CEN2018: SKYE CANYON NORTH ARROYO

HEADING LINE NO 2 IS -

Drop Inlet #5 and #2 (DI52.WSW)

HEADING LINE NO 3 IS -

NDOT field inlets #2 and #5

WSPGW

WATER SURFACE PROFILE - ELEMENT CARD LISTING

[illegible]

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

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

ELEMENT NO	5 IS A REACH	* STATION	* INVERT	N	RADIUS	ANGLE	ANG PT	H
	U/S DATA			.013	.000	.000	15.000	Ø
ELEMENT NO	6 IS A REACH	* STATION	* INVERT	N	RADIUS	ANGLE	ANG PT	H
	U/S DATA	1027.170	2882.820	.013	.000	.000	8.000	Ø
ELEMENT NO	7 IS A REACH	* STATION	* INVERT	N	RADIUS	ANGLE	ANG PT	H
	U/S DATA	1065.450	2891.980	.013	.000	.000	.000	Ø
ELEMENT NO	8 IS A SYSTEM HEADWORKS	* STATION	* INVERT	*	W S ELEV			.000
	U/S DATA	1065.450	2891.980					

Date: 9-14-2022 Time: 3:13:33

CEN2018: SKYE CANYON NORTH ARROYO
Drop Inlet #5 and #2 (DI52.WSW)
NDOT field inlets #2 and #5

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Width	Flow Top Dia.-FT	Height/ Base Wt or I.D.	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	ISE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR Type Ch
1000.000	2882.660	.839	2883.499	11.00	10.82	1.82	2885.32	.00	1.27	1.49	1.500	.000	1 .0
.341	.0059					.0304	.01		2.31	1.50	.013	.00	PIPE
1000.341	2882.662	.837	2883.499	11.00	10.86	1.83	2885.33	.00	1.27	1.49	1.500	.000	1 .0
5.672	.0059					.0326	.18		2.32	1.50	.013	.00	PIPE
1006.013	2882.696	.805	2883.500	11.00	11.39	2.01	2885.51	.00	1.27	1.50	1.500	.000	1 .0
5.517	.0059					.0370	.20		2.50	1.50	.013	.00	PIPE
1011.530	2882.728	.775	2883.503	11.00	11.94	2.22	2885.72	.00	1.27	1.50	1.500	.000	1 .0
5.352	.0059					.0419	.22		2.69	1.50	.013	.00	PIPE
1016.883	2882.760	.746	2883.506	11.00	12.53	2.44	2885.94	.00	1.27	1.50	1.500	.000	1 .0
5.187	.0059					.0476	.25		2.89	1.50	.013	.00	PIPE
1022.070	2882.790	.719	2883.509	11.00	13.14	2.68	2886.19	.00	1.27	1.50	1.500	.000	1 .0
2.500	.0060					.0523	.13		3.10	1.50	.013	.00	PIPE
1024.570	2882.805	.706	2883.511	11.00	13.45	2.81	2886.32	.00	1.27	1.50	1.500	.000	1 .0
JUNCT STR	.0000					.1140	.01		3.21		.013	.00	PIPE
1024.670	2882.805	.405	2883.210	7.00	18.16	5.12	2888.33	.00	1.02	1.33	1.500	.000	1 .0
1.250	.0064					.1796	.22		5.95	1.04	.013	.00	PIPE
1025.920	2882.813	.399	2883.212	7.00	18.56	5.35	2888.56	.00	1.02	1.33	1.500	.000	1 .0
1.250	.0057					.1910	.24		6.13	1.10	.013	.00	PIPE

Date: 9-14-2022 Time: 3:13:33

CEN2018: SKYE CANYON NORTH ARROYO
Drop Inlet #5 and #2 (DI52.WSW)
NDOT field inlets #2 and #5

DI52

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Width	Flow Top Dia.-FT	Height/ I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	ISE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
1027.170	2882.820	.393	2883.213	7.00	18.98	5.60	2888.81	.00	1.02	1.32	1.500	.000	.00	1 .0
2.126	.2393					.1947	.41	.39	6.33	.37	.013	.00	.00	PIPE
1029.296	2883.329	.395	2883.724	7.00	18.82	5.50	2889.22	.00	1.02	1.32	1.500	.000	.00	1 .0
8.247	.2393					.1803	1.49	.40	6.25	.37	.013	.00	.00	PIPE
1037.543	2885.302	.409	2885.711	7.00	17.94	5.00	2890.71	.00	1.02	1.34	1.500	.000	.00	1 .0
5.403	.2393					.1578	.85	.41	5.85	.37	.013	.00	.00	PIPE
1042.946	2886.595	.423	2887.018	7.00	17.11	4.55	2891.56	.00	1.02	1.35	1.500	.000	.00	1 .0
3.938	.2393					.1381	.54	.42	5.48	.37	.013	.00	.00	PIPE
1046.884	2887.537	.438	2887.975	7.00	16.31	4.13	2892.11	.00	1.02	1.36	1.500	.000	.00	1 .0
3.043	.2393					.1209	.37	.44	5.13	.37	.013	.00	.00	PIPE
1049.927	2888.266	.453	2888.719	7.00	15.55	3.76	2892.48	.00	1.02	1.38	1.500	.000	.00	1 .0
2.440	.2393					.1058	.26	.45	4.80	.37	.013	.00	.00	PIPE
1052.367	2888.850	.469	2889.318	7.00	14.83	3.42	2892.73	.00	1.02	1.39	1.500	.000	.00	1 .0
2.005	.2393					.0927	.19	.47	4.49	.37	.013	.00	.00	PIPE
1054.372	2889.329	.485	2889.815	7.00	14.14	3.10	2892.92	.00	1.02	1.40	1.500	.000	.00	1 .0
1.676	.2393					.0812	.14	.49	4.20	.37	.013	.00	.00	PIPE
1056.049	2889.730	.503	2890.233	7.00	13.48	2.82	2893.06	.00	1.02	1.42	1.500	.000	.00	1 .0
1.420	.2393					.0711	.10	.50	3.92	.37	.013	.00	.00	PIPE

FILE: DI52.WSW

Program Package Serial Number: 7189

W S P G W - CIVILDESIGN Version 14.08

WATER SURFACE PROFILE LISTING

Date: 9-14-2022 Time: 3:13:33

CEN2018: SKYE CANYON NORTH ARROYO
Drop Inlet #5 and #2 (DI52.WSW)
NDOT field inlets #2 and #5

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Width	Flow Top Dia.-FT	Height/ I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	ISE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
1027.170	2882.820	.393	2883.213	7.00	18.98	5.60	2888.81	.00	1.02	1.32	1.500	.000	.00	1 .0
2.126	.2393					.1947	.41	.39	6.33	.37	.013	.00	.00	PIPE
1029.296	2883.329	.395	2883.724	7.00	18.82	5.50	2889.22	.00	1.02	1.32	1.500	.000	.00	1 .0
8.247	.2393					.1803	1.49	.40	6.25	.37	.013	.00	.00	PIPE
1037.543	2885.302	.409	2885.711	7.00	17.94	5.00	2890.71	.00	1.02	1.34	1.500	.000	.00	1 .0
5.403	.2393					.1578	.85	.41	5.85	.37	.013	.00	.00	PIPE
1042.946	2886.595	.423	2887.018	7.00	17.11	4.55	2891.56	.00	1.02	1.35	1.500	.000	.00	1 .0
3.938	.2393					.1381	.54	.42	5.48	.37	.013	.00	.00	PIPE
1046.884	2887.537	.438	2887.975	7.00	16.31	4.13	2892.11	.00	1.02	1.36	1.500	.000	.00	1 .0
3.043	.2393					.1209	.37	.44	5.13	.37	.013	.00	.00	PIPE
1049.927	2888.266	.453	2888.719	7.00	15.55	3.76	2892.48	.00	1.02	1.38	1.500	.000	.00	1 .0
2.440	.2393					.1058	.26	.45	4.80	.37	.013	.00	.00	PIPE
1052.367	2888.850	.469	2889.318	7.00	14.83	3.42	2892.73	.00	1.02	1.39	1.500	.000	.00	1 .0
2.005	.2393					.0927	.19	.47	4.49	.37	.013	.00	.00	PIPE
1054.372	2889.329	.485	2889.815	7.00	14.14	3.10	2892.92	.00	1.02	1.40	1.500	.000	.00	1 .0
1.676	.2393					.0812	.14	.49	4.20	.37	.013	.00	.00	PIPE
1056.049	2889.730	.503	2890.233	7.00	13.48	2.82	2893.06	.00	1.02	1.42	1.500	.000	.00	1 .0
1.420	.2393					.0711	.10	.50	3.92	.37	.013	.00	.00	PIPE

DI52														
1057.469	2890.070	.520	2890.591	7.00	12.85	2.57	2893.16	.00	1.02	1.43	1.500	.000	.00	1 .0
1.214	.2393	-	-	-	-	.0623	.08	.52	3.67	.37	.013	.00	.00	PIPE
1058.682	2890.361	.539	2890.900	7.00	12.26	2.33	2893.23	.00	1.02	1.44	1.500	.000	.00	1 .0
1.044	.2393	-	-	-	-	.0546	.06	.54	3.43	.37	.013	.00	.00	PIPE
1059.726	2890.611	.558	2891.169	7.00	11.69	2.12	2893.29	.00	1.02	1.45	1.500	.000	.00	1 .0
.902	.2393	-	-	-	-	.0479	.04	.56	3.20	.37	.013	.00	.00	PIPE
1060.628	2890.826	.578	2891.405	7.00	11.14	1.93	2893.33	.00	1.02	1.46	1.500	.000	.00	1 .0
.783	.2393	-	-	-	-	.0420	.03	.58	2.99	.37	.013	.00	.00	PIPE
1061.411	2891.014	.599	2891.613	7.00	10.62	1.75	2893.37	.00	1.02	1.47	1.500	.000	.00	1 .0
.679	.2393	-	-	-	-	.0369	.03	.60	2.80	.37	.013	.00	.00	PIPE
1062.090	2891.176	.621	2891.797	7.00	10.13	1.59	2893.39	.00	1.02	1.48	1.500	.000	.00	1 .0
.590	.2393	-	-	-	-	.0324	.02	.62	2.61	.37	.013	.00	.00	PIPE
1062.680	2891.318	.644	2891.961	7.00	9.66	1.45	2893.41	.00	1.02	1.48	1.500	.000	.00	1 .0
.512	.2393	-	-	-	-	.0285	.01	.64	2.44	.37	.013	.00	.00	PIPE
1063.192	2891.440	.668	2892.107	7.00	9.21	1.32	2893.42	.00	1.02	1.49	1.500	.000	.00	1 .0
.442	.2393	-	-	-	-	.0250	.01	.67	2.27	.37	.013	.00	.00	PIPE
1063.634	2891.546	.692	2892.238	7.00	8.78	1.20	2893.44	.00	1.02	1.50	1.500	.000	.00	1 .0
.382	.2393	-	-	-	-	.0220	.01	.69	2.12	.37	.013	.00	.00	PIPE

FILE: DI52.WSW

W S P G W - CIVILDESIGN Version 14.08

Program Package Serial Number: 7189

WATER SURFACE PROFILE LISTING

Date: 9-14-2022 Time: 3:13:33

CEN2018: SKYE CANYON NORTH ARROYO

Drop Inlet #5 and #2 (DI52.WSW)

NDOT field inlets #2 and #5

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

1064.016	2891.637	.718	2892.355	7.00	8.37	1.09	2893.44	.00	1.02	1.50	1.500	.000	.00	1 .0
.326	.2393	-	-	-	-	.0194	.01	.72	1.98	.37	.013	.00	.00	PIPE
1064.342	2891.715	.746	2892.461	7.00	7.98	.99	2893.45	.00	1.02	1.50	1.500	.000	.00	1 .0

DI52														
1064.618	2891.781	774	2892.555	7.00	7.61	.90	2893.45	.00	-.75	1.84	.37	.013	-.00	PIPE
1064.618	2891.781	774	2892.555	7.00	7.61	.90	2893.45	.00	-.00	1.02	1.50	1.500	.000	1 .0
1064.618	2891.781	774	2892.555	7.00	7.61	.90	2893.45	.00	-.77	1.71	.37	.013	.00	PIPE
1064.849	2891.836	804	2892.641	7.00	7.26	.82	2893.46	.00	-.00	1.02	1.50	1.500	.000	1 .0
1064.849	2891.836	804	2892.641	7.00	7.26	.82	2893.46	.00	-.80	1.59	.37	.013	.00	PIPE
1065.038	2891.882	836	2892.718	7.00	6.92	.74	2893.46	.00	-.00	1.02	1.49	1.500	.000	1 .0
1065.038	2891.882	836	2892.718	7.00	6.92	.74	2893.46	.00	-.84	1.48	.37	.013	.00	PIPE
1065.189	2891.918	869	2892.787	7.00	6.60	.68	2893.46	.00	-.00	1.02	1.48	1.500	.000	1 .0
1065.189	2891.918	869	2892.787	7.00	6.60	.68	2893.46	.00	-.87	1.37	.37	.013	.00	PIPE
1065.304	2891.945	904	2892.849	7.00	6.29	.61	2893.46	.00	-.00	1.02	1.47	1.500	.000	1 .0
1065.304	2891.945	904	2892.849	7.00	6.29	.61	2893.46	.00	-.90	1.27	.37	.013	.00	PIPE
1065.385	2891.965	941	2892.906	7.00	6.00	.56	2893.46	.00	-.00	1.02	1.45	1.500	.000	1 .0
1065.385	2891.965	941	2892.906	7.00	6.00	.56	2893.46	.00	-.94	1.18	.37	.013	.00	PIPE
1065.433	2891.976	981	2892.957	7.00	5.72	.51	2893.46	.00	-.00	1.02	1.43	1.500	.000	1 .0
1065.433	2891.976	981	2892.957	7.00	5.72	.51	2893.46	.00	-.98	1.09	.37	.013	.00	PIPE
1065.450	2891.980	1024	2893.004	7.00	5.45	.46	2893.46	.00	-.00	1.02	1.40	1.500	.000	1 .0

FILE: DI52.WSW

W S P G W - CIVILDESIGN Version 14.08

Program Package Serial Number: 7189

CEN2018: SKYE CANYON NORTH ARROYO

Drop Inlet #5 and #2 (DI52.WSW)

NDOT field inlets #2 and #5

WATER SURFACE PROFILE LISTING

Date: 9-14-2022 Time: 3:13:33

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Width	Top 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
1065.450	2891.980	1.024	2893.004	7.00	5.45	.46	2893.46	.00	1.02	1.40	1.500	.000	.00	1 .0

Inlet Sizing Computations

Grate Inlet Sizing Computation

Project Name & Number: CEN2018: SKYE CANYON NORTH ARROYO
Date: 9/15/2022
By: PK

Westwood

Notes:

Facility ID: SDDI#1
Drainage Condition: Proposed
Source of Flow: Q100 = WARR3(A)+PR2 = 48+1.5 = 49.5
Inlet Type: NDOT Type 2
Inlet Size: 6' X 4'

Known Information:

Q = Flow (cfs)	49.5
W = Width of Grate (ft)	4.00
L = Length of Grate (ft)	6.00
D = Diameter of Circle (in)	
Cf = Clogging Factor (%)	50

Weir Conditions:

$$HW = (Q/(Cw*Pc))^{2/3}$$

Cw = Weir Coefficient	3.00
P = Perimeter of grate (ft)	20.0
Pc = Perimeter (w/clogging) (ft)	10.0
HW = Headwater depth (ft)	1.40

Orifice Conditions:

$$HW = (Q/(Co*Ac))^2/2*g$$

Co = Orifice Coefficient	0.67
Ag = Grate Area (ft ²)	24.00
Gf = Grate Opening Factor	0.70
Ac = Grate Open Area (w/ clogging) (ft ²)	8.40
g = Gravity (fps)	32.20
HW = Headwater depth (ft)	1.20

Output:

Worst Case Scenario Occurs Under Weir Conditions

Headwater Depth = 1.40 ft with grate

Grate Inlet Sizing Computation

Project Name & Number: CEN2018: SKYE CANYON NORTH ARROYO
Date: 9/15/2022
By: PK

Westwood

Notes:

Facility ID: SDDI#2
Drainage Condition: Proposed
Source of Flow: Q100= WARR3(B)
Inlet Type: NDOT Type 2
Inlet Size: 2' X 2.5'

Known Information:

Q = Flow (cfs)	4.0
W = Width of Grate (ft)	2.50
L = Length of Grate (ft)	2.00
D = Diameter of Circle (in)	
Cf = Clogging Factor (%)	50

Weir Conditions:

$$HW = (Q/(Cw * Pc))^{2/3}$$

Cw = Weir Coefficient	3.00
P = Perimeter of grate (ft)	9.0
Pc = Perimeter (w/clogging) (ft)	4.5
HW = Headwater depth (ft)	0.44

Orifice Conditions:

$$HW = (Q/(Co * Ac))^2 / 2 * g$$

Co = Orifice Coefficient	0.67
Ag = Grate Area (ft ²)	5.00
Gf = Grate Opening Factor	0.70
Ac = Grate Open Area (w/ clogging) (ft ²)	1.75
g = Gravity (fps)	32.20
HW = Headwater depth (ft)	0.18

Output:

Worst Case Scenario Occurs Under Weir Conditions

Headwater Depth = 0.44 ft with grate

Grate Inlet Sizing Computation

Project Name & Number: CEN2018: SKYE CANYON NORTH ARROYO
Date: 9/15/2022
By: PK

Westwood

Notes:

Facility ID: SDDI#3
Drainage Condition: Proposed
Source of Flow: Q100= WARR3(C)
Inlet Type: NDOT Type 2
Inlet Size: 2' X 2.5'

Known Information:

Q = Flow (cfs)	3.0
W = Width of Grate (ft)	2.50
L = Length of Grate (ft)	2.00
D = Diameter of Circle (in)	
Cf = Clogging Factor (%)	50

Weir Conditions:

$$HW = (Q/(Cw \cdot Pc))^{2/3}$$

Cw = Weir Coefficient	3.00
P = Perimeter of grate (ft)	9.0
Pc = Perimeter (w/ clogging) (ft)	4.5
HW = Headwater depth (ft)	0.37

Orifice Conditions:

$$HW = (Q/(Co \cdot Ac))^2 / 2 \cdot g$$

Co = Orifice Coefficient	0.67
Ag = Grate Area (ft ²)	5.00
Gf = Grate Opening Factor	0.70
Ac = Grate Open Area (w/ clogging) (ft ²)	1.75
g = Gravity (fps)	32.20
HW = Headwater depth (ft)	0.10

Output:

Worst Case Scenario Occurs Under Weir Conditions

Headwater Depth = 0.37 ft with grate

Grate Inlet Sizing Computation

Project Name & Number: CEN2018: SKYE CANYON NORTH ARROYO
Date: 9/15/2022
By: PK

Westwood

Notes:

Facility ID: SDDI#4
Drainage Condition: Proposed
Source of Flow: Q100= WARR3(D)
Inlet Type: NDOT Type 2
Inlet Size: 2' X 2.5'

Known Information:

Q = Flow (cfs)	1.5
W = Width of Grate (ft)	2.50
L = Length of Grate (ft)	2.00
D = Diameter of Circle (in)	
Cf = Clogging Factor (%)	50

Weir Conditions:

$$HW = (Q/(Cw * Pc))^{2/3}$$

Cw = Weir Coefficient	3.00
P = Perimeter of grate (ft)	9.0
Pc = Perimeter (w/clogging) (ft)	4.5
HW = Headwater depth (ft)	0.23

Orifice Conditions:

$$HW = (Q/(Co * Ac))^2 / 2 * g$$

Co = Orifice Coefficient	0.67
Ag = Grate Area (ft ²)	5.00
Gf = Grate Opening Factor	0.70
Ac = Grate Open Area (w/ clogging) (ft ²)	1.75
g = Gravity (fps)	32.20
HW = Headwater depth (ft)	0.03

Output:

Worst Case Scenario Occurs Under Weir Conditions

Headwater Depth = 0.23 ft with grate

Grate Inlet Sizing Computation

Project Name & Number: CEN2018: SKYE CANYON NORTH ARROYO
Date: 9/15/2022
By: PK

Westwood

Notes:

Facility ID: SDDI#5
Drainage Condition: Proposed
Source of Flow: Q100= BAS1(D)
Inlet Type: NDOT Type 2
Inlet Size: 2' X 2.5'

Known Information:

Q = Flow (cfs) 7.0
W = Width of Grate (ft) 2.50
L = Length of Grate (ft) 2.00
D = Diameter of Circle (in)
Cf = Clogging Factor (%) 50

Weir Conditions:

$$HW = (Q/(Cw \cdot Pc))^{2/3}$$

Cw = Weir Coefficient 3.00
P = Perimeter of grate (ft) 9.0
Pc = Perimeter (w/clogging) (ft) 4.5
HW = Headwater depth (ft) 0.65

Orifice Conditions:

$$HW = (Q/(Co \cdot Ac))^2 / 2 \cdot g$$

Co = Orifice Coefficient 0.67
Ag = Grate Area (ft²) 5.00
Gf = Grate Opening Factor 0.70
Ac = Grate Open Area (w/ clogging) (ft²) 1.75
g = Gravity (fps) 32.20
HW = Headwater depth (ft) 0.55

Output:

Worst Case Scenario Occurs Under Weir Conditions

Headwater Depth = 0.65 ft with grate

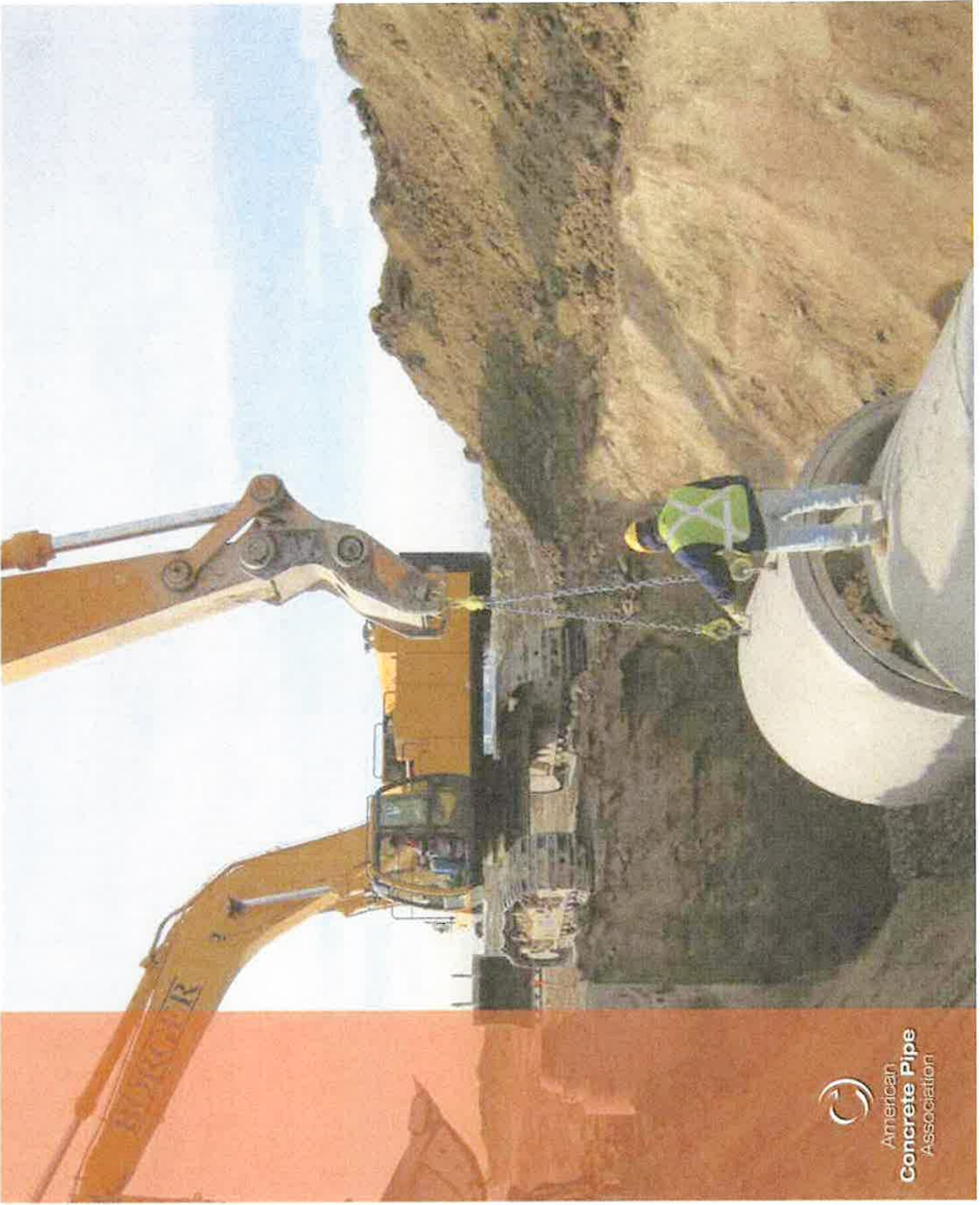
Lateral Loss Computations

APPENDIX D

D-Load Calculations

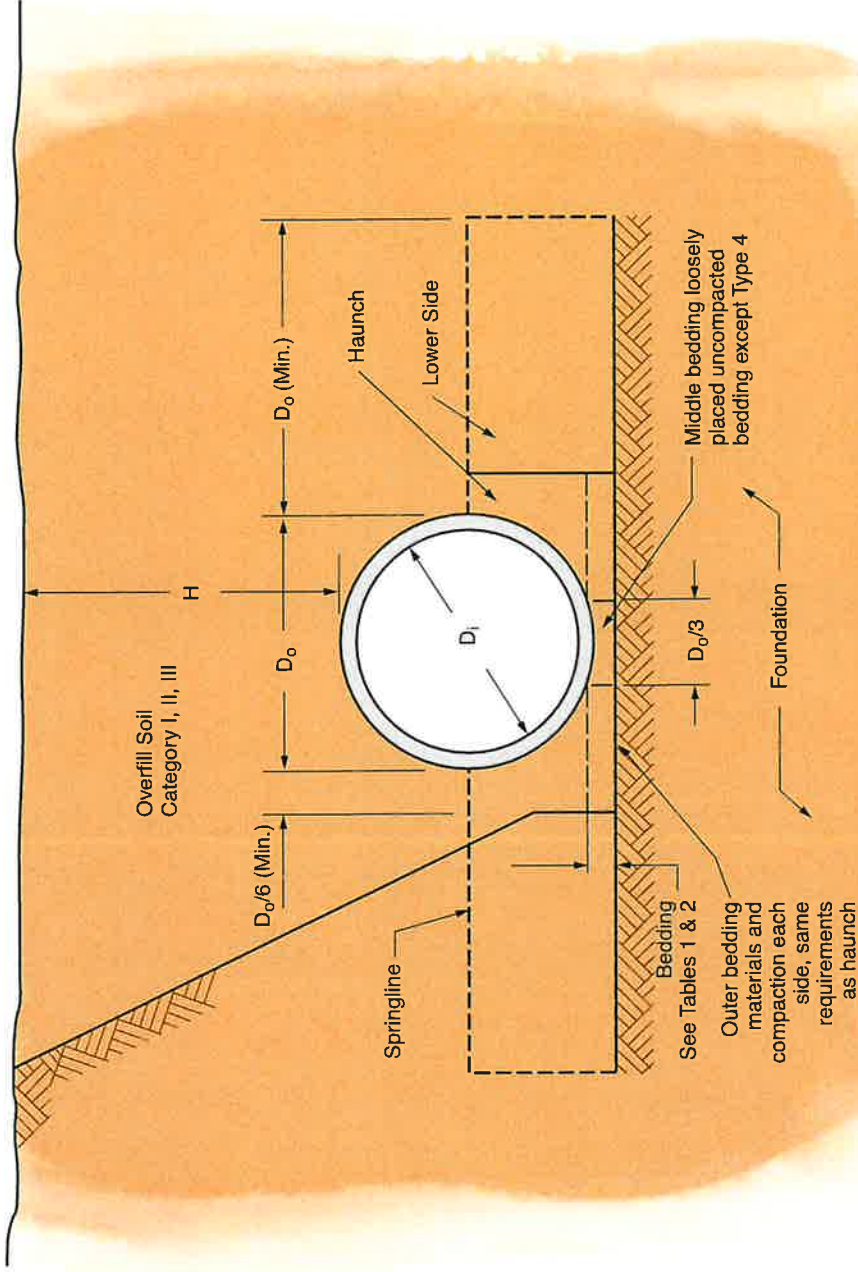
LRFD FILL HEIGHT TABLES

FOR CONCRETE PIPE



Standard Trench/Embankment Installation

Concrete pipe should be installed in accordance with the AASHTO LRFD Bridge Construction Specifications, Section 27 or ASTM C1479. Figure 1 shows the basic pipe and soil terminology.



There are four types of Standard Installations, each with its own soil and compaction requirements. Type 1 bedding provides the most support using highly compacted granular material, while Type 4 provides for less support allowing the use of silts and clay soils with little or no compaction. These four choices provide flexibility and versatility for the designer and contractor, as well as performance and economy for the owner that are not available with other types of pipe.

The soil and compaction requirements are provided in Table 1. Table 2 shows the equivalent soil designations per the Unified Soil Classification System (USCS) and AASHTO.

To facilitate your selection of the proper reinforced concrete pipe using the most beneficial Standard Installation for the conditions at the site, fill height tables are provided on the following pages. The required 0.01 inch crack D-Loads in units of lbs per linear foot per foot of diameter are provided numerically and the class of pipe per ASTM C76 (AASHTO M 170) meeting this requirement is designated by color of the cell.

Table 1: Standard Installation Soils and Minimum Compaction Requirements

Installation Type	Bedding Thickness	Haunch and Outer Bedding	Lower Side
Type 1	D _o /24 minimum, not less than 3" (75 mm) If rock foundation, use D _o /12 minimum, not less than 6" (150 mm)	95% Category I	90% Category I, 95% Category II, or 100% Category III
Type 2	D _o /24 minimum, not less than 3" (75 mm) If rock foundation, use D _o /12 minimum, not less than 6" (150 mm)	90% Category I or 95% Category II	85% Category I, 90% Category II, or 95% Category III
Type 3	D _o /24 minimum, not less than 3" (75 mm) If rock foundation, use D _o /12 minimum, not less than 6" (150 mm)	85% Category I, 90% Category II, or 95% Category III	85% Category I, 90% Category II, or 95% Category III
Type 4	No bedding required except if rock foundation, use D _o /12 minimum, not less than 6" (150 mm)	No compaction required, except if Category III, use 85%	No compaction required, except if Category III, use 85%

Reference: ASCE 15-98, "Standard Practice for Direct Design of Buried Precast Concrete Pipe Using Standard Installations (SIDD)", 1998.

Table 3: Reinforced Pipe Classes for 0.01 inch Crack Per ASTM C 76 (lbs/ft/ft)

Class I	≤ 800
Class II	≤ 1000
Class III	≤ 1350
Class IV	≤ 2000
Class V	≤ 3000
Special Design	> 3000

Table 2: Equivalent USCS and AASHTO Soil Classifications for Standard Installation Soil Designations

Representative Soil Types			Percent Compaction	
SIDD	USCS	AASHTO	Standard Proctor	Modified Proctor
Gravelly Sand (Category I)	SW, SP, GW, GP	A1, A3	100 95 90 85 80 75 61	95 90 85 80 75 59
Sandy Silt (Category II)	GM, SM, ML, Also GC, SC with less than 20% passing #200 sieve	A2, A4	100 95 90 85 80 49	95 90 85 80 75 46
Silty Clay (Category III)	CL, MH, GC, SC	A5, A6	100 95 90 85 80 45	90 85 80 75 70 40
Not Allowed for Haunch or Bedding	CH	A7	100 95 90 45	90 85 80 40

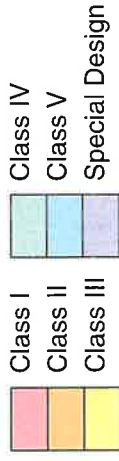
Reference: ASCE 15-98, "Standard Practice for Direct Design of Buried Precast Concrete Pipe Using Standard Installations (SIDD)", 1998.

NOTES:

1. Compaction and soil symbols – i.e. "95% Category I" refers to Category I soil material with a minimum Standard Proctor compaction of 95%. See Table 2 for equivalent Modified Proctor values.
2. Soil in the outer bedding, haunch, and lower side zones shall be compacted to at least the same compaction as the majority of soil in the overfill zone.

Fill Height Tables are based on:

1. $\gamma_s = 120$ pcf
2. AASHTO HL-93 live load
3. Positive Projecting Embankment Condition -
this gives conservative results in comparison to trench conditions

D-Load (lb/ft/ft) for Type 3 Bedding

**CLASS III PIPE SUFFICIENT FILL
HEIGHTS FROM 2 TO 14-FT**

Pipe Size (in)	1	2	3	4	5	6	7	8	9	10	11	12	13	14
12	1518	1369	947	817	805	838	896	964	902	1000	1098	1196	1294	1392
15	1459	1318	916	794	783	815	872	939	880	975	1070	1165	1260	1355
18	1384	1285	897	781	772	804	860	926	870	963	1057	1150	1243	1337
21	1247	1263	886	775	767	799	855	921	867	959	1051	1144	1236	1329
24	1229	1248	879	772	765	798	854	920	868	960	1051	1143	1235	1327
27	1189	1189	857	776	770	804	860	925	872	963	1055	1147	1238	1330
30	1119	1113	829	765	770	815	875	941	895	987	1079	1172	1264	1356
33	1044	992	808	758	770	817	879	946	913	1005	1097	1189	1281	1373
36	963	958	791	753	771	822	884	953	926	1018	1109	1201	1293	1385
42	891	937	778	751	775	828	891	961	939	1031	1123	1216	1308	1400
48	852	920	772	751	779	835	900	970	954	1046	1138	1231	1323	1416
54	838	905	769	751	786	843	909	981	969	1062	1154	1247	1340	1433
60	853	920	772	751	779	847	913	985	977	1070	1162	1255	1348	1440
66	816	886	808	755	798	852	918	991	986	1079	1171	1263	1355	1448
72	786	866	791	759	803	857	924	996	1076	1088	1180	1272	1364	1456
78	760	833	753	759	803	862	930	1003	1083	1097	1189	1281	1373	1464
84	739	814	761	769	813	872	939	1012	1092	1174	1198	1290	1382	1473
90	722	805	770	778	822	882	949	1022	1102	1184	1208	1299	1391	1482
96	708	813	779	788	832	892	959	1032	1112	1194	1277	1309	1400	1492
102	696	821	788	796	842	902	969	1042	1121	1203	1287	1319	1410	1501
108	687	829	798	806	852	912	979	1052	1131	1213	1297	1382	1420	1511
114	679	837	802	816	863	922	989	1062	1141	1223	1307	1391	1477	1521
120	673	845	800	826	873	932	999	1072	1152	1233	1317	1401	1487	1531
126	669	853	808	837	883	943	1010	1082	1162	1244	1327	1411	1497	1583

**CLASS III PIPE SUFFICIENT
UP TO 14-FT FILL HEIGHT**

**CLASS III PIPE SUFFICIENT
UP TO 13-FT FILL HEIGHT**

The preceding fill height tables are based on a concrete pipe installed in a positive projecting embankment installation with a soil unit weight of 120 lbs/ft³ and HL-93 live load per the AASHTO LRFD Bridge Design specifications at the surface. Pipe outside diameters were based on a wall C thickness since the larger outside diameters would represent the highest soil overburden load on the pipe. The required classes of pipe do not account for construction loads or any other load induced on the pipe prior to its completed installation, or live load in excess of HL-93.

Dimensions of Circular Concrete Pipe - Metric Units					
Designated Internal Diameter mm	Actual Internal Diameter mm	Wall B			Wall C
		Minimum Wall Thickness mm	Average Weight kg/m	Minimum Wall Thickness mm	Average Weight kg/m
300	305	50	162	69	197
375	381	57	216	75	262
450	457	63	253	82	335
525	533	69	327	88	417
600	610	75	430	94	505
675	686	82	500	100	602
750	762	88	598	107	708
825	838	94	695	113	821
900	914	100	832	119	940
975	991	113	923	125	1090
1050	1067	117	1057	132	1207
1200	1219	125	1324	144	1504
1350	1372	138	1589	157	1829
1500	1524	150	1927	169	2192
1650	1676	163	2295	182	2582
1800	1829	175	2695	194	2998
1950	1981	188	3125	207	3457
2100	2134	200	3585	219	3943
2250	2286	213	4078	232	4460
2400	2438	225	4598	244	5009
2550	2591	238	5179	257	5595
2700	2743	250	5752	269	6202
3000	3048	279	6344	298	7521
3600	3658	330	8104	349	10,540

Dimensions of Circular Concrete Pipe - Imperial Units						
Internal Diameter inches	Wall A		Wall B		Wall C	
	Minimum Wall Thickness inches	Average Weight pounds per foot	Minimum Wall Thickness inches	Average Weight pounds per foot	Minimum Wall Thickness inches	Average Weight pounds per foot
12	1-3/4	79	2	93	2-3/4	133
15	1-7/8	103	2-1/4	127	3	177
18	2	131	2-1/2	168	3-1/4	226
21	2-1/4	171	2-3/4	214	3-1/2	281
24	2-1/2	217	3	264	3-3/4	341
27	2-5/8	255	3-1/4	322	4	406
30	2-3/4	295	3-1/2	384	4-1/4	476
33	2-7/8	336	3-3/4	451	4-1/2	552
36	3	383	4	524	4-3/4	633
42	3-1/2	520	4-1/2	686	5-1/4	811
48	4	683	5	867	5-3/4	1011
54	4-1/2	864	5-1/2	1068	6-1/4	1232
60	5	1064	6	1295	6-3/4	1473
66	5-1/2	1287	6-1/2	1542	7-1/4	1735
72	6	1532	7	1811	7-3/4	2023
78	6-1/2	1797	7-1/2	2100	8-1/4	2329
84	7	2085	8	2409	8-3/4	2656
90	7-1/2	2395	8-1/2	2740	9-1/4	3004
96	8	2710	9	3090	9-3/4	3374
102	8-1/2	3078	9-1/2	3480	10-1/4	3765
108	9	3446	10	3865	10-3/4	4178
114	9-1/2	3840	10-1/2	4278	11-1/4	4611
120	10	4263	11	4716	11-3/4	5066
126	10-1/2	4690	11-1/2	5175	12-1/4	5542
132	11	5148	12	5655	12-3/4	6040
138	11-1/2	5627	12-1/2	6156	13-1/4	6558
144	12	6126	13	6679	13-3/4	7098
150	12-1/2	6647	13-1/2	7223	14-1/4	7659
156	13	7190	14	7789	14-3/4	8242
162	13-1/2	7754	14-1/2	8375	15-1/4	8846
168	14	8339	15	8983	15-3/4	9471
174	14-1/2	8945	15-1/2	9612	16-1/4	10,117
180	15	9572	16	10,263	16-3/4	10,785



American **Concrete Pipe** Association
 E-mail: info@concrete-pipe.org
www.concrete-pipe.org

APPENDIX E

City Planning Approval Letter

August 29th, 2022

Romeo Gumarang
City of Las Vegas
Department of Building and Safety
495 S. Main Street
Las Vegas, NV 89101

**Re: Justification Letter for Proposed 2-foot Grade Difference from Existing Ground
for Skye Canyon North Arroyo**

(APN: 126-12-515-101, 56-117, 610-009, 611-010, 613-014, 614-120, 616-082, 617-114)

Mr. Gumarang:

Westwood Professional Services respectfully submits this justification letter in support of proposed grades greater than 2-feet above and below existing ground on the subject site. The subject site is within an existing arroyo corridor in the Skye Canyon master planned community that is bounded by the major cross streets of Shaumber Road on the upstream side, Skye Village Road on the downstream side, Skye Canyon Park Drive on the south, and Iron Mountain Road on the north. The arroyo is within a 40-ft wide drainage easement approximately 2300-ft long and is bordered by recently constructed/upcoming residential developments.

Stabilization of the arroyo is required to protect adjacent residential developments from erosion. The proposed solution is to construct a closed conduit storm drain in the arroyo. This will lead to an increase in finished grade elevations within the arroyo corridor, although the elevations will generally remain below the adjacent ground outside the arroyo corridor. Matching the existing grade is unachievable due to the need to protect adjacent residences from erosion in the arroyo.

Thank you for considering this justification letter. Please contact me at (702) 284-5300 if you have any questions.

Sincerely,

WESTWOOD PROFESSIONAL SERVICES



Lant Leavitt, PE
Project Manager

APPROVED
DEPARTMENT OF COMMUNITY
DEVELOPMENT | PLANNING DIVISION
CITY OF LAS VEGAS, NEVADA
2-Foot Grade Difference Only
rgumarang
Aug 30 2022

APPENDIX F

Skye Canyon Development Agreement Excerpts

Inst #: 20190829-0004542

Fees: \$40.00

08/29/2019 09:47:00 AM

Receipt #: 3820396

Requestor:

LAS VEGAS CITY (PLANNING)

Recorded By: TAH Pgs: 915

DEBBIE CONWAY

CLARK COUNTY RECORDER

Src: FRONT COUNTER

Ofc: MAIN OFFICE

RECORDING COVER PAGE

(Must be typed or printed clearly in BLACK ink only
and avoid printing in the 1" margins of document)

APN# 125-12-810-001
See Attached

(11 digit Assessor's Parcel Number may be obtained at:
<http://redrock.co.clark.nv.us/assrealprop/owner.aspx>)

TITLE OF DOCUMENT

(DO NOT Abbreviate)

Fifth Amendment and Restatement
to the Development Agreement For
Skye Canyon Master Planned Community

Document Title on cover page must appear EXACTLY as the first page of the document
to be recorded.

RECORDING REQUESTED BY:

Fred Solis

RETURN TO: Name Fred Solis

Address 333 N. Rancho Dr. Bldg 3rd Floor

City/State/Zip Las Vegas NV 89106

MAIL TAX STATEMENT TO: (Applicable to documents transferring real property)

Name _____

Address _____

City/State/Zip _____

This page provides additional information required by NRS 111.312 Sections 1-2.

To print this document properly, do not use page scaling.

P:\Common\Forms & Notices\Cover Page Template Oct2017

Assessors Parcel Number

126-12-810-001
126-12-410-001
126-12-414-001
126-12-414-002
126-12-101-003
126-12-499-002
126-12-399-003
126-12-299-001
126-12-199-001
126-12-501-003
126-12-499-001
126-12-899-001
126-12-799-001
126-12-399-001
126-12-399-004
125-07-201-007
125-07-299-004
125-07-210-007
125-07-210-008
125-07-210-002
125-07-210-003
125-07-210-005
125-07-299-007
125-07-299-001
125-07-199-002
125-07-599-002
125-07-101-009
125-06-401-001
125-06-401-005
125-06-301-001
125-06-399-001

1
2
3
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8 **BILL NO. 2019-24**

9 **ORDINANCE NO. 6697**

10 AN ORDINANCE TO ADOPT THAT CERTAIN DOCUMENT ENTITLED "FIFTH
11 AMENDMENT AND RESTATEMENT TO THE DEVELOPMENT AGREEMENT FOR SKYE
12 CANYON MASTER PLANNED COMMUNITY," AND TO PROVIDE FOR OTHER
13 RELATED MATTERS.

13 Proposed by: Robert Summerfield, Director
14 of Planning

Summary: Adopts that certain document
entitled "Fifth Amendment and Restatement
to the Development Agreement for Skye
Canyon Master Planned Community,"
regarding property generally located at the
northwest corner of Grand Teton Drive and
Grand Canyon Drive.

17 THE CITY COUNCIL OF THE CITY OF LAS VEGAS DOES HEREBY
18 ORDAIN AS FOLLOWS:

19 SECTION 1: That certain document entitled "FIFTH AMENDMENT AND
20 RESTATEMENT TO THE DEVELOPMENT AGREEMENT FOR SKYE CANYON MASTER
21 PLANNED COMMUNITY," the substance of which was approved by the City Council on June
22 19, 2019, is hereby adopted in conformance with the provisions of NRS Chapter 278.

23 SECTION 2: Following adoption of this Ordinance, the document adopted by
24 Section 1 shall be attached to this Ordinance and recorded in the office of the County Recorder in
25 accordance with the provisions of NRS Chapter 278.

1 SECTION 3: If any section, subsection, subdivision, paragraph, sentence,
2 clause or phrase in this ordinance or any part thereof is for any reason held to be unconstitutional
3 or invalid or ineffective by any court of competent jurisdiction, such decision shall not affect the
4 validity or effectiveness of the remaining portions of this ordinance or any part thereof. The City
5 Council of the City of Las Vegas hereby declares that it would have passed each section, subsection,
6 subdivision, paragraph, sentence, clause or phrase thereof irrespective of the fact that any one or
7 more sections, subsections, subdivisions, paragraphs, sentences, clauses or phrases be declared
8 unconstitutional, invalid or ineffective.

9 SECTION 4: All ordinances or parts of ordinances or sections, subsections,
10 phrases, sentences, clauses or paragraphs contained in the Municipal Code of the City of Las Vegas,
11 Nevada, 1983 Edition, in conflict herewith are hereby repealed.

12 PASSED, ADOPTED and APPROVED this 7th day of August,
13 2019.

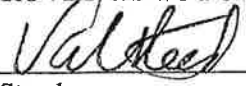
14
15 APPROVED:

16 By 
17 CAROLYN G. GOODMAN, Mayor

18 ATTEST:

19 
20 LUANN D. HOLMES, MMC
City Clerk

21 APPROVED AS TO FORM:

22  6-19-19
23 Val Steed, Date
Deputy City Attorney

1 The above and foregoing ordinance was first proposed and read by title to the City Council
2 on the 3rd day of July, 2019, and referred to a committee for recommendation; hereafter
3 the committee reported favorably on said ordinance on the 7th day of August, 2019, which
4 as a regular meeting of said Council; that at said regular meeting, the proposed ordinance
5 was read by title to the City Council and adopted by the following vote:

6 VOTING "AYE": Mayor Goodman and Councilmembers Anthony, Fiore, Diaz,
7 Knudsen and Seaman

8 VOTING "NAY": None

9 EXCUSED: Crear

10 ABSTAINED: None

11
12
13 APPROVED:

14 
15 _____
CAROLYN G. GOODMAN, Mayor

16 ATTEST:

17 
18 _____
LUANN D. HOLMES, MMC City Clerk

**FIFTH AMENDMENT AND RESTATEMENT TO THE
DEVELOPMENT AGREEMENT
FOR SKYE CANYON MASTER PLANNED COMMUNITY**

THIS FIFTH AMENDMENT AND RESTATEMENT TO THE DEVELOPMENT AGREEMENT FOR SKYE CANYON MASTER PLANNED COMMUNITY ("Agreement") is made and entered into this 7th day of August, 2019 by and between the **CITY OF LAS VEGAS**, a municipal corporation of the State of Nevada ("City") and KAG Property, LLC, a Delaware limited liability company ("KAG" or "Master Developer"). The City and Master Developer are sometimes referred to individually as a "Party" and collectively as the "Parties".

RECITALS

A. City has authority, pursuant to NRS Chapter 278 and Title 19 of the Code, to enter into development agreements such as this Agreement, with persons having a legal or equitable interest in real property to establish long-range plans for the development of such property.

B. City and Kyle Acquisition Group, LLC, the original owner, entered into a development agreement with respect to the development of the Original Property, which became effective on August 8, 2007 (the "Original Agreement").

C. Wachovia Bank, acting as the managing creditor of 41 total creditors, foreclosed on the Original Property on September 23, 2008. KAG was formed to own the Original Property.

D. City and KAG entered into the First Amendment and Restatement to the Development Agreement on February 1, 2012 (the "First Restatement").

E. On October 31, 2013, KAG recorded a Declaration of Covenants, Conditions and Restrictions Concerning Future Use and Development of Real Property with Reverter ("CC&R") as Instrument # 201206260000001 on the Original Property. Section 3.8 of the CC&R specifically appoints KAG as the attorney-in-fact to all Subsequent Owners (as defined therein) to, among other things, execute, acknowledge, record (as applicable) certain instruments and writings including, but not limited to, modifying and amending the First Restatement, as the same may be modified, amended or restated from time to time (the "Development Agreement").

F. The owners of the Original Property on the date of this Agreement are KAG Development South, LLC, a Delaware limited liability company ("KAGDS"); KAG Development West, LLC a Delaware limited liability company ("KAGDW"); Eastland, LLC, a Delaware limited liability company ("Eastland"); Section 12, LLC, a Delaware limited liability company ("Section 12"); Northland, LLC, a Delaware limited

liability company ("Northland"); MF Land, LLC, a Delaware limited liability company ("MF Land"); East of 95, LLC, a Delaware limited liability company ("East 95"); and G Land, LLC, a Delaware limited liability company ("G Land"). KAGDS, KAGDW, Eastland, Section 12, Northland, MF Land, East 95, and G Land, and their successors and assigns, may be collectively referred to as "Owner". Owner acquired the Original Property subject to the CC&R.

G. KAGDS transferred ownership of certain portions of the Property to "Designated Builders" (as defined below).

H. KAG has been duly appointed as the attorney-in-fact to Owner in accordance with the CC&R.

I. The Parties entered into the Second Amendment and Restatement of the Development Agreement effective July 15, 2015 and recorded as instrument number 20150723-0001557.

J. The Parties entered into the Third Amendment and Restatement of the Development Agreement effective November 17, 2016 and recorded as instrument number 20161117-0000713, which was subsequently amended by the First Amendment to Third Amendment and Restatement to the Development Agreement, adopted by Ordinance No. 6614 on April 4, 2018, and recorded as instrument number 20180411-0002905 (the "Third Restatement").

K. The Parties entered into the Fourth Amendment and Restatement of the Development Agreement effective ¹⁻¹⁶⁻¹⁹~~1-16-19~~ and recorded as instrument number ²⁰¹⁹⁰⁵¹⁶⁻⁰⁰⁰⁰⁸³²~~20190516-0000832~~ (the "Fourth Restatement"). Pursuant to the Fourth Restatement, the Property, which is generally located southwest of Interstate 95, was subjected to certain terms and conditions that differ from the terms and conditions applicable to that portion of the Original Property that is not included in the Property described on Exhibit "A" hereto, which is generally located northeast of U.S. 95 (the "EASTLAND Property").

L. Concurrently with the recording of the Fourth Restatement, the Parties entered into a Development Agreement for EASTLAND, which was recorded against the EASTLAND Property (the "EASTLAND Development Agreement"). The terms and conditions of the Fourth Restatement bind only the Property, and the terms and conditions of the EASTLAND Development Agreement bind only the EASTLAND Property. The Fourth Restatement and the EASTLAND Development Agreement each may be amended or modified independently from the other agreement.

M. Owner and certain Designated Builders are the legal owners of the Property currently subject to the Fourth Restatement.

N. The Parties desire to amend, incorporate, restate and supersede the Fourth Restatement, in conformance with the requirements of NRS Chapter 278, and as otherwise permitted by law, as set forth in this Fifth Amendment.

O. The Parties agree it is important to have a sole point of contact to facilitate the development of the Community under the terms of this Agreement. Master Developer has appointed Ninety Five Management, LLC, a Nevada limited liability company ("Development Manager") to act on behalf of the Master Developer on all matters as it relates to any communications with the City regarding the obligations and responsibilities of the Master Developer under this Agreement. Master Developer may designate a new Development Manager by providing written notice to City.

P. The Parties acknowledge that this Agreement will further the goals and values of City as provided by (i) Resolution R-176-2004 adopted by the City Council, (ii) City's Centennial Hills Sector Plan and (iii) the Las Vegas 2020 Master Plan.

Q. The Parties further acknowledge that this Agreement will (i) provide for public services, public uses and urban infrastructure, (ii) promote the health, safety and general welfare of City and its inhabitants, (iii) minimize uncertainty in planning for and securing orderly development of the Property and surrounding areas, (iv) ensure attainment of the maximum efficient utilization of resources within City at the least economic cost to its citizens, and (v) otherwise achieve the goals and purposes for which the laws governing development agreements were enacted.

R. As a result of the development of the Property, City will receive needed jobs, sales and other tax revenues, significant increases to its real property tax base and substantial improvements to the public infrastructure. City will additionally receive a greater degree of certainty with respect to the phasing, timing and orderly development of City infrastructure by a developer with significant economic resources and experience in the development process.

S. Master Developer understands and acknowledges that there are insufficient public services available in order to properly construct and populate the Community. Subject to the terms and conditions of this Agreement, Master Developer agrees to provide those necessary public services,

facilities and infrastructure improvements on the Property and outside the Property as specifically provided for herein.

T. Master Developer desires to obtain reasonable assurances that it may develop the Community in accordance with the terms, conditions and intent of this Agreement. Master Developer's decision to enter into this Agreement and commence development of the Community is based on expectations of proceeding and the right to proceed with the Community in accordance with this Agreement and the Applicable Rules.

U. Master Developer further acknowledges that this Agreement was made a part of the record at the time of its approval by the City Council and that Master Developer agrees without protest to the requirements, limitations, and conditions imposed by this Agreement.

V. The City Council, having determined that this Agreement is in conformance with Resolution R-176-2004, the Centennial Hills Sector Plan and the Las Vegas 2020 Master Plan, and that all other substantive and procedural requirements for approval of this Agreement have been satisfied, and after giving notice as required by the relevant law, and after introducing this Agreement by ordinance at a public hearing on July 3d, 2019, and after a subsequent public hearing to consider the substance of this Agreement on July 15th, 2019, the City Council found this Agreement to be in the public interest and lawful in all respects, and approved the execution of this Agreement by the Mayor of the City of Las Vegas.

NOW, THEREFORE, in consideration of the foregoing recitals, the promises and covenants contained herein and other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the Parties hereto agree as follows:

SECTION ONE

DEFINITIONS

For all purposes of this Agreement, except as otherwise expressly provided or unless the context otherwise requires, the following terms shall have the following meanings:

"Affiliate" of any person means (a) any other Person directly or indirectly controlling or controlled by or under direct or indirect common control with such Person and (b) any other Person that beneficially owns at least fifty percent (50%) of the voting common stock or partnership interest or limited liability

company interest, as applicable, of such Person. For the purposes of this definition, "control" when used with respect to any Person, means the power to direct the management and policies of such Person, directly or indirectly, whether through the ownership of voting securities, partnership interests, by contract or otherwise; and the terms "controlling" or "controlled" have meanings correlative to the foregoing.

"Agreement" means this Fifth Amendment and Restatement to the Development Agreement – Skye Canyon and at any given time includes all addenda and exhibits incorporated by reference and all amendments which hereafter are duly entered into in accordance with the terms of this Agreement.

"Alcohol Related Uses" means any alcohol uses as defined in the UDC and Ordinance 6266, as accepted by the Master Developer on May 8, 2018.

"Applicable Rules" means and refers to:

- (a) The provisions of the Code and all other uniformly-applied City rules, policies, regulations, ordinances, laws, general or specific, which were in effect on the Effective Date;
- (b) This Agreement;
- (c) The Skye Canyon Design Guidelines; and
- (d) The term "Applicable Rules" does not include:
 - (i) Any ordinances, laws, policies, regulations or procedures adopted by a governmental entity other than City;
 - (ii) Any fee or monetary payment prescribed by City ordinance which is uniformly applied to all development and construction subject to the City's jurisdiction; or
 - (iii) Any applicable state or federal law or regulation.

"BLM" means the Bureau of Land Management.

"Building Codes" means the development of the Community shall be subject to the Building Codes and Fire Codes in effect at the time of issuance of the permit for the particular development activity.

"CCRFCD" means the Clark County Regional Flood Control District.

"CCSD" means the Clark County School District.

"City" means the City of Las Vegas, together with its successors and assigns.

"City Council" means the Las Vegas City Council.

"City Infrastructure Improvement Standards" means in their most recent editions and with the most recent amendments adopted by the City, the Standard Drawings for Public Works Construction Off-site Improvements, Clark County, Nevada; Uniform Standard Specifications for Public Works Construction Off-site Improvements, Clark County, Nevada; Uniform Regulations for the Control of Drainage and Hydrologic Criteria and Drainage Design Manual, Clark County Regional Flood Control District; Design and Construction Standards for Wastewater Collection Systems of Southern Nevada; and any other engineering, development or design standards and specifications adopted by the City Council. The term includes standards for public improvements and standards for private improvements required under the UDC. The term does not include the Kyle Canyon engineered drawings contained in the Skye Canyon Design Guidelines.

"City Manager" means the person holding the position of City Manager at any time or their designee.

"Code" means the Las Vegas Municipal Code, including all ordinances, rules, regulations, standards, criteria, manuals and other references adopted therein.

"Community" means the Property and any and all improvements provided for or constructed thereupon.

"Designated Builder" means any legal entity other than Owner that owns any parcel of real property within the Community, whether prior to or after the Effective Date, provided that such entity is designated as such by Master Developer to City Manager in writing. For purposes of the Applicable Rules, the term "Designated Builder" is intended to differentiate between the Master Developer, Owner and their Affiliates in their capacity as developer or land owner and any other entity that engages in the development of a structure or other improvements on a Development Parcel within the Community. Any entity that is an Affiliate of Master Developer or Owner may become a Designated Builder if Master Developer notifies City Manager in writing that such entity intends to construct vertical improvements on a Development Parcel. Without limiting the foregoing, the following (or their respective permitted assigns) are Designated Builders: PN II, Inc., a Nevada corporation, dba Pulte Homes of Nevada ("Pulte"), Woodside Homes of Nevada, LLC, a Nevada limited liability company ("Woodside"), Century Communities of Nevada, LLC, a Delaware limited liability company ("Century"), Pardee Homes of

Nevada, a Nevada corporation ("Pardee") Skye Canyon Marketplace, LLC, a Delaware limited liability company ("Marketplace"), TA Las Vegas SR, LLC, a Delaware limited liability company ("TALV"), Grand Canyon Village, LLC, a Nevada limited liability company ("GCV"), and Smith's Food & Drug Centers, Inc., an Ohio corporation ("Smith's"). A Designated Builder is not a Party to this Agreement and may not enforce any provisions herein, but upon execution and recordation of this Agreement, a Designated Builder may rely on the land use entitlements provided herein. Each Designated Builder will work closely with the Master Developer to ensure the Community is developed in accordance with this Agreement.

"Designated Builder Parcel" means any real property within the Community owned by a Designated Builder.

"Development Parcels" means legally subdivided parcels of land within the Community that are intended to be developed or further subdivided.

"Development Phase" means separate development areas of the Property described on Exhibit "B" hereto.

"Development Phase Map, Final" means any final map recorded on the Property after the recordation of this Agreement and excludes the final map recorded in Book 147 Page 71 of Plats as "Parent Final Map of Skye Canyon Phase 1" and final maps for individual Designated Builder Parcels. The Phase Development Final Maps shall be submitted by the Master Developer in conformance to the Development Phase described on Exhibit "B".

"Development Phase Subdivision Map, Final" means any individual subdivision map located within a Development Phase that is submitted by Master Developer or a Designated Builder and approved by the City for recordation.

"Director of Planning" means the Director of the City's Department of Planning or their designee.

"Director of Public Works" means the Director of the City's Department of Public Works or their designee.

"Donated Fire Station Site" means Parcel 2.34 as shown on the Master Land Use Plan that will be utilized to construct a Fire Station to be owned or controlled by the City pursuant to Section 5.02.

"DWR" means the State of Nevada Division of Water Resources.

"Effective Date" means the date, on or after the adoption by City of an ordinance approving the

execution of this Agreement, and the subsequent execution of this Agreement by the Parties, on which this Agreement is recorded in the Office of the County Recorder of Clark County. Each party agrees to cooperate as requested by the other party to cause the recordation of this Agreement without delay.

"Entitlement Request" means a request by Master Developer or a Designated Builder for any land use approval including, without limitation, a tentative or final subdivision map.

"Final Inspection" means date of approved final inspection for a residential home to be occupied.

"Fire Station" means a building used for fire personnel and equipment.

"Grading Plan, Master Rough" means a plan or plans prepared by a Nevada-licensed professional engineer, to:

- (a) Specify areas of less than two hundred (200) acres in size where the Master Developer intends to perform rough grading operations;
- (b) Identify existing elevations and features that are to be preserved within the Community and do so at a drawing scale not to exceed one hundred feet (100') per inch;
- (c) Identify approximate future elevations and slopes of roadways, paseos, Development Parcels, open space, and drainage areas;
- (d) Identify rough design elevations on a two hundred foot (200') grid, and at street intersections, at pod boundaries and at drainage basin boundaries, or more frequently;
- (e) Identify locations and heights of potential stock piles; and
- (f) Prior to issuance of any rough grading permit, the Director of Public Works may require an update to the Master Drainage Study to address the impacts of phasing or diverted flows if the Master Drainage Study does not contain sufficient detail for that permit.

The Master Rough Grading Plan shall be reviewed by the Director of Public Works for conformance to the grading and drainage aspects of the approved Master Drainage Study and the Director of Planning shall consider the plan for the aesthetic aspects of the plan. The intent of the document is to establish rough grade elevations for both roadways and Development Parcels such that significant unanticipated grade and earthwork differences do not occur at the time of development of individual subdivisions.

"Grading Plan Specific", which accompanies the Technical Drainage Study, means a detailed

grading plan for a development site within the Community to further define the grading within residential or commercial subdivision sites as identified in the Master Rough Grading Plan to a level of detail sufficient to support construction drawings, in accordance with the CCRFCD Hydrologic Criteria and Drainage Design Manual.

"Investment Firm" means an entity whose main business is holding securities of other companies, financial instruments or property purely for investment purposes, and includes by way of example, and not limitation, Venture Capital Firms, Hedge Funds, and Real Estate Investment Trusts.

"LVVWD" means the Las Vegas Valley Water District.

"Master Developer" means KAG Property, LLC, a Delaware limited liability company, and its successors and assigns as permitted by the terms of this Agreement.

"Master Drainage Study" means the comprehensive hydrologic and hydraulic study to be approved by the Director of Public Works prior to the recordation of each Development Phase Final Map, including updates required by the City when changes to the conditionally approved study are proposed that must also be approved by the Director of Public Works attached hereto as Exhibit "G".

"Master HOA" means a unit-owners' association organized pursuant to NRS 116.3101, that is comprised of owners of residential dwelling units in the Community.

"Master Land Use Plan" means the approved site plan for the Community, which is Exhibit "F".

"Master Sanitary Sewer Study" means the comprehensive study to be approved by the Director of Public Works prior to the recordation of each Development Phase Final Map, including updates required by the City where changes to the approved densities or layout of the development are proposed that would impact downstream pipeline capacities and that may result in additional required Off-Property sewer improvements.

"Master Studies" means the Master Traffic Study, the Master Drainage Study, and the Master Sanitary Sewer Study.

"Master Traffic Study" means the comprehensive study and any required updates to be approved by the Director of Public Works prior to the recordation of each Development Phase Final Map attached hereto as Exhibit "G".

"Master Utility Improvements" means those water, sanitary sewer, storm water drainage, power,

street light and natural gas improvements within and directly adjacent to the Property necessary to serve the proposed development of the Community other than those utility improvements to be located within individual Development Parcels. All public sewer, streetlights, traffic signals, associated infrastructures and public drainage located outside of public right-of-way must be within public easements within common lots of the Master Developer or of the Designated Builder Parcels.

"Master Utility Plan" means a conceptual depiction of all existing and proposed utility alignments, easements or otherwise, within and directly adjacent to the Property necessary to serve the proposed development of the Community, other than those utility improvements to be located within individual Development Parcels. The Master Utility Plan may include the EASTLAND Property provided that any update will be considered an update for both the Property and the EASTLAND Property. The Master Developer shall align all proposed utilities within proposed public rights-of-way when reasonable and will dedicate such rights-of-way to the City before granting utility easements to specific utility companies, except easements for existing NV Energy facilities constructed pursuant to BLM grants, and Master Developer shall separately require Designated Builder to disclose the existence of such facilities located on (or in the vicinity of) any affected residential lots, and easements necessary for existing and future LVVWD water transmission mains.

"Metro" means the Las Vegas Metropolitan Police Department.

"NRS" means the Nevada Revised Statutes, as amended from time to time.

"Off-Property" means outside of the physical boundaries of the Property.

"Off-Property Improvements," as this definition relates to the Master Studies, means infrastructure improvements located outside the Property boundaries required by the Master Studies or other governmental entities to be completed by the Master Developer due to the development of the Community.

"On-Property" means within the physical boundaries of the Property.

"On-Property Improvements," as this definition relates to the Master Studies, means infrastructure improvements located within the Property boundaries required by the Master Studies or other governmental entities to be completed by the Master Developer due to the development of the Community.

"Off-Site Improvements" means any and all improvements necessary for a discrete parcel of property as required by the Applicable Rules.

"Original Property" means that certain 1661.95 gross acres of real property that was the subject of the Third Restatement.

"Owner" has the meaning given in Recital F of this Agreement, provided that a person shall be an Owner for purposes of this Agreement only for so long as such person owns a fee interest in the Property subject to this Agreement.

"Parent Map, Tentative" means a preliminary subdivision map of the Property that is the first discretionary request by the Master Developer to legally subdivide the Property pursuant to the provisions of NRS 278 and the UDC. Such map shall delineate all areas to be subdivided, including roadways and related necessary rights-of-way, easements and common areas. Furthermore, such map shall not include any individual residential lots.

"Parks Agreement" has the meaning given in Section 6.01 of this Agreement.

"Party," when used in the singular form, means either Master Developer or City and in the plural form of "Parties" means Master Developer and City.

"Planning Commission" means the City of Las Vegas Planning Commission.

"Planning Department" means the Department of Planning of the City of Las Vegas.

"Property" means that certain 1,032.72 gross acres of real property that is the subject of this Agreement. The legal description of the Property is set forth at Exhibit "A".

"RTC" means the Regional Transportation Commission of Southern Nevada.

"SNHD" means the Southern Nevada Health District.

"Standard Improvements" as this definition relates to Section Five, herein, means any and all Off-Site Improvements including, but not limited to, streets, sewers, sidewalks, curbs, gutters, storm drains streetlights and trails required in the Parks Agreement.

"Subdivision Map" means any instrument under NRS and the UDC which legally subdivides property or gives the right to legally subdivide property, including, without limitation, parcel maps, division of land into large parcels, tentative and development phase final maps, tentative commercial subdivision maps, final commercial subdivision maps, reversionary maps, condominium subdivision maps, or

tentative or final residential subdivision maps, for all or a portion of the Community.

"Sub-HOA" means a unit-owners' association organized pursuant to NRS 116.3101, that is comprised of owners of residential dwelling units in the Community and is subordinate to the Master HOA.

"Skye Canyon Design Guidelines" means the Skye Canyon Development Standards and Architectural Skye Canyon Design Guidelines, which have been prepared by Master Developer and reviewed and approved by City as a part of this Agreement, attached hereto as Exhibit "M".

"Technical Drainage Study" means: a comprehensive hydrologic study prepared under the direction of and stamped by a Nevada-licensed professional engineer, in accordance with the CCRFCD Hydrologic Criteria and Drainage Design Manual, to:

- (a) Estimate the impact of storm water run-off affecting a Development Parcel from on-property and off-property sources;
- (b) Estimate the impact of any storm water run-off that will affect down-stream off-property real property;
- (c) Identify the impacts of any storm water run-off that will affect the Development Parcel; the on-property proposed drainage facilities and patterns and any off-property drainage facilities and patterns;
- (d) Identify the means and methods necessary to mitigate such impact, including a commitment to implement, or pay for such mitigating improvements within a specified time frame; and
- (e) Identify the future elevations of roadways.

The Technical Drainage Study shall be approved by the Director of Public Works.

"Telecommunication Facility" means a wireless tower or antenna.

"Term" means the term of this Agreement.

"UDC" means the Unified Development Code attached hereto as Exhibit "S".

"Village Street" means any of those roadways identified as Village Streets that is depicted on Exhibit "L" and which Master Developer is obligated to construct in connection with the development of the Property pursuant to the Master Traffic Study, together with associated curb, gutter, underground utility improvements including fiber optic interconnect, streetlights, traffic control signs and signals other than those for which a fee was paid pursuant to Ordinance 5644, sidewalk or trail and landscaping as

indicated on the appropriate cross section in the Skye Canyon Design Guidelines. Prior to installation of the final lift of asphalt, Designated Builders may have access for Designated Builder Parcel underground utility connections.

SECTION TWO

APPLICABLE RULES AND CONFLICTING LAWS

2.01 Reliance on the Applicable Rules. City and Master Developer agree that Master Developer will be permitted to carry out and complete the development of the Community in accordance with the terms of this Agreement and the Applicable Rules. The terms of this Agreement shall supersede any conflicting provision of the City Code except as provided in Section 2.02 below.

2.02. Application of Subsequently Enacted Rules by the City. The City shall not amend, alter or change any Applicable Rule as applied to the development of the Community, or apply a new fee, rule regulation, resolution, policy or ordinance to the development of the Community, except as follows:

(a) The development of the Community shall be subject to the Building Codes and Fire Codes in effect at the time of issuance of the permit for the particular development activity.

(b) The application of a new uniformly-applied rule, regulation, resolution, policy or ordinance to the development of the Community is permitted, provided that such action is necessary to protect the health, safety and welfare of City residents, and provided that City gives Master Developer written notice thirty (30) days prior to implementing a new policy.

(c) Nothing in this Agreement shall preclude the application to the Community of new or changed rules, regulations, policies, resolutions or ordinances specifically mandated and required by changes in state or federal laws or regulations. In such event, the provisions of Section 2.04 to 2.06 of this Agreement are applicable.

(d) Should the City adopt or amend rules, regulations, policies, resolutions or ordinances and apply such rules to the development of the Community, other than pursuant to one of the above Sections 2.02(a), 2.02(b) or 2.02(c), the Master Developer shall have the option, in its sole discretion, of accepting such new or amended rules by giving written notice of such acceptance. City and the Master Developer shall subsequently execute an amendment to this Agreement evidencing the Master Developer's acceptance of the new or amended ordinance, rule, regulation or policy within a reasonable time.

2.03. Application of New Fees. Notwithstanding Section 2.02 above, City may increase fees imposed by Ordinance 5644, cost-based processing fees, entitlement processing fees, inspection fees, plan review fees, facility fees, water connection fees or sewer connection fees that uniformly apply to all development in City.

2.04 Conflicting Federal or State Rules. In the event that any federal or state laws or regulations prevent or preclude compliance by City or Master Developer with one or more provisions of this Agreement or require changes to any approval given by City, this Agreement shall remain in full force and effect as to those provisions not affected, and:

(a) Notice of Conflict. Either Party, upon learning of any such matter, will provide the other Party with written notice thereof and provide a copy of any such law, rule, regulation or policy together with a statement of how any such matter conflicts with the provisions of this Agreement; and

(b) Modification Conferences. The Parties shall, within thirty (30) calendar days of the notice referred to in the preceding subsection, meet and confer in good faith and attempt to modify this Agreement to bring it into compliance with any such federal or state law, rule, regulation or policy.

2.05 City Council Hearings. In the event either Party believes that an amendment to this Agreement is necessary due to the effect of any federal or state law, rule, regulation or policy, the proposed amendment shall be scheduled for hearing before the City Council. The City Council shall determine the exact nature of the amendment necessitated by such federal or state law or regulation. Master Developer shall have the right to offer oral and written testimony at the hearing. Any amendment ordered by the City Council pursuant to a hearing contemplated by this Section 2.05 is subject to judicial review, but such review shall be filed within twenty-five (25) calendar days from the date of the hearing. The Parties agree that any matter submitted for judicial review shall be subject to expedited review in accordance with Rule 2.15 of the Eighth Judicial District Court of the State of Nevada.

2.06 City Cooperation. City shall cooperate with Master Developer in securing any City permits, licenses or other authorizations that may be required as a result of any amendment resulting from actions initiated under Section 2.05. As required by the Applicable Rules, Master Developer shall be responsible to pay all applicable fees in connection with securing of such permits, licenses or other authorizations.

SECTION THREE

PLANNING AND DEVELOPMENT OF THE COMMUNITY

3.01 Master Developer and Obligations of and Actions by the Master Developer.

(a) Appointment of Master Developer by Owner. Unlike the Original Agreement and the First Amendment and Restatement where the entirety of the Original Property was owned by one entity, the Original Property now is owned by multiple entities. In order to carry out the intentions of this Agreement and more effectively carry out the terms of this Agreement, the Owner has appointed a representative of the Owner to serve as the Master Developer (as the term is used throughout the Agreement) on behalf of the Owner. The Master Developer shall act pursuant to authority granted to it under a separate agreement with the Owner and pursuant to the existing CC&R recorded against the Property. KAG has been appointed by the Owner to serve on behalf of the Owner as the Master Developer.

(b) Amendment and Restatement. The Fourth Restatement is hereby amended and restated as set forth in this Agreement.

(c) Role and Authority of Master Developer. Except as provided herein, the Parties agree that any communication, consent, approval, waiver, submission or other action by or on behalf of the Owner pursuant to the terms of this Agreement shall be made by the Master Developer. The Master Developer has the express authority to bind the Owner individually with respect to the Property and this Agreement, and the City has no obligation to verify or confirm that any decision made or action taken by Master Developer is acceptable to the Owner or consistent with the Owner's separate agreement and/or the existing CC&R recorded against the Property, including any decision or action of Master Developer that might or could impact Owner, unless and until the City has received written notice from the Owner certifying that (A) KAG (or any successor Master Developer) is no longer authorized to represent the Owner as Master Developer under this Agreement and (B) a successor Master Developer has been appointed by the Owner to serve as the Master Developer under this Agreement on behalf of the Owner, together with the name and contact information for such successor Master Developer.

(d) Effect of Breach or Default by Master Developer. The Parties acknowledge that the Master Developer is serving as the representative of the Owner. If Master Developer breaches this

Agreement or fails to perform any of its obligations hereunder after receiving written notice from the City of such failure or default in accordance with this Agreement, the City, shall have the right to exercise any and all rights and remedies available to the City with respect to such default, subject to the terms and conditions of this Agreement.

(e) Appointment of a Development Manager. The Parties recognize the effectiveness of having a single point of contact for the City and the various departments or governmental agencies to facilitate the development of the Community under the terms of this Agreement. Therefore, Master Developer has appointed the Development Manager to act on behalf of the Master Developer on all matters relating to any communications with the City regarding the obligations and responsibilities of the Master Developer under this Agreement. Master Developer may designate a new Development Manager by providing written notice to City.

3.02. Permitted Uses, Density, Height and Size of Structures. Pursuant to NRS Chapter 278, this Agreement must set forth the maximum height and size of structures to be constructed in the Community, the density of uses and the permitted uses of the land for each parcel within the Community.

(a) Maximum Units Permitted. The number of dwelling units within the Community shall not exceed five thousand two hundred (5,200).

(b) Permitted Unit Types. The types of buildings and dwelling units permitted in the Community are as set forth in the Skye Canyon Design Guidelines.

(c) Density. The maximum density permitted on the Property shall be as set forth in the Skye Canyon residential land use table and the related Master Land Use Plan, both of which are attached as Exhibit "F" to this Agreement. Master Developer shall have the right to determine the number of residential dwelling units to be developed on any Development Parcel so long as all the terms and conditions of the Skye Canyon Design Guidelines that relate to product density and product type are observed.

(d) Maximum Height and Size of Structures. The maximum height and size of structures within the Community is as set forth in the Skye Canyon Design Guidelines.

(e) Land Uses. City acknowledges and agrees that the land use categories allowed within the Community are designated on the Master Land Use Plan and the uses permitted within each category

are as described in this Agreement and the Skye Canyon Design Guidelines. The Skye Canyon Design Guidelines are attached as Exhibit "M".

(f) Proximity Restrictions. Pursuant to its general authority to regulate the sale of alcoholic beverages, the City Council declares that the public health, safety and general welfare of the Community are best promoted and protected by requiring that a Special Use Permit be obtained for all Alcohol Related Uses. Uses defined by "Alcohol Related Uses" shall have no specified spacing requirements between similar and protected uses.

3.03 [Intentionally omitted.]

3.04 Phasing of Construction.

(a) Generally. While Master Developer has the sole discretion to decide the commencement date for development of the Community and any improvements therein, Master Developer agrees to construct certain improvements that are a direct public benefit in coordination with the development milestones set forth in this Section 3.04 and in the Parks Agreement.

(b) Phasing Map. Attached hereto as Exhibit "B" is a map of the Community that generally describes the phases of construction of the Community. The phases may be revised by Master Developer as necessary to address the residential market demands. Revisions shall be coordinated with the Director of the City's Department of Planning and the Director of Public Works. Prior to the submittal of each Development Phase Map, Master Developer will submit a draft phasing schedule to City.

(c) Phasing Schedule. Master Developer shall complete the construction of all Village Streets within a Development Phase as follows:

A minimum of two lanes of asphalt pavement on the Village Street providing the main access to a particular Designated Builder Parcel, and a working sanitary sewer connection that has been accepted by the City shall be in place prior to Final Inspection of any dwelling units within that Designated Builder Parcel. Permanent improvements on all major access Village Streets shall be substantially constructed as determined by the Director of Public Works prior to issuance of any building permits beyond fifty percent (50%) of all units within that Designated Builder Parcel. In addition, a roadway network to the boundary of this Designated Builder Parcel must be completed such that both vehicular and pedestrian access is provided.

All Off-Site Improvements adjacent to that Designated Builder Parcel which will reasonably be used by residents of that parcel, shall be substantially constructed as determined by the Director of Public Works, prior to issuance of building permits beyond seventy-five percent (75%) of all units within that Designated Builder Parcel. The above thresholds notwithstanding, all adjacent Village Streets shall be substantially complete as determined by the Director of Public Works within twenty-four (24) months of the commencement of construction of such adjacent Village Streets or as amended with the traffic study phasing plan. All required landscaping along streets adjacent to the Designated Builder Parcel will be complete within two (2) months of the Final Inspection of the final unit in that Designated Builder Parcel.

(d) Site Grading. Master Developer and any Designated Builder may grade portions of the Property in conformance with the approved Master Drainage Study and applicable Development Parcel Technical Drainage Studies prior to approval of any additional drainage studies provided the Master Traffic Study has been approved, a Master Rough Grading Plan(s) has been approved for the area to be graded, the pertinent Development Phase Final Map is recorded and a completion bond has been posted with the City for the cost of the proposed grading. The completion bond will not exceed one million dollars (\$1,000,000.00) for each Master Rough Grading Plan (i.e. 200 acre area).

(e) Parks. Master Developer shall commence the design and construction of all parks and trails in the Community in accordance with the terms of the Parks Agreement.

(f) Assumption of Responsibility by Multiple Contractors. Permits that are awarded by City for each approved plan set will be based on work to be performed by each contractor. If a plan set includes multiple facets or phases of construction, separate contractors can pull permits. In the event of multiple permits and separate contractors per approved plan, Master Developer will provide City with regular updates identifying the approved permits that have been awarded for each plan.

3.05. Modifications. Modifications are changes that apply permanently to all development in the Community. The Parties agree that modifications are generally not in the best interests of the effective and consistent development of the Community, as the Parties spent a considerable amount of time and effort negotiating at arms-length to provide for the Community as provided herein. However, the Parties do acknowledge that there are special circumstances which may necessitate the modification of certain provisions to accommodate unique situations which are presented to the Master Developer upon

the actual development of the Community. Further, the Parties agree that modifications can change the look, feel and construction of the Community in such a way that the original intent of the Parties is not demonstrated by the developed product. To that end, the Parties also agree that the only proper entity to request a modification or deviation is the Master Developer entity itself. A request for a modification or deviation shall not be permitted from: a Designated Builder, any other purchaser of real property within the Community, the Master HOA or Sub-HOA.

(a) Applicant. Requests for all modifications may be made only by Master Developer.

(b) Minor Modifications. Minor Modifications are changes to the Skye Canyon Design Guidelines that include:

- (i) changes in architectural styles, color palettes and detail elements.
- (ii) the addition of similar and complementary architectural styles, color palettes and detail elements to residential or commercial uses.
- (iii) changes in building materials.
- (iv) changes in landscaping materials, plant palettes, and landscaping detail elements.
- (v) changes in the design of the arroyo(s).
- (vi) changes to the Required Facilities defined in the Parks Agreement attached hereto as Exhibit "D".

(c) Submittal, Review, Decision, and Appeal.

(i) An application for Minor Modification of the Skye Canyon Design Guidelines may be made to the Director of Planning for their consideration. The Director of the Department of Planning shall coordinate the City's review of the application and shall perform all administrative actions related to the application.

(ii) The Director of the Department of Planning may, in their discretion, approve a Minor Modification or impose any reasonable condition upon such approval. The Director of Planning shall issue a written decision within thirty (30) business days of receipt of the application. The decision is final unless it is appealed by the Master Developer pursuant to Section (iii) below. Applications for which no written decision is issued within thirty (30) business days shall be deemed approved. If the Director of

the Department of Planning rejects a request for a Minor Modification, the request shall automatically be deemed a Major Modification, and at the option of the Master Developer, the decision of the Director of the Department of Planning may be appealed to the Planning Commission.

(iii) Master Developer may appeal any decision of the Director of the Department of Planning to the Planning Commission by providing a written request for an appeal within 10 business days of receiving notice of the decision. Such appeal shall be scheduled for a hearing at the next available Planning Commission meeting.

(iv) Master Developer may appeal any action of the Planning Commission by providing a written request for an appeal within ten (10) business days of the Planning Commission action. Such appeal shall be scheduled for a hearing at the next available City Council meeting.

(d) Major Modifications.

(i) Any application for a modification to the Skye Canyon Design Guidelines that does not qualify as a Minor Modification is a Major Modification. All applications for Major Modifications shall be scheduled for a hearing at the next available Planning Commission meeting after the City's receipt of the application or its receipt of the appeal provided for in Section (c) above, whichever is applicable.

(ii) Any application for a modification to the Master Land Use Plan to reconfigure parcels as shown on the Master Land Use Plan is a Major Modification. The Major Modification process is not intended to change land use designations within the Community, but is only meant to allow for flexibility in final parcel configuration. Master Developer may apply for a Major Modification only after the Director of Planning determines in his/her sole discretion that there are no negative impacts to the Community to process such Major Modification. The Major Modification is not intended to act as a mapping action. Pursuant to this Section 3.05(d)(ii), a Major Modification may not be required if the Director of Planning, Director of Public Works and Fire Chief determine that there are no negative impacts to the Community for such request, in which case, the application may be approved administratively.

(iii) Prior to Planning Commission consideration of a Major Modification that increases density in the Community the Master Developer shall meet and confer with the Director of Public Works or his designee as to whether an update to the Master Studies is required. If the Director of

Public Works or his designee requires an update to one or more of the Master Studies, such update shall be prepared by Master Developer and submitted to the Department of Public Works no later than fifteen (15) business days prior to the Planning Commission hearing. Density increases considered under this Section 3.05(d)(iii) may not exceed the Maximum Units Permitted in Section 3.02(a) of this Agreement.

(iv) Master Developer may request a Major Modification for a Land Use designation change or other related changes to the Land Use Plan.

(v) All actions by the Planning Commission, except changes to the Land Use Plan which must go to City Council, becomes final and effective at the expiration of ten (10) days after the date of the decision, unless, within that period, a member of the City Council requests that the item be reviewed by the Council.

3.06 Deviation to Skye Canyon Design Guidelines. A deviation is an adjustment to a particular requirement of the Skye Canyon Design Guidelines for a particular Designated Builder Parcel or lot.

(a) Minor Deviation. A Minor Deviation must not have a material and adverse impact on the overall development of the Community and may not exceed twenty-five percent (25%) of a particular requirement delineated by the Skye Canyon Design Guidelines. For the sake of clarity, the intent of this section is not to be used as a deviation for the overall Community or entire subdivision(s). The intent of this section is to be used for individual lots or parcels within the Community when technical concerns or hardships exist. An application for a Minor Deviation may only be made under the following circumstances:

1) A request for deviation from any particular requirement delineated by the Skye Canyon Design Guidelines on twenty-five percent (25%) or less of the lots in a Designated Builder Parcel, provided that the Director of Planning has the discretion to treat such a request as a Major Deviation or a Minor or Major Modification to the Skye Canyon Design Guidelines if the Director deems such treatment is warranted; or

2) A request for deviation from the following, including but not limited to, particular requirements:

- a) Changes in architectural styles, color palettes and detail elements.
- b) The addition of similar and complementary residential or commercial uses

and architectural styles, color palettes and detail elements to residential or commercial uses.

c) Changes in building materials.

d) Changes in landscaping materials, plant palettes, and landscaping detail elements.

e) Setback encroachments for buildings, patio covers, courtyards, porches, miradors, casitas, architectural projections as defined by the Skye Canyon Design Guidelines, garages and carriage units.

f) Height of courtyard, retaining or other walls.

g) Lot widths, lot coverage and lot square footage.

(i) Administrative Review Permitted. An application for a Minor Deviation may be filed by the Master Developer or a Designated Builder as provided herein. Any application by a Designated Builder must include a written statement from the Master Developer that it either approves or has no objection to the request.

(ii) Submittal, Review and Appeal

(1) An application for a Minor Deviation from the Skye Canyon Design Guidelines may be made to the Director of the Department of Planning for their consideration. The Director of the Department of Planning shall coordinate the City's review of the application and shall perform all administrative actions related to the application.

(2) The Director of the Department of Planning may, in their discretion, approve a Minor Deviation or impose any reasonable condition upon such approval. The Director of the Department of Planning shall issue a written decision within thirty (30) business days of receipt of the application. The decision is final unless it is appealed by the Master Developer pursuant to Section (3) below. Applications for which no written decision is issued within thirty (30) days shall be deemed approved.

(3) Master Developer or Designated Builder may appeal any decision of the Director of the Department of Planning to the Planning Commission by providing a written request for an appeal within ten (10) business days of receiving notice of the decision. Such appeal shall be scheduled

for a hearing at the next available Planning Commission meeting.

(4) Master Developer or Designated Builder may appeal any action of the Planning Commission by providing a written request for an appeal within ten (10) business days of the Planning Commission action. Such appeal shall be scheduled for a hearing at the next available City Council meeting.

(5) Except as otherwise provided for herein, a request for a Minor Deviation shall be processed in accordance with procedures applicable to an administrative deviation application, as set forth in subsections (D) to (L), inclusive, of the Las Vegas Municipal Code 19.16.120. Minor Deviations are site specific and shall be processed for each individual lot or parcel.

(b) Major Deviation. A Major Deviation must not have a material and adverse impact on the overall development of the Community, may exceed twenty-five percent (25%) of any particular requirement delineated by the Skye Canyon Design Guidelines but may not exceed ten percent (10%) of the lots in a Designated Builder Parcel.

(i) Planning Commission Approval Required. An application for a Major Deviation may be filed by the Master Developer or a Designated Builder as provided herein. Any application by a Designated Builder must include a written statement from the Master Developer that it either approves or has no objection to the request. All actions by the Planning Commission becomes final and effective at the expiration of ten (10) days after the date of the decision unless, within that period, a member of the City Council files with the City Clerk a written request for the Council to review the approval. An appeal may be filed by the applicant and, with respect to an approval, by any property owner within the area of notification for the Planning Commission hearing, as well as by anyone who appeared, either in person, through an authorized representative or in writing, before the Planning Commission regarding the application. Pursuant to Code, the City Council may establish one or more fees to be paid in connection with the filing of an appeal, and the amount of any fee so established shall be as set forth in the City's fee schedule. A request to review may be filed by a member of the City Council.

(ii) Submittal, Review and Approval.

(1) All applications for Major Deviations shall be scheduled for a hearing at the

next available Planning Commission meeting after the City's receipt of the application.

(2) All actions by the Planning Commission on Major Deviations shall be scheduled for a hearing by the City Council within thirty (30) days of such action.

(c) If Master Developer or Designated Builder requests a deviation from adopted City Infrastructure Improvement Standards or the Kyle Canyon Engineered Details, an application for said deviation shall be submitted to the Land Development Section of the Department of Building and Safety and related fees paid for consideration by the City Engineer pursuant to the Applicable Rules.

(d) Any request for deviation other than those specifically provided shall be processed pursuant to Section 3.03 (Modifications of Skye Canyon Design Guidelines).

3.07. Entitlement Requests.

(a) Generally. City agrees to cooperate reasonably with Master Developer to:

(i) Expeditiously process all Entitlement Requests in connection with the Property that are in compliance with the Applicable Rules and Master Studies; and

(ii) Subject to reasonable conditions not otherwise in conflict with the Applicable Rules or the Master Studies, promptly consider the approval of Entitlement Requests.

(b) Required Zoning Entitlement for Property. The Parties acknowledge and agree that the proper means to legally entitle the Property for eventual development is by way of the Master Developer's application and for a Traditional Development (T-D) Zoning Classification and an approved Traditional Development Community Program for the Property in accordance with the UDC.

The City Council finds that this Agreement, together with the exhibits and attachments, which include the Master Land Use Plan, the Skye Canyon Design Guidelines, and the Master Studies fulfill and accomplish the required submittals pursuant to the T-D zoning district and shall be the basis of any approvals granted to the Master Developer under a T-D zoning district application.

(c) Other Entitlement Requests. Except as provided herein including the requirements of Section 7.05, all other Entitlement Request applications shall be processed by City according to the Applicable Rules. The Parties acknowledge that the procedures for processing such Entitlement Request applications are governed by the Code. In addition, any additional application requirements delineated herein shall be supplemental and in addition to such Code requirements.

(i) Parent Tentative Map. Master Developer shall satisfy all Code requirements and the following conditions precedent before filing an application for consideration of a Parent Tentative Map:

(1) Conditional approval of all Master Studies;

(2) Submittal of an exhibit acknowledging that all parcels within the Property, including those parcels "Not a Part" have, or will be provided legal access; and

(3) Submittal of a Master Utility Plan.

(4) The Parent Tentative Map shall show all additional right-of-way for turn lanes and bus turnouts required by the Master Traffic Study, and such additional rights-of-way shall be dedicated on the pertinent Development Phase Final Map unless an update to the approved Master Traffic Study is submitted to and approved by the Department of Public Works that shows that specific additional rights-of-way are not required. The Parent Tentative Map shall also identify all permanent easements required for pedestrian access, installation and maintenance of traffic control devices. The Parent Tentative Map shall clearly show all common areas (including medians) that will be perpetually maintained by the Master HOA. Comply with the recommendations of the approved Master Traffic Study update prior to occupancy of the site. If additional rights-of-way are not required and Traffic Control devices are or may be proposed within or adjacent to this site outside of the public right of way, all necessary easements for the location and/or access of such devices shall be granted on the Development Phase Final Map. Phased compliance will be allowed if recommended by the approved Master Traffic Study. No recommendation of the approved Master Traffic Study, nor compliance therewith, shall be deemed to modify or eliminate any condition of approval imposed by the Planning Commission or the City Council on the development of this site.

(ii) Development Phase Final Subdivision Map. Master Developer shall satisfy all Code requirements before filing an application for consideration of any Development Phase Final Subdivision Map. Such maps shall not contain any individual residential lots and the City shall not require any improvements, or security for such improvements prior to the recordation of such Development Phase maps, except for a performance bond to secure the placement of survey monuments as required by state law. However, for any Designated Builder Parcel that is a part of a particular recorded Development Phase Final Map, the Master Developer shall submit for approval all relevant construction drawings for

any off-site improvements required by this Agreement, any of the Master Studies or any land use entitlement for such Designated Builder Parcel, and the construction of such improvements shall be secured by an off-site improvement agreement made with the Master Developer prior to the recordation of a final map for such Designated Builder Parcel pursuant to the provisions of the UDC. Phasing and completion of such Off-Site Improvements is governed by the provisions of Paragraph 3.04(c).

(1) The City will accept submittals of tentative subdivision maps and Development Phase Final Subdivision Maps for Designated Builder Parcels for review and approval upon the concurrent submittal of any pertinent Development Phase Final Map(s) in response to the comments provided as a result of the City Blueline Technical Review.

(iii) Tentative Subdivision Map. Master Developer and/or Designated Builders shall satisfy all Code requirements for filing of an application for consideration of a tentative subdivision map. The Master Developer shall furnish a letter clearly delineating what Development Standard is to be applied to the tentative map at the time of submittal.

(iv) Site Development Plan Review. Master Developer and/or Designated Builders shall satisfy all Code requirements for the filing of an application for a site development plan review. The Parties further agree that:

(1) City staff shall consider and make a decision with respect to any application for a Site Development Plan within thirty (30) days of receipt of the application.

(2) Any appeal of an adverse decision on a site development plan review shall be scheduled for a hearing at the next available Planning Commission meeting after the City's receipt of the application for appeal.

(v) Special Use Permits. Master Developer and/or Designated Builders shall satisfy all Code requirements for the filing of an application for a special use permit. The Parties further agree that:

(1) Except as otherwise provided in this Agreement and the Skye Canyon Design Guidelines, special use permit applications shall be processed in accordance with the UDC.

(2) City shall not accept any special use permit application without written verification that the Master Developer either approves of the application or has no objection thereto.

(vi) Gaming Enterprise District—Hotel/Casino. A Gaming Enterprise District and an establishment offering non-restricted gaming is approved within the Community. City recognizes that non-restricted gaming establishments have been appropriately included and developed in other master-planned communities throughout the City and Clark County, and City acknowledges that the Community is an appropriate location for a non-restricted gaming establishment as well. A hotel or appurtenant structure associated with a non-restricted gaming establishment shall be no greater than one hundred sixty (160) feet in height.

3.08. Dedicated Staff and the Processing of Applications.

(a) Processing Fees. Generally. All Entitlement Requests, Minor or Major Modification Requests and all other requests related to the development of the Community shall pay the fees as provided by the UDC.

(b) Designated Builders will be permitted to submit Applications for building permits for model homes earlier than would otherwise be required under the Applicable Rules upon compliance with the same requirements that City has traditionally imposed on developers for model homes building permits as of the Effective Date.

(c) Inspection Fees. Construction documents and plans that are prepared on behalf of Master Developer for water facilities such as water pumping stations, water reservoirs, water transmission mains, and water distribution mains, that are reviewed by City for approval, shall not require payment of inspection fees to City unless the water service provider agrees not provide those inspection services.

3.09. Impact Statement as Required by Chapter 481, Statutes of Nevada 1999. The Impact Statement for Projects of Significant Impact within the Las Vegas Urban Growth Zone was timely submitted to City. City received and reviewed the Impact Statement and finds that it satisfies the statutory requirements. The Impact Statement is set forth herein at Exhibit "C."

3.10. Common Name for the Community. Master Developer shall establish a common name for the Community and shall disclose such proposed name to City by written letter to City Manager. City acknowledges that Master Developer will devote substantial resources to promote such common name and protect its value as a unique intellectual property right, which may include filing state and federal registrations for such name. The Parties therefore agree that Master Developer shall have the exclusive

right to own, control and license the name. City shall have no obligation to police the use, wrongful or otherwise, of the name by third parties.

3.11. "Saw-tooth Street" Mitigation Required. Where "Not a Part" parcels exist within or adjacent to the Property, that are or will be developed outside of the Community framework, but are bounded on two (or more) sides by developments within the Community, and that result in a "saw-tooth street improvement" (as generally and customarily defined in the Las Vegas Valley) or a non-continuous roadway, Master Developer shall construct such improvements necessary to tie the roadways and any applicable sidewalks or trails together or eliminate the saw-tooth, whichever is necessary. If such construction is restricted due to a lack of available rights-of-way, City agrees to either obtain the necessary rights-of-way at no cost to Master Developer or relieve Master Developer of the requirement to construct such facilities.

3.12. Identity Monuments. Prior to the construction of any identity monuments on the Property, Master Developer shall submit for approval a plan which includes the design and placement of the identity monuments. Such plan shall be reviewed and acted upon by City within thirty (30) days of receipt by City. If the City does act within thirty (30) days, City shall be conclusively deemed to have approved the design and location of the monuments. Sign permits for such Identity Monuments may be issued at any time after approval. Any appeal by the applicant of an adverse decision shall be scheduled for a hearing before the City Council within forty-five (45) days of the City's receipt of the application for appeal.

3.13. Common Area Landscaping. All common area landscaping abutting Village Streets shall be designed and constructed in accordance with the Skye Canyon Design Guidelines. Sidewalks, landscaping and other appurtenances within common areas abutting Village Streets shall be maintained by the Master HOA. Master Developer, and its successor and assigns, including the Master HOA, is hereby granted a perpetual license to plan, install, operate, maintain, and replace landscaping, irrigation, community signing, and related appurtenances in the City right of way (collectively, the "Encroachments"). The Encroachments shall be shown on off-site improvement plans or other drawings submitted by the Master Developer to the City for approval. The Encroachments shall conform to the terms and conditions contained in Exhibit "T". Any existing encroachment agreements entered into between the Parties prior to the Effective Date of this Agreement are hereby terminated and the encroachments contemplated

thereunder are hereby authorized under the terms of this Agreement. The Parties agree that such right of encroachment is for the mutual benefit of the City, Master Developer and the Master HOA and any Sub-HOA. Master Developer shall have the right to assign such encroachment rights to the Master HOA and any Sub-HOA and shall obtain approval in writing from the City prior to a transfer of encroachment obligation.

3.14. Streetlight and Banners. The City agrees to allow Master Developer to use non-standard streetlight poles, mast arms and luminaries set forth in Exhibit "N" within the Community. Luminaires shall comply with the requirements of the approved lighting study and shall be as approved by the City. The Master Developer and/or the Master HOA shall provide at no cost to the City pursuant to this Agreement: (i) five (5) each of the streetlight poles, luminaries mast arms and luminaries and associated appurtenances used as an initial minimum inventory within sixty (60) days of the Effective Date of this Agreement to be stored in a designated City storage yard; and (ii) replenishment of the minimum inventory within one hundred twenty (120) days of written notice from the City in perpetuity. If the City is compensated by a third party for a damaged streetlight pole, the Master Developer or Master HOA shall be reimbursed for the cost of that damaged streetlight pole. Master Developer shall provide a lighting study for all roadway, intersection, sidewalk and trail lighting. The lighting study shall meet the minimum lighting levels as required by the Uniform Standard Drawings for the Clark County area. The streetlights for the Community must be LED technology for energy efficiency.

At the Master Developer's option, and with written approval from the City, hanging brackets may be installed on the standard streetlight poles that would support the placement of banners. Banners may only be used for community identification, special events or seasonal identification. If installed, repairs to the poles or brackets as a result of bracket installation, or damage from banners, etc. will be performed by the Master HOA. Master HOA shall perform all repairs related to bracket and banner installation and operation within ten (10) working days of written notice from the City. Prior to installation of banners, the banner mounting hardware must be approved by the City's Traffic Engineering Maintenance Section, in addition to certification and approval from the pole manufacturer as to the type of brackets, materials, mounting methods, size of banner and wind loading is required to maintain structural integrity of the poles and maintain any and all pole warranties and certifications. A certification letter stamped and signed by a

registered Professional Engineer must be submitted to the Traffic Engineering Maintenance Section prior to approval for the banners.

3.15. Telecommunications Facilities. The Parties acknowledge that temporary and permanent Telecommunication Facilities are a necessary component to effective communication and will be necessary on the Property. The Parties agree that determining the appropriate location(s), number, and general appearance of Telecommunication Facilities as part of this Agreement will permit both the Master Developer and the City to appropriately plan the Community and will help minimize any potential conflicts or disputes that might arise in regard to permits for such facilities in the future. Therefore, the Parties agree that Telecommunication Facilities on the Property shall be subject to the following conditions:

(a) The Telecommunication Facilities must comply with Federal Communication Commission standards;

(b) The Telecommunications Facilities Map attached hereto as Exhibit "I" shall be approved as part of this Agreement. Minor Modifications to the Telecommunications Facilities Map may be made thereafter pursuant to the process outlined in Section 3.05 of this Agreement. The Telecommunication Facilities shall be located on the Property identified by the Telecommunication Facilities Map, subject to administrative review pursuant to the Code, unless otherwise indicated by the Skye Canyon Design Guidelines, and in the case of facilities located on City-owned property, approval of lease from the City is required;

(c) The Telecommunications Facilities shall be architecturally compatible with the Skye Canyon Design Guidelines and incorporate reasonable camouflaging/stealth techniques such as architecturally screened roof-mounted antennas or incorporation into flagpoles and the like;

(d) Master Developer shall use all reasonable efforts to ensure co-location of Telecommunication Facilities;

(e) Telecommunication Facilities shall not obstruct public safety communications and the usual and customary transmission of other communication services enjoyed by adjacent property owners; and

(f) Freestanding (stand alone) Telecommunications Facilities not located on City-owned property shall not be in excess of seventy (70) feet in height and shall not be located within one hundred

(100) feet of any residential lot.

3.16 Right-Of-Way Agreements For Optical Fiber. City shall permit the installation of optical fiber conduit and optical fiber, together with all necessary appurtenances in all City rights-of-way within the Property upon the proper execution of Right-Of-Way Agreement between the Master Developer, or its designee, and the City. Such Right-Of-Way Agreement shall include, at a minimum, the following provisions: a phasing plan for such improvements; any such improvements to be constructed within the City's right-of-way shall be indicated and approved on civil improvement plans; any such improvements shall not exceed one hundred twenty (120) feet in length within the public right-of-way, unless otherwise approved by the Director of Public Works; payment by the Master Developer or its designee of an initial fee of ten thousand dollars (\$10,000.00), and a continuing annual fee of five thousand dollars (\$5,000.00), payment of which is to commence upon the installation of the first instance of optical fiber within the optical fiber conduit, and on every anniversary of the first installation thereafter; Master Developer to notify the Director of Public Works in writing of the first instance of installation of optical fiber; and an annual payment by the Master Developer of one dollar and thirty-three cents (\$1.33) for each linear foot of conduit within the City's right-of-way, subject to annual adjustment based upon the Consumer Price Index, All Urban Consumers (CPI-U).

3.17. Blasting. Master Developer agrees to comply with all Code and City written policies as related to blasting.

3.18. Property Dedications to City. Except as provided in Section 7.05, any real property (and fixtures thereupon) transferred or dedicated to City or any other public entity shall be free and clear of any mortgages, deeds of trust, liens or encumbrances (except for any encumbrances that existed on the patent at the time it was delivered to Master Developer from the United States of America).

3.19. Anti-Moratorium. The Parties agree that no moratorium or future ordinance, resolution or other land use rule or regulation imposing a limitation on the construction, rate, timing or sequencing of the development of property including those that affect parcel or subdivision maps, building permits, occupancy permits or other entitlements to use land that are issued or granted by City shall apply to the development of the Community or portion thereof. Notwithstanding the foregoing, City may adopt ordinances, resolutions or rules or regulations that are necessary to:

- (a) comply with any state or federal laws or regulations as provided by Section 2.04, above;
- (b) alleviate or otherwise contain a legitimate, bona fide harmful and/or noxious use of the Property, in which event the ordinance shall contain the most minimal and least intrusive alternative possible, and shall not, in any event, be imposed arbitrarily; or
- (c) maintain City's compliance with non-City and state sewerage, water system and utility regulations. However, the City as the provider of wastewater collection and treatment for this development shall make all reasonable best efforts to insure that the wastewater facilities are adequately sized and of the proper technology so as to avoid any sewage caused moratorium.

In the event of any such moratorium, future ordinance, resolution, rule or regulation, unless taken pursuant to the three exceptions contained above, Master Developer shall continue to be entitled to apply for and receive consideration of Entitlement Requests and other applications contemplated in Section 3 in accordance with the Applicable Rules.

3.20. Cooperation in Financing. City will execute and deliver within thirty (30) days of a written request from Master Developer, such documents as may be reasonably necessary to acknowledge that:

- (a) City has no lien on the Property as a direct result of this Agreement, or disclosure of any City liens that exist; and
- (b) City is not aware of a default of this Agreement by Master Developer or if it is in default of this Agreement, the specific ground(s) of default. Nothing herein shall be deemed to relieve Master Developer of its obligations under this Agreement or its liability for failure to perform its obligations under this Agreement.

3.21. Franchise Agreements. City warrants that it has entered into franchise agreements with all of the public utility companies that provide adequate utility services to the Property, specifically, NV Energy, Century Link, Southwest Gas Corporation, and Cox Communications.

3.22. Commercial Development Standards and Design Guidelines. All commercial development within the community shall be subject to the commercial development standards and design guidelines pursuant to the C-2 zoning district of the UDC. All permissible uses shall refer to the zoning districts described in the table on page two (2) of the Skye Canyon Design Guidelines.

3.23. Development of the Arroyos. Master Developer is allowed to re-design the existing

arroyos on the Property as linear trails and/or parks subject to obtaining approval of Federal 404 permits that remove the arroyos from the waterways of the Americas. The arroyos shall be re-designed substantially similar to those shown on Exhibit "R".

SECTION FOUR

MAINTENANCE OF THE COMMUNITY

4.01 Maintenance of Public and Common Areas.

(a) Master Community HOA. Master Developer has organized a Master HOA to manage and maintain sidewalk, common landscape areas, any landscaping within the street rights-of-way including median islands, private drainage facilities located within common elements, including but not limited to, rip-rap lined channels and natural arroyos as determined by the Master Drainage Study or applicable Technical Drainage Studies, but excluding City dedicated public streets, curbs, gutters, streetlights upon City-dedicated public streets, City owned traffic control devices and traffic control signage and permanent flood control facilities as identified on the Regional Flood Control District Master Plan Update that are eligible for maintenance funding. The Parties acknowledge that the Master HOA has been formed prior to the Effective Date.

(b) Maintenance Obligations of the Master HOA and Sub-HOAs. Except as provided in the Parks Agreement, the Master HOA and the Sub-HOAs (which hereinafter may be referred to collectively as the "HOAs") shall be responsible to maintain in good condition and repair all common areas that are transferred to them for repair and maintenance (the "Maintained Facilities"), including, but not limited to all developed and undeveloped sidewalks, private streets, private alleys, private drives, landscaped areas, parks and park facilities, trails, amenity zones, drainage facilities within Common Elements, sight visibility zones, and any landscaping in, on and around medians and public rights-of-way.

Master Developer acknowledges and agrees that the Master HOA and Sub-HOA (as applicable) are common-interest communities created and governed by declarations ("Declarations") as such term is defined in NRS 116.037. The Declarations will be recorded by Master Developer or Designated Builders as an encumbrance against the property to be governed by the appropriate HOA. In each case, the HOA shall have the power to assess the encumbered property to pay the cost of such maintenance and repair and to create and enforce liens in the event of the nonpayment of such

assessments. Master Developer further agrees that such Declarations will contain a covenant running to the benefit of City, and enforceable by City, that such facilities will be maintained in good condition and repair. Such HOAs will be Nevada not-for-profit corporations with a board of directors elected by the subject owners, provided, however, that Master Developer may control the board of directors of such HOA for as long as permitted by applicable law.

(c) The Declaration for the Master HOA has been fully executed and recorded with the office of the Clark County Recorder, and contains (or effectively contains) the following provisions, the form of which provisions is to be approved by the City:

(i) that the governing board of the HOA must have the power to maintain the Maintained Facilities;

(ii) that the plan described in Section 4.02 can only be materially amended by the Master HOA board with the written consent of City;

(iii) that the powers under the Declaration cannot be exercised in a manner that would defeat or materially and adversely affect the implementation of the Maintenance Plan; and

(iv) that in the event the Master HOA fails to maintain the Maintained Facilities in accordance with the provisions of the plan described in Section 4.02, City may exercise its rights under the Declaration, including the right of City to levy assessments on the property owners for costs incurred by City in maintaining the Maintained Facilities, which assessments shall constitute liens against the land and the individual lots within the subdivision which may be executed upon. City shall have the right to review the Declaration for the sole purpose of determining its compliance with the provisions of this Section 4.

4.02 Maintenance Plan. For park and common areas, maintained by the Master HOA or Sub-HOA (as applicable) the corresponding Declaration pursuant to this Section 4 shall provide for a plan of maintenance that contains provisions that substantially conform to those set forth in Exhibit "F" of the Parks Agreement.

4.03 Release of Master Developer. Following Master Developer's creation of HOAs to maintain the Maintained Facilities, and approval of the maintenance plan with respect to each HOA, City will hold each HOA responsible for the maintenance of the Maintained Facilities in each particular

development covered by each Declaration and Master Developer shall have no further liability in connection with the maintenance and operation of such particular Maintained Facilities. Notwithstanding the preceding sentence, Master Developer shall be responsible for the plants, trees, grass, irrigation systems, and any other botanicals or mechanical appurtenances related in any way to the Maintained Facilities pursuant to any and all express or implied warranties provided by Master Developer to the HOA under NRS Chapter 116.

4.04 City Maintenance Obligation Acknowledged. City acknowledges and agrees that all permanent flood control facilities as identified on the Regional Flood Control District Master Plan Update and eligible for maintenance funding and all City dedicated public streets (excluding any landscape within the right-of-way), associated curbs, gutters, City-owned traffic control devices, signage, those improvements identified with Drainage Studies for public maintenance, and streetlights upon City-dedicated public streets within the Community and accepted by the City will be maintained by City in good condition and repair at the City's sole cost and expense. Maintenance of the non-standard streetlights is governed by Section 3.14. City reserves the rights to modify existing sidewalks and the installation of sidewalk ramps and install or modify traffic control devices on common lots abutting public streets at the discretion of the Director of Public Works. Master Developer or Master HOA will maintain all temporary detention basins identified in the Master Drainage Study. The City agrees to cooperate with the Master Developer and will diligently work with the CCRFCD to obtain acceptance of all permanent drainage facilities.

SECTION FIVE

PUBLIC FACILITIES

5.01. Elementary and Middle School Acreage. Master Developer shall cause the dedication, at no cost to the CCSD, of up to 31.83 net acres total (after public street right-of-way are deducted) for a total of two school sites (one 11.83 net acre elementary school site and one 20 net acre middle school site) as shown on the Master Land Use Plan. Master Developer further agrees to construct Master Utility Improvements and Off-Site Improvements including all underground school flasher infrastructure adjacent to the school parcels contemporaneous with the construction of adjacent Village Streets. Such improvements for each dedicated parcel shall be constructed by Master Developer on such schedule as

agreed between Master Developer and the CCSD. Within six (6) months of the Effective Date of this Agreement, the Master Developer shall enter into a Memorandum of Agreement ("MOA") with the CCSD for dedication, off-sites and development of schools which shall include the minimum demands and residual pressures at the water district side of the school sites' water meters previously agreed to between Master Developer and CCSD. Any modification and/or change to the Master Land Use Plan increasing or decreasing the density and/or number of dwelling units beyond or below the current maximum of five thousand two hundred (5,200) units may require the Master Developer to amend the MOA.

(a) Master Developer Obligations. City agrees that Master Developer has met its obligation in this Section 5.01 if it offers the dedication to the CCSD with restrictions requiring:

- (1) conformance with the Skye Canyon Design Guidelines as agreed upon within the Memorandum of Agreement between the Master Developer and the CCSD;
- (2) replacement of any Master Utility Improvements and Off-site Improvements or facilities installed by Master Developer damaged or removed by CCSD; and
- (3) a recorded Memorandum of Agreement with the CCSD.

5.02. Fire Protection.

(a) Construction of Fire Station within the Community. Master Developer shall construct a three-bay drive-through Fire Station within the Community at the Donated Fire Station Site in accordance with design, construction and program criteria to be provided by the City upon the request of the Master Developer. This criteria and the basis of design shall generally conform to the design of City of Las Vegas Fire Station 48. The Fire Station shall, at a minimum, be constructed to include the following:

- (i) A minimum gross floor area of ten thousand seven hundred (10,700) square feet;
- (ii) Three bays which must adequately enclose the fire apparatus; and
- (iii) The Fire Station must be built to LEED Silver standards in accordance with the U.S. Green Building Council for Building Design and Construction. City may seek and pay for LEED Silver certification.

Master Developer shall commence the design of the Fire Station on the Donated Fire Station Site within one hundred eighty (180) days after the Effective Date ("Fire Station Design Commencement Date"). The Master Developer shall meet with City prior to commencing the design of the Fire Station and shall submit building plans and specifications at the fifty percent (50%), ninety percent (90%) and one hundred percent (100%) plan set level for review and final approval by the City. The design shall be completed within eighteen (18) months of the Fire Station Design Commencement Date ("Fire Station Design Completion Date"). The Fire Station shall be completed within eighteen (18) months after the Fire Station Design Completion Date and the issuance of the building permit for the Fire Station.

Master Developer agrees to provide all Master Utility Improvements and Off-Site Improvements adjacent to the Donated Fire Station Site in addition to the construction of the Fire Station. City agrees to operate the Fire Station within thirty (30) days after the dedication of the Fire Station to City.

(b) Fire Station Location. Following completion of construction of the Fire Station in accordance with Section 5.02(a), Master Developer shall dedicate the Donated Fire Station Site to City.

5.03. Regional Transportation Center.

(a) Dedication of a Transit Center Site. Master Developer shall, at no cost to City or the RTC, dedicate up to two and one-half (2.5) gross acres of land to serve as a transit hub and transfer point for various bus routes. Such dedication shall be subject to a restriction that requires the RTC to allow, at no cost, at least one-half (1/2) acre of the RTC parcel to be used for parking facilities that serve both the RTC parcel and the Property. Master Developer shall construct Standard Improvements adjacent to the RTC parcel contemporaneous with the construction of adjacent Village Streets. The Transit Center shall be in the location shown on the Master Land Use Plan (Parcel 4.5) or in such alternate location approved by Master Developer, City and the RTC. Master Developer is under no obligation to dedicate any land to the RTC other than as required herein.

(b) Design of the Regional Transportation Center. RTC shall design the Transit Center in accordance with the Skye Canyon Design Guidelines, subject to the approval of Master Developer and City.

5.04 Police Services. Designated Builders shall pay City two hundred eighteen dollars (\$218) per residential unit for use in the construction of a Metro substation to serve the Community and the

surrounding area. Such payment shall be made concurrent with the building permit issued for each residential unit. City and Metro agree that all residential unit fees collected from development in the Community for a Metro substation shall be used for the construction of a Metro substation that is no more than one mile from the Community and shall be constructed and operating within one year from the completion of the Community.

SECTION SIX

OPEN SPACE, PARKS, TRAILS AND RECREATION FACILITIES

6.01. Parks Agreement. Concurrently with the execution of this Agreement, the Parties shall execute and cause to be recorded in the Official Records of Clark County, Nevada an Amended and Restated Parks Agreement – Skye Canyon, in the form attached hereto as Exhibit "D" (the "Parks Agreement"), describing the Parties' responsibilities regarding the design, construction, ownership and maintenance responsibilities for the open space, parks, trails and other recreation amenities to be provided by Master Developer. The Parties acknowledge that the Parks Agreement is a vital and integral part of this Agreement, and this Agreement would not have otherwise been approved and executed without the approval of the Parks Agreement by the City Council.

SECTION SEVEN

PROJECT INFRASTRUCTURE IMPROVEMENTS

7.01. Conformance to Master Studies. Master Developer agrees to construct and dedicate to City or other governmental or quasi-governmental entity or appropriate utility company, all infrastructure necessary for the development of the Community as required by the Master Studies and this Agreement.

7.02. Acquisition of Rights-of-Way and Easements. City acknowledges that certain rights-of-way and easements outside the boundaries of the Property may be necessary for the construction of the necessary infrastructure improvements. City shall assist the Master Developer in obtaining the necessary rights-of-way, easements or other interests not owned by Master Developer necessary to construct the necessary infrastructure improvements. With regard to any necessary roadways and/or necessary drainage corridors that are proposed to abut or cross BLM lands, Master Developer shall submit all required documentation to City to enable City to acquire the necessary rights from the BLM. City will accept and initiate processing these applications through the BLM upon submittal of the Master Studies

and will diligently pursue approval of the applications in a timely manner. In the event any required rights-of-way, easements or other interests cannot be obtained, City may allow a modification of the appropriate approved Master Study to permit development of the Community without such right-of-way, easements or other interest. Master Developer acknowledges and accepts: 1) that prior to BLM grant acceptance by the City for any right-of-way, easement or other interest on behalf of the Master Developer, that the Master Developer shall submit for approval all relevant construction drawings for any Off-Site Improvements required by this Agreement and any of the Master Studies for the property that is the subject of the BLM grant, and the construction of such improvements shall be secured by an Off-Site improvement agreement pursuant to the provisions of the UDC; 2) that there can be placed upon BLM grants by the BLM certain stipulations for which the Master Developer shall be fiscally responsible; 3) that the Master Developer shall indemnify the City, and pay, within a reasonable time, any costs associated with the stipulations, or penalties or fines associated with the violation of such stipulations; and 4) that these requirements for indemnification and payment of costs are included within the necessary Off-Site Improvement agreements for such improvements.

City is in the process of obtaining certain BLM reservations for the new Sheep Mountain Parkway alignment, as shown on Exhibit "J", and for regional flood control facilities as indicated in the Master Drainage Study. City and Master Developer agree to make reasonable efforts to ensure that all BLM reservations needed for Sheep Mountain Parkway and for regional flood control facilities do not expire and remain valid for the City's infrastructure needs. Failure to obtain the necessary BLM reservations as stated herein will require the City and Master Developer to amend this Agreement. However, if a determination is made by the BLM that certain activities must commence in order to retain BLM grants for detention basins or for Officer Igor Soldo Park for which the Master Developer is required to construct, the Developer shall comply with the BLM requirements for retaining the BLM grants.

7.03. Water Supply. The Parties acknowledge that City currently has no role in the allocation of water to customers of the Las Vegas Valley Water District. If, however, City assumes any role in water allocation during the term of this Agreement, City agrees it will endeavor to allocate or cause to be allocated to the Community water in order that the development of the Community will continue uninterrupted. City and Master Developer will cooperate with the Las Vegas Valley Water District in

granting over their respective properties reasonable easements or right-of-ways either On-Property or Off-Property necessary for the installation of water facilities to serve the development. Master Developer agrees to execute all Affidavits of Waiver and Consent forms required by City in order for water laterals and mains to be a part of any proposed special improvement districts.

7.04 Sanitary Sewer.

(a) Design and Construction of Sanitary Sewer Facilities Shall Conform to the Master Sanitary Sewer Study. Master Developer shall design and construct all sanitary sewer main facilities that are identified as Master Developer's responsibility in the Master Sanitary Sewer Study. Master Developer acknowledges and agrees that this obligation shall not be delegated to, transferred to or completed by any Designated Builder.

(b) Off-Property Sewer Capacity. The Master Developer and the City have analyzed the effect of the build out of the Community on Off-Property sewer pipelines. The Master Developer agrees to install parallel sewer lines as indicated in the approved Master Sanitary Sewer Study attached as Exhibit "H". The construction of Off-Property sewer pipelines will be performed at the percentage build out shown in this analysis. Master Developer and the City agree that the analysis may need to be revised as exact development patterns in the Community become known. All future offsite sewer analysis for the Community will consider a pipe to be at full capacity if it reaches a d/D ratio of 0.90 or greater. The sizing of new Off-Property sewer pipe will be based on peak dry-weather flow d/D ratio of 0.60 for pipes larger than fifteen (15) inches diameter.

7.05 Traffic Improvements.

(a) Obligation to Construct Village Streets solely on Master Developer. Master Developer is obligated to, and shall design and construct all Village Streets subject to Section 7.04 (b), as indicated in the Master Traffic Study. Master Developer acknowledges and agrees that this obligation shall not be delegated to, transferred to or completed by any Designated Builder.

(b) Traffic Signal Improvements. Master Developer or Designated Builders shall comply with Ordinance 5644 (Bill 2003-94), as amended from time to time by the City. The City, pursuant to Ordinance 5644, will construct the traffic signals identified in the Master Traffic Study when traffic signal warrants are sufficiently met in the opinion of the City Traffic Engineer.

(c) Updates. If required by the Director of Public Works, Master Developer or a Designated Builder shall submit and receive conditional approval of an update of the Master Traffic Study or a Designated Builder site specific traffic impact analysis prior to the approval of the following land use applications: tentative map (residential or commercial); site development plan review (multi-family or commercial); parcel map; or special use permit, but only if the applications propose land use, density, or entrances that substantially deviate from the approved Master Study or the development differs substantially in the opinion of the City Traffic Engineer from the assumptions of the approved Master Traffic Study . Additional public right-of-way may be required to accommodate such changes.

(d) Construction Phasing. Master Developer shall submit a phasing plan and estimated sequence for all required On-Property and Off-Property street improvements as a part of the Master Traffic Study. City and Master Developer agree the phasing plan is fluid and is dictated by development. Accordingly, the phasing plan may be modified based on the proposed development in the Community.

(e) Skye Canyon Engineered Details. Skye Canyon Design Guidelines shall include engineered details for each public street type, private street type, alley type, trail type, sidewalk type, path type or other roadways or pedestrian travel paths that differ from the City's Standard Drawings for the City's review and approval.

(f) Timing of Subdivision Improvements. Civil improvement plans for construction upon a Designated Builder Parcel may be submitted to Public Works after all of the following have occurred:

(i) conditional approval or concurrent with second submittal of a Technical Drainage Study for a Designated Builder Parcel;

(ii) if required by the Public Works Director, approval or concurrent with second submittal of a traffic study for a Designated Builder Parcel;

(iii) approval of a tentative map or site development plan review for the Designated Builder Parcel, as applicable; and

(iv) submittal upon receipt of first review for the master infrastructure of the civil improvement plans to the City for the surrounding master infrastructure.

Surrounding master infrastructure civil improvement plans for infrastructure that required to provide service to the builder parcel must be approved prior to or concurrent with approval of civil

improvement plans for the Designated Builder Parcel. Infrastructure that is adjacent to but not utilized by the builder parcel shall be required in compliance with Section 3.04(c).

(g) School Flashers. The installation of school flashers' foundations, poles, and underground infrastructure in front of any schools is the responsibility of the Master Developer. The school flasher equipment shall be provided and installed by CCSD.

7.06 Sheep Mountain Parkway. The City has planned the future Sheep Mountain Parkway, as depicted on Exhibit "J". In exchange for a negotiated reduction in and realignment of the Sheep Mountain Parkway footprint, the Master Developer shall:

- (i) pay for the engineering design of the new Sheep Mountain Parkway alignment as shown on Exhibit "J";
- (ii) construct the interim improvements of Sheep Mountain Parkway from Grand Teton Road to Iron Mountain Road. Interim improvements shall be guaranteed through one of the allowable methods in Code prior to the approval of construction drawings. The interim improvements must provide access acceptable to NV Energy to all high voltage transmission power poles and distribution facilities. The Master Developer shall not be required to relocate or adjust the high voltage transmission power pole near station 180 of the proof of concept plans in Exhibit "J"; however, any cost associated with any other high voltage transmission power lines or poles and distribution facilities that need to be adjusted or relocated as a result of constructing the ultimate grading or interim improvements shall be paid by the Master Developer.
- (iii) Master Developer shall grade Sheep Mountain Parkway from Grand Teton Road to Iron Mountain Road to the ultimate facility width pursuant to Exhibit "J" and shall construct the interim improvement pavement depth to match the section used for Shaumber Road as shown on Exhibit "O". The Master Developer shall construct and maintain sound walls as required by the City and shall construct retaining walls with the ultimate grading where such retaining walls are required to avoid high voltage transmission power pole adjustments or relocations. The Director of Public Works shall have sole, reasonable discretion to determine the southern or northern limits of the ultimate grading for Sheep

Mountain Parkway between Grand Teton Drive and Iron Mountain Road;

- (iv) Master Developer shall comply with all dust control requirements while grading and paving Sheep Mountain Parkway from Grand Teton Road to Iron Mountain Road until it is dedicated to the City. The City shall accept responsibility for dust control after the acceptance and the dedication of said portion of Sheep Mountain Parkway;
- (v) Master Developer shall commence construction of the interim improvements of Sheep Mountain Parkway from Grand Teton Road to Iron Mountain Road prior to the approval of entitlements for any Designated Builder Parcels immediately adjacent to the ultimate right-of-way for the Sheep Mountain Parkway alignment except on Parcel 2.35 on the Master Land Use Plan. However, if a determination is made by the BLM that certain activities must commence in order to retain grants needed for Sheep Mountain Parkway, the Master Developer shall comply with certain BLM requirements for retaining BLM grants associated with Sheep Mountain Parkway. With the City's assistance, Master Developer shall comply with BLM's administrative requirements to retain the BLM grants associated with Sheep Mountain Parkway. If the BLM requires certain construction activities, beyond the interim improvements within the Community, to retain the BLM grants associated with Sheep Mountain Parkway, then Master Developer along with the City's assistance shall construct the proposed twelve (12) foot trail as shown on Exhibit "O" from Iron Mountain Road to Kyle Canyon Road. Master Developer will not be responsible for any other construction requirements required by BLM that exceed Master Developer's requirements under this Agreement;
- (vi) The interim improvements of Sheep Mountain Parkway from Grand Teton Road to Iron Mountain Road shall be constructed all at once and completed by February 13, 2020;
- (vii) Master Developer dedicated and granted necessary rights-of-way and easements for embankment slopes to the City for the ultimate Sheep Mountain Parkway alignment, in accordance with Exhibit "J", prior to the recordation of any maps abutting the Sheep Mountain Parkway alignment; and

Interim plans included the new cross section and intersection flaring with 300-foot long

left turn lanes at the intersections of Iron Mountain and Grand Teton plus all traffic signal foundations and underground infrastructure including empty signal cabinets and a power source for each intersection to illuminate intersections and prepare them for future signals. Master Developer shall also construct permanent detention basins along the Puli Road alignment in accordance with the Master Studies and the approval of the Public Works Director. The Property was encumbered by BLM N-77772 and pursuant to Exhibit "J" this grant was vacated on April 12, 2018 through document 20180412:01039. The City will follow the Applicable Rules for any Property proposed for Sheep Mountain Parkway that is to be vacated.

7.07 [Intentionally omitted.]

7.08 Flood Control.

(a) Obligation to Construct Flood Control Facilities solely on Master Developer. Master Developer shall design and construct flood control facilities that are identified as Master Developer's responsibility in the Master Drainage Study. Master Developer acknowledges and agrees that this obligation shall not be delegated to, transferred to or completed by any Designated Builder.

(b) Other Governmental Approvals. The Clark County Regional Flood Control District, the Nevada Department of Transportation and any other state or federal agencies, as required, shall approve the Master Drainage Study prior to final approval from City. Clark County Department of Public Works shall receive a copy of the Master Drainage Study and shall have the opportunity to comment.

(c) Updates. The Director of Public Works may require an update to the Master Drainage Study or Master Technical Study as a condition of approval of the following land use applications: tentative map, residential or commercial; site development plan review, multifamily or commercial; or parcel map if those applications are not in substantial conformance with the approved Master Land Use Plan or Master Drainage Study. The update must be approved prior to the approval of any construction drawings and the issuance of any final grading permits. An update to the exhibit in the approved Master Drainage Study depicting proposed development phasing in accordance with the Development Agreement shall be submitted for approval by the Flood Control Section.

(d) Regional Flood Control Facility Construction by Master Developer. The Master

Developer agrees to design and substantially complete the Clark County Regional Flood Control District facilities as defined in the Master Drainage Study pursuant to an amendment to the Regional Flood Control District 2008 Master Plan Update prior to the final inspection of the first unit within each area protected by the appropriate drainage facility.

(i) Currently, a portion of Parcel 5.06, as depicted on the Master Land Use Plan attached as Exhibit "F", is reserved by City for future flood control needs in addition to Parcels 5.07 and 5.08. The Master Developer shall not file and the City shall not accept any applications from the Master Developer for land use entitlements or mapping actions for that portion of Parcel 5.06 reserved by City for future flood control needs. However, if City agrees that all or a portion of the reserved Property on Parcel 5.06 is not necessary for the City's flood control measures, then upon City's written notification to Master Developer of its release of any portion of Parcel 5.06 that is not needed for the City's flood control measures, said portion of Parcel 5.06 may be developed in accordance with the land use category shown on the Master Land Use Plan. Upon the City's release of its reservation of that portion of Parcel 5.06, the City may accept applications from the Master Developer for land use entitlements or mapping actions for that portion of the Property that had been reserved by the City for flood control.

(ii) A regional MPU facility from Skye Village Road east across US 95, as depicted in Exhibit "P" hereof, will be constructed with a combination of public and private monies ("MPU Facility"). The Master Developer shall pay for the design of the MPU Facility as defined in the Master Drainage Study pursuant to an amendment to the Regional Flood Control District 2008 Master Plan Update.

The City agrees to review and provide comments or approval to any design submittals for the MPU Facility within six (6) weeks from the date of submittal. The Master Developer shall pay for the construction of the MPU Facility from Skye Village Road to the US 95 crossing, and the MPU Facility from the US 95 crossing to the intersection of N. Skye Canyon Park Drive and Moccasin Road including the interim collection facility on the west side of US 95 (within Skye Canyon), and any additional portion of the MPU Facility located within the Skye Canyon and/or Eastland communities, with the exception of those portions of the MPU Facility the construction of which is to be paid for by the City pursuant to this subsection (ii), as further identified on Exhibit "P". Because the MPU Facility is a regional facility that will benefit both upstream and downstream property owners and the City, the City shall pay for the

construction of the MPU Facility crossing under US 95, and the MPU Facility from the intersection of N. Skye Canyon Park Drive and Moccasin Road to the outfall location East on Moccasin to the existing Upper Las Vegas Wash MPU Facility. The Master Developer agrees, with City's assistance, to update and add the MPU Facility to the Regional Master Plan and the City agrees to prioritize affected facilities and update the 10 Year Construction Program after the approval of the Master Plan Amendment. The City understands that the Master Developer and the Master Developer of the Eastland Master Planned Community have entered into a separate private agreement for the construction of the MPU Facilities.

If required by the Master Drainage Study or technical drainage studies, the above facilities or portions thereof shall be constructed prior to issuance of any building permits for affected downstream units or alternate flood protection or mitigation acceptable to City must be provided. In the event that the City's construction timing is not consistent with Master Developer's, the Master Developer shall modify connection point designs at Moccasin Road and North Skye Canyon Drive, as approved by the City Engineer. Notwithstanding the foregoing, in the event that Master Developer has fulfilled its abovementioned obligations with respect to the design and construction of the MPU Facility, but the City has not, the City shall not withhold, delay or further condition its issuance of any building permits and/or approvals requested by Master Developer for its desired development of the Community on the basis of the MPU Facility being incomplete.

(e) Construction Phasing. The phasing plan and schedule shown in Exhibit "Q" clearly identifies drainage facilities (interim or permanent) necessary prior to permitting any Designated Builder Parcels for construction. Permits for development within Designated Builder Parcels shall not be issued if the associated master plan facilities shown on Exhibit "Q" are not under construction. Permits for development within Designated Builder Parcels may be issued if the associated master plan facilities shown on Exhibit "Q" are under construction, however final inspections or certificates of occupancy shall not be issued until the City considers the associated master plan facilities shown on Exhibit "Q" to be substantially complete.

SECTION EIGHT

SPECIAL IMPROVEMENT DISTRICT

8.01 Special Improvement District. City agrees to consider and, if appropriate, process and

facilitate, with due diligence, any applications made by Master Developer for the creation of a special improvement district. If a request to create a special improvement district is made by Master Developer, the Parties agree to utilize the City's Master Developer Special Improvement District Guidelines, which are attached hereto at Exhibit "E." City shall cooperate with the Master Developer to include all eligible projects for a special improvement district. The Parties agree that nothing contained in this Section or elsewhere in this Agreement constitutes in any way a pre-approval or authorization of any such special improvement district and any special improvement district must be processed and approved pursuant to State law and the Applicable Rules.

SECTION NINE

REVIEW OF DEVELOPMENT

9.01 Frequency of Reviews. As provided by NRS Chapter 278, Master Developer shall appear before the City Council to review the development of the Community. The Parties agree that the first review occur no later than twenty-four (24) months after the Effective Date of this Agreement, and again every twenty-four (24) months on the anniversary date of that first review thereafter, or as otherwise requested by City upon fourteen (14) days written notice to Master Developer. For any such review, Master Developer shall provide, and City shall review, a report submitted by Master Developer documenting the extent of Master Developer's and City's material compliance with the terms of this Agreement during the preceding period.

The report shall contain information regarding the progress of development within the Community, including, without limitation:

- (a) data showing the total number of residential units built and approved on the date of the report;
- (b) specific densities within each subdivision and within the Community as a whole; and
- (c) the status of development within the Community and the anticipated phases of development for the next calendar year.

In the event Master Developer fails to submit such a report within thirty (30) days following written notice from City that the deadline for such a report has passed, Master Developer shall be in default of

this provision and City shall prepare such a report and conduct the required review in such form and manner as City may determine in its sole discretion. City shall charge Master Developer for its reasonable expenses, fees and costs incurred in conducting such review and preparing such report. If at the time of review an issue not previously identified in writing is required to be addressed, the review at the request of either party may be continued to afford reasonable time for response

9.02 Opportunity to be heard. The report required by this Section shall be considered solely by the City Council. Master Developer shall be permitted an opportunity to be heard orally and in writing before the City Council regarding performance of the Parties under this Agreement. The Director of the Department of Planning may, in their discretion, provide copies of the report to members of City's Planning Commission for their information and use.

9.03 Action by the City Council. At the conclusion of the public hearing on the review, the City Council may take any action permitted by NRS 278.0205 and/or this Agreement.

SECTION TEN

DEFAULT

10.01 Opportunity to Cure; Default. In the event of any noncompliance with any provision of this Agreement, the Party alleging such noncompliance shall deliver to the other by certified mail a ten (10) day notice of default and opportunity to cure. The time of notice shall be measured from the date of receipt of the certified mailing. The notice of noncompliance shall specify the nature of the alleged noncompliance and the manner in which it may be satisfactorily corrected, during which ten (10) day period the party alleged to be in noncompliance shall not be considered in default for the purposes of termination or institution of legal proceedings.

If the noncompliance cannot reasonably be cured within the ten (10) day cure period, the non-compliant Party may timely cure the noncompliance for purposes of this Section 10 if it commences the appropriate remedial action within the ten (10) day cure period and thereafter diligently prosecutes such action to completion within a period of time acceptable to the non-breaching Party. If no agreement between the Parties is reached regarding the appropriate timeframe for remedial action, the cure period shall not be longer than thirty (30) days from the date the ten (10) day notice of noncompliance and opportunity to cure was mailed by the non-compliant Party.

If the noncompliance is corrected, then no default shall exist and the noticing Party shall take no further action. If the noncompliance is not corrected within the relevant cure period, the non-complaint Party is in default, and the Party alleging non-compliance may declare the breaching Party in default and elect any one or more of the following courses.

(a) Option to Terminate. After proper notice and the expiration of the above-referenced period for correcting the alleged noncompliance, the Party alleging the default may give notice of intent to amend or terminate this Agreement as authorized by NRS Chapter 278. Following any such notice of intent to amend or terminate, the matter shall be scheduled and noticed as required by law for consideration and review solely by the City Council.

(b) Amendment or Termination by City. Following consideration of the evidence presented before the City Council and a finding that a default has occurred by Master Developer and remains uncorrected, City may amend or terminate this Agreement. Termination shall not in any manner rescind, modify, or terminate any vested right in favor of Master Developer, as determined under the Applicable Rules, existing or received as of the date of the termination. Master Developer shall have twenty-five (25) days after receipt of written notice of termination to institute legal action pursuant to this Section to determine whether a default existed and whether City was entitled to terminate this Agreement.

(c) Termination by Master Developer. In the event City substantially defaults under this Agreement, Master Developer shall have the right to terminate this Agreement after the hearing set forth in this Section. Master Developer shall have the option, in its discretion, to maintain this Agreement in effect, and seek to enforce all of City's obligations by pursuing an action pursuant to Section 10.03.

10.02. Unavoidable Delay; Extension of Time. Neither party hereunder shall be deemed to be in default, and performance shall be excused, where delays or defaults are caused by war, insurrection, strikes, walkouts, riots, floods, earthquakes, fires, casualties, or acts of God. If written notice of any such delay is given to one Party or the other within thirty (30) days after the commencement thereof, an automatic extension of time, unless otherwise objected to by the party in receipt of the notice within thirty (30) days of such written notice, shall be granted coextensive with the period of the enforced delay, or longer as may be required by circumstances or as may be subsequently agreed to between City and Master Developer. Any such extensions of time shall have no effect upon the timing of and the

conclusions reached in the reviews to be conducted pursuant to Section 9 above.

10.03. Limitation on Monetary Damages. City and the Master Developer agree that they would not have entered into this Agreement if either were to be liable for monetary damages based upon a breach of this Agreement or any other allegation or cause of action based upon or with respect to this Agreement. Accordingly, City and Master Developer (or its permitted assigns) may pursue any course of action at law or in equity available for breach of contract, except that neither Party shall be liable to the other or to any other person for any monetary damages based upon a breach of this Agreement or any other allegation or cause of action based upon or with respect to this Agreement.

10.04. Venue. Jurisdiction for judicial review under this Agreement shall rest exclusively with the Eighth Judicial District Court, County of Clark, State of Nevada or the United States District Court, District of Nevada.

10.05. Waiver. Failure or delay in giving notice of default shall not constitute a waiver of any default. Except as otherwise expressly provided in this Agreement, any failure or delay by any party in asserting any of its rights or remedies in respect of any default shall not operate as a waiver of any default or any such rights or remedies, or deprive such party of its right to institute and maintain any actions or proceedings that it may deem necessary to protect, assert, or enforce any of its rights or remedies.

10.06. Applicable Laws; Attorneys' Fees. This Agreement shall be construed and enforced in accordance with the laws of the State of Nevada. Each party shall bear its own attorneys' fees and court costs in connection with any legal proceeding hereunder.

SECTION ELEVEN

GENERAL PROVISIONS

11.01. Duration of Agreement. The Term of this Agreement shall commence upon the Effective Date and shall expire on the twentieth (20th) anniversary of the Effective Date, unless terminated earlier pursuant to the terms hereof. City agrees that the Master Developer shall have the right to request extension of the Term of this Agreement for an additional five (5) years upon the following conditions:

(a) Master Developer provides written notice of such extension to City at least one hundred-eighty (180) days prior to the expiration of the original Term of this Agreement;

(b) Master Developer is not in default of this Agreement; and

(c) Master Developer and City enter into an amendment to this Agreement memorializing the extension of the Term.

11.02. Assignment.

The Parties acknowledge that the intent of this Agreement is that there is a Master Developer responsible for all of the obligations in this Agreement throughout the Term of this Agreement.

(a) Assignments, Generally. At any time during the Term, Master Developer and its successors-in-interest shall have the right to sell, assign or transfer all of its rights, title and interests to this Agreement (a "Transfer") to any person or entity (a "Transferee"). Except in regard to Transfers to Pre-Approved Transferees (which does not require any consent by the City as provided in Section 11.02(b) below), prior to consummating any Transfer, Master Developer shall obtain from the City written consent to the Transfer as provided for in this Section 11, which consent shall not be unreasonably withheld, delayed or conditioned. Master Developer's written request shall provide reasonably sufficient detail and any non-confidential, non-proprietary supporting evidence necessary for the City to consider and respond to Master Developer's request. Master Developer shall provide information to the City that Transferee, its employees, consultants and agents (collectively "Transferee Team") has: (i) the financial resources necessary to develop the Community, in accordance with the terms and conditions of this Agreement, or (ii) experience and expertise in developing projects similar in scope to the Community. The Master Developer's request, including approval of the Assignment and Assumption Agreement reasonably acceptable to the City, shall be promptly considered by the City Council for their approval or denial within forty-five (45) days from the date the City receives Master Developer's written request. Upon City's approval and the full execution of an Assignment and Assumption Agreement by City, Master Developer and Transferee, the Transferee shall thenceforth be deemed to be the Master Developer and responsible for all of the obligations in this Agreement.

(b) Pre-Approved Transferees. Notwithstanding anything in this Agreement to the contrary, the following Transferees constitute "Pre-Approved Transferees," for which no City consent shall be required provided that such Pre-Approved Transferees shall assume in writing all obligations of the Master Developer hereunder by way of an Assignment and Assumption Agreement. The Assignment and

Assumption Agreement shall be approved by the City Manager, whose approval shall not be unreasonably withheld, delayed or conditioned. The Assignment and Assumption Agreement shall be executed by the Master Developer and Pre-Approved Transferee and acknowledged by the City Manager. The Pre-Approved Transferee shall thenceforth be deemed to be the Master Developer and be responsible for all of the obligations in this Agreement.

1) An entity owned or controlled by Master Developer or its Affiliates;

2) Any Investment Firm that does not plan to develop the Property. If Investment Firm desires to: (i) develop the Property, or (ii) Transfer the Property to a subsequent Transferee that intends to develop the Property, the Investment Firm shall obtain from the City written consent to: (i) commence development, or (ii) Transfer the Property to a subsequent Transferee that intends to develop the Property, which consent shall not be unreasonably withheld, delayed or conditioned. Investment Firm's written request shall provide reasonably sufficient detail and any non-confidential, non-proprietary supporting evidence necessary for the City Council consider. Investment Firm shall provide information to the City that Investment Firm or Transferee and their employees, consultants and agents (collectively "Investment Firm Team" and "Transferee Team", respectively) that intends to develop the Property has: (i) the financial resources necessary to develop the Community, in accordance with the terms and conditions of this Agreement, or (ii) experience and expertise in developing projects similar in scope to the Community. The Investment Firm's request, including approval of the Assignment and Assumption Agreement reasonably acceptable to the City, shall be promptly considered by the City Council for their approval or denial within forty-five (45) days from the date the City receives Master Developer's written request. Upon City's approval and full execution of an Assignment and Assumption Agreement by City, Investment Firm and Transferee, the Transferee shall thenceforth be deemed to be the Master Developer and responsible for the all of the obligations in this Agreement.

(c) In Connection with Financing Transactions. Master Developer has full and sole discretion and authority to encumber the Property or portions thereof, or any improvements thereon, in connection with financing transactions, without limitation to the size or nature of any such transaction, the amount of land involved or the use of the proceeds therefrom, and may enter into such transactions at any time and from time to time without permission of or notice to City. All such financing transactions shall

be subject to the terms and conditions of this Agreement.

11.03. Sale or Other Transfer Not to Relieve the Master Developer of its Obligation. Except as expressly provided herein in this Section 11, no sale or other transfer of the Property or any subdivided development parcel shall relieve Master Developer of its obligations hereunder, and such assignment or transfer shall be subject to all of the terms and conditions of this Agreement, provided, however, that no such purchaser shall be deemed to be the Master Developer hereunder. This Section shall have no effect upon the validity of obligations recorded as covenants, conditions, restrictions or liens against parcels of real property.

11.04 Indemnity; Hold Harmless. Except as expressly provided in this Agreement, the Master Developer shall hold City, its officers, agents, employees, and representatives harmless from liability for damage or claims for damage for personal injury, including death and claims for property damage which may arise from the direct or indirect operations of Master Developer or those of its contractors, subcontractors, agents, employees, or other persons acting on Master Developer's behalf which relate to the development of the Community. Master Developer agrees to and shall defend City and its officers, agents, employees, and representatives from actions for damages caused or alleged to have been caused by reason of Master Developer's activities in connection with the development of the Community. Master Developer and City agree to equally pay all costs and attorneys fees for a defense in any legal action filed in a court of competent jurisdiction by a third party alleging any such claims or challenging the validity of this Agreement, except for a defense in any legal action related to waiver of proximity restrictions specified in the UDC between Alcohol Related Uses and other Alcohol Related Uses and between Alcohol Related Uses and parks and/or schools. The provisions of this Section shall not apply to the extent such damage, liability, or claim is proximately caused by the intentional or negligent act of City, its officers, agent, employees, or representatives. This section shall survive any termination of this Agreement.

11.05. Binding Effect of Agreement. Subject to Section 11.02, the burdens of this Agreement bind, and the benefits of this Agreement inure to, the Parties' respective assigns and successors-in-interest and the property which is the subject of this Agreement.

11.06 Relationship of Parties. It is understood that the contractual relationship between City and

Master Developer is such that Master Developer is not an agent of City for any purpose and City is not an agent of Master Developer for any capacity.

11.07 Counterparts. This Agreement may be executed at different times and in multiple counterparts, each of which shall be deemed an original, but all of which together shall constitute one and the same instrument. Any signature page of this Agreement may be detached from any counterpart without impairing the legal effect to any signatures thereon, and may be attached to another counterpart, identical in form thereto, but having attached to it one or more additional signature pages. Delivery of a counterpart by facsimile or portable document format (pdf) through electronic mail transmission shall be as binding an execution and delivery of this Agreement by such Party as if the Party had delivered an actual physical original of this Agreement with an ink signature from such Party. Any Party delivering by facsimile or electronic mail transmission shall promptly thereafter deliver an executed counterpart original hereof to the other Party.

11.08 Notices. All notices required or permitted under this Agreement shall be given in writing and shall be deemed effectively given (a) upon personal delivery to the party to be notified, (b) three (3) days after deposit with the United States Post Office, by registered or certified mail, postage prepaid and addressed to the party to be notified at the address for such party, (c) one (1) day after deposit with a nationally recognized air courier service such as FedEx; or (d) an electronic record sent by e-mail pursuant to NRS 719.240. Either party hereto may change its address by giving ten (10) days advance notice to the other party as provided herein. Phone and fax numbers, if listed, are for information only.

If to City:

City of Las Vegas
495 South Main Street
Las Vegas, Nevada 89101
Attention: City Manager
Attention: Director of the Department of
Planning

If to Master Developer:

KAG Property, LLC c/o
R. Brett Goett, Esq.
7001 N. Scottsdale Road, Ste. 1040
Scottsdale, AZ 85253

With a copy to
Development Manager:

Ninety Five Management, LLC
11411 Southern Highlands Pkwy., Suite 300
Las Vegas, NV 89141

And a copy to:

Robert Gronauer
Kaempfer Crowell
1980 Festival Plaza, Suite 650
Las Vegas, NV 89135

11.09 Entire Agreement. This Agreement constitutes the entire understanding and agreement of the Parties. This Agreement integrates all of the terms and conditions mentioned herein or incidental hereto and supersedes all negotiations or previous agreements between the Parties with respect to all of any part of the subject matter hereof.

11.10 Waivers. All waivers of the provisions of this Agreement shall be in writing and signed by the appropriate officers of Master Developer or approved by the City Council, as the case may be.

11.11 Recording; Amendments. Promptly after execution hereof, an executed original of this Agreement shall be recorded in the Official Records of Clark County, Nevada. All amendments hereto must be in writing signed by the appropriate officers of City and Master Developer in a form suitable for recordation in the Official Records of Clark County, Nevada. Upon completion of the performance of this Agreement, a statement evidencing said completion, shall be signed by the appropriate officers of the City and Master Developer and shall be recorded in the Official Records of Clark County, Nevada. A revocation or termination shall be signed by the appropriate officers of the City or Master Developer and shall be recorded in the Official Records of Clark County, Nevada.

11.12 Headings; Exhibits; Cross References. The recitals, headings and captions used in this Agreement are for convenience and ease of reference only and shall not be used to construe, interpret, expand or limit the terms of this Agreement. All exhibits attached to this Agreement are incorporated herein by the references contained herein. Any term used in an exhibit hereto shall have the same meaning as in this Agreement unless otherwise defined in such exhibit. All references in this Agreement to sections and exhibits shall be to sections and exhibits to this Agreement, unless otherwise specified.

11.13 Release. Each residential lot shown on a recorded Subdivision Map within the Community shall be automatically released from the encumbrance of this Agreement without the necessity of executing or recording any instrument of release upon the issuance of a building permit for the construction of a residence thereon.

11.14 Severability of Terms. If any term or other provision of this Agreement is held to be

invalid, illegal or incapable of being enforced by any rule of law or public policy, all other conditions and provisions of this Agreement shall nevertheless remain in full force and effect, provided that the invalidity, illegality or unenforceability of such terms does not materially impair the Parties' ability to consummate the transactions contemplated hereby. If any term or other provision is invalid, illegal or incapable of being enforced, the Parties hereto shall, if possible, amend this Agreement so as to affect the original intention of the Parties.

11.15 Exercise of Discretion. Wherever a Party to this Agreement has discretion to make a decision, it shall be required that such discretion be exercised reasonably unless otherwise explicitly provided in the particular instance that such decision may be made in the Party's "sole" or "absolute" discretion or where otherwise allowed by applicable law.

11.16 No Third Party Beneficiary. This Agreement is intended to be for the exclusive benefit of the Parties hereto and their permitted assignees. Except as otherwise stated in Section 5.01, no third party beneficiary to this Agreement is contemplated and none shall be construed or inferred from the terms hereof. In particular, no person purchasing or acquiring title to land within the Community or residing in the Community shall, as a result of such purchase, acquisition or residence, have any right to enforce any obligation of Master Developer or City nor any right or cause of action for any alleged breach of any obligation hereunder by either party hereto.

11.17 Gender Neutral. In this Agreement (unless the context requires otherwise), the masculine, feminine and neutral genders and the singular and the plural include one another.

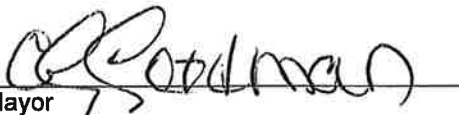
[Signatures on following pages]

In Witness Whereof, this Agreement has been executed by the Parties.

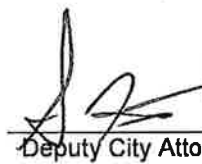
CITY:

CITY COUNCIL, CITY OF LAS VEGAS

By:


Mayor
Carolyn Goodman

Approved as to Form:


Seth T. Floyd
Deputy City Attorney
Deputy City Attorney 8/5/19

Attest:

City Clerk

By:


for LuAnn Holmes, City Clerk

MASTER DEVELOPER

KAG PROPERTY, LLC

By:

[Signature]

Name:

Garry V. Goett

Title:

Manager

In the County of CLARK, State of
NEVADA. On this 29th day of
JULY, 2019 before me, the
undersigned Notary Public personally appeared
GARRY V. GOETT, personally
known to me, proved to me through
documentary evidence, or identified by a credible
witness to be the person named in the foregoing,
and executed the same.

[Signature]
Notary Public Signature
HEATHER HUNTER
Printed Name

Commissioner Number

17-1487-1

My Commission expires: JANUARY 5,

2021



EXHIBITS

Exhibit "A"	Property Description
Exhibit "B"	Phasing Map
Exhibit "C"	Development Impact Notice and Assessment
Exhibit "D"	Parks Agreement
Exhibit "E"	Developer Special Improvement Guidelines
Exhibit "F"	Residential Land Use Table and Master Land Use Plan
Exhibit "G"	Master Drainage and Traffic Studies (on disk)
Exhibit "H"	Offsite Sewer Capacity Letter
Exhibit "I"	Telecommunication Facilities Map
Exhibit "J"	Sheep Mountain Parkway Right of Way
Exhibit "K"	Intentionally Omitted
Exhibit "L"	Village Street and Trail Section
Exhibit "M"	Skye Canyon Development Standards and Architectural Design Guidelines
Exhibit "N"	Skye Canyon Street Light Design
Exhibit "O"	Sheep Mountain Parkway Pavement Section
Exhibit "P"	MPU Exhibit
Exhibit "Q"	Flood Control Phasing Plan
Exhibit "R"	Arroyo Re-Design

Exhibit "S"	Unified Development Code
Exhibit "T"	Right-of-Way Encroachment License

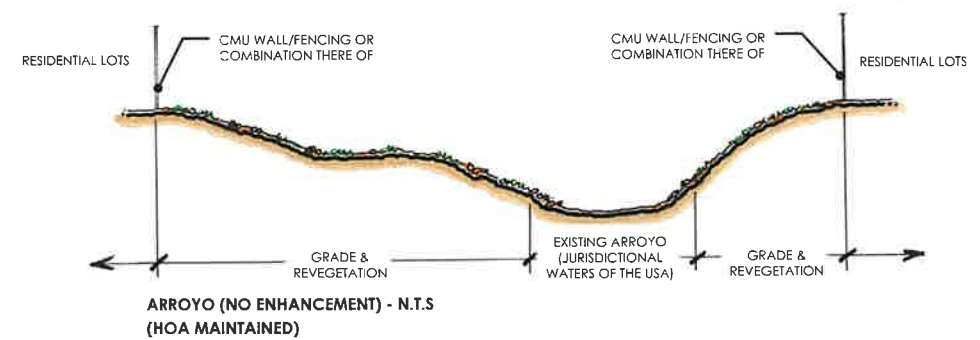
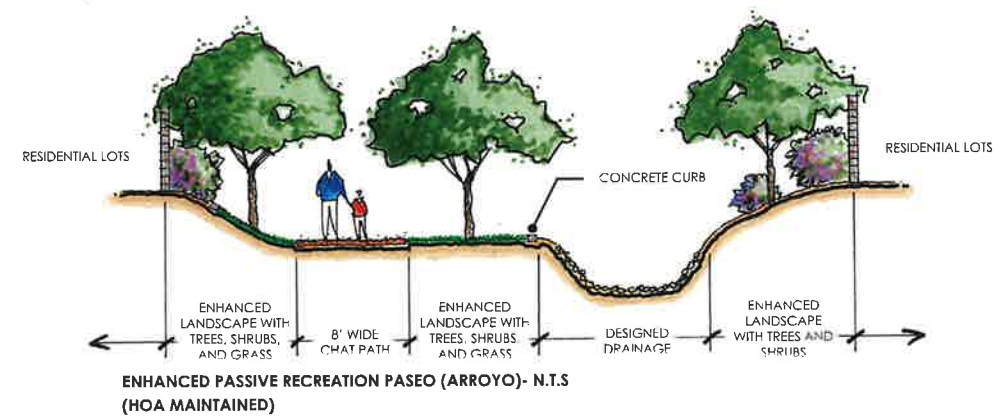
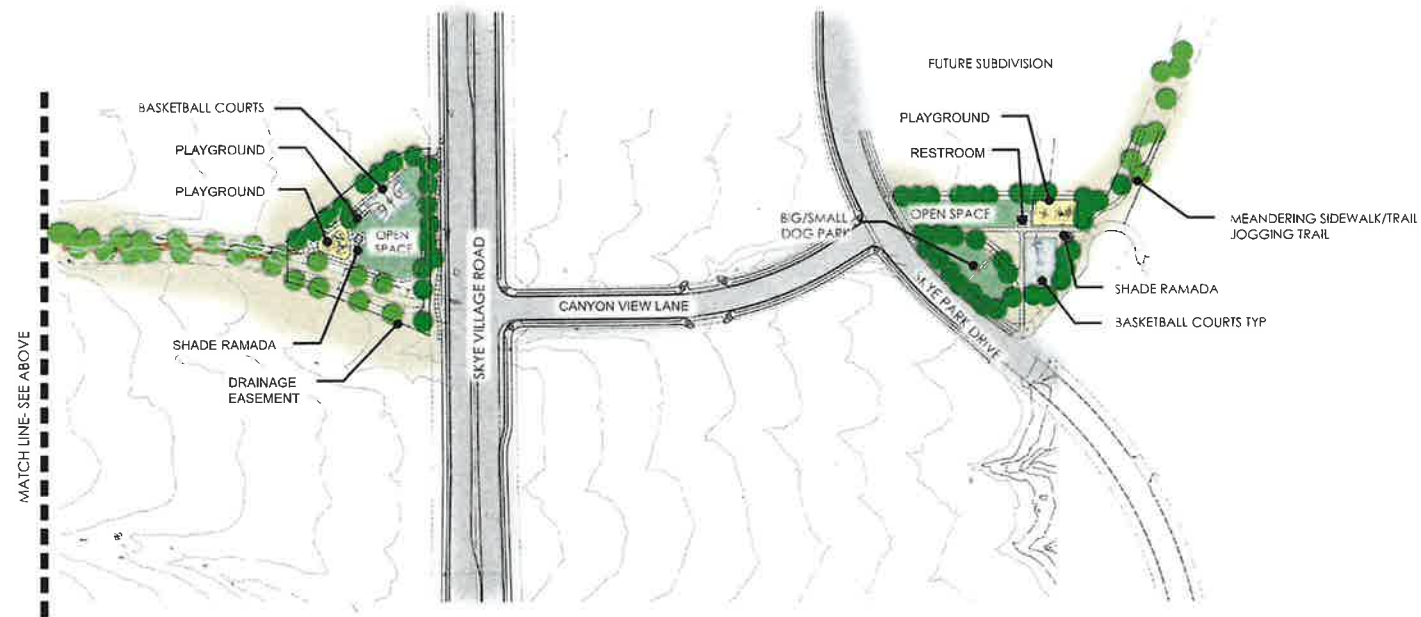
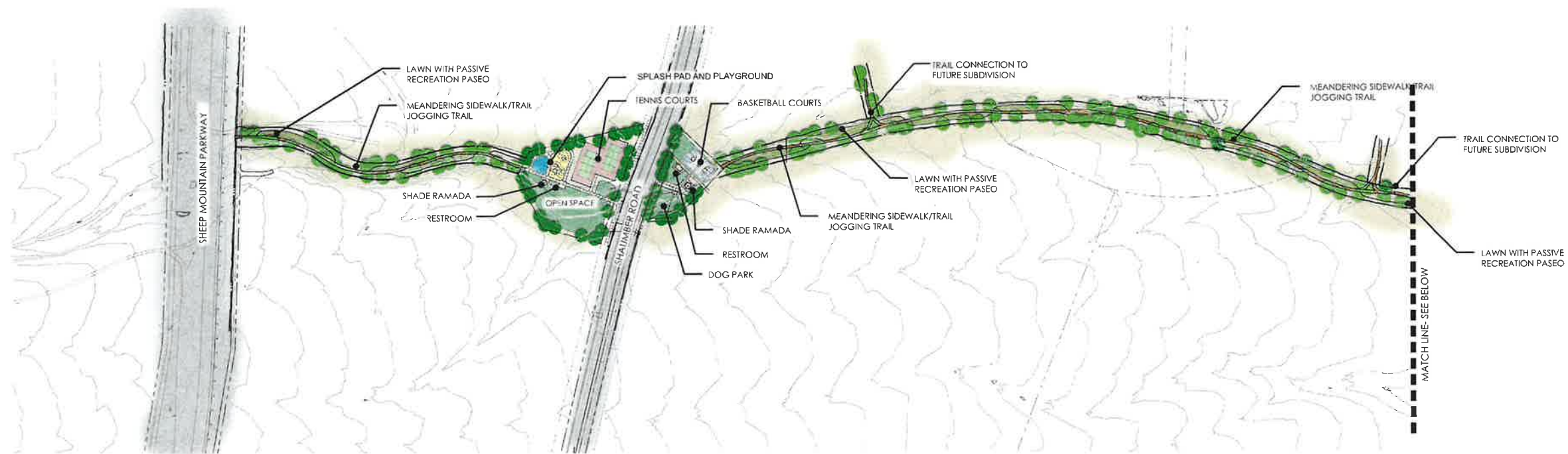


EXHIBIT R

SKYE CANYON- NORTH ARROYO
MAY 2nd, 2019

DONALD TEAL, R.L.A. NEVADA LICENSE #339. NOT FOR CONSTRUCTION

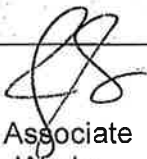


APPENDIX G

Reference Material

Skye Canyon Parcels 2.08 & 2.09
(DS05242)

Approval Letter

CITY OF LAS VEGAS			DATE:
INTER-OFFICE MEMORANDUM			June 2, 2020
TO: Land Development Services Department of Building & Safety			FROM: Jennifer Shinn, P.E.  Flood Control, Engr. Associate Department of Public Works
SUBJECT:	Drainage Study for:		COPIES TO:
	Skye Canyon Parcels 2.08 & 2.09		Westwood Professional Services
Cross Streets:	Skye Village Road and Skye Canyon Park Drive		Century Communities Nevada, LLC
File Number:	F:\Depot\DSMemos\DS05242C.doc		Bart Anderson, P.E., DevCo
Parcel Number:	126-12-501-004		CCRFCD
Zoning Action:	TMP-78129		
FEMA Flood Zone	YES	NO	X
Proposed Storm Drain	YES	X	NO

HISTORY	DATE RECEIVED	DATE REVIEWED	COMMENTS	REVIEW FEES	FEES PAID Payment Trn #
1 st Submittal	2/03/2020	2/24/2020	See Comments Below	\$400.00	3730987: \$400
2 nd Submittal	3/23/2020	4/14/2020	Conditionally Approved	\$400.00	3784959: \$400
3 rd Submittal	6/2/2020	6/2/2020	Concurrence Recv'd	N/C	N/A
			TOTAL FEES (LDDRS):	\$800.00	----

REMARKS:

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

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

- The study considers the Skye Canyon Phase 3A and 3B/C Infrastructure in place and functioning along with the upstream Skye Canyon Detention Basins 1 & 2 (DB1 and DB2). No occupancy permits within onsite 2.08/2.09 will be issued prior to the substantial completion of Phase 3A, and Phase 3B/C Infrastructure.
- Complete Grading Notes 18-20, referencing the existing storm drain facilities per Phase 1.

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

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

END OF REMARKS
JKS

T/R/S: T19S/R59E/S12
AREA F-12

Referenced Hydraulics

Project Description

Input Data

Station (ft)	Elevation (ft)
0+00.00	0.48
0+05.00	0.38
0+05.38	0.38
0+06.50	0.00
0+07.50	0.08
0+07.50	0.12
0+23.00	0.43

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 0.48)	(0+07.50, 0.08)	0.013
(0+07.50, 0.08)	(0+23.00, 0.43)	0.016

Options

Current Roughness weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Normal Depth	0.40	ft
Elevation Range	0.00 to 0.48	ft
Flow Area	2.62	ft²
Wetted Perimeter	17.86	ft
Hydraulic Radius	0.15	ft

Worksheet for Section 7

Results

Top Width	17.75	ft
Normal Depth	0.40	ft
Critical Depth	0.43	ft
Critical Slope	0.00652	ft/ft
Velocity	2.67	ft/s
Velocity Head	0.11	ft
Specific Energy	0.51	ft
Froude Number	1.23	
Flow Type	Supercritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.40	ft
Critical Depth	0.43	ft
Channel Slope	1.000	%
Critical Slope	0.00652	ft/ft

Cross Section for Section 7

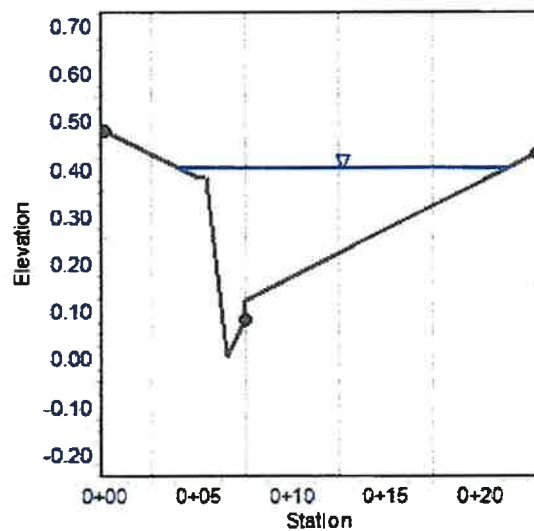
Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	1.000	%
Normal Depth	0.40	ft
Discharge	7.00	ft ³ /s

Cross Section Image



Worksheet for EO-3

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	3.700	%
Discharge	34.00	ft ³ /s

Section Definitions

Station (ft)	Elevation (ft)
0+00.00	0.15
0+07.50	0.00
0+15.00	0.15

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00.00, 0.15)	(0+07.50, 0.00)	0.013
(0+07.50, 0.00)	(0+15.00, 0.15)	0.013

Options

Current Roughness vweighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Normal Depth	0.33	ft
Elevation Range	0.00 to 0.15	ft
Flow Area	3.87	ft ²
Wetted Perimeter	15.37	ft
Hydraulic Radius	0.25	ft
Top Width	15.00	ft
Normal Depth	0.33	ft
Critical Depth	0.62	ft
Critical Slope	0.00327	ft/ft

Worksheet for EO-3

Results

Velocity	8.78	ft/s
Velocity Head	1.20	ft
Specific Energy	1.53	ft
Froude Number	3.04	
Flow Type	Supercritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.33	ft
Critical Depth	0.62	ft
Channel Slope	3.700	%
Critical Slope	0.00327	ft/ft

Cross Section for EO-3

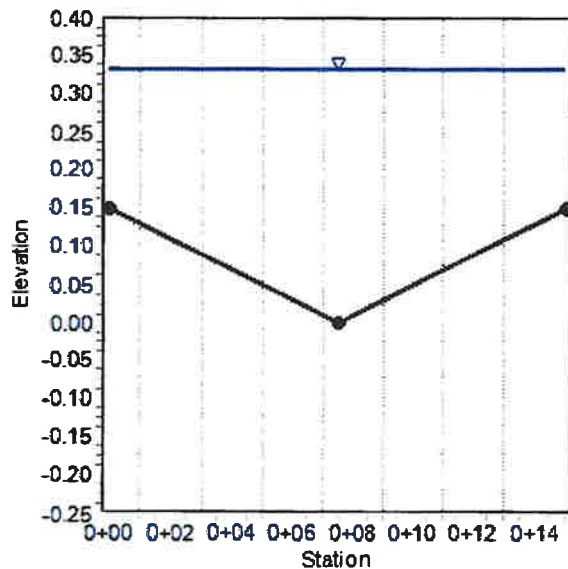
Project Description

Friction Method Manning Formula
Solve For Normal Depth

Input Data

Channel Slope	3.700	%
Normal Depth	0.33	ft
Discharge	34.00	ft ³ /s

Cross Section Image



Worksheet for EO-3W

Project Description

Solve For

Headwater Elevation

Input Data

Discharge		34.00	ft ³ /s
Crest Elevation		0.00	ft
Tailwater Elevation		0.33	ft
Crest Surface Type	Paved		
Crest Breadth		5.00	ft
Crest Length		15.00	ft

Results

Headwater Elevation	0.82	ft
Headwater Height Above Crest	0.82	ft
Tailwater Height Above Crest	0.33	ft
Weir Coefficient	3.06	US
Submergence Factor	1.00	
Adjusted Weir Coefficient	3.06	US
Flow Area	12.29	ft ²
Velocity	2.77	ft/s
Wetted Perimeter	16.64	ft
Top Width	15.00	ft

Cross Section for EO-3W

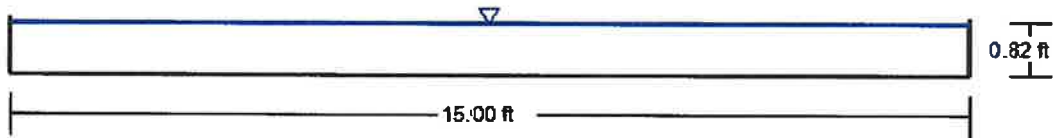
Project Description

Solve For Headwater Elevation

Input Data

Discharge		34.00	ft ³ /s
Headwater Elevation		0.82	ft
Crest Elevation		0.00	ft
Tailwater Elevation		0.33	ft
Crest Surface Type	Paved		
Crest Breadth		5.00	ft
Crest Length		15.00	ft

Cross Section Image



V: 1
H: 1

APPENDIX H

Reference Material

Skye Canyon 5.01 & 5.03

(DS5411)

Approval Letter

CITY OF LAS VEGAS		DATE:
INTER-OFFICE MEMORANDUM		March 31, 2021
TO: Land Development Services Department of Building & Safety		FROM: Jennifer Shinn, P.E. Flood Control, Engr. Associate Department of Public Works
SUBJECT:	Drainage Study for:	COPIES TO:
	Skye Canyon 5.01 & 5.03	Impulse
Cross Streets:	Shaumber Rd. & Iron Mountain Rd.	RCI Engineering
File Number:	F:\Depot\DSMemos\DS5411B.doc	Century Communities Nevada, LLC
Parcel Number:	126-12-511-001 & -003	Bart Anderson, P.E., DevCo
Zoning Action:	20-0296-TMP1	CCRFCFCD
FEMA Flood Zone	YES	NO X
Proposed Storm Drain	YES X	NO

HISTORY	DATE RECEIVED	DATE REVIEWED	COMMENTS	REVIEW FEES	FEES PAID Payment Trn #
1 st Submittal	1/19/2021	2/4/2021	See Comments Below	\$400.00	4135723: \$400
2 nd Submittal	3/10/2021	3/31/2021	Conditionally Approved	\$400.00	4199236: \$400
TOTAL FEES (LDDRS):				\$800.00	----

REMARKS:

***** The Conditional Approval of this Drainage Study is to allow the engineer/developer to submit the Improvement Plans to City Land Development Only.**

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

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

1. **This drainage study is acceptable in concept;** however, *City of Las Vegas* will not formally accept the study until the *Clark County Regional Flood Control District (CCRFCFCD)* has issued a letter of concurrence. The engineer should contact the CCRFCFCD to confirm that they have begun their review.
2. Label Section Detail 30/D-2 (Unit 3) as a "Public" Drainage Easement.

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

END OF REMARKS
HDR/JKS

T/R/S: T19S/R60E/S07
AREA G-07

Referenced Hydraulics

Outlet to Channel 10-year
Worksheet for Irregular Channel

SECTION 4

Project Description	
Project File	p:\clients\rc\lisky canyon phase 4\hydrology\lisky5.fm2
Worksheet	20-FOOT OUTLET TO CHANNEL
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

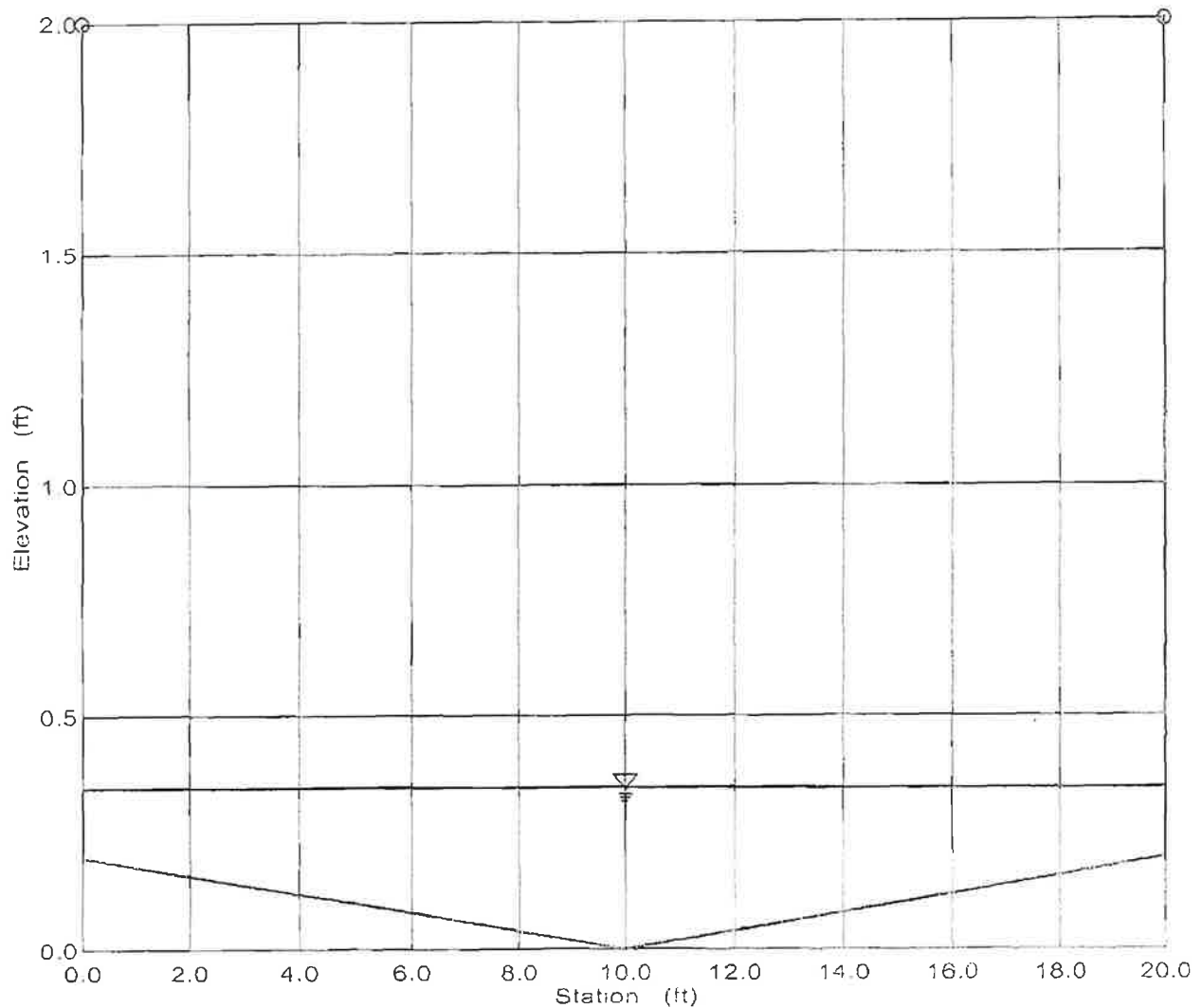
Input Data					
Channel Slope		0.010000 ft/ft			
Elevation range: 0.00 ft to 2.00 ft					
Station (ft)	Elevation (ft)	Start Station	End Station	Roughness	
0.00	2.00	0.00	20.00	0.013	
0.00	0.20				
10.00	0.00				
20.00	0.20				
20.00	2.00				
Discharge	22.00	cfs			

Results		
Wtd. Mannings Coefficient	0.013	
Water Surface Elevation	0.35	ft
Flow Area	4.94	ft ²
Wetted Perimeter	20.30	ft
Top Width	20.00	ft
Height	0.35	ft
Critical Depth	0.44	ft
Critical Slope	0.003658	ft/ft
Velocity	4.45	ft/s
Velocity Head	0.31	ft
Specific Energy	0.66	ft
Froude Number	1.58	
Flow is supercritical.		

Cross Section
Cross Section for Irregular Channel
SECTION 4

Project Description	
Project File	p:\clients\irc\liske canyon phase 4\hydrology\liske5.fm2
Worksheet	20-FOOT OUTLET TO CHANNEL
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Section Data	
Wtd. Mannings Coefficient	0.013
Channel Slope	0.010000 ft/ft
Water Surface Elevation	0.35 ft
Discharge	22.00 cfs



Outlet to Channel 100-year
Worksheet for Irregular Channel

SECTION 4

Project Description	
Project File	p:\clients\rci\skye canyon phase 4\hydrology\skye5.fm2
Worksheet	20-FOOT OUTLET TO CHANNEL
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Input Data					
Channel Slope		0.010000 ft/ft			
Elevation range: 0.00 ft to 2.00 ft.					
Station (ft)	Elevation (ft)	Start Station	End Station	Roughness	
0.00	2.00	0.00	20.00	0.013	
0.00	0.20				
10.00	0.00				
20.00	0.20				
20.00	2.00				
Discharge	48.00	cfs			

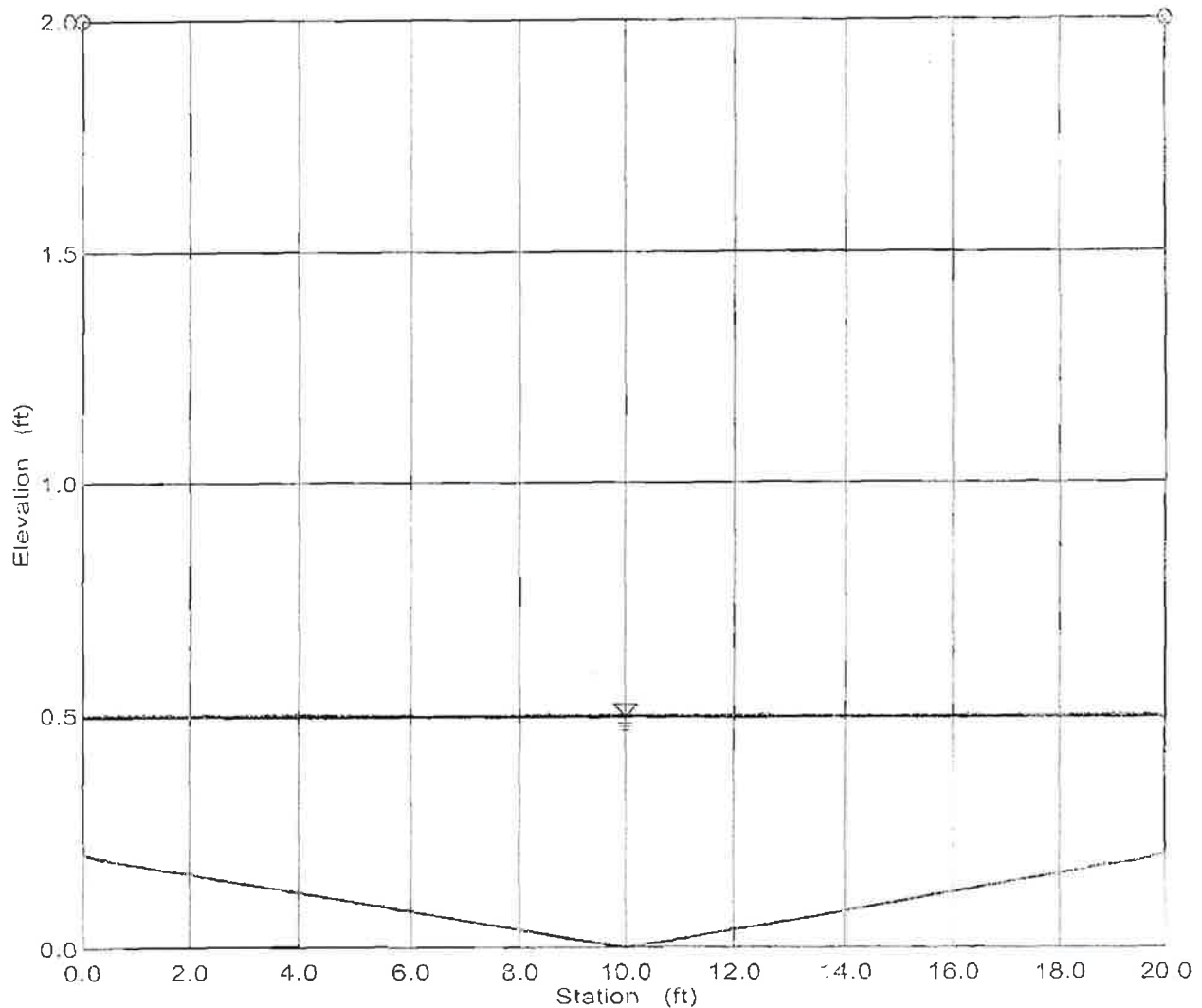
Results		
Wtd. Mannings Coefficient	0.013	
Water Surface Elevation	0.50	ft
Flow Area	7.93	ft ²
Wetted Perimeter	20.60	ft
Top Width	20.00	ft
Height	0.50	ft
Critical Depth	0.66	ft
Critical Slope	0.003168	ft/ft
Velocity	6.05	ft/s
Velocity Head	0.57	ft
Specific Energy	1.07	ft
Froude Number	1.69	
Flow is supercritical.		

Cross Section
Cross Section for Irregular Channel

SECTION 4

Project Description	
Project File	p:\clients\rci\skye canyon phase 4\hydrology\skye5.fm2
Worksheet	20-FOOT OUTLET TO CHANNEL
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Water Elevation

Section Data	
Wtd. Mannings Coefficient	0.013
Channel Slope	0.010000 ft/ft
Water Surface Elevation	0.50 ft
Discharge	48.00 cfs



APPENDIX I

Improvement Plans